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KOMRAT DEVLET UNİVERSİTETİ

Conferința științifico-practică
internațională
«Știință. Educație. Cultură»

«Bilim. Üretim. Kultura»
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konferençiyası

35-a ANIVERSARE A UNIVERSITĂȚII DE STAT DIN COMRAT CULEGERE DE ARTICOLE

VOLUMUL I

Științe economice
Tehnologii informaționale, matematică și fizică
Agricultură și industria alimentară
Drept și științe politice

KOMRAT DEVLET UNİVERSİTETİNİN 35-üncü YIL DÖNÜMÜ BİLİM YAZILARI TOPLUMU

TOM I

Ekonomika bilimneri
İnformaçiya tehnologiyaları, matematika hem fizika
Küü çorbacılı hem işletmä industriyası
Hak hem politika bilimneri

KOMRAT, 2026



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WELCOME ADDRESS OF THE RECTOR OF THE COMRAT STATE UNIVERSITY ON THE 35TH ANNIVERSARY OF THE UNIVERSITY'S FOUNDATION

Dear faculty, students, alumni, partners, distinguished guests and friends of Comrat State University!

On behalf of the Rector of Comrat State University, I am pleased to welcome you to the International Scientific and Practical Conference dedicated to a significant milestone — the 35th anniversary of our university. Thirty-five years is not just a period of time. It is a path of formation, development, and establishment of the university as an important educational and scientific center of the region. Over these years, Comrat State University has made significant progress in the field of research activities. We have successfully implemented a considerable number of scientific projects, created and developed modern research laboratories, and strengthened the scientific infrastructure. I would like to particularly highlight the growth of scientific productivity among our academic staff. Publications in international journals indexed in Scopus, the publication of monographs, active participation in international scientific projects and grants — all these testify to the high level of the university's academic potential. An important direction of our development has been internationalization. Participation in programs such as Erasmus+, Fulbright, and DAAD, as well as cooperation with foreign universities and research centers, opens new opportunities for students and faculty, promotes knowledge exchange, and facilitates the implementation of best practices. Our university takes pride in its academic staff. Over the years, many faculty members have successfully defended their doctoral and habilitation theses. Today, the university has developed its own scientific potential — specialists who actively conduct research, supervise undergraduate, master's, and doctoral theses, and shape a new generation of scholars

Dear conference participants! Today's event is not only a summary of achievements but also a look into the future. I am confident that the presentations, discussions, and exchange of experience will serve as a foundation for new ideas, joint projects, and scientific achievements. Allow me to wish all participants fruitful work, interesting scientific discoveries, inspiration, and new professional accomplishments. May the cooperation initiated or continued here bring tangible results and contribute to the development of science and education

Happy anniversary to our university! Congratulations to all of us!

Rector of Comrat State University, Associate Professor, PhD Serghei ZAHARIA



Conferința internațională științifico-practică în onoarea a 35-a aniversării a Universității de Stat Comrat

KOMRAT DEVLET UNİVERSİTETİNİN 35-ci YIL DÖNÜMÜNDƏ REKTORUN KARŞILAMA SÖZÜ

Saygılı üüretmenlerimiz, üürenicilerimiz, universiteti bitirən dostlarımız, ortaklarımız hem Komrat Devlet Universitetinin dostları!

Komrat Devlet Universitetinin rektoru adından universitetimizin 35ci yıl dönümünə adanmış Halklararası bilim-praktika konferençiyasının açılışında sizi selāmneerim! Otuz beş yıl! Dilä kolay söylemää. Ama bu yıllarda universitetin temeli koyuldu, gelişmää başladı, kaavileşti, üüseldi da, doorudan da, bilim hem üüretim merkezi oldu. Bu yılların içindä universitet çok ilerledi. Birliktä halklararası pek çok bilim projektlerini gerçekteştirdik, zamandaş üüretimi hem bilimin uurunu üüselттіk, bilim-aaraştırma laboratoriyalarını kurduk, bilimin altyapısını güçlendirdik. Özelliklä bizim üüretmenlerin bilim uurunda üüselmelerini söylemää isterim. Halklararası bilim jurnallarında, Scopus indeksli jurnallarda statyaların çıkması, monografiyalarının tiparlanması halklararası bilim projektlerinä, grantlarda hem simpoziumnara katılınar gösterer bizim üüretmenlerimizin üüsek uurunu. Bizim gelişimimizin önemni tarafı da internāionalizāiya oldu. Erasmus+, Fulbright, DAAD programalarına katılmamız, aşırılı universitetlärlän hem bilim merkezlerinnän işbirlii üüretmennär hem üürenicilər için çok yol açêr, bilim alış verişinä yardımcı olêr. Bizim bilim kadrolarımız bizim gururumuzdur! Bu yıllar içindä bizim üüretmenlerimizin çoyu doktor hem habilitat doktoru adını aldılar. Universitetimizin kendi bilim potēnialı formalaştı. Aaraştırma işini yapan bilimcilər, diplom projektlerini hem magistru hem doktorluk disertāiyalarını öneder, da bölä eni bilim kuşaanı hazırlêr.

Çok saygılı konferençiya katılımcıları! Bugün salt sonuçları açıklamêrız, büün gelecää dooru bakêrız, plan kurêrız! Bilerim, ani dokladlar, dartışmalar hem diskusiyalar eni ideyaların, projektlerin hem bilim başarılarının başlangıcı olacak. Her bir katılımcıya başarılar, bereketli çalışma hem ilham dileerim! Burada başadılan aaraştırmalar hem diskusiyalar Moldova biliminä hem dünnää biliminä uurlu olsun!

35-ci yılımız kutlu olsun!

*Komrat Devlet Universiteti Rektoru, İstoriya doktoru,
Konferençiar - Universitar, Serghei ZAKHARIA*



Conferința internațională științifico-practică în onoarea a 35-a aniversării a Universității de Stat Comrat

CUVÂNTUL DE SALUTARE AL RECTORULUI UNIVERSITĂȚII DE STAT COMRAT CU OCAZIA A 34-A ANIVERSARE A FONDĂRII UNIVERSITĂȚII

Stimați colegi, dragi oaspeți, studenți, absolvenți, stimați participanți ai conferinței științifice internațională cu participare practică!

În numele rectorului Universității de Stat din Comrat, am deosebita onoare să vă salut la Conferința științifică internațională cu participare practică, dedicată unei date remarcabile — cea de-a 35-a aniversare a universității noastre. Treizeci și cinci de ani nu reprezintă doar o perioadă de timp. Este un parcurs de formare, dezvoltare și afirmare a universității ca un important centru educațional și științific al regiunii. În acești ani, Universitatea de Stat din Comrat a înregistrat progrese semnificative în domeniul activității de cercetare științifică. Am reușit să realizăm un număr considerabil de proiecte științifice, să creăm și să dezvoltăm laboratoare moderne de cercetare, să consolidăm infrastructura științifică. Doresc să evidențiez în mod special creșterea productivității științifice a cadrelor noastre didactice. Publicațiile în reviste internaționale indexate în baza de date Scopus, editarea de monografii proprii, participarea activă la proiecte și granturi internaționale — toate acestea demonstrează nivelul înalt al potențialului academic al universității. Un domeniu important al dezvoltării noastre îl constituie internaționalizarea. Participarea în programele Erasmus+, Fulbright, DAAD, colaborarea cu universități și centre științifice din străinătate deschid noi oportunități pentru studenți și cadrele didactice, favorizează schimbul de cunoștințe și implementarea celor mai bune practici. Mândria universității o reprezintă resursa noastră umană științifică. De-a lungul anilor, mulți profesori au susținut cu succes teze de doctor și doctor habilitat. Astăzi, în universitate s-a format un potențial științific propriu — specialiști care desfășoară activități de cercetare activă, coordonează proiecte de licență, teze de master și doctorat, formând o nouă generație de Cercetători

Stimați participanți la conferință! Evenimentul de astăzi reprezintă nu doar un bilanț, ci și o privire spre viitor. Sunt convins că prezentările, discuțiile și schimbul de experiență vor constitui baza unor noi idei, proiecte comune și realizări științifice. Permiteți-mi să urez tuturor participanților mult succes în activitate, descoperiri științifice interesante, inspirație și noi realizări profesionale. Fie ca colaborarea inițiată sau continuată aici să aducă rezultate reale și să contribuie la dezvoltarea științei și educației

La mulți ani universității noastre! La mulți ani tuturor!

Rectorul Universității de Stat din Comrat, Serghei ZAHARIA, doctor, conferențiar universitar



Conferința internațională științifico-practică în onoarea a 35-a aniversării a Universității de Stat Comrat

**ПРИВЕТСТВИЕ РЕКТОРА КОМРАТСКОГО ГОСУДАРСТВЕННОГО
УНИВЕРСИТЕТА ПО ПОВОДУ 35-ОЙ ГОДОВЩИНЫ СО ДНЯ ОСНОВАНИЯ
УНИВЕРСИТЕТА**

Уважаемые коллеги, дорогие гости, уважаемые участники международной научно-практической конференции!

От имени ректора Комратского государственного университета рад приветствовать вас на Международной научно-практической конференции, посвящённой знаменательной дате — 35-летию нашего университета. Тридцать пять лет — это не просто отрезок времени. Это путь становления, развития и утверждения университета как важного образовательного и научного центра региона. За эти годы Комратский государственный университет уверенно продвинулся вперёд в сфере научно-исследовательской деятельности. Нам удалось реализовать значительное количество научных проектов, создать и развить современные исследовательские лаборатории, укрепить научную инфраструктуру. Особо хочу отметить рост научной продуктивности наших преподавателей. Публикации в международных журналах, индексируемых в базе Scopus, издание собственных монографий, активное участие в международных научных проектах и грантах — всё это свидетельствует о высоком уровне академического потенциала университета. Важным направлением нашего развития стала интернационализация. Участие в программах Erasmus+, Fulbright, DAAD, сотрудничество с зарубежными университетами и научными центрами открывают новые возможности для студентов и преподавателей, способствуют обмену знаниями и внедрению передовых практик. Гордостью университета являются наши научные кадры. За эти годы многие преподаватели успешно защитили диссертации на соискание учёных степеней доктора наук и доктора habilitation. Сегодня в университете сформирован собственный научный потенциал — специалисты, которые ведут активную исследовательскую работу, руководят дипломными проектами, магистерскими и докторскими диссертациями, формируя новое поколение учёных. Уважаемые участники конференции! Сегодняшнее мероприятие — это не только подведение итогов, но и взгляд в будущее. Уверен, что представленные доклады, дискуссии и обмен опытом станут основой для новых идей, совместных проектов и научных достижений. Позвольте пожелать всем участникам конференции плодотворной работы, интересных научных открытий, вдохновения и новых профессиональных достижений. Пусть сотрудничество, начатое или продолженное здесь, приносит реальные результаты и способствует развитию науки и образования.

С юбилеем наш университет! С праздником всех нас!

Ректор Комратского государственного университета, ЗАХАРИЯ С.К., доктор, конференциар-университар



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UDC 628.17: 338.246

**WATER FOOTPRINT: ORGANIZATIONAL AND ECONOMIC PRINCIPLES IN
THE CONTEXT OF “INDUSTRY 5.0”**

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Abstract. The water footprint is an economic and environmental instrument of sustainable development and reporting in the context of implementing EU directives on corporate sustainability reporting. This instrument contributes to addressing problems of freshwater scarcity and water quality degradation. The relationship between water footprint calculation and specific water consumption for berry production per unit of output is substantiated. Calculations of the impact of specific water consumption on production cost are carried out. Organizational principles for incorporating the water footprint into sustainability reporting in accordance with the European Sustainability Reporting Standards are proposed.

Keywords: water footprint, water use efficiency, specific water losses, agribusiness

Global economic processes intensify the issue of natural resource use for economic development on virtually all continents. At present, Ukraine’s agricultural sector is also exposed to critical factors caused by war and climate change. Changes in weather conditions (increase in air temperature, uneven precipitation distribution, inefficient moisture accumulation in soils, etc.) lead to an increase in the frequency and intensity of drought events both in Ukraine and in the Republic of Moldova. Along with globalization of the world economy, increasing anthropogenic pressure on the environment, growing food demand, and global conflicts over economic resources, climate change is accelerating. The combination of these factors and their synergy results in national-level problems, such as the expansion of risk-prone farming zones in the southern regions of Ukraine and the Republic of Moldova. In particular, the average grain yield in this zone over the past five years declined from 35.8 centners/ha in 1990 to 32.2 centners/ha in 2013–2022 in Ukraine. In the Polissia

and Forest-Steppe zones of Ukraine, yield growth from 30–37 centners/ha to 48–53 centners/ha has been recorded [1].

In addition to the significant territorial redistribution of crop structures, uneven dynamics of productivity growth are observed. Thus, compared to 1990, the average yield of cereals and legumes in the Forest-Steppe and Polissia increased by 46–61%, while in the Steppe zone it decreased by 10%. A similar situation is observed with respect to productivity changes of other major crops. Overall, the nationwide increase in cereal and legume yields in Ukraine has occurred due to regions with better water availability in the north of the country.

If current trends of increasing natural moisture deficit in arable land persist until 2050, about 3 million hectares of arable land in southern regions may become unsuitable for commercial crop production (without considering the consequences of war). As a result, taking into account dehydration of central and northern regions, gross grain production at the current level of agrotechnologies may decrease by 20–25%. Under climate change conditions, the level and regime of moisture supply across the country is the key limiting factor for production productivity and utilization of agricultural natural potential. To mitigate the negative effects of climate change on agricultural production, implementation of the Irrigation and Drainage Strategy of Ukraine until 2030 is required [2].

The smallest water footprint is observed in countries such as Latvia, Georgia, Hungary, China, Afghanistan, Peru, Congo, Angola, and others (600–1000 m³ of water per capita per year). The largest water footprint is observed in countries such as the USA, Greece, Malaysia, Italy, Thailand, and others (2300–2900 m³ per capita per year). A number of these countries are forced to import water to maintain current consumption levels. High per capita water footprints are ensured through water imports in the USA by 19%, Greece by 35%, Malaysia by 28%, Italy by 51%, and Thailand by 8%. The countries most dependent on water imports include Kuwait and Malta (87%), the Netherlands (82%), Bahrain and Belgium (80%). The richest countries in renewable water resources are Brazil (which uses 8,233 km³/year), the USA (3,069 km³/year), China (2,896 km³/year), and Indonesia (2,838 km³/year). In Ukraine, the average water footprint amounts to 1,575 m³ per person per year.

For Ukraine, climate change may develop according to four scenarios of Representative Concentration Pathways (RCP), which imply the following [2]:

- an increase in temperature across the entire territory of Ukraine: about 1.65°C in the Steppe zone and 1.74°C in the Forest-Steppe;
- climate change will not significantly affect precipitation levels; under the RCP 4.5 scenario, changes in precipitation range from 13 mm in the Steppe to 55 mm in the Forest-Steppe;
- the largest reduction in production by 2070 due to climate change is expected in the Steppe zone: wheat production may decrease by 11% under RCP 4.5 and by 18% under RCP 8.5.

Current problems related to freshwater scarcity may intensify in the future due to increased demand for water resources and reduced availability and quality. Researchers argue that humanity's dependence on water resources will grow, leading to threats to food security and environmental sustainability.

Total water consumption and pollution are usually considered as the aggregate volume of water required to sustain life activities or through such an environmental-economic instrument as the water footprint. Visualization of hidden water use along the product life cycle helps to understand the global nature of freshwater consumption and trade impacts on quantitative and qualitative water indicators and to make informed strategic decisions regarding water resource management at regional, national, and global levels.

The water footprint instrument makes it possible to assess quantitative and qualitative indicators of water use for producing a unit of output [3]. The water footprint is a comprehensive indicator that allows assessment of water resource distribution in space and time.

Water footprint assessment enables: understanding the geographical distribution of water resources for industry, agriculture, and domestic water supply; evaluation of water use efficiency; determination of sustainability of water resource use (sustainability reporting under existing EU

standards to be implemented in Ukraine from 2026); identification of the most appropriate strategic actions to enhance resilience, efficiency, and responsibility in water use.

Thus, the water footprint is an instrument that enables a broader and more accurate assessment of consumer or producer interaction with water resources. It is a comprehensive indicator allowing calculation of water consumption and pollution volumes. The water footprint provides precise information on how water is used for different purposes and forms the basis for conclusions on sustainable and equitable water use and allocation, as well as for assessment of environmental, social, and economic impacts [4]. According to expert estimates, 86% of humanity's water footprint belongs to the agricultural sector [5].

Water footprint assessment includes indicators related to: quantitative evaluation of the producer's process water footprint or spatial and temporal water distribution within a specific geographical area; assessment of environmental impacts; economic and social significance of the water footprint; development of strategies for incorporating the water footprint into product and service pricing throughout their life cycle.

Therefore, the main objective of water footprint assessment is to substantiate the production of specific goods from the perspective of water resource use and pollution during production. The water footprint is an analytical tool that plays a crucial role in understanding economic activity and environmental pollution and creates prerequisites for evaluating decisions on rational water resource use.

The total water footprint of the agricultural crop production process (WF_{proc}) is the sum of green, blue, and grey components and is calculated as:

$$WF_{proc} = WF_{proc,green} + WF_{proc,blue} + WF_{proc,grey}$$

All water footprints are expressed per unit of product, namely as water volume per mass of agricultural output, i.e., m^3/t or L/kg .

Economic efficiency of water use for agricultural production (thousand UAH/ m^3) represents the economic value of agricultural products per unit of consumed water and is calculated as the average producer price $[p]$ (thousand UAH/t), recommended by FAO, multiplied by a coefficient accounting for high product quality β and divided by the sum of green and blue water footprints:

$$E = \frac{price [p] \times \beta}{WF_{proc\ green} + WF_{proc\ blue}}$$

This methodology allows incorporation of both high product quality and total water resource costs borne by the business into product pricing, substantiates water resource use under climate change conditions using modern global approaches, and thereby ensures food and environmental security of the studied entities.

Water consumption without considering evapotranspiration as a component of berry crop water footprint calculation is as follows. Modern intensive berry cultivation currently requires automated irrigation and fertigation systems. These systems allow accounting, monitoring, and regulation of water use for irrigation and fertigation. Installation of a water meter is mandatory. Table 1 presents average water volumes required to produce 1 kg of blueberries or raspberries.

For 1 ha of blueberries, 3,300 plants per hectare aged 6–7 years are assumed, when bushes reach maximum yield. For 1 ha of raspberries, 3,300 plants per hectare aged 2–3 years are assumed, when bushes reach maximum yield.

Water productivity (WP) is an indicator measuring the amount of output or yield (kg) per unit of water used (m^3). It is calculated as:

$$WP = \frac{Y}{V};$$

where Y is crop yield, kg/ha; V is water volume, m³.

Thus, for blueberries,

$$WP = 10000 / 4850 = 2.06,$$

which means that 2.06 kg of blueberries are obtained per 1 m³ (1000 liters) of water used. Alternatively, producing 1 kg of berries requires 485 liters of water.

For raspberries,

$$WP = 12000 / 4285 = 2.8,$$

which means that 2.8 kg of raspberries are obtained per 1 m³ (1000 liters) of water used. Alternatively, producing 1 kg of berries requires 357 liters of water.

Table 1. Specific water consumption for berry crop production

Name	Irrigation water volume during the growing season (1 ha)	Precipitation during the growing season, m ³ (for the entire area)	Total water volume, m ³	Number of plants per 1 ha, pcs.	Yield per 1 ha, kg	Water volume used to produce 1 kg of berries, L
Blueberry	3350	4500	4850	3333	10000	485
Raspberry	3000	4500	4285	5700	12000	357

Source: compiled by the authors.

Total irrigation water consumption can be influenced by a number of factors and agronomic practices that significantly affect the volume of water required per 1 kg of output, including: mulching of planting rows; irrigation during early morning and late evening hours; use of soil sensors for monitoring soil moisture; application of agrotexiles; precise fertilizer application through irrigation and fertigation systems; selection of high-quality, high-yield planting material; application of ecological audit methodologies for river basins, community territories, and agribusinesses based on the developed methodology of systemic nature management (authors: Skrypchuk P.M., Rybak V.V.), both in irrigation and drainage zones.

Automated irrigation and fertigation systems make it possible to reduce the use of irrigation water (often groundwater, i.e., “blue” water) by 20–30%. If continuous monitoring using sensors and weather stations is applied, the use of rainwater (i.e., “green” water) in berry production can be further reduced by 5–10%.

Thus, the use of intensive cultivation technologies and automated irrigation and fertigation systems allows for a reduction in water consumption. Continuous monitoring and analysis enable a decrease in total water and fertilizer use through specific measures and agronomic practices, while simultaneously increasing yield quantity and quality.

Therefore, the organizational and economic principles of the water footprint constitute part of voluntary business sustainability reporting in line with EU reporting requirements, namely the European Sustainability Reporting Standards (ESRS). Accordingly, the implementation of sustainability reporting on the water footprint follows this algorithm:

1. Study national legislation and EU Directives on water use. It is essential to understand which requirements are already in force and which are planned in the near future (processes of harmonization and implementation of EU Directives in Moldova and Ukraine). Study experience, innovations, and best practices of the National University of Water and Environmental Engineering and the company “PROFPOLIV”.

2. Small enterprises may start with implementing the Global Reporting Initiative (GRI) to gradually introduce a culture of sustainable development and transition to reporting under the European Sustainability Reporting Standards.



Conferința internațională științifico-practică în onoarea a 35-a aniversării a Universității de Stat Comrat

3. Gradually implement individual provisions of sustainability reporting based on a resource-oriented approach, including adoption of best practices, development of data collection systems, and enhancement of staff competencies.
4. Engage specialists. High-quality reporting requires not only internal control but also external support, including audits, consulting, and training.
5. Ensure continuous development of both technologies and management systems to achieve a systemic effect.

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STRATEGIC DIRECTIONS FOR IMPROVING THE COMPETITIVENESS OF AGRICULTURAL ENTERPRISES

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Abstract: The article examines the theoretical, methodological and applied foundations for forming and strengthening the competitive potential of Ukrainian agricultural enterprises in conditions of economic instability and growing global competition. The relevance of the problem is substantiated in view of the increased investment attractiveness of the agro-industrial complex and its system-forming role in the national economy. The essence of competitive potential as the ability of enterprises to adapt, maintain market positions and long-term development under the influence of

endogenous and exogenous factors is revealed. Particular attention is paid to the organisational and economic mechanism of competitiveness management, the principles and patterns of management, the role of innovation, digital technologies and integration processes. The key determinants of increasing the competitive potential of agricultural products in domestic and foreign markets are systematised, and the priority strategic vectors of economic and social sustainability of agricultural enterprises are identified.

Keywords: competitive potential, competitiveness, agricultural enterprises, innovation, investment activity, organisational and economic mechanism, agricultural sector.

The competitive potential of a business entity is a key imperative of the market environment. It reflects the ability of a firm to adapt to market conditions, allowing it to take a leading position and maintain this status for as long as possible. Managing and increasing this potential is complicated by the endogenous complexity of the enterprise itself as a management object, as well as its high dependence on exogenous conditions (the external environment).

The agricultural and industrial complex of Ukraine is becoming an object of high interest for global investors. This investment attractiveness is due to a number of factors: the presence of a potentially high level of industrial development, the existence of a stable market for the sale of products, the prospect of a quick return on investment, and the interest of local authorities in the development of the industry. Therefore, the strategic imperative of Ukraine's agricultural policy is to create an optimal climate for capital investment.

Despite the volatility of the economic situation, investment activity in the agricultural sector is represented by a significant pool of companies. Even in conditions of instability, these investors remain one of the fundamental system-forming components of our country's economic architecture at the present stage.

Today, in the context of the economic performance of agricultural enterprises, there are positive trends, which are primarily achieved through an increase in the profitability of crop production (). At the same time, a comprehensive analysis of the calculated indicators points to the unsatisfactory overall status of their activities. Such diagnostics allow us to identify reserves and determine strategic vectors for increasing the competitive potential of agricultural enterprises. This should be done through the improvement of the economic mechanism, i.e., the necessary effective combination of economic instruments, methods, and levers of both market and state regulation of agricultural entities. It should also be done by defining the role of integration: clearly outlining the importance of integration directions of development to ensure a high level of competitiveness.

Achieving a competitive environment in agricultural enterprises is only possible if current management principles are followed and manifested in the form of stable patterns and scientific preconditions. System analysis has made it possible to identify the most significant and recurring management principles of competitiveness: the principle of coordination of interests, the principle of perfect competition, and the principle of management organisation. These principles are manifested in stable patterns:

- combination of centralisation and differentiation in management processes;
- the existence of a hierarchy of management and regulation levels;
- correspondence between the content of management and its organisational forms;
- synchronisation of the content of management functions with the type of organisational structure of the enterprise.

For agribusiness to advance to a qualitatively new technological level, it is necessary to introduce innovative business models. The application of advanced technologies and the modernisation of production capacities are the driving force behind Ukraine's economic renewal. In order to adjust technical operations that ensure savings in input resources, it is critically important to use modern tools:

- mobile laboratories (for operational analysis);
- satellite systems (for remote field monitoring);

- sensor equipment (for accurate data collection);
- remote data transmission (for instant access);
- advanced control systems (to ensure process accuracy).

It should be emphasised that these technologies have a mutually reinforcing effect, so they need to be integrated into a single complex. The primary task is to train staff in the use of these innovative tools and to prepare a highly qualified personnel reserve.

To strengthen the competitive potential of agricultural enterprises, the strategic integration of three key components is proposed:

- the latest scientific concepts (theoretical basis);
- modern technological achievements (practical tools);
- automation of production and application of digital technologies (implementation of IT solutions).

In addition, improvements in export infrastructure, including the construction of elevators and terminals and the development of waterway transportation, are a positive catalyst for investment in the agricultural sector.

A comprehensive set of initiatives has been developed to strengthen the competitive potential of agricultural entities, with an emphasis on strategic vectors for strengthening the economic and social sustainability of their development. Priority vectors for strengthening sustainability:

- optimisation of differentiation: balanced use of existing competitive advantages;
- stimulation of capital investment: active promotion of the investment climate;
- asset management: rational and effective exploitation of the resource potential of agricultural enterprises;
- institutional support: intensification of state aid to the agricultural sector of the economy;
- ensuring the basis for life: forming the material basis for the reproduction of the rural population;
- development of the labour sphere: creation of new and modernisation of existing jobs in rural areas;
- improving skills: stimulating employment through vocational training and education mechanisms;
- Increasing productivity: increasing the labour activity of the working-age population and ensuring the effective use of their labour potential;
- improving living conditions: solving the housing and material problems of rural residents and other social security measures.

A promising vector for gaining competitive advantages and forming the viability of agricultural enterprises is the introduction of innovations and innovative technologies. This will ensure the renewal of the product range in line with consumer demand in a competitive market environment. The development of a strategy for building competitiveness requires comprehensive measures to identify competitive advantages that directly affect the growth of their potential.

Strengthening the competitive potential of agricultural enterprises and maintaining their competitive advantages directly depends on the effectiveness of the organisational and economic mechanism used to manage their viability.

The mechanism for managing the competitiveness of agricultural enterprises includes the following key organisational and economic levers:

- intensification of investment and innovation activities with subsequent technical re-equipment of the enterprise's production base;
- development of targeted measures for the rational and effective use of production and financial resources;
- improving personnel management and increasing work motivation;
- introduction of product quality management procedures and certification;
- applying a comprehensive approach to diversification of activities and production planning;

- improving the company's marketing direction and providing additional support to the marketing department;
- improving information support for competitiveness management.

The fundamental components of the mechanism for ensuring the competitive potential of agricultural enterprises, which determine their potential market capabilities, include:

- customer-oriented competitive status: viability in competition for consumers;
- adaptive capacity (environment scanning): the ability to analyse exogenous and endogenous changes, predict their dynamics and respond appropriately;
- resource mobilisation: the ability to quickly attract the necessary amount of resources in a short time;
- labour efficiency: ensuring a high level of labour productivity;
- financial stability and performance: the ability to ensure liquidity (the speed of converting assets into cash) and solvency (timely fulfilment of current obligations), market stability (maintaining a stable position in a competitive market), high economic performance (generating high economic efficiency and effectiveness of core economic activities).

In addition, to determine the competitiveness of agricultural products in national and global markets, a key role is played by the algorithm for assessing the level of product competitiveness, which is a system for accounting for economic, technical and regulatory parameters. This procedure allows us to interpret the competitiveness of agricultural products as the achievement of such a comprehensive level of economic, technical and operational parameters at which they are able to withstand competition with similar goods of both foreign and domestic origin. Products gain a higher competitive status in the market when their attributes fully comply with all key laws, namely: technical and high-quality characteristics that include European standards.

A decisive factor in the formation and maintenance of competitive advantages of enterprises is the internal demand situation in the country, namely: its volume, structure and growth pattern. The decline in domestic demand observed in Ukraine has limited the stimulation of production and its modernisation. On the other hand, the prospects opening up for Ukrainian producers make it possible to predict the stimulating effect of growing aggregate demand on the intensification of production activity [7].

The attributes of quality consumer demand are becoming increasingly important for increasing competitive potential. The saturation of the Ukrainian market with foreign agricultural products, combined with the widening income gap among citizens, has caused a shift in consumer preferences towards global standards. Demand has become more selective and demanding in terms of pricing policy and product quality characteristics. These qualitative changes should theoretically serve as a catalyst for the formation of advantages for domestic producers in the agricultural sector. However, the limited purchasing power of the Ukrainian population forces it to prioritise cheaper food items over products with higher quality attributes. As a result, domestic consumer demand, in terms of consumer and quality criteria, lags behind the trends in economically developed countries. This makes it impossible for Ukrainian enterprises to focus on national preferences when expanding their agricultural products into large markets.

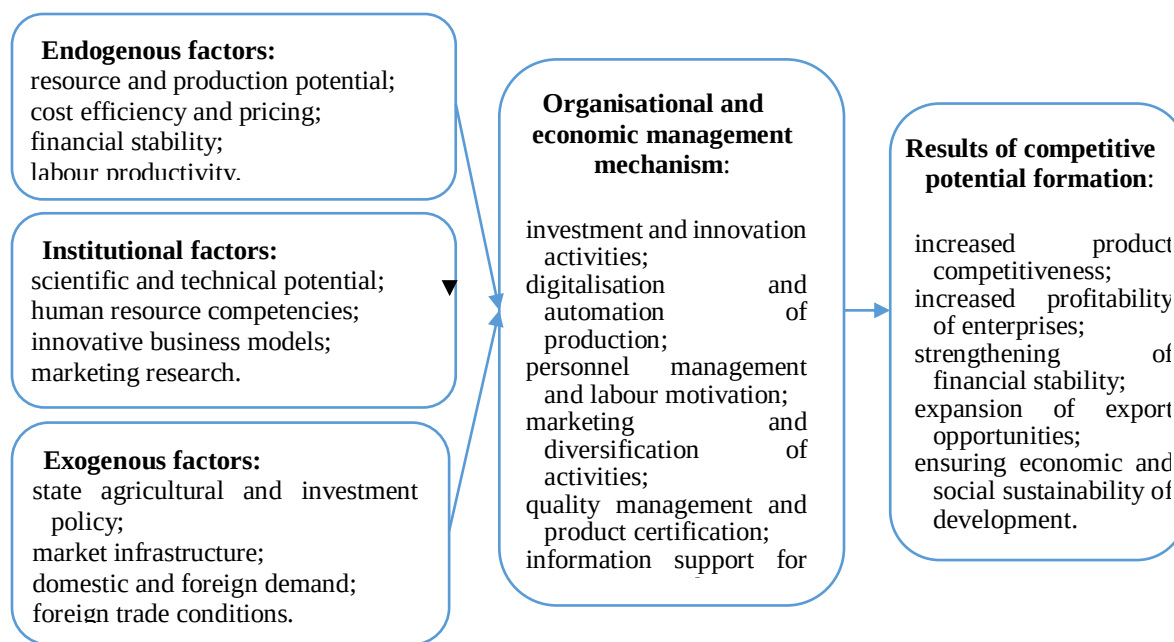


Figure 1. Mechanism for forming the competitive potential of agricultural enterprises

Source: developed by the author based on a synthesis of scientific approaches

In order to increase the competitiveness of agricultural products and stimulate their expansion into global markets, it is necessary to influence a number of interrelated determinants. These factors are conditionally divided into three groups (Figure 1).

All these determinants (factors) are interrelated and interdependent. Since they act in synergy, it is impossible to achieve the main strategic goal – increasing the competitive potential of products through the isolated progress (successful development) of only one group of these factors. To achieve the result, coordinated actions are needed, aimed at actively influencing all three groups of factors simultaneously.

Summarising the results of the study, it should be noted that the competitive potential of agricultural enterprises is a key prerequisite for their viability, sustainability and long-term development in the context of a changing market environment and intensifying global competition. Its formation is a complex, multifaceted process that depends on a combination of endogenous, institutional and exogenous determinants that interact closely and are interdependent. Ignoring even one of these groups of factors makes it impossible to achieve the strategic goal of sustainably increasing the competitive advantages of agricultural entities.

It has been established that the modern agricultural sector of Ukraine is characterised by significant development potential and high investment attractiveness, due to the availability of a resource base, an established sales market, export opportunities and the state's interest in supporting the industry. At the same time, despite positive trends in profitability growth, primarily in crop production, the overall level of economic performance of agricultural enterprises remains insufficient, which highlights the need to improve the organisational and economic mechanism for managing their competitiveness.

It has been proven that an effective combination of market and state regulatory instruments, investment and innovation activity, the introduction of modern digital technologies, automation of production processes and the development of human capital play a key role in strengthening competitive potential. Of particular importance is the integration of innovative business models, technological solutions and scientific approaches, which ensures a synergistic effect and contributes to increased productivity, product quality and the adaptability of enterprises to changes in the external environment.

It has been proven that the formation of a competitive environment in agricultural enterprises is only possible if basic management principles are observed, in particular the coordination of interests, a rational combination of centralised and decentralised management, the alignment of organisational structures with the content of management functions, and a clear hierarchy of management levels. The implementation of these principles creates scientifically sound prerequisites for stable development and effective use of resource potential.

Thus, strengthening the competitive potential of Ukrainian agricultural enterprises requires a systematic and comprehensive approach that involves coordinated action at the enterprise, industry and state levels. The implementation of the proposed strategic vectors will not only increase the competitiveness of agricultural products in domestic and foreign markets, but also ensure the economic and social sustainability of rural areas, which is an important condition for the sustainable development of the national economy as a whole.

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REGULATORY FRAMEWORK FOR MANAGING ECONOMIC PROCESSES IN THE CONTEXT OF SOCIAL TRANSFORMATIONS

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The article examines the normative foundations of managing economic processes under conditions of social transformation. The study focuses on the role of legal certainty and justice in shaping managerial decisions within the economic sphere and public governance. It is argued that economic management requires stable normative reference points that ensure predictability, consistency and public trust in decision-making. Special attention is paid to the relationship between economic management, public finance governance, and the exercise of public authority. The article also emphasizes the importance of normative regulation in ensuring continuity of managerial decisions and their alignment with European legal standards.

Keywords: economic management, normative regulation, legal certainty, public governance, public finance, managerial decisions

The current stage of socio-economic development is characterised by a significant complication of management tasks facing public authorities and other entities vested with powers in the economic sphere, whose activities are carried out within the limits and in the manner defined by the Basic Law of the state [2]. Economic processes are increasingly linked to legal norms, institutional constraints and social expectations, which necessitates a rethinking of traditional ideas about economic management. Under such conditions, it cannot be reduced solely to technical decisions on the distribution of resources or the regulation of individual areas of economic activity, but requires a clear regulatory framework capable of ensuring the predictability, consistency and internal coherence of management decisions.

The normative foundations of economic process management form a system of rules within which economic relations are influenced and the permissible limits of the exercise of authority are determined, in accordance with the requirements of legality and legal certainty enshrined in national legislation [1]. They define the permissible limits of the exercise of authority, establish requirements for the content of management decisions and set criteria for their legitimacy. It is through regulatory control that economic decisions acquire legitimacy and public recognition, as they are perceived as being based on generally binding norms rather than on situational considerations. The absence of clearly defined rules or their inconsistent application leads to a decline in confidence in management mechanisms and complicates the implementation of long-term economic guidelines.

Of particular importance in this context is the principle of legal certainty, which requires stability of regulatory provisions, clarity of their interpretation and consistency in their application. This is of fundamental importance for the economic sphere, as management decisions directly influence the financial behaviour of economic entities, the formation of investment expectations and the distribution of public resources. In conditions of legal uncertainty, economic decisions lose their predictability, which creates additional risks and negatively affects budgetary discipline and the overall level of economic activity.

The regulatory framework for managing economic processes is inextricably linked to the issue of public governance. At the same time, the principle of the rule of law is the systemic basis of public-administrative relations and should determine the content of management decisions in various spheres of public life, including the economic sphere [4, p. 35-36], which means that economic management should be carried out taking into account not only considerations of expediency, but also legal and value orientations that ensure that management decisions meet public expectations.

The category of justice plays an important role in the system of normative principles of economic management. It determines public perception of decisions on the distribution of budget funds, state support and financing of socially significant programmes. In this case, fairness is not an abstract moral idea, but a criterion for evaluating management decisions in terms of their acceptability to society. It is compliance with this criterion that contributes to the formation of trust in public authorities and reduces social tension.

This approach is confirmed by the legal positions of the Constitutional Court of Ukraine, according to which the implementation of the principle of the rule of law is linked to the regulation of social relations on the basis of justice [3], which is of direct importance for the economic sphere, where management decisions are often redistributive in nature and affect various social groups. In this context, regulatory principles guarantee that economic management is carried out within the framework of established rules and does not become arbitrary.

Public finance management is one of the most sensitive segments of economic management. Budgetary decisions reflect the priorities of socio-economic development and demonstrate the level of accountability of public authorities to society. Regulatory certainty in this area ensures the consistency of budgetary policy reduces the risk of selective decisions and promotes the rational use of financial resources. In the absence of clear rules, budget management loses its predictability, which negatively affects the stability of the financial system and the possibility of implementing medium- and long-term economic programmes.

It should be emphasised that the regulatory framework for managing economic processes acts as a kind of stabilising factor in conditions of prolonged social change. It is through regulatory harmonisation that the relative stability of economic decisions is ensured, even in the presence of external fluctuations and internal transformations. Under such conditions, management activities in the economic sphere acquire the characteristics of consistency and systematic, which makes it possible to avoid sudden and unpredictable changes in the rules of economic behaviour.

Particular attention should be paid to the relationship between regulatory requirements and managerial discretion. On the one hand, the management of economic processes is impossible without a certain amount of leeway for decision-making, taking into account specific circumstances. On the other hand, excessive discretion without clear regulatory guidelines creates the risk of unequal application of rules and the formation of different conditions for individual entities. In this context, regulatory principles serve as a means of limiting arbitrariness and ensuring uniformity of management influence.

Regulatory certainty is also essential for building trust in economic policy. Trust stems from the predictability of management decisions, their compliance with declared rules, and consistency in application. In the absence of such compliance, even economically sound decisions may be perceived as unfair or selective. That is why regulatory frameworks are not declarative but practical in nature, influencing daily management activities.

In the sphere of public resource allocation, regulatory control serves to guarantee equal access to the financial opportunities provided for by law. It determines the conditions for financing, the procedure for adopting budgetary decisions, and the requirements for their justification. This approach reduces the likelihood of subjective decisions and contributes to the formation of a sense of justice in society. With clear rules in place, economic management is perceived as orderly and accountable.

Equally important is the impact of regulatory frameworks on the consistency of economic decisions between different levels of public authority. Uniform rules ensure the coordination of

management decisions within the state, which is particularly relevant for the implementation of nationwide socio-economic development programmes. In the absence of uniform regulatory guidelines, management decisions may lose their mutual consistency, which reduces their overall effectiveness and complicates the achievement of set goals.

An important feature of the regulatory framework for economic management is its ability to ensure the continuity of management decisions. Continuity means preserving the basic rules and principles of management regardless of changes in political priorities or the personnel of government bodies. This is of fundamental importance for the economy, as it allows maintaining trust in the management system and supporting stable expectations regarding future economic conditions.

In the context of the interaction between economic management and the legal system, it should be noted that regulatory frameworks serve as a link between economic goals and legal requirements. They ensure the integration of economic decisions into the legal field and make it impossible to separate them from the general principles of the rule of law. This approach allows economic management to be viewed as a component of public governance that is subject to the general requirements of legality and fairness [4].

The harmonisation of economic management with the legal norms of the European Union also reinforces the importance of regulatory frameworks. The processes of approximation to European standards involve not only the formal adoption of norms, but also a change in the management culture in the economic sphere. In this dimension, normative principles serve as a guideline for the formation of decisions that are compatible with the principles of legal certainty, equality and justice, which are common to the European legal space.

In the context of European integration, the regulatory framework for economic management is becoming increasingly important. The harmonisation of the national management system with the legal norms of the European Union entails increased requirements for the quality of management decisions, their legal justification and compliance with generally accepted principles of public governance. In this regard, economic management is increasingly oriented towards legal certainty and fairness as universal guidelines that ensure the compatibility of national management decisions with European standards.

Thus, the regulatory framework for economic management is a necessary condition for the proper functioning of the economy in the context of social transformation. Its significance lies not only in the formal regulation of economic relations, but also in ensuring the consistency of management decisions with legal and value-based guidelines. The combination of legal certainty and fairness creates the conditions for increasing trust in public authorities and promoting balanced socio-economic development.

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CHALLENGES TO NATIONAL SECURITY IN THE CONTEXT OF THE FORMED SYSTEM OF UKRAINE'S FOREIGN TRADE RELATIONS (1990S–2000S)

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Abstract. The article examines the conditions for the formation of Ukraine's foreign economic relations in the 1990s and early 2000s, emphasizing the significance of the preservation of the Soviet economic heritage and dependence on Russia, which constrained the diversification of foreign trade and European integration. The study demonstrates that this model of foreign economic relations generated structural vulnerabilities in national security and laid the groundwork for future Russian aggression.

Keywords: the economic history of Ukraine, foreign trade system, foreign trade policy, national security, Russian aggression.

The formation of Ukraine's foreign economic relations system in the 1990s and early 2000s was influenced by a complex set of historical, economic, geopolitical, and political-legal factors. The combined effect of these factors determined the trajectory of the country's integration into the global economy. At the same time, they generated structural risks and vulnerabilities in national security, which later manifested in Russian aggression.

The first major challenge for independent Ukraine was the inertia-driven preservation of elements of the Soviet economic heritage. In particular, the initial conditions for the development of the national economy were as follows:

1. Regional development disparities resulting from Soviet structural and economic policies. For decades, the Russian authorities promoted the development of the eastern and southern regions, focusing them on heavy and energy-intensive industries as well as agriculture, which were closely integrated into the unified economic space of the USSR. At the same time, Western Ukraine remained on the periphery of economic processes, with limited investment and a less developed industry. The regional imbalance inherited from the USSR became a factor in the divergent political orientations of the regions, the economic dependence of eastern Ukraine on Russian markets, and the cultural and linguistic ambivalence exploited by Russia.

2. The historically established colossal military complex (accounting for one-third of the Union total) and industrial infrastructure, closely integrated (approximately 80% of supplies) with the Union production structure, required enormous capital investments [1, p. 524]. In the context of losing other suppliers and markets, its functionality was maintained through continued interaction with Russia.

3. The inherited high-consumption economic model: in the early 1990s, the Ukrainian economy ranked sixth in the world in terms of natural gas consumption, with Russia remaining its primary supplier [1, p. 527].

4. An outdated material and technical base and obsolete fixed assets, along with the preservation of Soviet state standards, technical norms, and production regulations, reduced the productivity of national manufacturing and prevented Ukrainian producers from competing in international markets. By inertia, Russia and other former Soviet republics (Belarus, Kazakhstan, Turkmenistan, etc.) remained the main markets for Ukrainian goods.

This meant that, from the moment of independence, Ukraine effectively lacked control over critical components of its economic and technological security, perpetuating a long-standing structural dependence on Russia.

Despite the officially declared course toward diversification of foreign economic relations, Russia remained Ukraine's main trading partner for an extended period. In 1996, countries of the CIS (primarily Russia) accounted for 50.1% of national exports and 63.5% of imports, while by 2006, these figures had declined to 32.2% and 46.7%, respectively [2]. Although the share decreased, it remained significant. Russia controlled energy resources, key markets, and production-technological chains. Ukrainian export sectors (metallurgy, machine-building, and agriculture) were closely linked to Russian demand or logistics. This enabled Russia to exert influence over Ukraine's domestic political decisions through economic leverage, while creating a high barrier for the Ukrainian economy in transitioning to independent markets.

Alongside the continued reproduction of trade and economic ties with Russia in the 1990s and 2000s, there was a noticeable diversification of Ukraine's foreign trade vectors toward the EU, Asia, and the Middle East. For instance, in 1996, the EU accounted for 22.1% of national exports and 24.4% of imports, rising to 30.7% and 34.7%, respectively, ten years later. However, the closer integration of Ukrainian producers with European markets did not significantly affect the commodity structure of foreign trade. Ukraine continued to export primarily industrial raw materials and food products, with little increase in the share of high value-added goods. Critical imports continued to be supplied by Russia. These factors suggest the situational nature of Ukraine's reorientation toward Western European markets. The implementation of a multi-vector strategy in Ukraine's foreign political and economic relations was constrained by the inertia-driven maintenance of close politico-economic ties with Russia, alongside a parallel policy of courting Europe. This ultimately limited the country's European integration course, created national security risks due to increased pressure from Russia, and restricted Ukraine's international competitiveness.

In fact, since 1991, Ukraine's foreign economic relations have operated at the crossroads of two opposing poles: the Western (EU, NATO, market reforms, liberalization) and the Eurasian (Russia-centric policies, the former Soviet integration mechanisms, energy dependence). The aspiration to "Looking West, Watching East" meant that Ukraine could not achieve full integration into European structures, had to account for Russia's influence, and found itself in the role of a "buffer zone," which heightened its strategic vulnerability [3, p. 89]. This geopolitical ambivalence laid the foundation for subsequent conflicts, ranging from gas crises to the annexation of Crimea and the full-scale war.

In the 1990s and 2000s, the Ukrainian state retained Soviet bureaucratic practices, a centralized and inefficient management model, and corrupt mechanisms, which Russia actively exploited. Government authorities and business groups with economic interests in Russia impeded reforms and European integration, keeping the country within Russia's sphere of influence. For example, in the 1990s and 2000s, Ukraine's foreign trade flows were controlled by about two dozen corporate structures that united companies of mostly heavy industry. They included, in particular, the Interpipe Group, the Donbass Industrial Union, the Privat Group, the System Capital Management, Naftogaz Ukrainy, Ukravto, Ukrprominvest, etc. [4, p. 196]. All these companies were structurally linked to Russia through inherited production chains and dependence on Russian resources, markets, and logistics. Purely Russian companies, such as Lukoil, Alfa Group, Russian Aluminium, Itera, and Gazprom, were also present on the Ukrainian market, controlling the respective economic sectors [5, p. 346].

All of this allowed Russia, for years, to employ a wide range of instruments: energy blackmail, trade blockades, political pressure, information operations, and lobbying of pro-Russian political forces. This enabled Russia to undermine the development of Ukrainian statehood and create the preconditions for future military aggression.

The model of Ukraine's foreign economic relations and the corresponding integration policy formed in the 1990s and 2000s entrenched dependence on Russia, failed to ensure full integration with the EU, did not create economic instruments to deter aggression, weakened the country's internal



resilience, and deepened regional and socio-political contradictions. As a result, Russia retained the ability to influence Ukraine's economic, political, and informational spheres, undermine its internal stability, and limit the implementation of integration priorities. This demonstrates that the preservation of the Soviet politico-economic heritage and the inefficiency of Ukraine's 1990s–2000s foreign economic policy were among the key determinants of contemporary national threats, with the war representing a manifestation of the long-standing imbalance in external development vectors.

At the same time, in the context of the Ukrainian-Russian war, Ukraine's economy is undergoing a transformation: digitalization is accelerating, innovative development is intensifying, and production and trade are being structurally reoriented toward Western markets, making Ukrainian business more flexible, adaptive, and competitive. From a geopolitical perspective, Ukraine's international position has strengthened, integration with the EU and NATO has deepened, and the country's global visibility and influence have increased. This appears to be a powerful impetus for finally overcoming the Soviet politico-economic heritage and dismantling Russia's historically entrenched influence.

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E-COMMERCE TRENDS – EXPERIENCE OF LATVIA

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Abstract. The article identifies key research trends and developments of e-commerce in Latvia. The paper explores a literature analysis of e-commerce researches in Latvia from 2015 to 2025, based on the Web of Science data base. Major themes include the impact of technological factors on e-commerce growth, the importance of regional development. The article also features the survey of Latvian entrepreneurs, highlighting the use of mobile devices (smartphones, tablets, computers) in

business. Findings reveal that 42.8% frequently use mobile channels for purchasing, while 32.2% are infrequent or non-users. The research underscores the importance of enhancing digital competencies and tailoring strategies to improve e-commerce outcomes in Latvia.

Keywords: e-commerce, mobile devices (smartphones, tablets, computers), Latvia, small and medium-sized enterprises.

The sustainability of e-commerce is increasingly pertinent amidst growing consumer demand and environmental concerns. E-commerce adoption has surged, particularly during the COVID-19 pandemic, with global retail sales projected to reach significant figures, evidencing its integral role in modern commerce [2; 13; 10; 12].

The authors analyze e-commerce tendencies in Latvia with the use of literature analysis as well as analyzed data from the questionnaire that was given to Latvian entrepreneurs. The authors conducted an analysis of research on e-commerce issues in Latvia over the past ten years (2015-2025) based on articles published in the *Web of Science* database. This classification provides an insight into the prevailing trends and the main areas of research they focused on during this period.

Research has prominently focused on understanding the technological factors influencing e-commerce development in Latvia. Jēkabsone and Gudele present an analysis of regional factors contributing to e-commerce development, emphasizing the importance of technological advancement and human skills [3]. This highlights a vital intersection where technology and human factors facilitate the growth of e-commerce platforms in Latvia. Additionally, Gaitniece's examination of Online Recommendation Systems (ORS) uncovers the barriers faced by companies in effectively deploying these systems, showcasing the gap between potential technological capabilities and actual implementation within the Baltics [1].

Ina Gudele significantly contributes to the understanding of e-commerce development in Latvia by systematically analyzing the factors influencing its adoption among enterprises. Jēkabsone & Gudele articulate how varying degrees of e-commerce utilization affect business efficiency and effectiveness, underscoring the need for tailored strategies to enhance operational outcomes. Their findings indicate that entrepreneurs who leverage e-commerce effectively exhibit pronounced differences in their perceptions of social and regulatory factors compared to those who do not engage with these tools at all. This highlights the critical necessity for targeted training programs aimed at enhancing the digital competencies of business operators [3; 4].

Another research area encompasses consumer behavior in online marketplaces, particularly in the context of ongoing crises such as the COVID-19 pandemic. Pollák et al. analyze how digital marketing tools transformed from optional to essential due to pandemic-induced changes in consumer habits [9]. This aligns with Vasiliev's work, which underscores the importance of visual content in enhancing marketing effectiveness aimed at Latvian consumers [14]. Moreover, the studies by Stukalina and Muhammad further explore the implications of real-time customer communication on satisfaction, loyalty, and overall customer experience in e-commerce. Their findings indicate critical gaps in communication strategies among e-commerce businesses that need to be addressed to meet evolving consumer expectations [7].

Mietule et al. investigate the correlation between online marketplaces and global business development, suggesting that such platforms act as catalysts for e-commerce transformation [6]. This research contextualizes Latvia's position within the larger framework of globalization and marketplace evolution, shedding light on how local businesses are affected by global trends. Research also addresses logistical challenges and sustainability within the e-commerce paradigm. Scedrovs et al. perform an eco-efficiency analysis of last-mile delivery systems, advocating for sustainability as a focal point in the growing e-commerce sector, which is increasingly vital in light of global environmental concerns [11].

The research conducted by Nikiforova et al. focuses on the risks associated with e-commerce processes, particularly concurrent execution scenarios in online transactions. Their findings reveal

	never	rarely	medium	often	always
Mobile access to e-mail	8.3	25	17.9	10.7	38.1
Mobile version of the website	15.5	17.9	19	19	28.6
Messenger groups for solving business tasks	8.3	26.2	19.1	20.2	26.2
SMS marketing	13.1	21.4	22.7	19	23.8
Mobile access to company resources (databases, etc.)	13.1	25	14.3	23.8	23.8
Company has developed its own mobile applications	31	22.6	16.6	17.9	11.9
Advertising targeted for use on mobile devices	23.8	19	23.8	17.9	15.5
Mobile devices for managing production processes	17.9	27.4	20.1	17.9	16.7
Payments of a company bills from a mobile phone	13.1	17.9	23.7	16.7	28.6
Equipment of a company transport system with location data transmission systems	16.7	21.4	17.8	26.2	17.9
Own mobile application	26.2	21.4	19	16.7	16.7
Augmented reality technologies	38.1	13.1	20.3	20.2	8.3
Possibility to purchase (order, pay, choose a delivery method) your products or services through mobile	17.9	14.3	25	10.7	32.1

potential risks and gaps in current practices that necessitate further exploration to mitigate issues for both buyers and businesses involved [8].

According O.Lavrinenko et al. research, important factors influencing the use of mobile devices (smartphones, tablets, computers) at entrepreneurship in Latvia are the availability of IT specialists, the level and quality of IT infrastructure and the ability of companies to adapt to new corporate structures. are important factors influencing the use of mobile devices in Latvia. Also noted the importance in stimulating the use of mobile technologies of technological tools such as identification systems and electronic digital signatures [5].

To assess the ability of small and medium-sized enterprises (SMEs) to purchase goods or services electronically, the authors used a database of surveyed by authors Latvian entrepreneurs in 2023. A total of 252 entrepreneurs participated in the survey. The survey was conducted online using a combined sampling method, which is not repeated. SMEs were asked to respond their use of mobile devices in their businesses in the context of digitalization. Along with their use of various mobile devices, entrepreneurs evaluated the ability to purchase goods and services mobile (see Table 1). Table1. Assessing the ability to purchase goods and services online, along with the use of other mobile technologies and devices (smartphones, tablets, etc.) in sme's in the context of digitalization in recent years (1 - never, 2 – rarely, 3 medium, 4 – often, 5- always)?

Source: authors' calculations based on the results of a survey of Latvian entrepreneurs (n=252)

A majority (42.8%) of entrepreneurs report “often” or “always” using mobile channels to purchase products/services (10.7% often + 32.1% always). This suggests substantial adoption of mobile purchasing among businesses. 32.1% of respondents say they can purchase via mobile “always,” indicating strong integration of mobile purchasing in many SMEs. A further 10.7% report it occurs “often”. 25% report “medium” usage, while 14.3% say “rarely,” and 17.9% report it as “never.” Summed, about 32.2% are non-users or infrequent users, highlighting room for growth.

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PERFORMANCE AND TOOLS OF AUTOMOTIVE COMPANIES IN MOLDOVA: A FIRM-LEVEL ANALYSIS

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Abstract. The Eastern European automotive industry is becoming a strategic area for production and subcontracting and is increasingly important within the European value chain. Moldova, with a growing number of automotive companies connected to global production networks, is an intriguing but still understudied case in this field. The objective of this study is to examine the economic and financial characteristics of automotive companies in Moldova, comparing them with other similar Eastern European nations from an industrial point of view. An attempt is made to determine whether the Moldovan context has particularities regarding the performance, operational structure and role of companies in the global value chain, taking into account the differences between nationally and internationally controlled companies. The analysis is based on a quantitative approach and analyzes balance and productivity indicators using a multivariate regression model. The analysis examines the effects of the national context, ownership structure and organizational characteristics. The aim is to provide a systemic view of the automotive industry in Moldova, enriching the debate on European industrial integration and on the strategies of companies in low value-added contexts

Keywords: Moldova, automotive, performance, economics, statistical analytics

Introduction

In recent decades, the European automotive industry has undergone a production and geographical reorganization, with a progressive relocation of activities to Central and Eastern Europe. This process has led to the increasing integration of emerging economies into the continental value chain, supported by comparative advantages related to labor costs, proximity to Western markets, and alignment with European institutional standards [1; 2]. Although countries such as Poland, the Czech Republic and Hungary have been widely studied as success stories, peripheral and more recently entrant economies in European production have received less attention, despite the growing role of manufacturing and subcontracting [3; 4].

Moldova represents a relevant case in this context, having attracted investments in the automotive sector, particularly in components and labor-intensive activities. The presence of foreign-controlled firms raises questions regarding the economic and financial performance, cost structure, productivity, and strategic role of local units within the value chain. In peripheral contexts, the ability to create value and achieve upgrading depends on structural constraints and a strong dependence on group strategies, necessitating a firm-level analysis [5; 6]. This study provides a firm-level comparative analysis of the Moldovan automotive sector, comparing it with other Eastern European countries with similar industrial profiles. The aim is to contribute to the debate on the position of peripheral economies in the European automotive value chain through a systematic description of the economic and business characteristics and performance determinants of firms operating in Moldova.

Literature review

In recent years, the European automotive industry has undergone many major transformations. These changes have had a significant impact on production, corporate strategies, and

the value chain. Since the 1990s, the sector has experienced various shocks, such as the shift to electric mobility, the digitalization of processes, and disruptions due to the pandemic and the conflict between Russia and Ukraine. Recent literature highlights how these changes have reinforced the trend of international fragmentation in production, as well as a growing focus by multinational companies on regionalization and nearshoring strategies, especially within the European continent [7; 8].

Eastern Europe plays a significant role in the automotive sector, but there are differences between countries in productivity and technology. The concept of Global Value Chains has been used to study how value is distributed within the sector. Recent research shows that participation in these chains has uneven effects on economies and firms, often leading to specializations that involve low-value roles in peripheral economies [9]. Empirical research based on firm-level data shows that location within Eastern European countries frequently results in segments characterized by high labor intensity and limited strategic autonomy, with ambiguous effects on economic and financial performance [10]. Functional and technological upgrading occurs only under specific conditions of institutions, human capital, and organizational capabilities, which are lacking in recently integrated economies. Economic literature increasingly focuses on analyzing corporate financial performance, moving beyond macro or sectoral approaches. Studies of large European corporate databases show that the profitability of manufacturing firms is strongly influenced by factors such as size, age, capital intensity, and cost structure [11]. Company size continues to emerge as one of the main drivers of performance, by virtue of economies of scale, greater access to credit and a more efficient organization of production processes [12].

The relationship between productive investments and economic performance, contrary to the traditional view that associate's investments with better returns, has been heavily criticized in recent studies, as this relationship strongly depends on the time horizon and the role of the company within the value chain [13; 14]. In the automotive sector, in particular, investments made by companies located in peripheral economies are often used for production adaptation and compliance with the standards imposed by lead companies, rather than autonomous technological upgrading strategies, resulting in a zero or even negative impact on profitability in the short term, without guaranteeing long-term benefits in terms of value creation [1; 15].

Recent studies in International Business have reconsidered the role of multinational corporations and foreign subsidiaries, challenging the thesis that foreign ownership automatically translates into better performance for local firms. This paper provides a comparative quantitative analysis of the automotive industry in Moldova and other Eastern European countries to contribute to the debate on the role of peripheral economies in the automotive value chain and the firm factors influencing performance in contexts of asymmetric production integration.

Research hypothesis

This study explores how a country's context, firm characteristics, and their economic performance are linked. The available evidence shows diverse and sometimes conflicting results, particularly for peripheral economies that are well integrated into international production networks.

RQ1: Do automotive companies located in Moldova show different economic and financial performance compared to similar companies or companies operating in other Eastern European countries?

RQ2: To what extent does company size affect the financial performance of automotive companies?

RQ3: Is firm age associated with significant differences in the financial performance of automotive firms?

RQ4: Does belonging to an industrial group influence the financial performance of automotive companies, and in what direction?

Methodology

The study adopts a quantitative approach based on the analysis of firm-level financial statement data. The objective is to examine the relationship between the national context and certain structural characteristics of automotive companies and their economic and financial performance, with particular attention to the Moldovan case. The study was conducted on a sample of 15.308 automotive companies operating between 2015 and 2024 in Moldova, Bulgaria, Romania, Slovakia, Serbia, and North Macedonia. The countries were chosen to ensure a consistent comparison while maintaining a focus on the context of interest. Corporate performance is measured through Return on Assets (ROA), a commonly used indicator to assess the efficiency of the use of invested resources.

The analysis is conducted by estimating a multiple linear regression model, which allows for the simultaneous assessment of the association between the variables considered and economic and financial performance. The model includes a set of control variables related to the main corporate characteristics discussed in the literature, including firm size, investment intensity, company age, membership in an industrial group, and geographical location.

Results

The study presents the empirical results conducted on a sample of 15.308 companies divided as follows (Table 1):

Table 1. Companies for Country							
	Bulgaria	North Macedonia	Moldova	Romania	Serbia	Slovakia	Total
Businesses	6,276	785	269	6,050	953	975	15.308
Value %	41%	5.13%	1.76%	39.52%	6.23%	6.37%	

The table shows a strong concentration in Bulgaria and Romania, while Moldova represents a marginal share of the sample. Balance sheet data were extracted from the Orbis database, which ensures comparability and consistency at the company level. To describe the size of the companies in the sample, three complementary indicators are used: total assets, turnover and number of employees, in line with the literature and the EU regulatory definition (figure 1).

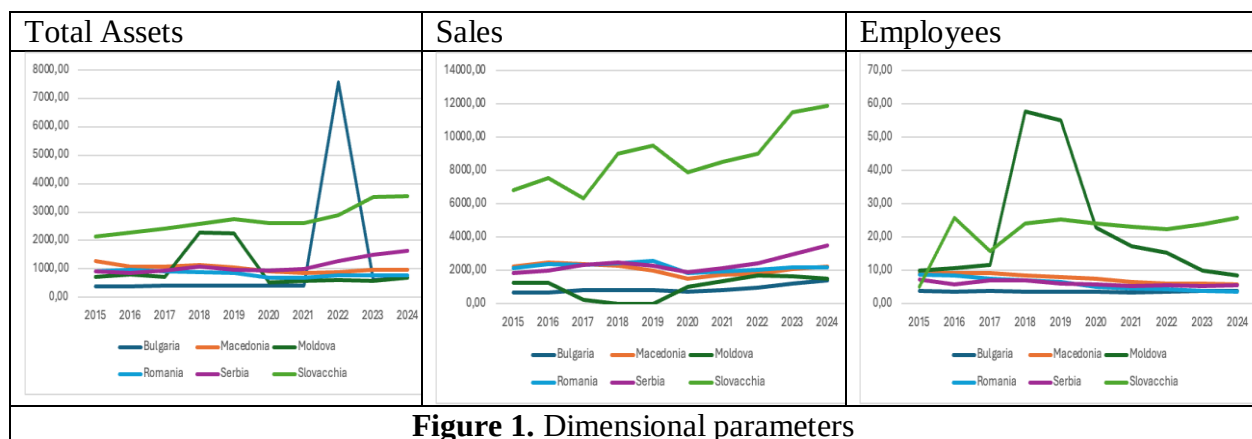


Figure 1. Dimensional parameters

The figure shows that Slovakia is the most solid and dynamic country, with steady growth in revenue and total assets. Bulgaria shows an uneven trend, with an anomalous peak in total assets in 2022, likely due to a one-off effect. Moldova stands out for an exceptional peak in employees in 2019-2020, well above average. Serbia shows steady and moderate revenue growth, while Romania and North Macedonia show more stable and consistent trends. To analyze the sample's financial performance, three consolidated indicators were chosen: ROA, EBIT, and EBITDA. These parameters allow for a comprehensive analysis of the companies' profitability and operating performance. Figure 2 summarizes the performance of the three indicators.

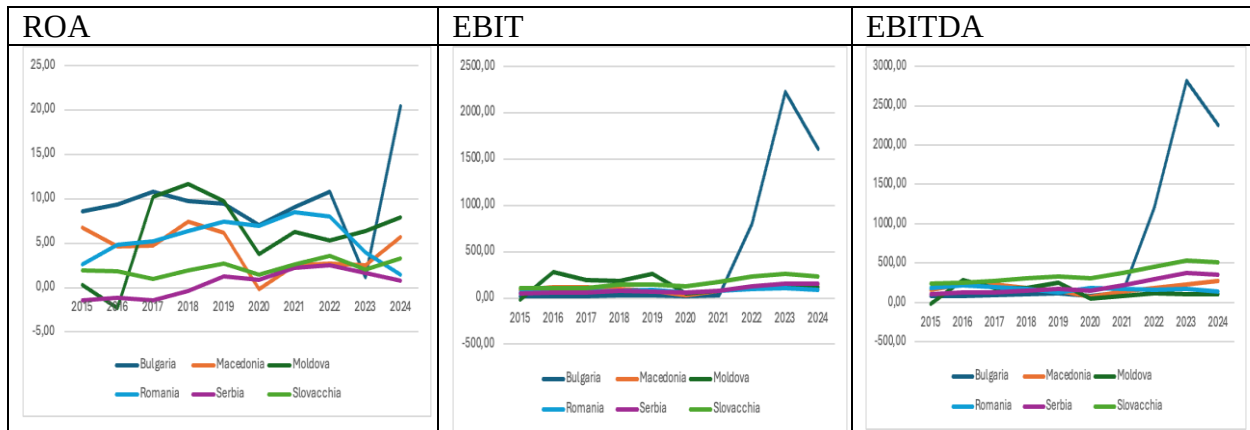


Figure 2. Economic parameters

The figure highlights Bulgaria's exceptional performance, which has seen a dramatic surge in EBIT and EBITDA since 2021, closing 2024 with the highest profitability in the sample. Slovakia remains solid and consistent in its growth, while Moldova exhibits a volatile cyclical trend. Serbia, Romania, and Macedonia, on the other hand, maintain flat and stable trends. The analysis continues with the estimation of a multiple linear regression model, aimed at verifying the determinants of corporate profitability. This approach allows us to evaluate the marginal effect of each factor, while simultaneously controlling for the other variables included in the model, to assess the relative importance of size, investment structure, company age, number of companies within the group, and group complexity on ROA. The analysis was conducted with the statistical software R, using the following specification:

$$lm = ROA \sim \text{Dummy\_Moldova} + \text{Size} + \text{Investment Structure} + \text{Company Age} + \text{Group Number}$$

The formula derives the dummy variable, which takes on a value of one for Moldovan companies and zero for those from other countries, to compare the Moldovan case with the rest of the sample. The EBIT and EBITDA variables were initially considered but subsequently excluded from the final estimates to avoid multilinear problems with ROA; thus, the model allows us to identify the main drivers of the economic and financial performance of the analyzed sample. The analysis yields the following results (Table 2):

Table 2. Regression analysis					
<i>Residuals:</i>					
<i>Min</i>	<i>1Q</i>	<i>Median</i>	<i>3Q</i>	<i>Max</i>	
-103.864	-7.495	-2.820	6.049	100,823	
<i>Coefficients:</i>					
	<i>Estimate</i>	<i>Std.Error</i>	<i>t value</i>	<i>Pr(> t)</i>	
(intercept)	4.20E+03	4.41E+02	9,518	< 2e-16	***
Dummy_Moldova	-1.14E+03	1.43E+03	-0.797	0.425554	
Size	6.58E+02	5.61E+01	11,723	< 2e-16	***
Investment Structure	-6.14E-03	6.82E-02	-0.09	0.928275	
Company Age	-2.20E+01	6.35E+00	6.35E+0 0	0.000549	***
Group number	-3.99E+00	3.75E+00	-1.065	0.286797	

The model shows that structural size is a significant determinant of profitability (coefficient +658.0; $p < 0.001$), suggesting that larger firms may benefit from economies of scale, better resource management capabilities, and market power. Firm age has a negative effect on ROA (coefficient -22;

$p=0.000549$), indicating that more mature firms may experience organizational rigidity or a lower capacity for innovation, reducing profitability. The Moldova dummy is not significant (coefficient - 1.140; $p=0.426$), so no systematic differences in performance compared to other countries are observed. Investment structure and the number of firms belonging to the group are not significant determinants of ROA. The model is significant overall (F- statistic 27.94; $p<2.2e-26$), but the R^2 is low (0.009), indicating that the variability in ROA is explained only to a minimal extent by the factors considered.

Hypothesis testing

Based on the study and the model results, the following conclusions are reached.

RQ1: Do automotive companies located in Moldova show different economic and financial performance compared to similar companies or companies operating in other Eastern European countries?

Hypothesis 1 is rejected; the Dummy variable Moldova is not significant, indicating that there are no performance disparities related exclusively to the national context.

RQ2: To what extent does company size affect the financial performance of automotive companies?

Hypothesis 2 is confirmed; size emerges as the main positive driver of profitability, validating the existence of economies of scale and greater operational efficiency in larger firms.

RQ3: Is firm age associated with significant differences in the financial performance of automotive firms?

Hypothesis 3 is confirmed; the effect of age on ROA is significant and negative, suggesting that longer-lived firms suffer from organizational rigidity or lower innovative capacity.

RQ4: Does belonging to an industrial group influence the financial performance of automotive companies, and in what direction?

Hypothesis 4 is not confirmed; group membership does not appear to be a significant determinant of ROA.

Conclusions, limitations and future implications

The research highlights that the Moldovan national context does not present systemic diversity in terms of economic performance compared to the other Eastern European countries analyzed, suggesting that automotive companies in Moldova operate with profitability dynamics aligned with regional neighbors. The main driver of ROA growth is the size of the company, which allows the most structured companies to benefit from economies of scale, while the age of the companies tends to generate rigidities that penalize their performance. The main limitations of the study lie in the reduced explanatory capacity of the statistical model, which leaves part of the variability of the performance unresolved, and in the limited representativeness of the Moldovan sample compared to the Bulgarian or Romanian one. This paves the way for future research obligations that should focus more on the integration of Moldovan companies into the global value chain, investigating variables such as technological intensity and the role of foreign control to better understand how this country can evolve from a center of subcontracting to more advanced production segments.

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PROMOTION AND PRESERVATION OF CULTURAL HERITAGE – THE CASE OF POLAND AND ALBANIA

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Abstract. This paper examines the promotion and preservation of cultural heritage (CH) in Eastern Bloc countries, focusing on Poland and Albania, highlighting the strategies, challenges, and perspectives for development (in both countries). Through an analysis of institutional strategies, and

specific initiatives, the study aims to identify effective practices and provide recommendations for improving heritage management. The findings suggest that while both countries have established solid foundations for CH preservation, they face distinct challenges related to administrative coordination, financial resources, and community engagement. The study discusses perspectives on future directions, considering geopolitical changes and contributes to a broader understanding of cultural heritage dynamics in post-socialist contexts.

Keywords: cultural heritage (CH), cultural heritage management, international cooperation, promotion and preservation of cultural heritage, cultural economics.

1. Introduction

Cultural heritage (CH) is a crucial component of national identity, serving as a repository of collective memory and a source of continuity for societies. In Eastern Bloc countries, including Poland and Albania, the preservation and promotion of CH have been deeply influenced by their political histories, particularly during the communist era.

The historical trajectory of CH in Poland and Albania is marked by periods of both protection and neglect, heavily influenced by the ideological imperatives of their respective communist regimes. Diplomatic relations between the two countries began in 1937. Albania received Polish support for its membership in NATO and the European Union. In 1993, the two countries signed an agreement on cultural and scientific cooperation [1]. It is worth emphasizing that the process of building and maintaining relations between the two countries, as well as the exchange between them, has never been one-sided [2].

Poland's CH, deeply rooted in its Catholic and Slavic traditions, faced significant threats during World War II and the subsequent Soviet influence. Despite the destruction wrought by the war, the post-war communist government undertook extensive reconstruction efforts, notably the rebuilding of Warsaw's Old Town. However, the regime also sought to control cultural narratives, promoting socialist realism and downplaying pre-communist heritage. After 1989, Poland experienced a cultural renaissance, emphasizing the restoration of its historical sites and promoting its rich cultural traditions on the global stage. According to Kowalska [3], there is probably no community in Poland that would not have a local program for the protection of CH, and the aspects of overlapping/interpenetrating cultures of national minorities and ethnic groups living in the borderland areas are particularly complex.

Albania's CH reflects its diverse history, including Illyrian, Roman, Byzantine, Ottoman, and communist influences. Under the regime of Enver Hoxha, Albania adopted an isolationist stance, which had profound effects on its CH. The regime's focus on erasing religious influences led to the destruction of numerous churches, mosques, and religious artifacts. However, the regime also promoted certain aspects of Albanian folklore and traditions as part of a nationalistic cultural policy. Since the fall of communism, Albania has faced significant challenges in preserving its heritage, compounded by economic difficulties and the lack of a coherent cultural policy. As Allkja and Dhrami [4] point out, in the context of territorial management and CH in Albania, an apparent dichotomy emerges between the "old and new," as well as between development and the need to preserve heritage. Although the protection and valorization of CH occupy an essential place within planning policies, difficulties are observed in effectively maintaining and implementing these values in spatial development practice.

This article examines the approaches taken by Poland and Albania in preserving and promoting their CH, focusing on the implications for national identity and the prospects for future CH management. The primary objective of this study is to compare and analyze the promotion and preservation strategies of CH in Poland and Albania. The study aims to identify the strengths and weaknesses of each country's approach and provide recommendations for enhancing heritage management practices. The research methodology includes a desk study analysis, involving institutional reports and academic literature.

2. Comparative analysis: strategies of preservation and promotion

The strategies employed by Poland and Albania to preserve and promote their CH exhibit both similarities and differences, shaped by their unique historical and political contexts. In both countries, the state played a central role in CH preservation during the communist era. Poland's approach was characterized by a blend of reconstruction and ideological control, with the government prioritizing sites that aligned with socialist ideals. In contrast, Albania's preservation efforts were selective, focusing on aspects of heritage that supported the regime's nationalistic agenda while actively suppressing religious and external influences.

The fall of communism ushered in a new era of CH management in both countries. Poland's transition to democracy and integration into the European Union facilitated significant investments in heritage conservation and promotion. The country has successfully leveraged its heritage as a tool for tourism and national branding. Albania, however, has struggled with limited resources and institutional weaknesses, leading to the neglect of many historical sites. Nevertheless, recent efforts to revitalize CH, often supported by international organizations, have shown promise.

2.1. International promotion

The country's international promotion, in terms of image, economy, tourism, and culture, is facilitated, among other things, by the Expo. These fairs are strategic projects within the Strategy for Responsible Development. They are described as the largest and most prestigious events, focusing on finding solutions to global problems. A permanent element of the presentation of EXPO participants is the promotion of the CH of participating countries. During the fair, pavilions are prepared along with internal exhibitions promoting a given country and its achievements in a selected thematic area, and promotional programs are implemented related to the economy, culture, tourism, and the regions. World Expos, with a general theme, are held every five years, while International Expos, held between World Expos, focus on a single thematic area [5].

Albania is a founding member of the Bureau International des Expositions (BIE), an international organization responsible for overseeing and regulating international exhibitions. The country was not a member of the BIE from 1949 to 2008. Poland first participated in the fair in 1933, while Albania did so in 1937. Albania has had its own pavilion at every World Expo since 2000 [6]. By participating in the Expo, Poland and Albania have the opportunity to showcase their CH, achievements, and development directions to the international community.

Table 1. Lists the Expo fairs (and preceding specialized fairs) in which both countries participated.

Year, City (Country)	Main topic	Characteristic elements	
		Poland	Albania
1867, Paris (France)	Agriculture, Industry and Fine Arts	✓ Małnecki's piano factory, Maksymilian Fajans' photographic studio, Troetzer's metal tool factory, Lilpop and Rau factory	-
1873, Vienna (Austria)	Culture and Education	✓	-
1878, Paris (France)	New Technologies	✓	-
1889, Paris (France)	Celebration of the centenary of the French revolution	✓	-
1893, Chicago (United States)	Fourth centenary of the discovery of America	✓	-
1925, Paris (France)	n.d.	The trained tower designed by Józef Czajkowski, painting by Zofia Stryjeńska	-



1933, Chicago (United States)	The independence among Industry and scientific research.		-
1937, Paris (France)	Arts and technology in modern life	The pavilion includes several structures connected by porticos and wide galleries	
1939, New York (United States)	Building the World of Tomorrow	Openwork tower, Władysław Jagiełło's monument	-
1992, Seville (Spain)	The Age of Discovery		-
1998, Lisbon (Portugal)	The Oceans, a Heritage for the Future		-
2000, Hanover (Germany)	Humankind – Nature - Technology	The pavilion's scenography referred to the Polish tradition of 19th-century wooden manor houses and towns; highlighting the tradition and heritage with modern development and innovation	Highlighting the fusion of tradition and modernity
2005, Aichi (Japan)	Nature's Wisdom (Nature's Matrix, The Art of Life, Development for Eco-Communities)	A pavilion with a façade made of reinforced white wicker, designed by Krzysztof Ingarden; concerts of Fryderyk Chopin's music, scenographic reconstruction of a fragment of the 11th salt mine in Wieliczka; highlighting natural beauty and an approach to environmental protection	Highlighting the Albania's closeness to nature and its diverse landscapes
2008, Saragossa (Spain)	Water and sustainable development	The facade of the pavilion is made in the image of a brine graduation tower, the exhibition was arranged using white, futuristic structures resembling sails.	-
2010, Shanghai (China)	Better City – Better Life	A pavilion with a facade reminiscent of folk cutouts. Silver - Exhibition Design - pavilions between 1,750m ² and 2,500m ²	Highlighting the balance between the protection of CH and modern urban solutions
2015, Mediolan (Italy)	Feeding the Planet, Energy for Life	A pavilion with an openwork facade resembling a wooden apple box; apple tree orchard on the roof	Highlighting the agricultural heritage, a pavilion with a minimalist form
2017, Astana (Kazakhstan)	Future Energy (Solutions for Tackling Humankind's Greatest Challenge)	The pavilion presents a story inspired by pure, unspoiled nature intertwined with themes of revitalization, afforestation and clean coal technologies; Gold Award- Exhibition Design - pavilions smaller than 400 m ²	-
2020/2021, Dubai (United Arab Emirates)	Connecting Minds, Creating the Future (Opportunity, Mobility, Sustainability)	A wooden pavilion decorated with a sculpture of a flock of migrating birds – a design by the WXCA studio; Silver Award - "Creative Display" category - Pavilions Category B	Highlighting the country's transformation into a modern society; a pavilion

			combining traditional elements with modern materials and technologies
2025, Osaka (Japan)	A country whose main resource is creative people (the "gene of creativity" that passed down from generation to generation)	A wooden pavilion commemorates the wave of Polish creativity and innovation that is spreading. The musical section is connected to the work of Fryderyk Chopin; „Best Medium Pavilion” – brown award, „Best Exhibition / Display” – silver award.	-

Source: own study based on [6-11].

The Expo pavilion sets and events are planned thematically, with stories connecting their individual zones. For example, the Polish exhibition at Expo 2020 in Dubai featured five distinct zones [12]: 1. Inspired by nature - vegetation typical of various regions of Poland in artistic interpretations by illustrators, poster designers, poets and typographers; 2. A home for creativity - the multimedia art installation "Polish Table" is an artistic object created by Polish craftsmen, artists, and engineers and made of copper, glass, wood, ceramics, and carbon fibers; 3. Spirit of ingenuity - Polish successes, including in the area of culture through the presentation of a wooden sculpture with submerged multimedia carriers and artifacts; 4. Land of plenty - temporary exhibitions prepared by regions and institutional partners; 5. Landscapes of creativity - large-format multimedia projections and music shows.

The last edition of the fair - Expo 2025, took place in Osaka, Japan. The organizers of Expo 2025 Osaka, Kansai, also emphasize the fair's role as a lever in passing on philosophy and past achievements as a legacy to future generations [13]. The fair was expected to be visited by 28.2 million visitors (including 3.5 million from outside Japan). Poland has entered the fair with the motto "Poland: Heritage that drives the future," emphasizing the importance of drawing on heritage (including steadfastness, openness, solidarity, and a willingness to collaborate) to find answers to today's emerging challenges. The event highlighted the "creative gene" passed down through generations and the legacy of famous Poles, including Fryderyk Chopin, Nicolaus Copernicus, Ignacy Łukasiewicz, Maria Skłodowska-Curie, Bronisław Piłsudski, Stanisław Lem, and Jan Szczepanik.

The story connecting the four zones of the Polish pavilion included: 1. Tradition/Heritage – knowledge of heritage, sentiment that stirs memories and tradition as a source of inspiration; 2. Nature – emotionality towards nature manifested in Chopin's works, Polish idyllic landscapes; 3. People – values visible in the profiles of famous Poles: courage, openness, creativity, the ability to flexibly adapt to changes, constant searching, solidarity and hospitality; 4. The Future – showing Chopin's creative gene within the framework of Polish technological and social innovations [7].

2.2. Implications for national identity and the perspectives for future CH management

The preservation and promotion of CH in Poland and Albania have profound implications for national identity. In Poland, the revival of historical sites and traditions has reinforced a sense of continuity and resilience, helping to forge a post-communist national identity rooted in both its pre-communist past and its European aspirations. Albania's experience, however, reflects the challenges of reconciling a complex and often painful history with the need to build a cohesive national identity. The selective promotion of CH has sometimes led to tensions, particularly in relation to religious and ethnic diversity.

Looking ahead, the future of CH preservation and promotion in Poland and Albania will depend on several factors, including economic resources, political will, and international cooperation. Poland's success in CH management provides a strong foundation for future efforts. The country can

continue to build on its achievements by fostering public engagement, promoting digital heritage initiatives, and ensuring that preservation efforts are inclusive and reflective of the nation's diverse history. For Albania, the path forward requires a concerted effort to strengthen institutional capacity and secure adequate funding for heritage projects. International partnerships and community involvement will be crucial in preserving Albania's rich and diverse heritage. Additionally, the development of a comprehensive cultural policy that balances national pride with inclusivity will be essential for fostering a sense of shared identity.

3. Conclusion

The promotion and preservation of CH in Poland and Albania offer valuable insights into the broader challenges faced by Eastern Bloc countries in managing their cultural legacies. While Poland has made significant strides in leveraging its heritage for national development, Albania continues to grapple with the complexities of its past and the demands of the present. Both countries, however, demonstrate the enduring importance of CH as a cornerstone of national identity and a vital resource for future generations. This article provides an overview of the international promotion and preservation of CH in Poland and Albania, offering insights into their historical contexts, strategies, and future perspectives.

However, the comparative analysis also reveals several areas that warrant further scholarly investigation. Future research could focus on the long-term social and economic impacts of heritage-based development models, particularly in peripheral and rural regions. Additionally, more in-depth studies are needed on community participation and grassroots initiatives in CH preservation, examining how local actors influence narratives of the past and contribute to sustainable heritage management.

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THE LEADING EUROPEAN SOCCER CLUBS: SOME ECONOMIC AND FINANCIAL EVALUATIONS

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Abstract. The study analyses the economic and financial performance of the leading European soccer clubs (“Big Five”) in the decade 2015-2024 in a comparative perspective, to assess the impact of the pandemic crisis and the performance of the various companies. Through the analysis of profitability ratios (ROA) and capital strength ratios, the research tests three fundamental hypotheses regarding the recovery of post-pandemic profitability, the improvement of the financial structure, and the impact of the geographical context on performance. The results show only partial and asymmetric recovery in profitability (H1 partially confirmed), while the overall financial structure fails to show the desired improvements, revealing a worrying persistence of debt (H2 not confirmed). On the other hand, the decisive influence of the national soccer system is confirmed (H3 confirmed), with the German Bundesliga clearly distinguishing itself for stability and low use of financial leverage compared to the structural fragility of Serie A and Ligue 1. The study concludes by suggesting greater harmonisation of UEFA’s control policies to ensure economic and financial sustainability over time.

Keywords: Financial Ratio Analysis, UEFA Financial Fair Play, European Club Soccer, European football.

1. Introduction

European professional soccer has transformed into a global industry characterised by multi-billion dollar financial flows, while maintaining an inherent structural vulnerability that threatens its long-term sustainability [1]. Although the introduction of stringent regulations such as UEFA’s Financial Fair Play has aimed to streamline club management, the divergence between national governance models, from the financial rigour of the Bundesliga to the high leverage of Serie A and Ligue 1, remains marked [2]. In this context, indebtedness is not only a financing tool, but often reflects a systemic imbalance between ambitions for sporting success and the ability to generate stable operating cash flows [3].

This research aims to analyse, over ten years (2015-2024), the economic and financial dynamics of the European “Big Five”, identifying the resilience trajectories and risk factors characterising the different soccer leagues in the post-pandemic era.

2. Literature (outline)

A bibliographic search on Scopus at the end of January 2026 with the words “European Soccer Performance” identified 504 documents, of which only 47 were Limited to Business, Management and Accounting.

Interest among scholars is growing (Figure 1), especially in the UK, Germany, the USA, France, and Spain (Figure 2). Articles were mainly published (Figure 3).

Figure 1: By year

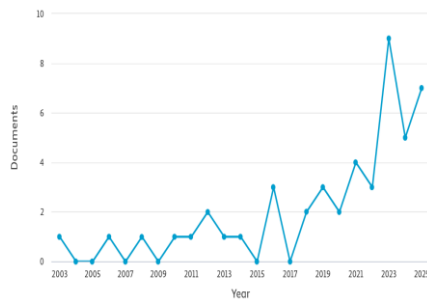


Figure 2: By country

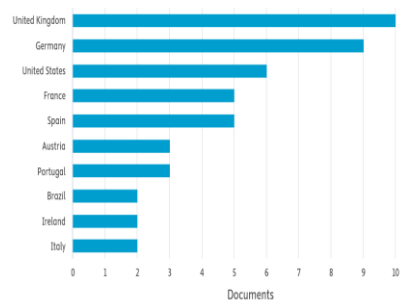
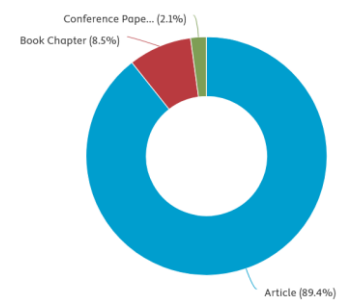


Figure 3: By type



Source: Scopus

To analyse the bibliometric characteristics of scientific contributions, VOSviewer maps the documents (Figure 4) and the 233 keywords (Figure 5) to highlight citation frequency and publication period.

Figure 4: The most cited documents

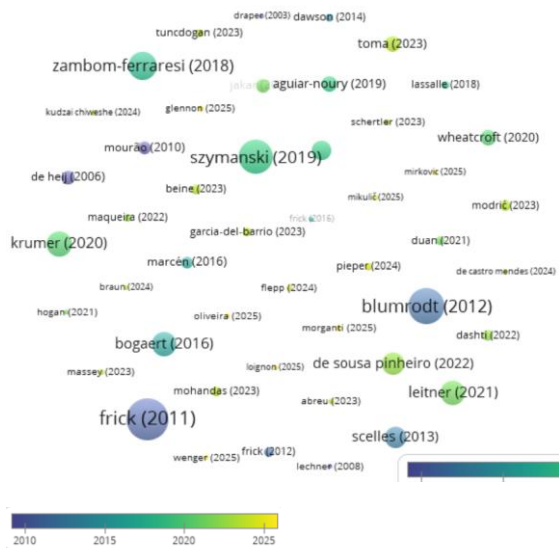
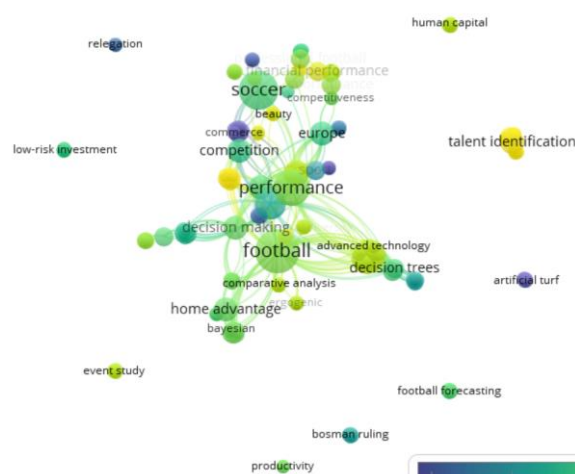


Figure 5: The most frequent keywords



Source: Our own elaboration

The sector appears fragmented, with studies that do not refer to a cohesive, localised tradition. Recent academic literature, however, has examined the determinants of performance and economic value in professional soccer, highlighting the critical roles of human and social capital. Glennon et al. [4], for example, show that the use of qualified international talent positively affects competitive performance, not only in individual skills but also in the ability to diversify tactical strategies. However, talent management requires complex organisational setups: Loignon et al. [5] warn that an excessive concentration of “stars” can be counterproductive if not mediated by a high structural social

capital within the team. At the same time, the study of selection processes underscores how Relative Age Effects affect both a club's sporting success and its long-term financial potential [6]. Finally, the analysis of market value drivers has been successfully extended to women's soccer, confirming that athletic performance and media visibility are pillars of card pricing [7]. There are not many performance studies using balance sheet data. Continuing previous study experiences [8], this paper aims to verify the following research hypotheses:

H1: The profitability of European soccer clubs increases after the pandemic break.

H2: The clubs' financial structure improves.

H3: The geographical context and the soccer system affect economic and financial performance.

3. Methodology

The analysis focuses on the five major European leagues, Serie A (Italy), Premier League (England), La Liga (Spain), Bundesliga (Germany) and Ligue 1 (France), which make up the economic core of continental professional soccer. The survey is based on balance sheet data extracted from the Orbis Europe Full database and analytically considers the ten-year trend of an economic indicator, the ROA (Return on Assets), and one indicator, the financial leverage, for which only the outcomes are presented. For each championship, ten clubs were selected based on the highest number of appearances in the top national division during the decade 2015-2024, to ensure representativeness, sample stability, and temporal continuity of the analysis.

The history series of the two indices was subjected to descriptive statistics and unidirectional ANOVA and Tukey-Kramer tests to identify statistically significant differences between alloys.

4. Results

4.1. II Return on Assets (ROA)

It is an economic performance indicator that measures the company's ability to generate operating profit from its assets. It enables more effective, comparable assessment of the economic performance of clubs of different sizes and financial structures [2]. Its formula is: $(\text{Operating Income} / \text{Total Assets}) * 100$.

Table 1 shows the descriptive statistics.

Table 1 – ROA: Descriptive statistics																					
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total sample											Ligue one										
Average	-3,03	-1,66	3,17	2,46	-0,23	10,40	-14,35	-7,79	-2,63	-1,00		-12,71	-1,04	-5,56	2,72	6,65	-6,02	-11,87	-6,77	-6,66	-2,27
Standard error	2,85	1,65	1,79	1,69	1,62	2,35	2,26	2,31	1,91	1,67		9,28	3,75	4,20	2,23	2,92	2,88	2,94	8,26	6,48	4,24
Medium	1,11	0,12	2,21	1,14	0,94	-5,90	10,71	-6,12	-1,98	-0,61		-0,34	0,06	0,35	0,38	5,89	-6,14	-13,64	-3,30	-7,79	0,00
Mode	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D		#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D
Standard deviation	17,34	9,90	10,86	10,44	10,15	15,08	14,98	14,62	12,26	10,03		26,24	10,62	11,11	5,46	7,15	7,05	8,31	20,23	15,88	9,48
Sample variance	300,74	98,01	117,94	109,09	102,90	226,43	224,29	213,87	150,31	100,58		688,58	112,73	123,51	29,85	51,15	49,70	69,05	409,31	251,79	89,87
Curtosis	6,06	0,13	0,68	1,42	2,33	0,90	2,58	3,66	2,89	1,66		3,16	1,04	-0,85	3,20	3,37	0,18	-0,92	3,16	0,42	0,72
Asymmetry	-1,83	0,76	0,21	0,70	1,02	-1,20	-1,44	-1,52	0,48	0,89		-1,84	-1,00	-1,21	1,82	1,67	0,08	0,18	-1,59	0,52	0,47
Range	102,59	38,93	48,69	51,11	52,19	67,29	76,13	73,77	72,04	44,32		77,94	32,53	24,29	14,54	19,70	20,46	23,83	58,05	45,79	22,80
Minimum	-69,86	24,54	22,08	28,96	32,02	51,14	65,99	60,37	33,91	29,34		69,86	21,56	22,08	-1,45	0,47	16,09	25,34	44,64	27,14	11,58
Maximum	32,73	14,39	26,61	22,15	20,17	16,16	10,14	13,40	38,13	14,97		8,08	10,96	2,21	13,09	20,17	4,37	-1,51	13,40	18,65	11,22
Sum	112,29	59,71	117,36	93,55	-8,93	426,43	631,37	311,44	107,71	35,83		101,65	-8,33	38,93	16,34	39,92	36,10	94,92	40,62	39,97	11,37
Counting	37,00	36,00	37,00	38,00	39,00	41,00	44,00	40,00	41,00	36,00		8,00	8,00	7,00	6,00	6,00	6,00	8,00	6,00	6,00	5,00
Level of confidence(95,0 %)	5,78	3,35	3,62	3,43	3,29	4,75	4,55	4,68	3,87	3,39		21,94	8,88	10,28	5,73	7,51	7,40	6,95	21,23	16,65	11,77
Serie A											La liga										
Average	-4,86	-5,70	5,88	-3,87	-5,26	-14,42	-17,21	-14,43	-6,13	-3,82		8,20	5,17	2,75	5,48	2,46	-1,63	-15,06	-4,38	0,55	-2,08
Standard error	3,37	2,51	4,44	3,95	3,86	6,38	5,11	6,38	4,22	4,45		5,65	2,98	2,72	5,01	0,94	1,14	4,60	3,73	1,83	1,03
Medium	-2,70	-2,91	5,29	-3,92	-5,33	-8,36	-18,61	-13,93	-4,86	-0,44		5,04	7,48	1,06	1,41	2,13	-0,15	-10,36	-0,49	0,30	-2,47
Mode	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D		#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D
Standard deviation	10,10	7,93	14,04	12,51	12,19	20,16	16,16	20,13	13,38	14,06		13,84	6,67	6,65	11,29	2,29	3,22	13,81	9,88	5,18	2,31
Sample variance	102,06	62,84	197,04	156,38	148,62	406,50	261,22	407,29	177,81	197,62		191,44	44,45	44,23	125,57	5,26	10,38	190,81	97,61	26,84	5,35

Curtosis	0,77	2,16	-	0,96	1,28	2,18	0,26	1,07	2,55	2,12	0,40		1,78	4,08	-	1,39	0,21	-	1,6	-	0,39	3,23	1,23	2,95	-	2,1
Asymmetry	-0,53	-	-	-	-	-	-0,74	-0,35	-1,16	-0,46	-		1,22	-	0,34	0,77	0,4	-	0,6	-	1,19	-	1,82	1,20	0,72	0,0
	34,81	25,3	43,4	43,6	44,8	67,2	59,5	73,1	51,6	42,1		39,5	16,5	17,0	29,2	5,5	7,81	44,2	29,7	18,7	5,4	2				5,4
Range		23,7	16,8	28,9	32,0	51,1	49,3	60,3	33,9	29,3							0,2	-	0,6	-	46,6	22,7	-	7,78	4,9	
Minimum	-	24,12	2	6	2	14,6	12,8	16,1	10,1	17,7	12,7		6,86	6,47	5,68	7,06	6	6,76	9	6	6	6	6	6	6	6
Maximum	10,69	1,57	26,6	14,6	12,8	16,1	10,1	12,8	17,7	12,7	6		32,7	10,1	11,4	22,1	5,8	0	1,05	2,43	6,96	4	4	4	4	4
Sum	-	43,77	57,0	58,7	38,7	52,5	144,24	172,13	144,29	61,2	38,2		49,1	25,8	16,5	27,4	14,75	13,0	135,55	30,6	4,42	10,39			10,39	
Counting	9,00	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0		6,00	5,00	6,00	5,00	6,0	8,00	9,00	7,00	8,00	0			5,0	
Level of confidence(95,0 %)	7,77	5,67	10,0	8,95	8,72	14,4	11,5	14,4	9,54	10,0	6		14,5	8,28	6,98	13,9	2,4	2,69	10,6	9,14	4,33	2,8	7			2,8
Premier League												Bundesliga														
Average	-5,41	7,08	6,01	4,69	5,33	16,7	19,5	-5,07	-2,06	0,58		6,53	7,28	5,49	5,95	6,0	-	9,31	4,80	6,45	1,38	4,9			4,9	
Standard error	5,12	3,66	3,42	3,55	3,26	5,72	6,70	3,49	5,02	3,00		3,91	2,39	2,25	2,49	2,2	4,43	2,22	2,81	2,57	2,8				2,8	
Medium	1,23	5,26	4,45	7,09	1,04	-8,36	13,2	-4,08	-4,20	3,08		4,23	6,88	4,52	5,95	5,0	-	8,34	3,63	6,96	1,87	5,8			5,8	
Mode	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D		#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D	#N/D
Standard deviation	15,35	10,3	9,67	11,2	10,3	18,0	21,1	11,0	15,8	9,50		8,73	5,36	5,50	6,60	6,0	11,7	5,88	7,43	6,81	6,9				6,9	
Sample variance	235,6	107,08	93,4	126,03	106,39	327,04	448,43	121,88	252,33	90,19		76,2	28,6	30,2	43,5	36,27	137,66	34,5	55,1	46,3	47,76				47,76	
Curtosis	5,63	0,67	0,77	2,84	0,08	-1,68	1,32	-0,07	5,06	0,08		3,77	0,02	2,37	2,09	3,5	-	1,26	1,76	1,12	1,14	0,8			0,8	
Asymmetry	-2,22	0,62	0,39	1,49	0,92	-0,40	-1,24	-0,43	1,96	0,47		1,88	0,00	1,42	1,13	0	0,76	1,34	0,50	0,59	0				0,5	
Range	52,14	29,8	32,1	38,2	30,4	50,0	66,1	37,0	57,4	31,0		21,7	14,2	15,5	20,3	18,03	16,4	19,7	21,3	18,7					18,7	
Minimum	-	24,5	-	21,6	25,9	43,7	65,9	25,2	19,3	16,1		-	0,08	0,12	0,04	1,69	0,3	26,4	16,1	18,0	-	7,88	5,4		5,4	
Maximum	8,84	5,28	22,8	16,5	4,49	6,38	0,20	11,8	38,1	14,9		21,6	14,3	15,5	18,6	18,42	1,39	0,29	1,79	13,4	12,82				12,82	
Sum	-	48,68	56,6	48,0	46,8	53,2	167,85	195,13	50,7	20,5	-	32,6	36,3	32,9	41,6	42,26	65,1	33,5	45,1	9,67	29,93				29,93	
Counting	9,00	8,00	8,00	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0		5,00	5,00	6,00	7,00	7,0	7,00	7,00	7,00	7,00	6,0			6,0	
Level of confidence(95,0 %)	11,80	8,65	8,08	8,03	7,38	12,9	15,1	7,90	11,3	6,79		10,8	6,65	5,77	6,10	5,5	10,8	5,43	6,87	6,30	7,2	5			7,2	
Source: Our own elaboration																										

Source: Our own elaboration

There was a significant contraction during the 2020-2021 period, attributable to COVID-19. Since 2022, a gradual recovery in average values has been observed, supported by the return of spectators to the facilities and the broader economic-financial reconstruction. The median is close to the average. Outliers do not heavily skew the distribution. Standard deviations, often exceeding 10%, and high variances indicate marked heterogeneity across clubs and leagues. In contrast, kurtosis and asymmetry show an alternating trend, indicating that distributions are sometimes more concentrated towards low values during crisis years and more balanced in recovery periods.

The Bundesliga stands out for its positive average profitability and limited variability, confirming the high management solidity that characterises the German model, historically based on balance and financial prudence. The Spanish “La Liga” also stands out for its relatively stable profile, with moderate fluctuations and a rapid recovery after the pandemic. The lowest standard deviation values and the positive asymmetry over several years indicate a slight prevalence of above-average results. Serie A and the Premier League have negative average values and greater dispersion, which suggests a less robust context than that of continental competitors. The sixth-degree polynomial interpolation functions in Table 2 allow the trend to be graphically illustrated.

Table 2 - ROA: Interpolation equations

	Interpolating curve equation	R ²
Serie A	$y = 0,0034x^6 - 41,659x^5 + 210463x^4 - 6E+08x^3 + 9E+11x^2 - 7E+14x + 2E+17$	R ² = 0,896
Premier League	$y = 0,0125x^6 - 151,34x^5 + 764335x^4 - 2E+09x^3 + 3E+12x^2 - 3E+15x + 8E+17$	R ² = 0,9647

Ligue one	$y = -0,01x^6 + 120,78x^5 - 609718x^4 + 2E+09x^3 - 2E+12x^2 + 2E+15x - 7E+17$	$R^2 = 0,7291$
La liga	$y = -0,0087x^6 + 105,06x^5 - 530232x^4 + 1E+09x^3 - 2E+12x^2 + 2E+15x - 6E+17$	$R^2 = 0,8762$
Bundesliga	$y = -0,0026x^6 + 31,29x^5 - 157877x^4 + 4E+08x^3 - 6E+11x^2 + 5E+14x - 2E+17$	$R^2 = 0,8309$

Source: Orbi data processing

The R^2 values are optimal, allowing the plot of the interpolating curves alongside the broken lines (Figure 6).

Figure 6 - ROA trends



Source: Orbis data processing

The graphs highlight what has already been proposed: a worsening during the pandemic, followed by a gradual but partial recovery in 2022-2024. Leagues with a more stable economic structure, such as the Bundesliga and La Liga, return more quickly to values close to or above zero, while Serie A, Premier League and Ligue 1 show a delay in normalising results.

To identify possible statistically significant differences in the mean ROA values of the five alloys, a one-factor ANOVA was conducted (Table 3).

Table 3 – ROA: Analysis of one-factor variance						
SUMMARY						
Groups	Counting	Sum	Average	Variance		
Serie A	10	-69,8279	-6,98279	45,60009		
Premier league	10	-51,1248	-5,11248	66,35387		
Ligue one	10	-43,5268	-4,35268	36,46922		
La liga	10	1,462993	0,146299	43,40033		
Bundesliga	10	17,08941	1,708941	38,50114		
VARIANCE ANALYSIS						
Origin of the variation	SQ	dof	MQ	F	Significance value	F crit
Between groups	541,951	4	135,4878	2,941234	0,030447	2,578739
In groups	2072,922	45	46,06493			
Total	2614,873	49				

Source: our own processing

4) is higher than the critical value (2.57), with a significance level of 0.03. This rejects the null hypothesis and indicates that the ROA averages differ significantly across championships, suggesting structural asymmetries. The post-Anova test detects them (Table 4).

Table 4 - ROA: Tukey-Kramer Test					
Comparison	Difference	Standardised difference	Critical Value	Pr > Diff	Significant
Bundesliga vs Serie A	8,692	2,864	2,841	0,047	Yes
Bundesliga vs Premier League	6,821	2,247	2,841	0,181	No
Bundesliga vs Ligue one	6,062	1,997	2,841	0,284	No
Bundesliga vs La Liga	1,563	0,515	2,841	0,985	No
La Liga vs Serie A	7,129	2,349	2,841	0,149	No
La liga vs Premier league	5,259	1,733	2,841	0,425	No
La liga vs Ligue one	4,499	1,482	2,841	0,579	No
Ligue one vs Serie A	2,630	0,867	2,841	0,908	No
Ligue one vs Premier League	0,760	0,250	2,841	0,999	No
Premier League vs Serie A	1,870	0,616	2,841	0,972	No
q statistic:			4,018		
Significant minimum difference			8,625		
Source: our own processing					

There is only one significant difference between the Bundesliga and Serie A ($p = 0.047$): the average profitability of German activities is higher than that of Italian activities. The economic and financial rigour imposed by the German model, primarily through budgetary controls, is likely to have contributed to a more sustainable management of clubs in the medium term, in contrast to Serie A, which is characterised by high operating costs and low profitability.

4.2. The leverage index (hints)

Similar analyses of this ratio show that, over the period 2015-2024, European soccer clubs have a high overall dependence on debt capital, with average values above 100% across the entire sample and an increasing trend over the decade. This dynamic confirms that the use of debt in professional soccer represents a strategic choice, functional to the pursuit of sporting competitiveness, rather than a sign of financial fragility. The results show marked heterogeneity between and within championships, with particularly high data dispersion, indicative of the coexistence of different financial models. Serie A and Ligue 1 have among the highest average debt levels, accompanied by substantial internal variability, a sign of fragile, uneven capital structures. The Premier League highlights lower average values and greater internal consistency, suggesting a more balanced use of leverage. La Liga shows a highly discontinuous trend over time, reflecting a financial structure polarised between a few highly indebted clubs and the rest of the league.

The Bundesliga clearly distinguishes itself from the other leagues, recording the lowest average debt levels and a limited dispersion, consistent with a management model oriented towards self-financing and cost control. Although German clubs have also been affected by the pandemic, the impact on their financial profile is temporary and limited.

Analysis of variance confirms the existence of statistically significant differences between the championships. In particular, the tests show that the Bundesliga differs significantly from all other leagues in that it relies less on debt, whereas between Serie A, the Premier League, La Liga and Ligue 1, there are no statistically significant differences. Overall, the results suggest that indebtedness in European soccer follows specific trajectories linked to the management and institutional models of individual leagues, rather than common system dynamics.

5. Discussion and conclusions

The survey of the five major European leagues mapped the sector's trend over the period 2015-2024.

The first hypothesis (H1) is partially confirmed. The ROA shows an asymmetrical recovery. While English and German clubs are returning to levels close to stability, Serie A and Ligue 1 are struggling to recover positive margins, burdened by operating costs that remain too high relative to their revenues.

On the other hand, the second hypothesis (H2) is not confirmed, as the debt ratio indicates that, for most championships, debt has deteriorated or remained stable compared to the pre-COVID period. The increase in debts to external shareholders and lenders, combined with a contraction in equity at many clubs, suggests that the financial structure remains weak and worrying.

It is, however, confirmed that the geographical context and the soccer system affect economic and financial performance. Analysis of variance and post hoc testing indicate that the differences between alloys are not random. The Bundesliga is a model of superior management efficiency, while Serie A and Ligue 1 show systemic fragilities linked to their respective national contexts and governance models.

The research follows in the footsteps of Glennon et al. [2] and confirms that UEFA's regulations have not yet levelled out the structural differences between nations. The persistent financial fragility found (H2) supports Morrow's thesis [1] on the sector's intrinsic vulnerability. However, new studies suggest that economic resilience could pass through alternative strategies, such as the optimisation of human capital [4] and the strengthening of internal social capital [5], elements that seem more rooted in the German model than in the Franco-Italian one. Sporting performance can therefore no longer be analysed separately from the risk of insolvency and must be part of a broader reflection on financial growth, sporting success, institutional changes and the commercialisation of elite European soccer [9]. The results suggest managers are managing leverage more wisely. On the other hand, public authorities are asked to adopt stricter rules on economic matters applicable throughout the UEFA area.

This study has obvious limitations. First of all, it is only quantitative and limited to two ratios that cannot exhaust the complexity of the economic-financial representation of soccer companies. In the future, therefore, it is hoped that a greater number of ratios and research, including qualitative research, will be used. The potential economic impact of youth sectors [6] and the enhancement of women's soccer [7] should also be explored as solutions to financial rebalancing.

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**MODERNIZAREA MANAGEMENTULUI RESURSELOR UMANE PRIN
EFICIENTIZAREA PROCESELOR DE STOCARE ȘI PROCESARE A DATELOR ÎN
ÎNTRINDERILE INDUSTRIALE, CA FACTOR DETERMINANT AL
SUSTENABILITĂȚII ORGANIZAȚIONALE**

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Abstract. This research highlights the importance of data storage and processing in human resource management within industrial enterprises, emphasizing their role in organizational efficiency, compliance, and strategic development. The modern industrial environment generates large volumes of employee data, and the use of advanced information systems—such as cloud computing, relational databases, and ERP/HRM solutions—ensures information integrity, security, and accessibility.

Consequently, digitalization prompts a rethinking of human resource management by automating labor records and payroll processes, reducing costs, and minimizing administrative errors. Furthermore, the integration of predictive analytics and artificial intelligence supports HR planning, prevents staff turnover, and identifies training needs. Correlating HR data with production processes contributes to an efficient allocation of skills and increased productivity. Finally, implementing security measures compliant with data protection regulations strengthens trust and supports the economic and social sustainability of industrial enterprises.

Keywords: HRM digitization, human resources management, human resources processes, industrial enterprises, organizational efficiency, etc.

Introducere

Întreprinderile industriale reprezintă un pilon esențial al dezvoltării economice, contribuind la productivitate, inovare și formarea unei economii competitive, iar resursele umane constituie componenta critică pentru funcționarea și evoluția acestora. În industria modernă, presiunea automatizării, digitalizării și creșterea exigențelor operaționale transformă radical modul în care informațiile despre angajați sunt colectate, stocate și analizate.

Gestionarea datelor de resurse umane devine astfel un element strategic în întreprinderile industriale, influențând eficiența proceselor, reducerea riscurilor și creșterea adaptabilității la schimbările tehnologice [13]. Rolul digitalizării este puternic resimțit și în Republica Moldova, unde întreprinderile se confruntă cu provocări legate de competențele digitale reduse, costurile modernizării și deficitul de personal calificat [1, 16].

Scopul cercetării reprezintă analiza modului în care digitalizarea proceselor HR (resurse umane) contribuie la eficientizarea managementului resurselor umane în industrie, identificând în același timp cerințele funcționale pentru dezvoltarea unui software dedicat evidenței HR în întreprinderile industriale din Republica Moldova. În acest sens, ca obiective ale cercetării se stabilesc:

- ✓ identificarea particularităților gestionării datelor HR (resurse umane) în mediul industrial;
- ✓ analiza impactului digitalizării asupra eficienței proceselor de personal;
- ✓ evaluarea provocărilor din industria moldovenească privind digitalizarea HR (resurse umane);

- ✓ definirea cerințelor tehnice pentru un soft de evidență HR (resurse umane) adaptat industriei;
- ✓ formularea unor direcții moderne de optimizare a managementului datelor.

Materiale și metode

Pentru realizarea cercetării, autorul s-a fundamentat pe:

- analiză documentară a literaturii naționale și internaționale privind managementul resurselor umane și digitalizarea acestui proces,
- studierea publicațiilor și rapoartelor din Republica Moldova privind digitalizarea industriei și piața muncii,
- alicarea comparației și sintezei între practicile internaționale și realitățile locale,
- interpretarea datelor privind Industriile 4.0 aplicabile sectorului industrial din Republica Moldova.

Discuții

Gestionarea datelor HR (resurse umane) în întreprinderile industriale reprezintă ansamblul de procese, politici, tehnologii și responsabilități prin care datele sunt colectate, stocate, prelucrate, protejate și utilizate eficient pentru a sprijini funcționarea și dezvoltarea întreprinderii. Gestionarea datelor în aceste întreprinderi presupune anumite particularități care sunt provocate de specificul sectorului și anume: procese complexe, muncă în ture, automatizare și necesitatea siguranței operaționale. Aceste particularități pot fi caracterizate de [5, 6, 18, 20]:

- Volumul mare al datelor operaționale- de obicei procesele industriale generează fluxuri informaționale masive, deoarece acestea se deduc din: pontarea orelor efectiv lucrate, normare, evidența schimburilor, monitorizarea echipamentelor de protecție, instruirii obligatorii, etc.
- Necesitatea actualizării continue a competențelor- tehnologiile industriale evoluează rapid, iar certificările, autorizările și instruirile devin elemente critice pentru siguranță și performanță;
- Rigorile securității și sănătății în muncă- industria implică riscuri semnificative, iar gestionarea digitală a incidentelor, controalelor medicale și fișelor de Securitate și Sănătate în Muncă devine esențială;
- Structuri organizaționale complexe- întreprinderile industriale au ierarhii rigide, solicitând sisteme digitale care permit trasabilitate și claritate în procese pe care le desfășoară în cadrul acestora.
- Fluctuație și deficit de personal calificat- întreprinderile industriale de obicei se confruntă des cu fluctuație de personal înaltă și cu deficit de personal calificat.

Aceste caracteristici de obicei atrag după sine și o serie de provocări. Iar acestea în mare parte ar putea fi soluționale prin digitalizarea HR (resurse umane) în întreprinderile industriale. Digitalizarea ar ușura semnificativ gestionarea proceselor în resursele umane, inclusiv și cele din Republica Moldova, deoarece aceasta implică anumite avantaje bine venite pentru întreprinderile industriale care pot conduce la sporirea eficienței gestiunii resurselor umane, optimizarea costurilor și obținerea de performanțe la întreprindere. Cu toate acestea întreprinderile industriale înregistrează o serie de provocări în tranziția la digitalizarea proceselor de gestiune a resurselor umane și anume [18]:

- Competențe digitale reduse în rândul personalului administrativ și tehnic,
- Costuri mari ale digitalizării, în special pentru IMM-uri,
- Lipsa specialiștilor IT capabili să dezvolte sisteme interne,
- Reticență și teamă față de sisteme noi, în special dintre angajații cu vechime mai mare.

Situația actuală în Republica Moldova

Digitalizarea managementului resurselor umane (MRU) în întreprinderile industriale din Republica Moldova se caracterizează printr-un nivel de dezvoltare moderat, cu diferențe semnificative în funcție de dimensiunea întreprinderii și capacitatea investițională. Conform datelor Biroului Național de Statistică al Republicii Moldova, în anul 2023 aproximativ 68% dintre

întreprinderile industriale utilizau tehnologii informaționale pentru evidența personalului și calculul salariilor, însă doar 24% dintre acestea dispuneau de soluții informatizate integrate pentru managementul resurselor umane [4]. Aceste date indică faptul că digitalizarea este concentrată în principal asupra funcțiilor administrative obligatorii, fără o abordare strategică a funcției HR (resurse umane).

Analiza structurii utilizării aplicațiilor informatice relevă faptul că peste 60% dintre întreprinderile industriale mici și medii folosesc aplicații de tip 1C- Contabilitate exclusiv pentru salarizare, în timp ce procese precum evaluarea performanței, managementul competențelor sau planificarea carierei sunt digitalizate în mai puțin de 15% dintre cazuri. Această situație confirmă concluziile Organizației Internaționale a Muncii, potrivit cărora, în economiile emergente, digitalizarea resurselor umane este orientată preponderent spre automatizarea operațiunilor de bază și mai puțin spre susținerea deciziilor manageriale strategice [10].

În contrast, întreprinderile industriale mari și cele cu capital străin prezintă un nivel mai ridicat de maturitate digitală. Potrivit unui raport al Băncii Mondiale, aproximativ 45% dintre întreprinderile industriale mari din Republica Moldova utilizează sisteme ERP integrate (SAP, Microsoft Dynamics, Oracle), care includ module dedicate managementului resurselor umane, comparativ cu doar 12% în cazul întreprinderilor mici și mijlocii [21]. Această diferență este reflectată și în eficiența proceselor HR (resurselor umane), întreprinderile digitalizate raportând o reducere medie de 30–40% a timpului alocat activităților administrative de personal.

În ceea ce privește pontajul și evidența timpului de muncă, datele statistice arată că aproximativ 52% dintre întreprinderile industriale utilizează forme de pontaj electronic (card, cod PIN sau biometric), în timp ce restul continuă să folosească foi de pontaj manuale sau tabele Excel [4]. Nivelul redus de digitalizare a acestui proces generează riscuri sporite de erori în calculul salariilor și limitează capacitatea managementului de a analiza productivitatea muncii.

Conform Indicelui Economiei și Societății Digitale (DESI) adaptat pentru țările Parteneriatului Estic, Republica Moldova se situează sub media regională în ceea ce privește digitalizarea proceselor de afaceri, înregistrând un scor de 33 puncte din 100, comparativ cu media Uniunii Europene de 52 puncte [7]. Această discrepanță se reflectă direct și în nivelul de digitalizare a managementului resurselor umane din sectorul industrial.

Așadar, printre principalele obstacole în calea digitalizării managementului resurselor umane în întreprinderile industriale din Republica Moldova se numără resursele financiare limitate, deficitul de competențe digitale ale personalului HR, rezistența la schimbare organizațională și lipsa unor strategii coerente de transformare digitală la nivel managerial, adică aceleași obstacole care se identifică și la nivel mondial. În concluzie, deși există premise favorabile pentru dezvoltarea digitală a managementului resurselor umane, nivelul actual de implementare rămâne insuficient pentru a susține competitivitatea pe termen lung a întreprinderilor industriale, fiind necesare investiții suplimentare în tehnologii, competențe și politici organizaționale orientate spre inovare.

Rezultate

Întreprinderile industriale se caracterizează prin structuri organizaționale complexe, un număr mare de angajați operaționali, muncă în schimburi și expunere sporită la riscuri profesionale, ceea ce impune o abordare specializată a managementului resurselor umane. Software-urile HR generaliste sunt orientate preponderent către organizații din sectorul serviciilor și nu integrează în mod adecvat particularitățile activităților industriale, precum evidența precisă a timpului de muncă în condiții de lucru continuu, gestionarea sporurilor specifice sau monitorizarea competențelor tehnice obligatorii.

Un argument esențial îl constituie necesitatea automatizării proceselor de pontaj și salarizare, dar nu numai, întrucât evidența manuală a timpului de lucru în industrie generează erori frecvente, costuri suplimentare și riscuri de neconformitate legală. Un software dedicat permite integrarea cu

sisteme biometrice și de control al accesului, asigurând corectitudinea datelor utilizate în calculul salariilor și sporurilor, precum și transparența relațiilor de muncă.

Așadar, dacă să ne referim la acele caracteristici pe care ar trebui să le aibă un software de management al resurselor umane destinat întreprinderilor industriale, atunci acesta trebuie să fie proiectat astfel încât să răspundă cerințelor specifice ale mediului de producție, caracterizat prin volume mari de personal, muncă în schimburi, riscuri profesionale ridicate și necesitatea respectării stricte a normelor de securitate și legislație a muncii. În acest context, una dintre funcționalitățile esențiale ale unui astfel de sistem o reprezintă modulul de pontaj automatizat, care trebuie să permită integrarea cu cititoare biometrice, tehnologii RFID, sisteme de control al accesului și turelare, asigurând generarea automată a fișelor de prezență și reducerea erorilor umane în evidența timpului de lucru [15].

De asemenea, un software HR performant trebuie să includă un modul dedicat administrării instruirilor și certificărilor profesionale, având capacitatea de a gestiona programe de formare, cursuri obligatorii, autorizări specifice posturilor industriale, termene de expirare ale certificărilor și istoricul instruirilor fiecărui angajat. Această funcționalitate contribuie la asigurarea conformității legale și la menținerea competențelor necesare desfășurării activităților industriale în condiții de siguranță [19].

Un alt element critic îl constituie digitalizarea proceselor de securitate și sănătate în muncă (SSM), care din an în an devin tot mai importante pentru fiecare întreprindere, dar în special pentru cele industriale, unde de obicei cel mai des se pot întâmpla accidente la locul de muncă sau apar diverse riscuri accentuate al funcțiilor. Astfel, pentru a-și justifica eficiența, software-ul HR (resurse umane) trebuie să permită gestionarea fișelor de evaluare a riscurilor profesionale, raportarea incidentelor și accidentelor de muncă, monitorizarea echipamentelor individuale de protecție, evidența controalelor medicale și generarea automată a rapoartelor solicitate de autoritățile competente, în conformitate cu cadrul normativ național și european [6, 12].

În ceea ce privește recrutarea, soluțiile moderne de HR trebuie să integreze funcționalități de recrutare automatizată, bazate pe selecția candidaților în funcție de competențe, experiență și calificări tehnice. Integrarea cu platformele naționale de ocupare a forței de muncă, precum cele gestionate de Agenția Națională pentru Ocuparea Forței de Muncă dar și altele, precum și utilizarea instrumentelor de analiză predictivă pot contribui la reducerea timpului de angajare și la creșterea calității procesului de selecție [2, 9].

De asemenea, pentru susținerea deciziilor manageriale, software-ul HR destinat întreprinderilor industriale trebuie să includă dashboard-uri analitice avansate, care să ofere indicatori-cheie de performanță specifici mediului industrial, precum productivitatea muncii, rata absențelor, competențele critice, fluctuația personalului și costurile asociate resurselor umane. Corelarea datelor HR cu indicatorii de producție permite o analiză integrată a performanței organizaționale și sprijină procesul decizional la nivel strategic [14].

O funcționalitate emergentă, cu relevanță tot mai mare în context industrial, este analiza predictivă a riscului de epuizare profesională (burnout). Prin corelarea datelor privind sarcinile repetitive, orele suplimentare, ritmul de muncă și performanța individuală, software-ul HR (resurse umane) poate contribui la identificarea timpurie a riscurilor psihosociale și la implementarea măsurilor preventive, aspect evidențiat și în literatura de specialitate recentă [8].

Având în vedere volumul și sensibilitatea datelor gestionate, securitatea informațională reprezintă o cerință fundamentală pentru orice software HR utilizat în întreprinderile industriale. Sistemul trebuie să respecte standardele internaționale de securitate a informației și să fie conforme cu legislația națională privind protecția datelor cu caracter personal, asigurând confidențialitatea, integritatea și disponibilitatea informațiilor [11].

Nu în ultim rând, un software HR (resurse umane) destinat mediului industrial trebuie să permită integrarea cu sistemele existente ale întreprinderii, inclusiv soluții ERP, sisteme SCADA (Sistem amplu de Monitorizare, Control și Achiziții de Date), Manufacturing Execution Systems (MES) și aplicații financiar-contabile. Această integrare facilitează schimbul de date între funcțiile

de resurse umane și procesele operaționale, contribuind la creșterea eficienței organizaționale și la o gestionare coerentă a resurselor întreprinderii [17].

Concluzii

În contextul transformărilor digitale accelerate și al provocărilor structurale cu care se confruntă întreprinderile industriale, formularea unor recomandări coerente privind digitalizarea managementului resurselor umane devine esențială pentru creșterea competitivității și sustenabilității acestora. În primul rând, se recomandă automatizarea proceselor administrative repetitive din domeniul resurselor umane, precum evidența timpului de muncă, calculul salariilor, gestionarea concediilor și administrarea documentelor de personal. Automatizarea acestor activități contribuie la reducerea erorilor umane, la diminuarea costurilor administrative și la eliberarea timpului personalului HR pentru activități cu valoare adăugată mai mare, orientate spre dezvoltarea capitalului uman și sprijinirea deciziilor manageriale.

O altă recomandare vizează dezvoltarea competențelor digitale ale personalului, în special ale specialiștilor în resurse umane și ale managerilor de linie. Nivelul redus al competențelor digitale reprezintă una dintre principalele bariere în implementarea eficientă a soluțiilor informatice HR. Prin urmare, este necesară organizarea unor programe sistematice de formare profesională, axate pe utilizarea aplicațiilor HR, analiza datelor și înțelegerea proceselor digitale, astfel încât personalul să poată valorifica în mod eficient funcționalitățile sistemelor implementate și să susțină procesul de schimbare organizațională.

Totodată, investițiile în infrastructura digitală industrială constituie o condiție indispensabilă pentru succesul digitalizării managementului resurselor umane. Aceste investiții trebuie să includă atât modernizarea echipamentelor hardware și a rețelelor informatice, cât și implementarea de soluții software integrate, capabile să conecteze funcțiile HR cu procesele de producție, financiar-contabile și de control operațional. O infrastructură digitală adecvată permite colectarea și analiza datelor în timp real, facilitând luarea deciziilor bazate pe informații relevante și actualizate.

În final, se recomandă consolidarea colaborării dintre întreprinderile industriale și instituțiile de formare profesională, inclusiv universități, colegii și centre de instruire tehnică. Această cooperare poate contribui la alinierea competențelor dobândite de absolvenți cu cerințele reale ale pieței muncii industriale, precum și la dezvoltarea unor programe de formare continuă adaptate nevoilor întreprinderilor. Implicarea mediului academic și a instituțiilor de formare în procesele de digitalizare poate sprijini transferul de cunoștințe, inovarea și dezvoltarea capitalului uman calificat, element esențial pentru succesul pe termen lung al sectorului industrial.

În concluzie, implementarea acestor recomandări poate contribui la transformarea managementului resurselor umane dintr-o funcție predominant administrativă într-un factor strategic de dezvoltare organizațională, capabil să susțină adaptarea întreprinderilor industriale la cerințele economiei digitale.

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ECONOMIC AND SOCIAL DIMENSIONS OF TRADITION BEARERS: INCENTIVES, CONSTRAINTS AND SUSTAINABILITY OF INTANGIBLE CULTURAL HERITAGE

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Abstract: Intangible cultural heritage (ICH) represents a unique domain of the cultural sphere, whose existence and transmission rely primarily on individuals and communities. This paper examines ICH transmission as a human-capital-based process with economic, social, and psychological implications. The study focuses on the institutional title “Bearer of Folk Craft Tradition” as an example of a mechanism combining symbolic recognition, limited economic incentives, and social support. Insights are drawn from selected theses on the subject, highlighting the significance of recognition, community embeddedness, and intrinsic motivation for sustaining traditional skills. The findings show that public acknowledgment and institutional frameworks enhance motivation, facilitate intergenerational skill transfer, and support the economic viability of traditional crafts. Psychological factors, cultural identity, and social cohesion are critical for long-term sustainability. The paper also identifies the relevance of institutionalized ICH protection, as exemplified by the Czech Republic’s nomination process recognized by UNESCO, and outlines directions for the author’s ongoing research.

Keywords: Intangible cultural heritage; Bearer of Folk Craft Tradition, human capital; institutional incentives; social recognition; sustainable transmission.

Introduction: Intangible cultural heritage (ICH) is a specific component of the cultural sphere whose existence and transmission are primarily based on individuals and communities. The process of transmitting ICH can be understood as a form of cultural transmission grounded in human capital, shaping value orientations, behavioral norms, ways of thinking, and practical skills of individuals and groups [1, p. 1]. The appropriate transformation of knowledge into concrete offerings can contribute to the sustainable development of communities, the sharing of economic benefits, and simultaneously to the protection and revitalization of intangible cultural heritage and cultural landscapes. Key factors include stakeholder involvement, mechanisms of benefit distribution, and the quality of cultural interpretation [2, p. 631].

Effective safeguarding and transmission of ICH depend not only on institutional and financial instruments but also on the internal motivational mechanisms of tradition bearers. Psychological components of their human capital, particularly intrinsic motivation, emotional investment, cultural self-confidence, and access to social support - prove to be crucial for the long-term willingness of bearers to invest time, knowledge, and skills, even under conditions of limited economic returns [3, p. 16].

ICH is widely recognized as a potential factor strengthening social cohesion and societal resilience. Standard economic indicators are insufficient to capture values such as identity, trust, and collective efficacy [4, p. 189]. The use of artificial intelligence and machine learning in the protection and innovation of ICH is an emerging field [5, p. 487]. At the same time, the safeguarding of intangible cultural heritage is often overlooked, likely due to the inherent nature of intangible assets as “heritage” [6, p. 14]. Well-designed combinations of economic incentives, symbolic recognition, and social support can enhance the psychological resilience of tradition bearers and increase the sustainability of ICH transmission.

The aim of this paper is to present the economic, social, and psychological dimensions of the role of Bearers of Folk Craft Tradition, emphasizing their significance in sustaining traditional crafts and cultural identity in the Czech Republic, while laying the groundwork for the author's further research into these actors.

Bearers of the Folk Craft Tradition Title: Traditional and folk culture form an integral part of the cultural heritage of every country. Since 2001, the Minister of Culture of the Czech Republic has annually awarded the title *Bearer of Folk Craft Tradition* to outstanding folk artisans in public recognition of their work. This distinction is based on a project referred to by UNESCO as “Living Human Treasures,” whose objective is to preserve traditional crafts threatened by extinction, to document their techniques, and to transmit these skills to future generations. The initiative builds upon UNESCO's document „Recommendation on the Safeguarding of Traditional Culture and Folklore“, which calls on states to devote increased attention to living cultural heritage [7].

The „Bearer of Folk Craft Tradition“ title is legally regulated by Government Regulation No. 5/2003 Coll. on awards in the field of culture; it thus represents formal state recognition rather than informal community-based acknowledgment. The title is associated with the award of a diploma, a financial benefit, and the licensing of the “Bearer of Tradition” trademark. This trademark may be used by bearers to label their own products as a guarantee of quality and authenticity [8].



Picture No.1: Logo Bearer of Folk Craft Tradition (Folk Art)

Source: Source: [9]

Context and Role in Society: The title is regarded as a prestigious form of recognition of tradition, quality, and continuity in folk production. Title holders are often perceived as bearers of unique skills and regional identity, such as practitioners preserving specific crafts including weaving, bobbin lace-making, traditional blacksmithing, wickerwork, and indigo printing. At the same time, the programme serves as a practical instrument for safeguarding intangible cultural heritage in the Czech Republic and includes exhibitions and public presentations of artisans and their work. The Czech Republic has gone even further in the protection of intangible cultural heritage.

The nomination process for the Bearers of Tradition is inscribed on UNESCO's lists of intangible cultural heritage. „Strategy for Safeguarding Traditional Crafts: The Bearers of Folk Craft Tradition Programme“ was entered in 2022 into the UNESCO Register of Good Safeguarding Practices. According to UNESCO (2026), the programme emerged from research activities conducted by the National Institute of Folk Culture. This research demonstrated that most traditional workshops face long-term economic difficulties, particularly in financing production and securing markets for their products. The programme combines institutional, economic, and symbolic instruments. It also includes systematic documentation and expert evaluation of traditional crafts. Awarded artisans receive comprehensive promotional support, and programme outcomes are made accessible to the public through specialized web platforms, publications, audiovisual materials, and permanent exhibitions [10].

Methodology, research: For future research on the Bearers of Folk Craft Tradition, the current phase draws on an analysis of existing master's and doctoral theses, as this group represents an institutionally defined and closed population for which no comprehensive, systematic empirical research has yet been conducted. Existing findings are largely based on partial qualitative studies in which students typically approach individual bearers according to regional proximity, personal contacts, or thematic affinity, which inherently limits the generalisability of the results. Consequently, the next stage of research will involve an original empirical study based on a census approach. A

census is a research method in which all units of the target population are examined rather than a selected sample; it is most commonly applied when the population is limited in size, clearly identifiable, and of central relevance to the research objectives.

In the case of the Bearers of Folk Craft Tradition, this approach is particularly appropriate, as it enables a comprehensive capture of their economic, social, and motivational characteristics without sampling bias and allows for a holistic assessment of the role of this institutional instrument in safeguarding and sustaining intangible cultural heritage. The article draws on findings from several selected dissertations and theses focusing on tradition bearers and presents the economic, social, and psychological aspects of their role, with particular emphasis on their importance for the sustainability of traditional crafts and cultural identity in the Czech Republic. The results of this research will serve as a basis for further, more extensive research by the author. These works were identified through the theses.cz database of publicly available academic theses.

Table No. 1: Description of Theses Related to Intangible Cultural Heritage (author's selection)

No.	Year	Thesis	Title	Research Focus
1	2025	Doctoral	Embodied Heritage: The Path to a Living Phenomenon (Exploring the Practice of Intangible Cultural Heritage through the Example of Puppetry in the Czech Republic)	Qualitative, puppetry
2	2023	Doctoral	Folk Embroidery in the Moravian Kopenice Region in a Historical, Social, and Cultural Context	Qualitative, embroidery
3	2024	Master's	The Significance of the Bearer of Folk Craft Tradition Title	Qualitative, 7 tradition bearers, 9 regional representatives
4	2020	Bachelor's	The Contribution of the Bearer of Folk Craft Tradition Title to the Preservation and Development of Folk Crafts in the Czech Republic	Qualitative, 14 tradition bearers

Source: Created by the author of the publication [11, 12, 13, 14].

The following section presents a synthesis of research findings derived from the theses listed in Table No. 1. In line with the aim of the article, the key findings are summarized below.

Economic Aspect: Traditional crafts and folk practices provide their bearers not only with prestige and recognition but also with opportunities for economic engagement through product sales, commissions, courses, and cooperation with institutions. Awards and public recognition motivate creators to continue their work, support the transmission of skills to subsequent generations, and contribute to economic viability. Key factors include public interest, availability of materials, and support from institutional or cultural organizations. Barriers such as administrative obligations and high entry costs may economically endanger artisans and, consequently, the continuity of tradition.

Social Aspect: Traditional crafts function as powerful instruments of social cohesion and cultural identity. They maintain intergenerational ties, foster community participation, and enable adaptive transformation of tradition without losing its core essence. These practices connect material and intangible dimensions of cultural heritage, incorporate environmental and aesthetic values, and create spaces for education, collaboration, and the sharing of experience. Active engagement of both communities and creators is essential for preserving cultural vitality and ensuring the future transmission of skills.

Table 2: Summary of Economic and Social Aspects

Aspect	Key Findings
Economic	– Awards and recognition motivate artisans to continue their craft. – Skill transmission supports long-term economic sustainability. – Income from product sales, commissions, and courses strengthens economic stability. – Public interest and promotion are crucial for the preservation of traditions. – Administrative and material barriers (entry costs, legislation) threaten the economic viability of artisans.
Social	– Traditions strengthen community cohesion and connect generations. – Adaptation and a dynamic understanding of tradition ensure its relevance. – Material, intangible, and environmental dimensions are interconnected. – Cooperation and the sharing of experience are key to cultural vitality. – Traditions reinforce identity, pride, and social participation of community members.

Source: Created by the author of the publication

The title „Bearer of Folk Craft Tradition“ demonstrates how tradition functions simultaneously as an economic and a social phenomenon. From an economic perspective, it brings measurable benefits such as awards, a certification trademark, and financial remuneration, and acts as an institutional incentive supporting the sustainability of crafts. From a social and cultural perspective, it provides a system of recognition that enhances community status and supports the intergenerational transmission of skills. This case offers a suitable framework for further research linking economic, social, and cultural dimensions of traditional skills.

Relevance for Further Research: The title „Bearer of Folk Craft Tradition“ represents a concrete, institutionally embedded case of “tradition” as an economic and social phenomenon:

- From the perspective of economics and finance: it enables analysis of the value of skills and knowledge that are not easily defined as market goods; the title leads to measurable benefits (awards, certification trademarks, financial rewards) and functions as a mechanism of institutional incentives, offering an example of an incentive scheme within public policy.
- From the social and cultural perspective: the title operates as a system of social recognition that influences community status and is linked to the intergenerational transmission of skills.

Future research aims to examine the economic and social aspects of tradition bearers as actors, focusing not only on the existence of the title itself, but on how its existence shapes their behaviour, motivation, and economic position.

Conclusion: The article demonstrates that intangible cultural heritage (ICH) should not be understood solely as a cultural value but also as a specific form of human capital with significant economic, social, and psychological impacts. Traditional skills of bearers represent knowledge whose value is manifested not only in the market but also in identity, social cohesion, and community stability. The title “Bearer of Folk Craft Tradition” functions as an effective institutional tool that combines symbolic recognition with limited yet meaningful economic benefits. Public recognition and institutional support strengthen bearers’ motivation to continue their craft and transmit their skills to future generations.

At the same time, it becomes evident that the economic returns of traditional crafts are often secondary to intrinsic motivation, cultural self-confidence, and social ties. Psychological aspects of human capital therefore appear crucial for the long-term sustainability of ICH transmission. The importance of an institutional framework is illustrated by the fact that the Czech Republic’s nomination process for the Bearer of Folk Craft Tradition program is recognized and registered in the UNESCO Register of Good Safeguarding Practices. This international context confirms the relevance of combining economic, social, and symbolic tools for ICH protection.

This contribution draws on insights from several selected doctoral and master's theses on the Bearers of Traditions, highlighting their economic, social, and psychological aspects and their importance for sustaining traditional crafts and cultural identity in the Czech Republic. These findings will serve as a foundation for the author's ongoing, more detailed research, aiming to analyze bearers as active agents shaped by institutional, social, and cultural environments. Finally, the study emphasizes the need for further interdisciplinary research focusing on the integration of institutional mechanisms, psychological motivation, and social dynamics of tradition bearers to ensure the long-term sustainability of intangible cultural heritage transmission.

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CIRCULAR ECONOMY AND PUBLIC ADMINISTRATION IN SLOVAKIA

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Abstract. The article characterizes the differences between linear and circular economies. It presents strategic documents, action plans and legislative frameworks for the functioning of the circular economy. Using the example of selected cities, it presents specific aspects of waste processing and the overall transition to a circular economy in the public administration entities studied.

Keywords: Circular economy, production chain, strategic documents, circular economy, public administration

Introduction

At the beginning, we define two concepts. Circular economy as a theory of how to replace linear production chains with cyclical chains in order to minimize waste generated during the chain, as well as at its end. The second concept, circular economy, is the practical aspect of the use of production chains. From the perspective of linear production chains, the used product becomes waste, and from the perspective of cyclical production chains, the product becomes a secondary raw material. It can be simply stated that the more developed a given country is, the more often waste is transformed into a secondary raw material [1, p.1]. In this particular case, we will focus on strategic documents, action plans and legislative frameworks for the functioning of the circular economy. Using the example of selected cities, we will present specific aspects of waste processing. It should be noted that the term circular economy is used primarily in legal and conceptual documents of the European Union in the sense of circular economy.

1. Characteristics and difference between linear and circular economy

As stated by several authors, the modern circular economy is a cyclical process, where even the primary raw materials leading to production or consumption are viewed as renewable. [2, p. 2]. The circular economy is a model of production and consumption that involves sharing, renting, reusing, repairing, replacing worn-out parts, and recycling existing materials and products for as long as possible.

The goal of the circular economy is to produce so-called zero waste, which represents a state where almost no waste is produced [3, p.13].

Table 1 shows the main differences between the linear and circular economies. We can see that in a linear economy, a product is produced, consumed and disposed of in relation to a product. In a circular economy, a product is produced, consumed, repaired, reused or recycled. From an

ecological perspective, a linear economy is characterized by ecological inefficiency, because the product goes to waste after consumption. A circular economy is characterized by high ecological efficiency, because after consumption, the product is either remanufactured, repaired, partially or completely recycled and reused in the production process. Thus, the reuse of production raw materials is negligible in a linear economy, while in a circular economy, there is a high degree of recycling of production raw materials.

Table 1. Differences in linear and circular economy

	Lineárne hospodárstvo	Obehové hospodárstvo
Životný cyklus produktu	vyrobit' – spotrebovať – zlikvidovať	vyrobit' – spotrebovať – opraviť – znovu použiť – recyklovať
Ekológia	ekologická neúčinnosť	ekologická efektívnosť
Časové využitie výrobných surovín produktu	krátkodobé – jednorazové použitie surovín vo výrobnom procese	dlhodobé – viacnásobné životné cykly surovín vo výrobnom procese
Opätovné využitie	mizivé	recyklácia vo vysokej miere

Source: DAŠKO, M. 2021. Analysis of the quality of local environmental governance from the perspective of users of public services and employees of local government. p. 13

In essence, the linear economy can be evaluated as a waste of natural resources, energy and the production of unnecessary waste. Therefore, the transition from a linear economy to a circular economy represents a reduction in negative environmental impacts, an increase in the use of secondary raw materials and a strengthening of competitiveness and innovation, which is in line with the main objective of the Europe 2020 document - "A strategy for smart, sustainable and inclusive growth" [4, p.10] .

2. European Union circular economy legislation

The first Circular Economy Action Plan was adopted by the European Commission in 2015. It included measures to help stimulate Europe's transition to a circular economy, strengthen global competitiveness, boost sustainable economic growth and create new jobs. The Action Plan set out concrete and ambitious measures covering the entire life cycle of a product, from production to consumption, waste management and the market for secondary raw materials, and a revised legislative proposal on waste.

The European Green Deal is a new strategy for economic growth adopted by the European Commission (EC) at the end of 2019. The European Union (EU) is currently in the process of transforming itself towards a circular economy (CE) model, which was announced in 2014. The EC envisages a smooth transition from a linear economic model based on "extract – process – dispose" to a circular economic model in which discarded products become waste for recycling. At the same time, the EC recommends using raw materials more efficiently and recycling them. Within the framework of the European Green Deal, the European Commission focuses the process of macroeconomic coordination with the aim of integrating the UN Sustainable Development Goals, placing sustainability, environmental protection and the well-being of EU citizens at the centre of economic policy and the Sustainable Development Goals [5, pp.1-2] .

3. Circular economy and waste management in regions in Slovakia

If we analyze some basic statistical data on waste in individual regional cities, we will create a picture of how waste management is implemented in Slovakia.

- In the city of **Banská Bystrica**, waste was managed in the following way in 2019: 46% was landfilled, 43% was recycled. No waste was recovered for energy.
- In **Bratislava**, waste was managed in the following way in 2019: 56% of waste was recovered for energy, 9% of waste was landfilled, recycling was at the level of 25%, 2% was handed over to another entity
- In the city of **Košice**, waste was managed in the following way in 2019: 1% was landfilled, 32% was recycled. 63% of municipal waste was recovered for energy.
- In the city of **Nitra**, waste was managed in the following way in 2019:

57% was landfilled, 22% was recycled.

- In the city of **Prešov**, waste was managed in the following way in 2019:
60% was landfilled, 29% was recycled.
- In the city of **Trenčín**, waste was managed in the following way in 2019:
60% was landfilled, 32% was recycled.
- In the city of **Trnava**, waste was managed in the following way in 2019:
44% was landfilled, 44% was recycled. Municipal waste from the city of Trnava is not recovered for energy purposes.
- In the city of **Žilina**, waste was managed in the following way in 2019:

53% was landfilled, 40% was recycled. Municipal waste from the city of Žilina is not energy-recovery. Waste treatment accounted for 4% [6, p.109]. From this data, we can conclude that in most regions, more than half of waste is still landfilled.

Conclusion

If in the last chapter we had a simple conclusion and we said a, that the vast majority of waste is landfilled, we did not say b. This means that we will certainly not be able to meet the common EU goals to which we have committed ourselves at such a pace. The common goal was to fulfill the Waste Directive and that by 2020 we will sort and recycle 50% of municipal waste in Slovakia.

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ASSESSMENT OF THE IMPLEMENTATION AND MONITORING OF THE SUSTAINABLE DEVELOPMENT GOALS IN THE REPUBLIC OF MOLDOVA

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Abstract: This study assesses the progress and monitoring mechanisms related to the implementation of the Sustainable Development Goals (SDGs) in the Republic of Moldova, with a special focus on SDG 8 “Decent Work and Economic Growth”. The authors will present the conceptual framework of the SDGs and will present the interdependence between the environmental, social and economic dimensions.

The purpose of this paper is to present the progress of the Republic of Moldova in the process of nationalizing the 2030 Agenda and implementing the proposed Sustainable Development Goals. At the same time, we will analyze the tools for monitoring the implementation of the SDGs and their efficiency. As an example, SDG8 Decent Work and Economic Growth will be brought. The paper details the role of the International Labor Organization (ILO) as a custodian entity for labor indicators, presenting a set of key indicators reported to the UN. In particular, indicator 8.8.2, which measures compliance with the rights of association and collective bargaining, places the Republic of Moldova at a good score of 0.9 (on a scale where 0 is the maximum performance).

Key words: sustainable development, sustainable development goals, decent work and economic growth

The Sustainable Development Summit Declaration was adopted in September 2015 by the UN member states, including the Republic of Moldova. By this decision, the signatory countries committed to implementing the 2030 Agenda for Sustainable Development. The Agenda is complex and comprises 17 Sustainable Development Goals and 169 targets.[1] The Sustainable Development Goals (SDGs), also known as the Global Goals, include actions to end poverty, hunger, AIDS, and discrimination against women and girls, while also protecting the planet. The 2030 Agenda is universally applicable to all states, regardless of their development level or priorities, as it encompasses aspects of the primary development pillars: economic, social, and environmental.

This approach dates back to the 1992 Earth Summit in Rio de Janeiro, when sustainable development was mentioned as having three pillars – the environment, the social and the economic dimension. Sustainable development is enshrined under Article 3(3) of the Treaty on European Union as one of the long-term objectives of the EU. The concept of “sustainable development” itself has a broad and long-term approach. Developed by the Brundtland Commission, the definition widely used by the UN and the EU states that: “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”[2] Thus,

the goals included in the 2030 Agenda aim to increase the responsibility of the population, public authorities, and the business community regarding the rational use of existing resources.



Fig. 1. The SDGs wedding cake [3]

The Sustainable Development Goals should be approached as an integrated and interdependent system, not as a set of separate sectoral goals. The SDG Wedding Cake model, developed by the Stockholm Resilience Centre, provides a coherent conceptual framework that highlights the interdependencies between the ecological, social and economic dimensions of sustainable development.

In this approach, the biosphere is the foundation of sustainable development. Environmental goals (such as climate action, clean water, protection of terrestrial and aquatic ecosystems) form the structural basis on which human societies can be built. Without maintaining the functioning of ecosystems and respecting planetary boundaries, social and economic progress becomes unsustainable in the long term.

Above this foundation lies the societal system, which includes goals aimed at human well-being, social equity and community cohesion. Poverty reduction, ensuring access to education, health, energy, gender equality and peace are conditional on ecological stability and, in turn, create the necessary framework for economic development.

The economic system, represented in the upper layer, must be understood as subordinate to and dependent on both society and the biosphere. Economic growth, innovation, infrastructure, and production and consumption patterns must be designed to support social objectives without compromising the ecological base.[3]

The Sustainable Development Goals have been implemented in the policies and strategies of all signatory countries. Accordingly, each of them has aligned all sectoral strategies with the provisions of the 2030 Agenda.

The first step in the process of adapting the provisions of the 2030 Agenda at the national level, taking into account the complexity of the provisions, but also the discrepancy in the functioning of the current organizational structures and laws, was to adjust the 17 goals, the targets mentioned in them, and the monitoring indicators to the specific context of each country.

In the Republic of Moldova, this process began between July 2016 and February 2017, when a comprehensive study was organized, involving all stakeholders (development partners, private sector, academia and civil society organizations). The purpose of this activity was to:

- identify the relevance of the SDGs and analyze the level of correlation between the 2030 Agenda and national policy priorities;
- adapt (formulate) the objectives and targets of the 2030 Agenda in accordance with national needs and priorities, and identify the policy documents in which they are to be integrated;
- define the main indicators necessary for monitoring and evaluating the level of implementation of the SDGs.

As a result of this process, the objectives and targets of the 2030 Agenda were included in national strategic planning documents, in particular, in the National Development Strategy “Moldova 2020”, which reflects only a third of these objectives and only half of the SDG indicators. Later, following several recommendations, the Government elaborated the National Development Strategy “European Moldova 2030” (NDS) – the national long-term strategic vision document, which indicates the directions of the country’s development and which adapts the priorities, objectives, indicators, as well as the targets of the international commitments assumed by the Republic of Moldova to the national context.[4]

It should be noted that the Republic of Moldova is recording moderate overall progress in terms of implementing the 2030 Agenda, with clear improvements in education, gender equality, water, energy and institutions, but with setbacks or limited progress for the objectives targeting: poverty, food security, decent work, industry and sustainable cities (table 1).

Table 1. Progress results for each objective for the period 2023-2025

SDG	2023	2024	2025	Trend
SDG 1 No poverty	60	60	57	slight decline
SDG 2 Zero hunger	67	63	56	significant decline
SDG 3 Health	57	60	57	volatile, stagnation
SDG 4 Quality education	74	80	80	significant steady progress
SDG 5 Gender equality	75	77	79	continuous progress
SDG 6 Water and sanitation	57	59	61	moderate progress
SDG 7 Clean energy	64	71	71	significant progress
SDG 8 Decent work	60	50	52	regression, then slight recovery
SDG 9 Industry/innovation	68	58	53	continuous decline
SDG 10 Reduced inequalities	68	69	65	decline in 2025
SDG 11 Sustainable cities	53	48	53	low level, slight recovery
SDG 12 Responsible consumption	60	64	69	consistent progress
SDG 13 Climate action	56	59	63	moderate progress
SDG 14 Life below water	63	63	63	stable
SDG 15 Life on land	63	63	70	significant progress in 2025
SDG 16 Peace and institutions	48	56	56	improvement, then stabilization
SDG 17 Partnerships	60	48	56	volatile, partial recovery

Sursa: elaborat de autor în baza [6; 5]

According to the established methodology, 100 points are awarded for significant progress, 75 for moderate progress, 50 for limited progress and 0 for decrease, the score per SDG being the average of the national indicators analyzed for 2024 with reference to 2023 and updated for 2025.

The Sustainable Development Goals (SDGs) have been adapted to the national context and are being integrated into strategic planning documents for implementation, monitoring, and evaluation. Given the complexity and the long-term involvement of various public stakeholders, a Guide for the Nationalization of the SDGs was published in March 2017 to streamline this process.

This Guide outlines the key actors, the essential stages for integrating SDGs into national frameworks, and the specific roles of coordinating authorities. Ultimately, aligning policy development with predefined budgets is a critical prerequisite for successfully implementing the 2030 Agenda at the national level.[1]

Table 2. Stages of nationalization of sustainable development goals

Nr.	Actions	Responsible
1	Stage 0 (precondition) Integrating the SDGs into the National Development Strategy	State Chancellery
2	Stage I Integrating the SDGs into sectoral and cross-sectoral policy documents	Central Administrative Authorities
3	Stage II Integrating the SDGs into the Government's action plan	State Chancellery

4	Stage III Integrating the SDGs into the institutional planning process	Central Administrative Authorities
5	Stage IV Integrating the SDGs into the medium-term budgetary framework	Ministry of Finance

Source: developed by the author based on data [1]

In this regard, the Republic of Moldova is also making some progress by developing and improving national normative acts, which include important directions from the Sustainable Development Goals (table 3).

Table 3. Key elements of a framework for strategic coherence and monitoring

Element	Progress 2023 - 2025
Strategy "European Moldova 2030"	Directly link SDGs to national targets and 10 dimensions of quality of life
National Monitoring Framework LHG 953/2022, revised 657/2025M	Strengthen indicators, align with international and EU metadata, action plan for data availability
National SDG Platform	Centralized dissemination of SDG indicators, support for data-driven policies
Availability of SDG indicators	Fully available: 65% in 2024 (up from 50% in 2017M; partially: 16%; unavailable: 19%

Source: developed by the author based on [6; 5]

In order to monitor and evaluate the results obtained through the implementation of state strategies and policies in order to achieve the objectives of the 2030 Agenda, special attention was paid to the process of analyzing, reviewing and developing the necessary indicators.[7]

It is appropriate to describe here the structure and classification of the indicators used to monitor the achievement of the Sustainable Development Goals (SDGs). To facilitate the implementation of the global indicator framework, all indicators are classified by the IAEG-SDGs into three tiers, based on their level of methodological development and data availability at the global level:

- Tier 1: The indicator is conceptually clear, has an internationally established methodology and available standards, and data are regularly produced by countries (for at least 50% of countries and the population in every region where the indicator is relevant).
- Tier 2: The indicator is conceptually clear, has an internationally established methodology and available standards, but data are not regularly produced by countries.
- Tier 3: No internationally established methodology or standards are yet available for the indicator, but the methodology/standards are being (or will be) developed or tested. (As of the 51st session of the UN Statistical Commission, the global indicator framework no longer contains any Tier III indicators). [8]

All indicators are equally important; the tier system is established solely to assist in the development of global implementation strategies. For Tier I and Tier II indicators, data availability at the national level may not align exactly with the global classification; therefore, countries are encouraged to create their own classifications for implementation.

Between 2020 and 2023, we contributed to a comprehensive study on the right to work and labor protection as part of the State Program project: „Human Rights in the Republic of Moldova: Financial Dimension and Consolidation through Efficient Public Expenditure Management”. Below, we detail the progress and monitoring of this right, specifically as reflected in SDG 8: Decent Work and Economic Growth.

As the International Labour Organization (ILO) is responsible for all labor-related initiatives and rights, it reports annual data to the UN for 14 SDG indicators across five of the 17 goals. These statistical indicators are maintained in the ILO's 'Labour Market-Related SDG Indicators' (ILOSDG) database. It is important to note that these figures may differ from those in the UN Global SDG Indicators Database. While data is submitted to the UN annually, the ILOSDG database within

ILOSTAT is updated more frequently. Furthermore, because the UN's reporting criteria are more stringent, the ILOSDG database typically contains a more comprehensive set of records.[8]

Below we will present the Sustainable Development Goals indicators presented by the International Labour Organization and reported to the UN. This includes the latest metadata, concepts, definitions, data sources, calculation methods for the data presented, as well as other additional information.

Table 4. Sustainable Development Goals indicators presented by the International Labor Organization.

Indicator number	Indicator name	Link de acces
Indicator 1.1.1	Proportion of population living below the international poverty line by sex, age, employment status and geographical location (urban/rural)	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+1.1.1
Indicator 1.3.1	Proportion of population covered by social protection floors/systems, by sex, distinguishing between children, unemployed, elderly, disabled, pregnant women, newborns, victims of work accidents and poor and vulnerable	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+1.3.1
Indicator 5.5.2	Proportion of women in management positions	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+5.5.2
Indicator 8.2.1	Annual growth rate of real GDP per person employed	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+8.2.1
Indicator 8.3.1	Proportion of informal employment in total employment, by sector and sex	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+8.3.1
Indicator 8.5.1	Average hourly earnings of employees, by sex, age, employed and persons with disabilities	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+8.5.1
Indicator 8.5.2	Unemployment rate, by sex, age and persons with disabilities	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+8.5.2
Indicator 8.6.1	Proportion of young people (aged 15-24) not in education, employment, training	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+8.6.1
Indicator 8.7.1	Proportion and number of children aged 5-17 engaged in child labour, by sex and age	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+8.7.1
Indicator 8.8.1	Fatal and non-fatal occupational injuries per 100,000 workers, by sex and migrant status	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+8.8.1
Indicator 8.8.2	Level of national compliance with labour rights (freedom of association and collective bargaining) based on ILO textual sources and national legislation, by sex and migrant status	https://ilostat.ilo.org/resources/concepts-and-definitions/description-sustainable-development-labour-market-indicators/about-sdg-indicator-8-8-2/
Indicator 10.4.1	Share of labour in GDP	https://unstats.un.org/wiki/display/SDGeHandbook/Indicator+10.4.1

Sursa: elaborat de autor în baza datelor [<https://ilostat.ilo.org/resources/concepts-and-definitions/description-sustainable-development-labour-market-indicators/>]

Focusing on SDG Indicator 8.8.2, within Goal 8 (Decent Work and Economic Growth), it is noteworthy that in 2018, the 20th International Conference of Labour Statisticians adopted a resolution recommending the ILO as the custodian agency for this indicator and endorsing its proposed methodology.

This indicator measures the level of national compliance with freedom of association and the effective recognition of the right to collective bargaining (FACB). It covers all ILO member states and is based on six textual sources from ILO supervisory bodies, as well as national legislation for states that have not ratified ILO Conventions No. 87 (1948) or No. 98 (1949).

Indicator 8.8.2 essentially converts qualitative text from multiple sources into a quantitative score based on predefined criteria. The scale ranges from 0 to 10, where 0 represents the best possible score (highest compliance with FACB rights) and 10 represents the worst. In 2021, the Republic of Moldova recorded a score of 0.9, a level maintained since 2017.[9] Here we can mention the most recent progress made (table 5):

Table 5. Progress on SDG 8 – Decent Work and Economic Growth

Indicator	2022	2023	2024
GDP growth per capita	15,7%	-2,1%	2,4%
GDP growth per employed person	-6,7%	-1,6%	4%
Indicator	2022	2023	2024
Non-agricultural informal employment	23%	23%	20,6%
NEET 15–29 years	–	27,6%	25,4%
Gender wage gap	13,6% (2021)	15,6%	16,6%

Source: developed by the author based on[5; 6]

Table 5 highlights a mixed evolution of the progress recorded under Sustainable Development Goal 8 – Decent Work and Economic Growth in the period 2022–2024. The analyzed indicators reflect both signs of economic recovery and the persistence of structural vulnerabilities in the labor market.

GDP growth per capita has experienced volatile dynamics. After a significant advance in 2022 (15.7%), 2023 marked a contraction of -2.1%, which suggests an unstable economic context. In 2024, the indicator returns to a positive trend (2.4%), signaling a modest recovery, but the growth rate remains well below the annual target of 7.5%, necessary for the full achievement of SDG 8.

A similar situation is observed in the evolution of GDP per employed person, a relevant indicator of labor productivity. The negative values in 2022 (-6.7%) and 2023 (-1.6%) indicate a decline in the economic efficiency of the workforce. However, the 4% increase in 2024 confirms a recovery in productivity, suggesting improvements in work organization, investment or better use of human capital.

Regarding non-agricultural informal employment, the stagnation at 23% in the period 2022–2023 indicates difficulties in formalizing employment relations. The decrease of this indicator to 20.6% in 2024 represents important progress, as reducing informal work is essential for increasing the quality of jobs, social protection and tax revenues.

The NEET rate for the population aged 15-29 remains high, although an improvement is observed between 2023 (27.6%) and 2024 (25.4%). This decrease suggests a gradual integration of young people into education, training or the labour market, but the level of the indicator continues to reflect significant challenges in the transition from education to employment.

In contrast to these positive developments, the gender pay gap has steadily widened, increasing from 13.6% in 2021 to 16.6% in 2024. This negative trend indicates a deepening of pay inequalities between women and men and directly affects the overall score of SDG 8, undermining the principles of decent work and social inclusion.

Following the approval of the 2030 Agenda, the reporting method and the content of the indicators targeting the Sustainable Development Goals became more complicated. If the MDGs (Millennium Development Goals, established for the period 2000-2015) had 8 objectives, 21 targets and 60 indicators, the SDGs currently have 17 objectives, 169 targets and 232 indicators. Of which the ILO (International Labour Organization), as the custodian agency, reports to the UN data for 14 sustainable development indicators, grouped into 5 of the 17 objectives, respectively. The ILO is responsible for: consisted of 8 goals and 60 indicators, the SDGs now comprise 17 goals and 232 indicators. As the custodian agency, the ILO is responsible for 14 indicators across 5 goals, with duties including:

- Compiling national statistics from data producers;



- Verifying country data/metadata to ensure international comparability;
- Developing international standards for Tier III indicators;
- Estimating global and regional aggregates and identifying data gaps;
- Reporting annual data to the UN and contributing to SDG progress reports;
- Strengthening national capacities to produce high-quality labor-related data.[8]

The central role of 'decent work for all' in achieving sustainable development is anchored in SDG 8. Job creation, social protection, labor rights, and social dialogue are not only integral to this goal but are also embedded as targets across the other 16 SDGs. However, while the UN's model relies on national actions to meet global targets, some argue that the gap between sustainability goals and environmental reality continues to widen, particularly in high-consumption countries.

In conclusion, while the Republic of Moldova demonstrates a strong institutional commitment to the 2030 Agenda - evidenced by its stable and positive score of 0.9 for SDG Indicator 8.8.2 a significant challenge remains. The transition from MDGs to SDGs has not only multiplied the technical requirements for data reporting but has also highlighted a growing paradox. Despite achieving high marks in regulatory compliance and formal reporting, the gap between global sustainability targets and the practical environmental and social realities often persists.

The ILO's role as a custodian agency is vital in ensuring that „decent work” is not just a statistical abstraction but a lived reality. However, for Moldova, the next phase of development must move beyond 'nationalizing' indicators. It must focus on ensuring that economic growth does not outpace ecological limits, addressing the critique that high-consumption patterns continue to undermine the very sustainability we seek to measure.

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DEVELOPMENT OF THE "GREEN" ECONOMY IN THE REPUBLIC OF BELARUS: MAIN DIRECTIONS, PROBLEMS AND PROSPECTS

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Abstract. In the study, in the context of achieving the Sustainable Development Goals, the problems of the development of the "green" economy in the Republic of Belarus are considered, the main approaches to the implementation of this model of economic relations are characterized, the problems and prospects of this process are identified.

Keywords: "green" economy, Sustainable development goals, economic activity, environmentally friendly products.

For modern Belarus, which is a socially oriented state and belongs to the category of countries with a very high level of human development, achieving the Sustainable Development Goals (SDGs) means creating institutional conditions to ensure the transparent and inclusive development of Belarusian society and the state [1]. To a large extent, achieving the SDGs is the key to strengthening state sovereignty, creating safe and comfortable living conditions for people, and preserving natural systems for current and future generations. In the technological aspect, this implies achieving high-quality growth of the national economy on a modern digital technological base, which should minimize the inherent conflict of any industrial activity with the human environment. This should help to increase the degree of environmental safety of various economic and social facilities. In the economic aspect, it is necessary to ensure and maintain macroeconomic balance as a condition for the dynamics of economic growth, increase the competitiveness of Belarusian business entities, develop innovative industrial clusters and technology platforms, and create a favorable environment for the development of small and medium-sized businesses. In the social aspect, it is necessary to ensure the maintenance of high standards of quality and standard of living of the population with a stable level of employment, the creation of comfortable living conditions and the development of the individual potential of the citizens of the country.

That is why the SDGs are implemented in the main legal acts defining the vector, parameters and tools for ensuring the long-term development of the country: the National Strategy for Sustainable Development of the Republic of Belarus for the period up to 2040, the National Strategy for Water Resources Management in the context of Climate Change for the period up to 2030, the Program of Socio-economic Development of the Republic of Belarus for 2026-2030, etc. On the one hand, the progress made towards greening national development is evidenced by the fact that in the post-Soviet space, at the time of 2024, Belarus ranked 32nd in the world in terms of environmental efficiency

index (for comparison: Estonia – 1, Lithuania – 21, Latvia – 30, Ukraine – 41, Kazakhstan – 72, Georgia – 77, Russia – 83, Moldova – 86, Armenia – 94, Kyrgyzstan – 105, Uzbekistan – 107, Turkmenistan – 120, Azerbaijan – 121, Tajikistan – 167) [2]. On the other hand, the material for reflection is provided by statistical information characterizing the dynamics of the country's sustainable development and presented in the booklet "Belarus on the way to achieving the Sustainable Development Goals, 2024" [3].

The current environmental situation urgently requires humanity to implement specific measures aimed at both mitigating the effects of climate change and adapting to climate change, as well as at sustainable reduction of harmful anthropogenic impact on the environment. The "green" economy is proposed as an institutional response, which is "often considered as a new economic model replacing the neoliberal one and contributing to the fight against urgent global problems that have taken the form of a new crisis" [4, p. 20].

That is why ensuring environmental safety and the transition to rational production and consumption models have been identified as one of the main priorities of the long-term development of the Republic of Belarus. This model of economic organization is focused on achieving long-term goals of socio-economic development and carbon neutrality with extensive use of resource-efficient production methods, significant reduction of environmental risks and minimization of environmental degradation rates.

At the legislative level, this course of the modern Belarusian state is enshrined in such national strategic and program documents as: the National Action Plan for the Development of a "green" Economy in the Republic of Belarus for 2021-2025, the National Action Plan for the Conservation and Sustainable Use of Biological Diversity for 2021-2025, the Strategy of Scientific, Technical and Innovative Development in the field of environmental protection and sustainable use of natural resources for 2021-2025, The Environmental Protection Strategy of the Republic of Belarus for the period up to 2035, the State Program "Environmental Protection and Sustainable Use of Natural Resources for 2021-2025", the State Program "Agrarian Business" for 2021-2025, etc. The country has developed and implemented standards for the implementation of the SDGs in economic and managerial practice, systematically implements measures to support companies exporting environmentally friendly products, introduced systems for monitoring greenhouse gas emissions and ensuring biosafety. In Belarus, agricultural land is one of the most valuable resources, therefore, state control over the use and protection of land has been strengthened in the country, work on the reclamation of disturbed lands has been intensified, etc.

According to the Belarusian expert community, the state's economic policy in implementing the green economy model should be based on the following approaches and principles:

- equal treatment of economic, social and environmental problems;
- transition to a low-carbon economy;
- prioritization of the development and use of renewable energy sources and new environmentally friendly materials;
- creation of an effective waste management system for production and consumption;
- compliance with the requirements of legislation on environmental protection, sanitary and hygienic rules and regulations, and environmental standards in carrying out economic activities;
- compliance with environmental protection conditions during economic reform;
- focus on reasonable compromises in resolving conflicts over the need to comply with environmental restrictions and requirements when conducting business;
- economic stimulation by means of the state credit and pricing policy of carrying out measures on resource conservation and development of innovations;
- widespread use of economic instruments to cover the costs associated with the use of environmental insurance and fines against business entities;
- development of international cooperation in order to preserve, protect and restore the integrity of planetary ecosystems [5, p. 45].

The key document defining the architecture and principles of building an eco-oriented national economy is the National Action Plan for the Development of a "green" economy in the Republic of Belarus for 2021-2025 [6]. The strategic goal of the implementation of this document is the development of an inclusive, innovative and digital "green" economy, which is considered as a driver of environmental innovation, economic growth and a factor of social stability. The priorities for the development of a "green" economy based on the principles of sustainable consumption and production in the Republic of Belarus have been identified:

- a closed-cycle economy (circular economy), which involves a sharp reduction in the carbon intensity of products and a qualitative transformation of the entire life cycle of goods (from development to their maintenance and disposal);

- the production of organic products based on the use of organic fertilizers (organic chelated micro fertilizers, natural microbiological liquid humic fertilizers, fertilizers from vermicompost, etc.) with a significant reduction in the use of pesticides, fertilizers and antibiotics in agriculture;

- ecological tourism and agroecotourism as a basis for sustainable rural development and a factor in the development of agribusiness;

- smart and energy efficient cities through the construction of buildings that have a lower impact on the environment and require lower operating costs;

- urban mobility, based on public and personal electric transport and related infrastructure;

- conservation and sustainable use of biological and landscape diversity, including through a significant increase in forest areas;

- the sphere of "green" financing as a basis for supporting environmentally friendly, resource-saving, low-carbon projects;

- scientific, personnel and educational support for the transition to a "green" economy.

From the point of view of production organization, the green economy model actualizes the use of circular business models and industrial symbiosis as a practice of multilateral cooperation, as a result of which waste or by-products of one enterprise become raw materials for another, thereby ensuring economic efficiency and reducing resource consumption. Ideally, such resource-efficient production is characterized by efficient use of resources, significant reduction of damage to natural systems and negative consequences for human health, minimizing environmental risks at the stage of production of goods and services by reducing the emission of pollutants into the environment and minimizing waste generation throughout the life cycle of the products or services. However, one should take into account the fact that "many measures in the field of the green economy are of a strategic nature, that is, it is assumed that there is a significant time interval between the moment of investing resources and obtaining the expected effect from their investment" [7, p. 70].

The development of a "green" economy, which is focused on a closed material cycle of resource provision, reducing consumption of all types of raw materials and fuel and energy resources, and maximizing the use of waste, significantly changes consumption as a social phenomenon. The consequence of this is both the development of a sharing economy based on the collective use of goods or services without compulsory ownership, and the growing popularity of eco-design, which is based on the integration of environmental aspects into the process of creating goods. In addition, the economic feasibility of developing market mechanisms for a "green economy" in the country is determined by the fact that the return from the ecosystem services market in Belarus alone is estimated at US\$ 5 billion annually [8].

The national Action Plan for the development of the "green" economy focuses on the widespread use of scientific and technological progress in order to conserve resources, increase the environmental friendliness of products and prolong the product life cycle, maximize the beneficial properties of goods and services while minimizing their negative impact on the environment, maximize the involvement of waste in economic turnover in order to replace natural resources, increasing employment by creating "green" jobs, etc. In a broad sense, the development of a "green" economy in Belarus "can play an important role in such areas as the digital economy, education, healthcare, tourism, etc. (implementation through public-private partnerships, the issuance of "green"

bonds and the "greening" of enterprises in the real sector of the economy, the development of venture financing, the development of specialized training programs, the involvement of specialists and scientists in the development of energy-intensive and environmental innovations, the creation of waste recycling enterprises, etc.)" [9, p. 58]. The specific practices and effectiveness of the implementation of the principles of the "green" economy in practice within the framework of the main directions can be judged by the following data (table).

Table – The main directions of the development of the "green" economy in Belarus.

The direction of the development of the "green" economy	The overall results of the development of the "green" economy
Closed-loop economy (circular economy)	Using the principles of circular business models, plants for the production of office paper from waste paper were built in Borisov (Goznak Paper Mill), the use of used oils in the Krupsky district of the Minsk region, and the use of wood waste to produce biofuels in Brest (Kommunalnik). Rental services for housing, cars, bicycles and scooters are developing in the country. Some agricultural organizations operate biogas energy complexes based on the use of agricultural waste. The country is implementing projects for the construction of Novopolotsk, Gomel, Volkovysk, Pukhovichi regional municipal solid waste management complexes, and the construction of a waste recycling plant in the Bobruisk region. At the same time, the reconstruction of the municipal solid waste (MSW) landfill in Baranovichi, the reconstruction of the MSW sorting production complex in Minsk, as well as the creation of facilities for the use of RDF fuel in cement production in the Mogilev region at JSC Krichevtsementnoshifer is underway.
Sustainable consumption and production	Amendments have been made to a number of legislative acts of the Republic of Belarus, RUE Ecologiyainvest has developed draft technical regulations establishing the specifics of environmental certification of products, and an environmental audit of industrial organizations is being conducted based on the methodology of resource-efficient and cleaner production developed by the United Nations Industrial Development Organization (UNIDO).
Development of production and circulation of organic products	A number of regulatory legal acts have been adopted to implement the provisions of the Law of the Republic of Belarus "On the Production and Circulation of Organic Products". There is a positive growth trend in the number of producers of organic agricultural products and areas of agricultural land certified for the production of organic products in the country, and the production of organic fertilizers is actively developing. National certification bodies have been established and accredited on the basis of RUE "Scientific and Practical Food Center of the National Academy of Sciences of Belarus" and RUE "Belarusian State Institute of Metrology".
Development of ecological tourism and agroecotourism	Decree of the President of the Republic of Belarus No. 365 dated October 9, 2017 "On the development of Agroecotourism" and the National Strategy for the Development of Tourism in the Republic of Belarus for the period up to 2035 were adopted, and a program of financial support for the development of agroecotourism is being implemented. The republican contest "The best farmstead of the Year" is held annually in the country, in which estates are selected in



	three categories: "Ethnoculture", "Ethnoculture" and "Agrotouristic cluster". Measures are being implemented to develop ecological tourism in specially protected natural areas (Berezinsky Biosphere Reserve, four national parks and 28 reserves of national importance).
Smart and energy efficient cities	A large-scale regional development project "Smart Cities of Belarus" is being implemented, aimed at the systematic introduction of smart city technologies in the regions. Smart city concepts and roadmaps have been developed for 11 cities with a population of over 80,000 people identified as potential centers of economic growth (Orsha, Baranovich, Pinsk, Novopolotsk, Polotsk, Mozyr, Lida, Borisov, Soligorsk, Molodechno, Bobruisk). Since 2009, only resource-efficient residential buildings have been designed and built in the country.
Development of low-carbon energy	In the country, renewable energy is developing in cooperation with nuclear energy in the direction of increasing energy efficiency, digitalization in the sectors of the national economy, and building smart energy networks. The share of primary energy production from renewable energy sources in the gross consumption of fuel and energy resources will reach 7-8 percent by 2026.
Development of electric transport (infrastructure) and urban mobility	The country has taken measures to encourage the purchase of electric vehicles and the development of infrastructure, which have led to an avalanche-like increase in the number of such vehicles, and measures are being taken to manufacture and/or assemble electric vehicles, traction motors and charging stations. Two enterprises are engaged in the production of electric buses in the country: JSC "Belkommunmash Holding Management Company" and JSC "Minsk Automobile Plant". The country has also established the production of electric charging stations for both industrial and individual use (Vityaz OJSC, Energopromis LLC, etc.).
Climate change mitigation and adaptation to climate change	In order to increase resilience to climate change and reduce vulnerability, measures are being implemented based on effective public administration and intersectoral (interdepartmental) coordination, balanced funding from internal and external sources, the development of international cooperation, awareness-raising activities, as well as monitoring and reporting.
Conservation and sustainable use of biological and landscape diversity	In the country, the preservation of natural ecosystems and landscapes is achieved by declaring specially protected natural territories (reserves, national parks, sanctuaries, natural monuments), as well as establishing a legal regime for the special protection of typical and rare natural landscapes and biotopes.
Development of the sphere of "green" financing	The Belarusian financial market uses elements of "green" lending (JSC "Development Bank of the Republic of Belarus", JSC "Belinvestbank", JSC "Belarusian People's Bank", etc.). Work is also underway to improve the financing mechanism for "green" construction through the use of "green" bonds issued by government agencies, legal entities individuals for the purpose of implementing environmentally sound investment projects in construction.
Scientific, personnel and educational support for the	Belarus pays great attention to the development of continuous environmental education and upbringing, and the Green Schools educational project is actively developing. The country conducts

transition to a "green" economy	research in the following areas: issues of energy efficiency, energy conservation; creation of intelligent electric power systems, smart electricity consumption; creation of environmental and energy technologies in architecture and construction; rational use, reproduction and management of natural resources; issues of biological and landscape diversity; study of ecosystems of protected natural areas; technologies of waste collection, neutralization and use, etc.

Thus, the development of a "green" economy in the Republic of Belarus contributes to achieving sustainable economic growth, increasing production efficiency, involving small and medium-sized businesses in the development of this model of economic relations and improving the quality of life of the country's population. In general, this contributes to the transformation of the national economy into a stronger, more competitive and environmentally efficient economic system.

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CZU 332.1

**ASPECTS REGARDING LABOR MARKET DEVELOPMENT IN THE SOUTHERN
REGION OF THE REPUBLIC OF MOLDOVA**

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Abstract: The labor market is a fundamental pillar of regional economic development, reflecting both the economy's capacity to generate jobs and the level of integration of the active population. This article examines the possibilities for developing the labor market in the Southern Region of the Republic of Moldova, a region marked by structural imbalances, high external migration and a low degree of economic diversification. The analysis focuses on the existing reserves available to the region in order to identify the best positions for economic activity and to better perceive where the best results will be achieved. This analysis also allows us to solve a complex of problems related to employment in the region.

Keywords: labor force, labor market; employment; region.

Economic development is a complex and long-term process through which an economy experiences quantitative growth and qualitative transformations, the main purpose of which is to improve the standard of living of the population. The essential elements of economic development are economic growth and development, which connect the resources and production factors used. The central place within this multitude of resources and, at the same time, the most important element from a logistical point of view is the human factor. This is considered not only the key element of economic development, but also the final objective of this activity. More specifically, the human factor, through its efforts and ability to work, is transformed into labor force.

Employment requires constant attention from all stakeholders: the state, the business environment and the scientific community, as it directly contributes to the achievement of various socio-economic transformations.

The state regulates employment policy through a system of measures with direct or indirect influence on the labor market. State employment policy is the policy that intervenes at different levels.

Next, we will analyze the development of the labor market at the regional level, namely in the Southern Development Region of the Republic of Moldova, which includes the following districts: Cahul, Cantemir, Căușeni, Cimișlia, Basarabeasca, Leova, Ștefan-Vodă and Taraclia. Of the total area of the territory of the Republic of Moldova, the region occupies 24.2%, and of these, 62.1% is occupied by agricultural areas.

In order to determine the possibilities for the development of the labor market in the region, we analyze the existing reserves or natural resources available to the region. This will allow us to identify the best positions for economic activity and to better perceive where we will achieve the best results. For these reasons, it should not be forgotten that human labor must be used rationally and wisely, and the result of labor must bring maximum economic effect.

Following research into the presence or absence of mineral deposits, it is observed that in the Southern Region of the Republic of Moldova we have small brown coal deposits (Vulcănești-Cahul, Etulia-Vlădiceni), which are characterized by high ash content and low temperature capacity, meaning that it has a very low efficiency for its extraction, because the extraction costs will be higher than those of marketing. Consequently, they are not extracted. Also, oil accumulations have been discovered, which even if extracted are in very small and insignificant quantities, which is why they

do not have industrial importance either. Combustible natural gases have been discovered in small quantities (Ciobalaccia village, Cantemir district) they can only be used for local needs.

Among other underground resources we find sand, clay, limestone for cutting, bentonite, mineral waters. Accordingly, in the Southern Development Region, the discovered underground resources cannot significantly contribute to a strong development of the economy, but small and medium-sized enterprises can be established, which would use this local resource for the production of construction materials specific to the region such as bricks, clay bricks, tiles, etc., without them being transported from other economic regions of the country.

A special role in the short list of underground resources of the region belongs to underground waters. This resource is used in households and is considered the main source of drinking water, but which cannot be used for industrial irrigation, because in the world drinking water obtains a status of strategic wealth of states.

In parallel with drinking water, among the underground riches in the same category are also mineral waters. Even though they are in smaller quantities and have no importance in industry, they can be used in the economy of the curative field. An example where local mineral water is used is the "Nufărul Alb" sanatorium in the municipality of Cahul, which uses mineral water from a depth of 460 m for curative purposes. This mineralized water possesses special curative properties. Having a chloride-sodium composition, with a temperature of 36° C and a mineralization of 68 g/l., it treats a wide range of disorders of the musculoskeletal system. Beneficiaries of the treatments offered by the "Nufărul Alb" sanatorium are not only residents from the entire country, but also representatives from many other countries of Europe and Asia, especially from Germany. In this way, groundwater plays an important role in the development of the Region from an economic point of view.

But the main wealth of the Southern Region is and remains the land, with its fertile soil layer. According to the analyses carried out by researchers, of the entire surface of the Republic of Moldova, approximately 80% is covered with ordinary and carbonate chernozems. The chernozem of the Republic of Moldova in its structure contains humus in the proportion of 3.5-4.3%, or what constitutes about 280-320 t/ha. For a more detailed characteristic of the soil, it should be shown how much nitrogen, phosphorus, potassium is contained in it in total, as well as the number of microelements. Accordingly, it is necessary to present the physical, structural properties and the state of hydrostability, etc. However, all this information does not interest us at the moment, since it is within the competence of specialists in the field. But even without possessing the information in question, it is understood that agriculture is the priority branch of the economy and contributes to the development of the labor market in the region.

From this it follows that a significant role is played by soils, which directly depend on climatic conditions. In the analyzed region, temperatures are very favorable. The annual average temperature is +9.5° +10° C. From March to December, positive average monthly temperatures are recorded, and from December to February, negative temperatures. Based on this, we can safely say that in the Southern Region of the Republic of Moldova there are all the prerequisites for seriously developing agriculture. The recorded atmospheric precipitation is 400-450 mm, they usually fall unevenly and this is one of the risk factors of the region. From these considerations it follows that in the region it is necessary to develop artificial irrigation, which allows the development of competitive, but not subsistence, agriculture.

So, this analysis allows us to establish the priority directions of labor market development and at the same time to solve a complex of problems directly related to the production process, which from an economic point of view is more convenient to take place in the localities of the region, where everything necessary to carry out a certain activity is found. In other words, in these circumstances, in the Southern Region of the Republic of Moldova, developed infrastructure is required, which will significantly contribute to the development of the marketing network of the finished product obtained. The most important remain the access roads, which require major repairs. In parallel with the roads, for the development of high-performance agriculture, it is also required to create a stable irrigation

system, and prepare the necessary number of rooms in the form of sheds, warehouses, places for the preparation of fertilizers, etc.

In agriculture, as in other areas, an important and decisive role is played by the marketing of the crop and the income that these producers ultimately obtain, but not intermediaries. Namely, analyzing the income obtained from the marketing of finished products, it will depend on whether the producer will develop this activity or not. Moreover, according to the conditions that exist in the region, where we have tens of thousands of hectares of unused land, it is much more correct and convenient to activate small and medium-sized businesses in the agricultural field. Namely, small and medium-sized enterprises have the opportunity to consolidate land areas of about 100-150 ha and coordinate them according to the legislation in force. At the same time, organizing and creating enterprises that own large areas, that is, thousands of hectares, is problematic, because the lands are divided into small shares.

But for the solution of these tasks, an important role falls to the state in the person of the Ministry of Agriculture and Food Industry with its subdivisions up to the district agricultural departments and local mayors. Namely, the creation of favorable conditions for those who wish to advance in this field, their certification, consultation and training of personnel in the agricultural field, granting loans, supporting them in the marketing of the obtained production depends on the involvement of these structures.

From the above it follows that agriculture is a primary foundation in feeding the population. It is one of the main levers of state security, therefore it is important who works in this field, how they work and what results are obtained. Respectively, when selecting those who wish, the studies obtained or the desire to do them in the respective field, the accumulated practice, the level of responsibility and organizational and household capabilities.

The state, represented by the district agricultural departments, which are substructures of the Departments of the Ministry of Agriculture and Food Industry in its work activity, must practice visiting fields and agricultural lands, workplaces during the season of necessary work. To hold seminars with interested parties before the start of agricultural work, to inform them of what changes have been introduced in the respective field, when, how and how much they must pay taxes, when to apply for loans and which ones are more convenient. Under what conditions can loans be obtained, to inform them of what contracts have been concluded at the Government level and what will be the cost of marketing the finished product. The state is the one that must guarantee producers that the production obtained will be carried out at a convenient cost, and the risk of unfavorable conditions, unforeseen situations, the state will solve them. The state is the one that protects and helps producers to refrain from using high-quality fertilizers, herbicides and insecticides against diseases and pests, etc.

In agriculture in the Republic of Moldova, the biggest problem is creating favorable conditions for the marketing of finished products. Because it often happens that most producers do not have the opportunity to enter the market, but even more often they do not manage to stand at the stall to market their production, because most often the land does not allow this. In these circumstances, they are forced to resort to the services of intermediaries, who have taken over the places at the market and propose a purchase cost that may correspond to 30-50% of the market price and in the end the situation is obtained that not the one who produces but the one who sells wins, and the one who produces remains at a loss even if the price on the market is very favorable. In such circumstances, the agricultural producer loses courage, begins to incur debts to the people who work for him and accordingly financial problems begin. Such situations are used by people who have only one goal: to make money, without being interested in the moral side of the issue. In such cases, the state must remove from its protection these producers who, in turn, do not comply with the necessary requirements. This would mean that the latter will not benefit from state privileges (support in financing, in the production, in the material and informational field) and will not obtain any facilities.

To the above, we can add that in order to develop a competitive labor market in agriculture, which corresponds to the current reality, it is necessary to take into account some measures at the

legislative level. According to the above, in the Southern Development Region of the Republic of Moldova there are tens and tens of thousands of hectares of agricultural land that the owners do not use. In these circumstances, the state should create the necessary conditions for the owners to be interested in processing these lands, but if they do not have the possibility to ensure decent and very transparent conditions for leasing these lands, where the state should take over the guarantee of ensuring the necessary payments. The situation in which people who have the means go to the fields and process them, then collect the harvest and sell it without paying anything to the owners is unacceptable in a state where the law is at the top of the table. But in the Republic of Moldova, unfortunately, such cases are also recorded. The reasons for this are that at the time when the fragmentation of fields and the transfer of ownership to the citizens of the localities took place, most of them were or had reached an advanced age and could not afford to travel to inspect these fields. This should be done by the cadastral workers of the city halls, together with the employees of the agricultural department of the District Councils and in the presence of the district police officer.

However, and also analyzing the above, we can say with confidence that in the Southern Region of the Republic of Moldova, as a result of the creation of favorable conditions, the labor market in agriculture is unlimited. In open ground, orchards, vineyards, field crops grow very well and give high results: such as wheat, barley, sunflower, corn.

Even though I mentioned above, I would like to draw attention once again to the fact that the district agricultural departments, by conducting seminars, will help owners in choosing the appropriate varieties depending on the land, its quality, as well as the area. This will allow to maintain the balance in the timely performance of spring works, care and harvesting works. But the basic condition is that these seminars and meetings should not be just for their own sake, but in addition to the presentation of theoretical information, to a large extent also persist the practical part of it by presenting successful practices, with the demonstration of new methods, but which have been adjusted to our environmental requirements, as well as to the climatic ones. These meetings are required to be organized in localities where there are performances, by explaining the ways to reach such levels and by offering to discuss with the persons concerned.

There are very few large agricultural enterprises in the Southern Region of the Republic of Moldova, therefore it is necessary to allow the development of small and medium-sized enterprises with 5-30 employees. These enterprises will deal with the cultivation of field crops, viticulture, the production of fruits, vegetables and various berries such as blackcurrant, strawberries, raspberries, etc.

With the development of small and medium-sized businesses in the agricultural sector, the following problems can be solved: **optimal use of small plots of land; all members of the team bear responsibility for achieving the final result; accessibility of modernization of the production process; flexibility of changing the activity process at the moment and in a short time; possibility of expanding areas of activity.**

A fairly widespread activity, at the moment, in the Southern Region of the Republic of Moldova is the cultivation of vegetables in greenhouses. This activity is mostly carried out on small plots of land near the house. As a result, the farmer produces 4-5 tons/year of vegetables that he sells, without benefiting from state protection. Of course, this occupation does not lead to an increase in jobs or to the growth of the national economy.

Of course, lately a lot of attention has been paid to the development of high-performance agriculture and considerable financial support has been given to the creation of large greenhouse complexes, but we must not forget that these expenses are very expensive. If we talk about the foundation of a greenhouse of one hectare, then here we would be talking about 250 thousand euros just for the creation of support structures and high-performance foils, 150-200 microns with its processing with various additives that give it resistance to breakage and against sunlight. But at the same time we must not forget that in addition to this, the farmer must procure the necessary seed material and fertilizers, plus the greenhouses are required to be equipped with other very necessary equipment. Another very important factor is the selection of personnel and the payment of appropriate

salaries until the first harvest. But this is a very long period. For example, for tomatoes, the period from sowing to obtaining the first harvest lasts about 100 days, a period during which certain expenses are incurred, and not small ones. Therefore, the issue of greenhouses, which have an area of 1-4 ha and more, should be taken into account by local authorities. Such large areas of sheltered land require the use of high technologies and a modernized production process. Part of these expenses should be subsidized by the state. At the same time, we cannot compare the circuit of financial means in agriculture with that in the commercial environment. In other words, special credit lines must be created for farmers, with their guarantee by the state, with privileged conditions, because the duration of obtaining crops is very different, and when we obtain it we must think that the next harvest will be after a very long period of time or even the next year, but the areas must be prepared in advance, the seed material purchased and much more. At the same time, at the state level, the marketing of the production obtained at a very good cost and not through the help of intermediaries must be guaranteed. At the same time, the harvest received must correspond not only to the planned quantity, but also to the required quality. For this, farmers must be sure that there will be no problems in carrying out production, both on the domestic and foreign markets and they will not sell everything for nothing. In turn, they will contribute to the formation of the state budget and, at the same time, to the creation of new well-paid and efficient jobs. Also in these circumstances, we should also discuss the creation of possibilities for irrigation of agricultural areas at an appropriate cost, because the application of the legislation in force provides that the price of drinking water for economic agents be undifferentiated and is not welcome for those in agriculture, where water is one of the basic means of production.

At the moment, only one of the main directions of labor market development has been described, namely the growth of agricultural products both in open and sheltered fields. At the same time, directions have been reached, which, following the implementation of certain measures and the creation of appropriate conditions, would significantly contribute to the population of the Southern Development Region practicing these activities. Therefore, jobs in agriculture will be attractive.

With the increase in agricultural products, both in terms of quantity and quality, a situation is created when a lot of jobs appear in some auxiliary activities, which are not directly related to agriculture. In this context, we can talk about the development of areas related to the processing and preservation of secondary products, which are not made fresh, namely:

- Development of a network of refrigerators.
- Creation of an integrated system for preserving vegetables and fruits.
- Organization of the production of fruit juices, vegetables, fruits, berries, etc.
- Expansion of fruit drying points.
- Creation of logistics centers to facilitate contacts between different agricultural producers.
- The emergence of entities specialized in transporting agricultural production at advantageous prices.

Concomitant, in the Southern Region of the Republic of Moldova, another traditional branch of agriculture that would significantly contribute to the creation of new jobs could be the development of viticulture. In this traditional field, in the south of the country, many people are engaged in sheep breeding, fewer in the breeding of large horned cattle, goats, domestic rabbits, pigs, and we practically do not encounter enterprises that would deal with the breeding of nutria, chinchillas, etc. The private sector is the one that develops these directions, but which has no interest in developing the respective branch from a scientific point of view, the modernization costs are very expensive.

Of the aforementioned, many works are done manually, but it is necessary that milking, feeding, cleaning the stables be automated. Accordingly, by introducing modern technologies, the number of jobs in the respective field will decrease and well-paid ones will open. The respective direction will have an advantage, when the market for selling their own production will be expanded for local producers, they will no longer need intermediaries.

At the moment, beekeeping is well monitored and good results are obtained from raising and selling birds on the domestic market.

Analyzing the above, we can see that the livestock sector in the Southern Region of the Republic of Moldova has many reserves in creating well-paid and attractive jobs. The sector must be developed not only in increasing the number of animals, but also in creating small and medium-sized enterprises for processing livestock products.

Another direction that can be developed is fish farming. In the region, namely in the lower course of the Prut, there are the largest meadow lakes: Beleu-6.26 km², Dracele-2.65 km², Rotunda-2.08 km², Fontan-1.16 km², etc. which are practically silted up, but which have a depth of up to 0.5 m. At the same time, in the area there is also one of the largest fish farms in our country, which was created artificially and which is now in a deplorable state due to the lack of investment and an owner interested in improving its activity.

Natural and artificial lakes require serious investments, small and medium-sized enterprises in the Republic of Moldova cannot afford this, but by attracting various projects with external funding, the respective branch will be revived, which will lead to the creation of a considerable number of jobs.

The Southern Development Region of the Republic of Moldova has what is needed to revive activity in these areas, namely: **land areas necessary for growing the entire range of agricultural crops are; the seed fund is quite diversified and available to producers; land is for pastures and fodder crops; there are the necessary water reserves to create an irrigation system; breeds for reproduction in the animal husbandry system are or can be easily procured; there are minimum conditions for the development of fish farming.**

More complicated is the creation of a product processing system. If we talk about drying fruits, vegetables, berries, milk processing, preparing cheese at home, large expenses are not required, but at the industrial level large investments are necessary. To create jobs in this field, in addition to special premises, modern equipment, well-trained personnel are also needed, who can use advanced technologies, be able to handle the latest generation equipment. This will allow the labor market to develop throughout the country and not only in the Southern Region of the Republic of Moldova.

At the present time, when the young population is leaving abroad to organize a better life, the development of the labor market must be an essential priority for the state. Many have left with their families, which means that they do not foresee the possibility of returning. Therefore, the labor market must be convenient and attractive for both employers and employees. Through various measures, confidence in the future must be developed in the young generation. Experience can be borrowed from states that have achieved good results in the previously analyzed areas, but for this, all stakeholders must consolidate their powers to succeed, but as long as this is not achieved, nothing will move forward.

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THE DIGITAL YOUTH PORTFOLIO AS A TOOL FOR YOUTH SOCIAL INCLUSION

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Abstract. This paper examines the Digital Youth Portfolio (DYP) as a tool for promoting youth social inclusion in a digital society. The DYP is defined as a learner-owned digital profile that documents competencies developed through formal, non-formal, and informal learning, as well as civic and youth-work participation. By improving the visibility, articulation, and portability of these competencies, the portfolio helps reduce the recognition gap between young people's abilities and their validation in education, employment, and social participation, particularly for vulnerable groups such as NEET youth. Based on a comparative analysis of international practices - Youthpass, Open Badges, Finland's digital youth work model, Cities of Learning in the UK, Skills Summary in Ireland, and Australia's Skills Passport, the study identifies key mechanisms supporting inclusion: reflective processes that build self-efficacy, verifiable micro-credentials, and an ecosystem of recognition linking youth services, education, and employers. The paper concludes that Digital Youth Portfolios are most effective when supported by open standards, policy integration, and capacity-building for youth workers and employers.

Keywords: youth social inclusion; digital youth portfolio; digitalization; non-formal education; employability; social participation; open badges; micro-credentials

Introduction

The transition of young people from education to employment and active social participation has become increasingly complex in the context of rapid digital transformation, economic volatility, and changing labour market demands. Traditional pathways, once characterized by linear progression from formal education to stable employment, have been replaced by fragmented trajectories that require adaptability, transversal competencies, and the capacity for lifelong learning. In this environment, many young people, particularly those in vulnerable situations and those categorized as Not in Employment, Education, or Training (NEET), experience difficulties not because of a lack of abilities, but because of the limited visibility and recognition of the competencies they possess outside formal education systems. Employers increasingly value skills such as communication, teamwork, problem-solving, digital literacy, and civic engagement.

These competencies are frequently developed through non-formal and informal activities: volunteering, participation in youth organizations, community projects, caregiving responsibilities, or creative and digital initiatives. However, formal certification systems rarely capture these experiences, creating a „recognition gap” between what young people can do and what they are able to prove in institutional or labour market contexts. This gap contributes to prolonged unemployment, social marginalization, and diminished self-efficacy among youth. Contemporary understandings of

social inclusion extend beyond access to income and material resources and encompass participation, belonging, and the ability to contribute meaningfully to society. In the digital era, inclusion increasingly depends on access not only to technology, but also to the capacity to use digital tools for personal development, learning documentation, and professional identity formation.

As such, digital instruments can play a transformative role in supporting youth inclusion when they are designed not merely as repositories of information, but as structured environments for reflection, articulation of skills, and interaction with institutional actors. The Digital Youth Portfolio (DYP) emerges in this context as an innovative tool capable of bridging the gap between learning experiences and their social and economic recognition [3]. Unlike a traditional curriculum vitae, the DYP allows young people to document evidence of competencies acquired across different life domains and to present these in a coherent, verifiable, and portable format. The DYP integrates elements such as e-portfolios, open digital badges, micro-credentials, and self-assessment records into a unified digital profile owned by the young person. This profile enables the aggregation of educational achievements, non-formal learning outcomes, civic engagement, and practical experiences into a form that can be understood by educators, youth workers, and employers alike.

Through this mechanism, the portfolio contributes to reducing informational asymmetries between youth and opportunity providers, facilitating smoother transitions into employment and social participation. Importantly, the portfolio is not only a technological solution but also a pedagogical and social process. The act of constructing the portfolio encourages reflection, self-assessment, and awareness of one's own capabilities, which are essential components of self-efficacy and empowerment. For vulnerable youth, this process can help reframe periods of inactivity or marginalization as valuable learning experiences.

The aim of this paper is to analyze the Digital Youth Portfolio as a practical instrument for youth social inclusion, examining both its theoretical foundations and its operationalization through international good practices. The study seeks to identify the mechanisms through which digital portfolios enhance recognition of non-formal learning, support employability, and contribute to individualized support for vulnerable youth groups. The article was developed within the framework of Subprogram 030101 „Strengthening the resilience, competitiveness, and sustainability of the economy of the Republic of Moldova in the context of the accession process to the European Union”, institutional funding.

Literature review

The concept of social inclusion has evolved significantly over recent decades. Earlier approaches associated inclusion primarily with economic participation and access to material resources. Contemporary frameworks adopted by international organizations such as the United Nations and the European Union expand this understanding to encompass participation in community life, access to opportunities, civic engagement, and the ability to contribute meaningfully to society [5][11]. In this broader sense, inclusion implies not only being present within social systems, but being recognized as an active and capable participant. Within the digital society, social inclusion increasingly depends on access to information and communication technologies (ICTs) and, more importantly, on the capacity to use these technologies for beneficial personal and professional outcomes.

Scholars in digital inclusion studies emphasize that mere access to devices does not ensure inclusion [9]. Digital literacy, motivation, and the ability to transform digital tools into instruments of opportunity are essential dimensions of what is often referred to as “digital capital”. A significant body of literature highlights the role of non-formal education (NFE) in developing transversal skills such as teamwork, leadership, intercultural communication, and problem-solving. NFE refers to organized learning processes that take place outside formal educational curricula, often within youth organizations, community initiatives, volunteering activities, and civic engagement projects.

These environments foster competencies that are highly valued in modern labour markets but are rarely captured by formal certification systems. This discrepancy has led to what researchers describe as a “recognition gap”, where young people possess valuable skills but lack the means to

demonstrate them. The concept of Validation of Prior Learning (VPL) emerged as a response to this issue, promoting mechanisms through which competencies acquired outside formal schooling can be identified, assessed, and recognized. European and international policy documents increasingly advocate for the integration of VPL mechanisms into youth and employment strategies, emphasizing that recognition must be formative and supportive rather than purely summative [12]. The use of portfolios as learning and assessment tools has long been present in educational research. Two major perspectives can be identified: portfolios as products and portfolios as processes. Showcase portfolios function as curated collections of best work intended for external evaluation. In contrast, learning portfolios serve as reflective spaces where individuals document experiences, analyze learning outcomes, and plan personal development. For youth social inclusion, the process-oriented understanding of portfolios is particularly relevant. Constructivist learning theories suggest that reflection is central to knowledge construction and identity formation.

The act of selecting experiences, articulating competencies, and documenting evidence allows young people to reinterpret their life trajectories, transforming perceived inactivity into meaningful learning narratives. This reflective dimension contributes to self-efficacy and psychological empowerment, especially for vulnerable youth groups. With the advancement of digital technologies, traditional portfolios have evolved into digital formats that offer portability, verifiability, and integration across systems. The introduction of Open Badges and micro-credentials represents a major innovation in this field [10]. Unlike traditional degrees that aggregate long periods of study, micro-credentials recognize specific, granular competencies and embed metadata that allows verification of the issuer, criteria, and evidence.

The concept of “open recognition” underlying digital badges challenges the monopoly of formal institutions in certifying learning. Community organizations, youth centers, and non-governmental actors can issue credentials that gain value through networked trust rather than hierarchical authority. This model is particularly beneficial for marginalized youth who may not complete formal education pathways but can accumulate multiple small credentials demonstrating practical abilities. While digital tools hold significant potential for enhancing inclusion, the literature also warns of the risk of a “second-level digital divide” [9]. Many young people are proficient users of digital media for communication and entertainment but lack the skills to use digital platforms for professional development, documentation of learning, and career planning. Without adequate guidance, digital portfolios may inadvertently favor youth who already possess higher levels of digital and social capital.

Research from countries that have implemented digital youth work strategies demonstrates that the effectiveness of digital portfolios depends heavily on mediated support from trained youth workers [13]. The portfolio is most effective when embedded within mentoring and reflective processes rather than offered as a self-service technological solution. A recurring theme in the literature is that the value of digital credentials depends on their recognition by employers [4]. Studies indicate that while employers are increasingly open to skills-based hiring, awareness of digital badges and portfolios remains limited, particularly among small and medium enterprises [3][9].

Successful cases show that when employers are involved in designing or recognizing badge systems, the credibility and utility of these tools increase significantly. This has led to the notion of an “ecosystem of recognition”, where youth organizations, educational institutions, policymakers, and employers share a common understanding of competencies and credentials. Within such ecosystems, digital youth portfolios function not merely as personal records but as recognized instruments that facilitate transitions between education, employment, and social participation.

Materials and methods

This study uses a qualitative, exploratory design based on synthesis and comparative analysis of international practices related to digital portfolios, non-formal learning recognition, and youth inclusion. The approach integrates theoretical perspectives, policy frameworks, and practical implementations to identify how Digital Youth Portfolios (DYP) support youth social inclusion across different contexts. The analysis draws on three categories of sources: European and

international policy documents on youth work, validation of learning, and digital inclusion (e.g., Erasmus+, Youthpass, Council of Europe strategies); technical standards related to Open Badges, micro-credentials, and digital portfolio interoperability; and empirical reports and case studies from initiatives such as Youthpass, Cities of Learning (UK), Verke and Open Badge Factory (Finland), Skills Summary (Ireland), and the National Skills Passport (Australia).

A thematic analysis was applied, focusing on articulation of competencies, recognition and trust, portability, mediated access, and policy integration. The study relies on secondary data and does not include longitudinal tracking of beneficiaries; however, the consistency of evidence across contexts provides a reliable basis for understanding the role of DYP in fostering youth social inclusion.

Results and discussion

The analysis of international practices reveals that Digital Youth Portfolios operate through distinct but complementary architectures of recognition that contribute to youth social inclusion. These architectures differ in emphasis, reflective, data-oriented, place-based, or systemic, but share common principles related to visibility of competencies, validation of non-formal learning, and improved transitions into employment and social participation. The Youthpass instrument developed within the Erasmus+ framework illustrates a process-oriented approach to digital portfolios [14]. Youthpass is not limited to issuing a certificate; it structures a reflective learning process around key competences for lifelong learning.

Participants are guided to identify, describe, and assess what they have learned during youth exchanges, volunteering, or training activities. This model demonstrates that the value of the portfolio lies in the reflective dialogue rather than the final document. Studies show that young participants gain increased self-confidence and a clearer understanding of their own competencies [3][9][10]. For youth with limited academic success, this recognition of non-academic abilities is particularly significant. The Youthpass approach equips young people with the language needed to articulate their skills in employment contexts, thereby reducing informational asymmetry between youth and employers. Open Badges represent a shift toward granular, verifiable recognition of skills [10].

Each badge contains embedded metadata describing the issuer, criteria, and evidence, allowing third parties to verify competencies without prior knowledge of the issuing organization. This transparency creates trust based on evidence rather than institutional hierarchy. For marginalized youth, micro-credentials provide achievable milestones that can be accumulated progressively. Instead of relying on long educational pathways, young people can collect small recognitions for specific skills, creating a “stackable” pathway toward employability. The existence of badge “backpacks” that aggregate credentials from multiple sources supports portability and lifelong use. Finland provides an example of how digital portfolios can be embedded into national youth work systems [13].

Through the activities of Verke and platforms such as Open Badge Factory, digital recognition is integrated into everyday youth work practice. Youth organizations issue badges for leadership, teamwork, and practical skills, and these badges are recognized by parts of the formal education system. A key success factor in the Finnish model is the extensive training of youth workers. Digital tools are used as pedagogical instruments rather than standalone technologies. This mediated use ensures that digital portfolios do not widen the digital divide but instead become tools of guided empowerment.

The Cities of Learning initiative in the UK demonstrates how digital portfolios can map informal learning opportunities within a geographic area and connect them to employment pathways [7]. Through digital platforms, young people can visualize how participation in a local workshop or youth activity can lead to further training and eventually to employer engagement. This model addresses the problem of disconnected opportunities. By creating visible pathways, the portfolio system helps youth understand how small steps contribute to larger goals. The initiative also involves employers in the ecosystem, increasing the credibility of the badges issued. The Irish Skills Summary tool focuses on translating youth experiences into professional terminology [8]. Many young people

struggle to describe their competencies in language understood by employers. The tool guides users through a structured process of identifying experiences and converting them into recognized competencies. This approach highlights that digital portfolios must support articulation, not only documentation. The presence of youth workers or mentors during this process is essential for helping youth recognize the value of their experiences. Australia's movement toward a National Skills Passport illustrates a systemic approach to digital credentialing [1][6].

The aim is to aggregate formal qualifications, vocational training, and micro-credentials into a single digital profile accessible throughout a person's life. This responds to the reality of non-linear career paths and frequent job changes. Such systems emphasize portability and lifelong learning, ensuring that competencies remain visible across different sectors and career stages. Across all analyzed models, several common factors determine the effectiveness of Digital Youth Portfolios in promoting social inclusion: reflective process that builds self-efficacy and awareness of skills; open and interoperable standards that ensure data portability and ownership; mediated support from trained youth workers to prevent digital exclusion; employer engagement to ensure recognition of credentials; integration into policy frameworks rather than isolated technological projects. These factors demonstrate that the success of digital youth portfolios depends less on the specific software used and more on the surrounding ecosystem of recognition and support.

Conclusions

The analysis conducted in this paper demonstrates that the Digital Youth Portfolio (DYP) represents more than a technological innovation; it is a practical mechanism for enhancing youth social inclusion through the recognition and articulation of competencies developed across formal, non-formal, and informal learning environments [2]. By making previously invisible skills visible, the DYP reduces informational asymmetries between young people and opportunity providers, supporting smoother transitions into employment and active social participation. The comparative examination of international practices highlights that the effectiveness of digital portfolios is not determined by the platform itself, but by the surrounding ecosystem of recognition. Reflective processes, open technical standards, mediated support from youth workers, and employer engagement are essential components that transform digital portfolios from simple repositories into instruments of empowerment.

Digital youth portfolios contribute to inclusion in three main ways. First, they strengthen self-efficacy by enabling young people, especially those from vulnerable backgrounds, to recognize and articulate their competencies. Second, they enhance portability and verifiability of credentials through interoperable digital standards such as open badges and micro-credentials. Third, they facilitate coordination between youth services, education systems, and employers within a shared language of competencies.

At the same time, the study identifies significant challenges. Without adequate digital literacy support and professional mediation, digital portfolios risk reinforcing a second-level digital divide. Without employer awareness and acceptance, digital credentials may lack practical value in labour market contexts. Therefore, digital youth portfolios must be embedded within coherent youth, education, and employment policies rather than implemented as isolated digital tools. In conclusion, the Digital Youth Portfolio can serve as an effective instrument for youth empowerment and social inclusion when supported by appropriate governance frameworks, open standards, and capacity-building measures for both youth workers and employers. Its role is not to replace formal education or traditional certification, but to complement them by recognizing the full spectrum of young people's learning and capabilities.

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DIGITALIZATION OF CHILD SOCIAL PROTECTION: THE ROLE OF THE DIGITAL SOCIAL CASE FILE

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Abstract. This paper analyzes the digitalization of child social protection systems with a focus on the Digital Social Case File (DSCF) as an instrument for inter-agency coordination and evidence-informed case management. Using a qualitative comparative approach, the study synthesizes lessons from international implementations and examines how digital case management can support the identification, assessment, and monitoring of children in vulnerable situations through structured workflows and cross-sector data linkage (social, education, health, and justice). The analysis indicates that DSCF-based systems can reduce administrative fragmentation, improve the targeting and continuity of interventions, and strengthen traceability and accountability in service delivery. At the same time, implementation effectiveness depends on governance and operational conditions, including data protection and access control, interoperability standards, institutional capacity, and measures to mitigate digital exclusion, particularly in rural and disadvantaged communities. The paper concludes that DSCFs can improve the responsiveness of child social protection policies when designed around professional case management processes and supported by robust data security frameworks and continuous staff training.

Keywords: digital social protection, digital social case file, child protection, case management, data integration, social services

Introduction

The administration of social welfare is undergoing a significant transformation driven by digital technologies and integrated information systems. Historically, child protection systems have relied on paper-based administrative records, where information was fragmented across institutions and often inaccessible in real time. This fragmentation limited coordination between social, educational, health, and justice services and reduced the capacity to monitor vulnerable children consistently across sectors. The transition toward a Digital Social Case File (DSCF) represents a shift from static record-keeping to a process-oriented model of digital case management. In this model, the digital system does not merely store information but supports the professional workflow of social workers through structured stages such as intake, assessment, planning, intervention, and monitoring.

For the Republic of Moldova, this transition is not only a technological modernization but also a strategic response to demographic, social, and regional pressures [3][4]. High rates of migration, population decline, and the increased number of children left in the care of extended family members have placed additional demands on social protection services. The war in Ukraine further intensified these pressures, as the influx of refugees, many of them children, highlighted the limitations of manual systems in tracking and supporting highly mobile and vulnerable populations. In this context, the “RESTART” reform of social assistance provides the administrative foundation for digital transformation. The consolidation of 33 district directorates into 10 Territorial Agencies of Social Assistance (ATAS) creates the structural conditions for the implementation of a unified digital system. The DSCF can function as the operational instrument that ensures the consistent application of the case management methodology across geographic areas. The implementation of a DSCF in

Moldova is closely linked to broader objectives of European integration and public administration modernization.

This requires interoperability through the use of the national MConnect platform, allowing data exchange between institutions and reducing the administrative burden on families; adherence to data protection principles, ensuring that digitalization strengthens rights-based service delivery; and the use of integrated data for evidence-informed policy decisions and resource allocation. The central argument of this paper is that the success of digitalization depends less on technical complexity and more on the alignment between digital workflows and professional social work practice. Particular attention must be paid to bridging the digital divide affecting rural areas and ensuring that digital tools support, rather than replace, the human dimension of social work. Moldova's current stage of reform provides an opportunity to design a DSCF that avoids previously documented shortcomings of rigid digital systems in other countries and that contributes to a more coherent and responsive child protection system. The article was developed within the framework of Subprogram 030101 „Strengthening the resilience, competitiveness, and sustainability of the economy of the Republic of Moldova in the context of the accession process to the European Union”, institutional funding.

Literature review

The academic literature on the digitalization of social protection highlights a shift from paper-based record systems toward integrated digital case management platforms that support professional workflows in social work practice. A recurring distinction is made between digital records, which simply store information, and digital workflows, which are designed to reflect the cyclical stages of case management: intake, assessment, planning, intervention, monitoring, and closure [12] [13]. Workflow-based systems can contribute to methodological consistency in service delivery; however, excessive procedural rigidity may constrain professional judgment and reduce flexibility in complex cases. Estonia's Social Services and Benefits Registry (STAR) is frequently cited as a successful example of integrated digital governance in social services. There are several key characteristics of the Estonian model: high interoperability through the X-Road infrastructure, which allows real-time data exchange between national registers without duplication; the use of the system to standardize social work practices across municipalities; and its dual function as both an operational tool for practitioners and a data source for policymakers. In contrast, the United Kingdom's early implementation of the Integrated Children's System (ICS) is widely discussed as an example of challenges associated with technology-driven reform [11]. Evaluations report that the system increased administrative workload for social workers, with a substantial proportion of time spent on data entry.

This led to concerns about a shift in focus from direct interaction with children and families toward compliance with digital documentation requirements, a phenomenon called administrative or “screen-level” bureaucracy. In humanitarian and crisis contexts, alternative models such as the open-source Primero/CPIMS+ platform have been developed to ensure operational resilience. These systems are designed with offline functionality and “store-and-forward” capabilities, allowing data collection and synchronization in areas with limited internet connectivity. Such features are considered essential for social protection systems operating in rural or emergency settings. The studies on EU interoperability and data governance introduce additional considerations related to fundamental rights [6][7][8].

While interoperability between institutions improves efficiency and coordination, it is highlighted the need for strict purpose limitation, ensuring that social data is not repurposed for law enforcement or surveillance activities. Debates also address the tension between the right to data erasure and the necessity of retaining historical records in child protection cases. Furthermore, concerns are raised about the potential for digital systems to be used as tools for workforce monitoring, which may increase pressure on social workers and prioritize speed over qualitative engagement.

Materials and methods

This study applies a qualitative comparative research design to examine the digitalization of child social protection through the lens of the Digital Social Case File (DSCF). The DSCF is treated as the primary unit of analysis, understood as a digital system intended to support the stages of professional case management in social work practice.

The research combines policy analysis, document analysis, and socio-technical systems modeling. The empirical basis of the study consists of:

(i) the legislative and regulatory framework of the Republic of Moldova, including Law on data protection and the provisions of the “RESTART” social assistance reform;

(ii) technical and operational documentation related to the MConnect interoperability platform and the emerging eSocial ecosystem; and

(iii) international documentation, evaluation reports, and academic studies describing digital welfare implementations in Estonia (STAR) [2], the United Kingdom (Integrated Children’s System), and humanitarian platforms such as CPIMS+/Primero [9][10].

A comparative analytical approach is used to identify variables associated with successful and problematic digital implementations in child protection systems. The Estonian STAR system is examined as a model of high interoperability and methodological standardization, while the United Kingdom’s ICS is analyzed as an example of challenges associated with technology-driven administrative burden. Humanitarian digital case management platforms are reviewed to assess design features relevant for low-connectivity and crisis contexts. The study further employs socio-technical gap analysis to evaluate how the six stages of the Moldovan case management cycle (intake, assessment, planning, implementation, monitoring, and closure) can be operationalized within a digital environment.

This analysis focuses on the interaction between digital workflows, institutional structures, and professional practice. Finally, a security-by-design perspective is applied to assess how data protection principles and access controls can be integrated into the technical architecture of a DSCF. This allows the study to examine the relationship between interoperability, data governance, and the protection of fundamental rights within digital child protection systems.

Results and discussions

The analysis of the Moldovan social protection system indicates favorable structural conditions for digital transformation, combined with significant operational vulnerabilities [5]. Moldova possesses a well-developed e-governance infrastructure, demonstrated by the capacity of the MConnect platform to process a high volume of inter-institutional data exchanges. At the same time, frontline social service delivery remains largely dependent on paper-based procedures and fragmented information flows. The RESTART reform has reduced administrative fragmentation by consolidating 33 district directorates into 10 Territorial Agencies of Social Assistance (ATAS), creating the organizational preconditions for the implementation of a unified eSocial platform. However, socio-economic data reveal a pronounced rural–urban divide, with child poverty rates of 44.6% in rural areas compared to 14.4% in urban areas [1].

This suggests that the effectiveness of a DSCF depends critically on its functionality in low-connectivity and resource-constrained environments. Comparative analysis of international cases provides further clarification. The Estonian STAR system demonstrates how interoperability can reduce administrative burden and support methodological standardization across territories. In contrast, evidence from the United Kingdom’s Integrated Children’s System shows how technology-driven documentation requirements can increase administrative workload and reduce time available for direct interaction with beneficiaries. A key result of this study is the mapping of the case management cycle onto digital functions within a DSCF.

This mapping illustrates the transition from static document storage toward a process-oriented workflow, where the system supports professional practice through structured prompts, risk alerts, and periodic review mechanisms. Moldova has the opportunity to design a DSCF that avoids previously documented shortcomings of rigid digital systems. International humanitarian platforms

such as CPIMS+/Primero demonstrate the relevance of modular architectures and offline functionality for rural and crisis contexts. The analysis indicates that the effectiveness of a DSCF depends less on technical sophistication and more on the alignment between digital workflows and professional social work practice.

Data protection considerations are identified as central design requirements rather than secondary compliance tasks. While interoperability between institutions improves coordination, strict access controls and purpose limitation are necessary to prevent misuse of sensitive data. Properly designed interoperability, such as automated retrieval of basic administrative information through MConnect, can reduce routine paperwork and allow social workers to focus on complex case interventions. Overall, the transition toward an eSocial platform can be interpreted as an institutional transformation in how child protection services are organized and delivered. The DSCF can be positioned as a tool that can improve coordination, consistency, and responsiveness in child social protection when supported by appropriate governance, infrastructure, and professional training.

As shown in **Table 1**, the transition from paper-based case handling to a DSCF involves more than the digitization of documents. Each stage of case management is supported by specific digital features that introduce automation, interoperability, and structured guidance into daily professional practice. The table illustrates how digital tools can assist social workers through smart forms, automated alerts, interoperable referrals, and mobile data entry, while also ensuring better tracking of case timelines and outcomes. This mapping demonstrates that the value of a DSCF lies in its ability to embed the logic of case management directly into the system's workflow. At the same time, it highlights potential risks if these digital processes become overly rigid, reinforcing the need for systems that support, rather than constrain, professional judgment.

Table 1. Mapping Case Management steps to digital functions

Case management step	Traditional (paper) process	Digital Social Case File (DSCF) functionality
Intake	Handwritten notes from phone call/visit. Manual check of previous files	Digital triage - referral received via portal or entered manually. System auto-checks MConnect for existing files to prevent duplication.
Assessment	Filling out the Complex Assessment Form. Calculating risk scores manually.	Smart forms - dynamic forms with logic gates (e.g., if „Disability” selected, medical fields appear). Auto-calculation of risk levels.
Planning	Writing the Individual Assistance Plan (IAP). Physically delivering copies to partners.	Dynamic IAP - live plan with assigned tasks and deadlines. Interoperable referrals sent electronically to health/education partners.
Implementation	Logging visits in a paper register.	Mobile logging - workers tick off tasks on tablets during visits. Voice-to-text notes for narrative entries.
Monitoring	Manual review of paper files to check timelines.	Automated alerts - system notifies worker/supervisor of upcoming deadlines (e.g., „3-month placement review due”).

Closure/Review	Writing a closure report and archiving the physical folder.	Outcome tracking - structured data entry on case outcomes. Digital archiving with retention periods auto-enforced.

Source: elaborated by author

Beyond illustrating functional differences, the table also clarifies how digital systems can redistribute professional time. Tasks that traditionally required manual verification, repeated data entry, and physical transmission of documents can be partially automated through interoperability and structured digital workflows. This creates the potential for social workers to allocate more time to direct interaction with children and families rather than administrative processing. Furthermore, the mapping reveals how a DSCF can enhance institutional coordination. By embedding interoperable referrals and shared digital records into the planning and implementation stages, the system reduces delays between agencies and improves continuity of care. This is particularly relevant in cases involving multiple institutions, such as schools, healthcare providers, and social services, where timely information exchange is critical for effective intervention. The table also demonstrates the importance of real-time monitoring mechanisms. Automated alerts and structured tracking of deadlines introduce an additional layer of procedural reliability that is difficult to achieve in paper-based systems. At the same time, this feature underscores the necessity of careful system design to avoid excessive proceduralization, where professional discretion may be replaced by rigid system prompts. This mapping provides a practical framework for evaluating future DSCF implementation. Each digital function listed can serve as a benchmark for assessing whether the system genuinely supports case management methodology or merely replicates paper-based procedures in digital form. In this sense, **Table 1** functions not only as an explanatory model but also as an evaluative tool for policymakers and system designers involved in the development of the eSocial platform.

Conclusions

The Republic of Moldova currently has favorable institutional and technological conditions for advancing the digitalization of child social protection. The RESTART reform has created an administrative structure suitable for system integration, while the MConnect platform provides the necessary interoperability infrastructure. At the same time, international experience demonstrates that the success of such initiatives depends not only on technical solutions but also on organizational alignment and professional usability. Evidence from Estonia indicates that interoperable digital systems can support methodological consistency and effective governance. Conversely, experience from the United Kingdom highlights the risks associated with rigid, documentation-driven digital platforms that increase administrative burden for social workers. Humanitarian digital case management models further demonstrate the importance of resilience, modularity, and offline functionality in rural and crisis-affected environments. For Moldova, the Digital Social Case File represents a practical instrument for strengthening coordination, continuity, and accountability in child protection services. Its effectiveness, however, depends on strict adherence to case management methodology, careful integration of data protection principles, and continuous attention to the needs of frontline practitioners. When designed as a support tool for professional practice rather than a compliance mechanism, the DSCF can contribute to a more coherent and responsive child social protection system. The findings suggest that digitalization, if implemented with attention to governance, infrastructure, and human factors, can enhance the capacity of social services to respond to the needs of vulnerable children.

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ORGANISATIONAL AND ECONOMIC BASES OF SUSTAINABLE LAND USE IN VARIOUS FORMS OF AGRIBUSINESS ORGANISATION

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Abstract. The article examines the functioning of various forms of agribusiness organisation and the organisational and economic foundations of sustainable land use in the context of the transformation of Ukraine's agricultural sector. It is argued that institutional and organisational factors in the development of the agricultural sector, the protection of national interests and the ensuring of socio-economic and political stability in society, especially in the context of European integration processes and military challenges, have a decisive influence on the level of food security in the country. Changes in the land fund and crop structure are analysed, characterised by a reorientation towards grain and oil crops, a reduction in fodder and labour-intensive crops, and the negative impact of military operations. The transformation of agribusiness forms with the strengthening of the role of agricultural holdings and systemic problems of farming development has been identified. It has been substantiated that the imperfection of agricultural policy and limited investment and innovation support hinder sustainable development and economic security, and niche agribusiness has been identified as a tool for balancing them.

Keywords: sustainable development, land use, agribusiness, niche agribusiness, farms, food and economic security.

The agricultural sector of Ukraine operates in conditions of profound transformations in land use caused by institutional and economic changes, European integration, market globalisation, climate risks and the consequences of military actions. Increased land concentration, a shift towards a limited range of export and raw material crops, a reduction in socially significant and labour-intensive types of agricultural production, as well as low levels of innovation and digitalisation are leading to an imbalance between economic, environmental and social interests in land use and exacerbating the problems of rural development.

The lack of a holistic organisational and economic approach to sustainable land use in various forms of agribusiness limits the efficient use of land resources and increases risks to the food and economic security of the state. In this regard, a pressing scientific and practical task is to substantiate and implement comprehensive mechanisms for sustainable land use at the macro, meso and micro levels, aimed at improving state agricultural policy, supporting farming, activating investment and innovation processes, diversifying agricultural production and restoring the socio-economic potential of rural areas.

An analysis of contemporary scientific literature indicates a steady increase in the attention paid by domestic and foreign researchers to the problems of sustainable development of the agricultural sector, transformation of land use, organisational and economic foundations of agribusiness, and ensuring food security in the context of global and military challenges. Significant scientific achievements have been made in works devoted to the analysis of structural changes in agricultural production and the land fund of Ukraine during the period of independence.

Statistical and analytical materials from the State Statistics Service of Ukraine, in particular the Statistical Yearbook of Ukraine (2022–2024), record long-term trends in the reduction of cultivated areas, changes in the structure of crops in favour of export-oriented crops, as well as

the significant impact of geopolitical factors and military actions on the functioning of the agricultural sector. Similar conclusions are confirmed by industry analytical reviews and infographic reports on Ukraine's agricultural economy for 2022–2023, which highlight the growing raw material orientation of agricultural production and the declining role of livestock and fodder crops.

The works of domestic scholars such as O. Marinchenko, O. Shubravska, V. Heyets, L. Moldavan, and O. Borodina, the institutional and organisational-economic aspects of the development of the agricultural sector are examined in depth, in particular the transformation of agribusiness forms, the concentration of land resources, and the dominance of agricultural holdings. In their opinion, agricultural holdings play a key role in shaping export potential and foreign exchange earnings, but their activities do not always coincide with the goals of sustainable development of rural areas, employment of the population, and restoration of social infrastructure.

The issues of small-scale and family farming have been thoroughly covered in both domestic and foreign studies in recent years. The works of B. Graeub, H. Wittman and S. Wiggins emphasise the need for state support for small producers, their integration into value chains, and the development of niche agribusiness as an alternative to excessive concentration of production [7, pp. 72-73].

At the same time, despite the significant amount of scientific work, the complex organisational and economic foundations of sustainable land use, taking into account the interaction of various forms of agribusiness organisation, remain insufficiently researched in the current literature. There is limited coverage of the coordination of land use management mechanisms at the macro, meso and micro levels, as well as the integration of niche and small-scale agribusiness into the national and regional economy in the context of martial law, post-war recovery and European integration requirements.

The purpose of the article is to substantiate the organisational and economic foundations of sustainable land use, taking into account various forms of agribusiness organisation, as well as to identify areas for harmonising management mechanisms at the macro, meso and micro levels in order to improve the efficiency of the agricultural sector, develop rural areas and strengthen the food and economic security of the state.

The state and trends of the economy and the agricultural sector are determined by institutional and organisational factors that influence the development of the agricultural sector, which shapes the level of food security of the state, strengthens mechanisms for protecting national interests, and guarantees socio-economic and political stability in society. In view of this, it is advisable to take into account the nature and characteristics of the main factors of the location and purpose of niche agricultural businesses on the structural components of the community or state economy. This type of agribusiness systematically balances social, environmental, economic and security processes in the national economy in the context of European integration processes, namely:

Macro level. However, it is necessary to take into account: the principles and trends of globalisation and European integration, the export-import processes of the national economy, the dynamics of agricultural markets, the state's foreign agricultural policy, financial support for the development of agribusiness, pricing policy, demand for circular and 'experience' economies, food security of the population, martial law, digitalisation and innovation in the agricultural sector, the state of competition, protection of the domestic food market, the level of income of the population, labour market security, the taxation system, and the image of the state.

Meso level. We take into account: the effectiveness of the agricultural sector management and regulation system, the level of economic and agricultural development in regions and communities, the specifics and specialisation of agribusiness, the state and quality of natural resources, taking into account climate change, the level of infrastructure in the region, logistics for agribusiness, the level of income of the population in the regions, natural, geographical and climatic conditions, the development of regional information and communication networks, access of agribusiness to innovation, and the existence of public entities to protect their interests.

Micro level. We coordinate: strategies for the development of the agricultural sector with financial and economic incentives, innovations in process management and digitalisation (resources and systems) of management in the agricultural sector, the profitability of niche agribusiness, the cost structure, level of labour productivity, staff incentives, provision of appropriately qualified personnel, staff salary levels, product life cycle phase requirements, corporate culture.

Today, in our opinion, the parameters for improving investment and innovation support for the agricultural sector in the system of ensuring the economic security of the state are held back by the stagnant and depressed nature of the development of rural areas in Ukraine, which is marked by the neglect of socio-economic infrastructure, the actual 'extinction' of villages, the intensification of deviant and opportunistic behaviour among the population, and the exacerbation of economic imbalances.

Over the past 30 years, there have been significant changes in Ukraine's land fund: a 10% reduction in cultivated areas; changes in the structure of cultivated areas; and the annexation and occupation of territories. The structure of the sown areas of major agricultural crops as a percentage of the total area can be compared in Figure 1. Changes in the structure and area of crops and the structure of the land bank of agricultural land in Ukraine are shown in Table 1.

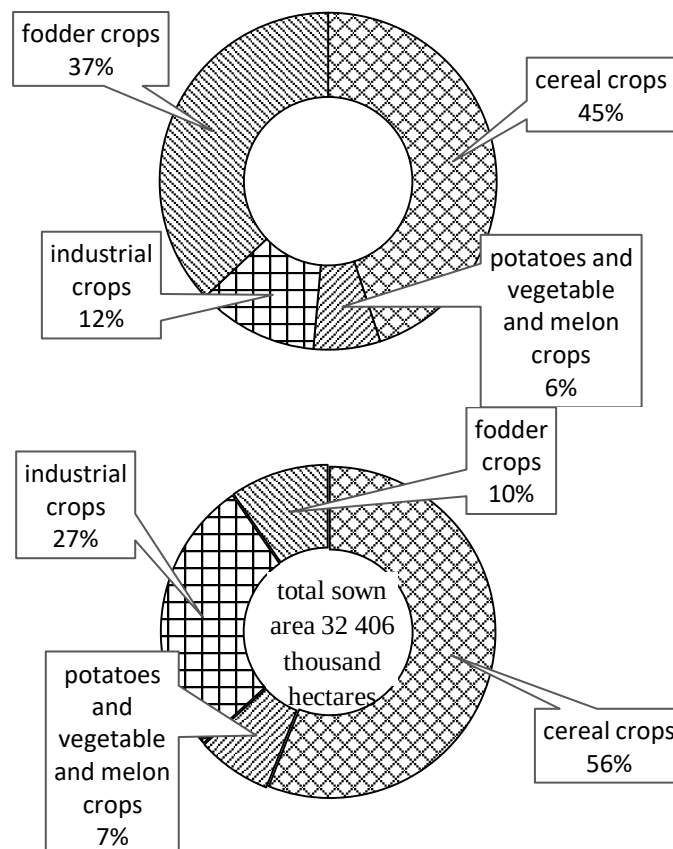


Figure 1. Structure of cultivated areas of major agricultural crops in 1990 (top) and 2010 (percentage of total area). Compiled by the author of the article based on data from the statistical yearbook of Ukraine from the State Statistics Service of Ukraine [5, pp. 245-248].

Table 1. Change in the structure of agricultural land area, million hectares (the table shows the change in the structure and area of crops as of the pre-war years for comparison purposes)

Name of agricultural crop	Structure of the agricultural land bank, million hectares as of 2019.	Structure of agricultural land area, million hectares, 1990 (agricultural land fund amounted to 32.4 million hectares)	Structure of agricultural land area, million hectares, 2020 (agricultural land fund amounted to 41.3 million hectares)	Structure of agricultural land area, million hectares, 2022
Wheat	6.8	7.6 (26.4%)	6.8 (23.2%)	5.2
Corn	5.0	1.2 (3.8%)	5.4 (18.5%)	4.2
Barley	2.6	2.7 (8.4%)	2.6 (8.9%)	1.7
Other cereals and legumes	0.9	3.0 (9.4%)	1.0 (3.3%)	0.3
Sunflower	5.8	1.6 (5.0%)	7.0 (23.9%)	5.3
Soybeans and rapeseed	2.9	0.2 (0.6%)	2.7 (9.2%)	2.8
Sugar beet	0.3	1.6 (5.0%)	0.2 (1.0%)	0.2
Other industrial crops	0.3	0.3 (1.0%)	0.5 (1.8%)	-
Potatoes	1.3	1.4 (4.4%)	1.3 (4.5%)	1.2
Fodder crops	1.7	12 (37%)	1.7 (5.7%)	0.3
	4.8 (not sown)			
	8.9 (hayfields, pastures)		1.0	0.8

Compiled by the author of the article based on data from the statistical yearbook of Ukraine published by the State Statistics Service of Ukraine [5, pp. 245-248].

Over the past decade, the number of agricultural holdings has increased. The number of agricultural enterprises that emerged on the basis of reformed collective agricultural enterprises increased in 2007 compared to 2000 by 1,752 units, or 13.3%. However, the average size of these enterprises has decreased significantly – from 1,884 hectares in 2000 to 1,093 hectares in 2007, i.e. almost by half. At the same time, there was a significant increase in the number of private enterprises (by 42.5%) and the area of their land (by 18.7%) and a decrease in the number of production cooperatives (by 41.7%) and the area of their land (by 4.3 times). The number of separate subsidiary farms and enterprises in other sectors of the economy increased (by 88.3%) [4, p. 7].

In 2009, agricultural holdings leased about 17.6% of arable land. Some of them lease more than 250,000 hectares of land and plan to increase their land area. Trends over the last 10-15 years have varied in both crop and livestock production. For example, from 2015 to 2019, the largest growth in production was seen in cereals and legumes — 25% (15.3 million tonnes). The production of industrial crops also increased by almost a quarter — 24% (6.79 million tonnes). Processed products, fruits and vegetables increased slightly — by only 7% (0.83 million tonnes) and 1% (0.47 million tonnes), respectively. Livestock products are the only group of goods that showed a negative result: -6% (-0.90 million tonnes).

The change in the production of major agricultural products over 30 years (from 1990 to 2020) is as follows. Over 30 years, grain production increased by 29%, and fruit and vegetable production by 19%. Among industrial crops, it is worth noting a 78% decrease in the gross harvest of sugar beets

and a 7-fold increase in the harvest of oilseeds. On the other hand, milk production decreased by 62%, meat production by 43%, while egg and honey production remained at the same level.

Exports of agricultural products in 2020 in millions of US dollars amounted to: sunflower oil - 5,325 (5,275 thousand tonnes); corn - 4,886 (corn 23,800 thousand tonnes); wheat and wheat-rye mixture - 3,596. Production of main types of agricultural products in 2021, million tonnes: corn - 42.1 million tonnes (+39% compared to 2020); wheat – 33 million tonnes (+30% compared to 2020); barley – 9.9 million tonnes (+25% compared to 2020). The main trends in the agricultural market in 2022 are as follows. For example, the FAO food price index in September 2022 was 136.3 points, which is 6% higher than in September 2021. The situation improved somewhat after the launch of the ‘grain corridor’ from Ukrainian ports under the auspices of the UN. [3, pp. 24, 53, 86].

Ukraine is a key supplier to many countries that are heavily dependent on food imports. Some of these countries belong to the group of least developed countries, while many others are low-income countries with food shortages. Before the war, Ukraine accounted for about 50% of global sunflower oil production and 13% of grain exports. Ukraine's share in the exporting countries of major crop products in 2021/22 MY: sunflower – 41%; sunflower oil – 41%; rapeseed – 18%; corn – 13%; barley – 17%; wheat – 9%; soybeans – 1%.

As a result of the full-scale invasion in 2022, the sown area decreased significantly from 28.6 million hectares (2021) to 21 million hectares in 2022. 2022 season: spring sowing was carried out with fewer losses thanks to the fact that farmers had mostly purchased fertilisers, seeds and plant protection products in 2021. 2023 season: the situation worsened with next year's harvest, with winter crop areas decreasing by 38%.

The State Fiscal Service of Ukraine declares 18.7 million hectares of agricultural land, the owners of which use a simplified taxation regime. About 5% of agricultural land (or about 1.5 million hectares) is used by farmers. Another 5-6 million hectares of land are used by private farms. According to the Law of Ukraine ‘On Peasant Farming,’ economic activity carried out by an individual using a land plot of no more than 2 hectares is not considered entrepreneurial activity. The size of the land plot is often used to identify or determine the status of small farmers. The most common is land ownership of less than 2 hectares. However, in Chile, family farms (small owners) are those that manage up to 12 hectares, up to 50 hectares in Peru, and up to 66 hectares in Ecuador. [2, pp. 83-85]

The European Union is characterised by a steady increase in the consolidation of farmers, with their average size almost doubling over the last 20 years. Such trends are characteristic of Poland and, according to scientists, also of Ukraine in peacetime (small farmers in our country are five times larger than the average size of Polish small farmers) [1, pp. 1341–1348], [6, pp. 682–685].

Agricultural enterprises in Ukraine are divided into two types: corporate farms and individual small commercial farms. As of 2018, there were about 9,892 corporate farms (mainly successors to former collective and state farms), which cultivated about 1,650 hectares of arable land, accounting for up to 50% of GDP. There were also about 30,441 small individual farmers who cultivated an average of about 105 hectares of land per farm, which together accounted for about 13% of Ukraine's arable land. In the pre-war years, the structure of crops in private farms is presented in Table 2.

Table 2. Structure of crops in private farms as a percentage of the total area under cultivation

Types of crops	All households and farms	Farms with land plots, ha		
		0.5 and less	0.5- 1.0	1.0 and above
Cereals	53.0	24.5	37.7	59.7
Oilseeds	18.4	0.5	1.1	24.0
Potatoes	11.8	42.4	25.8	5.2
Vegetables and fruit	3.6	14.9	6.5	1.6
Fodder crops	13.2	17.7	28.9	9.5

An analysis of crop types and acreage in private farms as a percentage of total acreage shows that in the pre-war years, small landowners also focused on the grain market, as it was the least costly agricultural business. However, it is known that this was facilitated by the lack of a balanced state policy towards rural areas and the agricultural sector, as well as the expanded formation of agricultural holdings. It was mainly agricultural holdings that purchased grain crops at prices that were not profitable for small farmers (August-November of the current year). This policy did not contribute to the preservation of rural settlements and jobs in the countryside, contributed to the transfer of significant areas of land for lease, led to a lack of working capital for small producers and the inability to develop or diversify (transition or organisation of agribusiness in berry growing, small-scale livestock farming, horticulture, etc.), [5, pp. 527-561].

Thus, after analysing the structural changes in the land fund and cultivated areas, emphasising the growing role of agricultural holdings and the simultaneous problems of the development of small and family farming, it was established that insufficient state support, low level of innovation and limited investment support are hindering the sustainable development of rural areas and threatening food and economic security.

Of particular value is the identification of niche agribusiness as a tool for balancing economic, social, environmental and security processes at the national level. The article is of practical importance for the development of state policies aimed at supporting various forms of agribusiness, diversifying production and restoring the socio-economic potential of rural areas.

Our own assessment shows that the study offers a comprehensive methodology for integrating small, niche and corporate agribusinesses into a system of sustainable land use, which is relevant in the context of military challenges and European integration processes. The article provides a scientific basis for further practical and political decisions in the development of Ukraine's agricultural sector.

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INTELIGENȚA ARTIFICIALĂ CA INSTRUMENTAR ÎN AGRICULTURA 4.0 ¹

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Abstract. Sustainable Development aims to improve the quality of people's lives without compromising the planet's potential. The "Agriculture 4.0" paradigm promotes the principles of a Circular Economy - an economic system that involves the reuse, repair, rental, reconditioning and recycling of products and materials, in order to keep them in use for as long as possible and minimize waste generation and pollution. Accordingly, Agriculture 4.0 uses advanced technologies - sensors, robots, satellites and drones - to generate and process a huge volume of data accessible through mobile devices and various platforms. By using Artificial Intelligence, contemporary agriculture can integrate and aggregate various skills in an interactive manner and help identify feasible entrepreneurial solutions. The purpose of this research is to evaluate the possibilities and benefits of implementing the "Agriculture 4.0" principles by using Artificial Intelligence for a competitive development of the Republic of Moldova agriculture, according to the Sustainable Development principles promoted by the UN and the European Union's Common Agricultural Policy. The research was carried out within the "Artificial Intelligence-based Innovation in Life Sciences and Engineering for a Circular Economy" (AI-InnoScEnCe) project, funded by the European Union through the Horizon Europe research and innovation programme. The project's primary objective is to enhance the impact of academic research in engineering and economics by promoting innovation and entrepreneurship focused on the circular economy.

Keywords: AI-InnoScEnCe, Artificial Intelligence, Agriculture 4.0, Sustainable Development, Circular Economy.

Introducere

Dezvoltării Durabile are ca scop îmbunătățirea calității vieții oamenilor fără de a afecta capacitățile planetei noastre. Paradigma „Agricultura 4.0” urmărește promovarea principiilor Economiei Circulare – sistem economic ce implică reutilizarea, repararea, închirierea, recondiționarea și reciclarea produselor și materialelor, pentru a le menține în uz cât mai mult timp și a minimiza generarea de deșeuri și poluarea. Respectiv, Agricultura 4.0 folosește tehnologiile de vârf – senzori, roboți, sateliți și drone – pentru a genera și procesa un volum uriaș de date accesibile prin dispozitive mobile și diverse platforme. Prin utilizarea Inteligenței Artificiale, agricultura contemporană poate integra și agrega diverse competențe într-o manieră interactivă și ajută la identificarea unor soluții antreprenoriale fezabile. **Scopul** prezentei cercetări este de a evalua posibilitățile și beneficiile implementării principiilor Agriculturii 4.0 și folosirii Inteligenței Artificiale în dezvoltarea competitivă a agriculturii Republicii Moldova, țară candidat pentru aderarea la Uniunea Europeană, conform principiilor Dezvoltării Durabile promovate de ONU și de Politica Agricolă Comună a Uniunii Europene. Cercetările au fost realizate în cadrul proiectului „*AI-Empowered Innovation in Natural Science and Engineering for Circular Economy*” (**AI-InnoScEnCe**), finanțat de Uniunea Europeană prin programul pentru cercetare și inovare „**Horizon Europe**” [1, 18], **nr. de ref. 101127683** (Imaginea 1), care are ca obiectiv principal sporirea impactului cercetării academice în științele ingineresti și economice prin promovarea inovării și a spiritului antreprenorial orientate către economia circulară.



Imaginea 1. Logo-ul proiectului „AI-InnoScEnCe”

Sursa: [27]

Proiectul reunește într-un consorțiu parteneri din Germania - Universitatea Tehnică din Hamburg (coordonatorul proiectului) și Tutech Innovation GmbH, din Serbia - Universitatea din Novi Sad și Institutul de Cercetare pentru Inteligență Artificială, precum și din Republica Moldova -

Universitatea de Stat „Bogdan Petriceicu Hasdeu” din Cahul, Incubatorul de Afaceri Cahul și Centrul de inovare „Inotek” din Cahul.

Un obiectiv important al proiectului *AI-InnoScEnCe* îl constituie cercetarea și promovarea metodelor de utilizare a IA în contextul avansării paradigmei și a strategiilor de Dezvoltare Durabilă.

Material și metodă

În vederea atingerii obiectivelor cercetării, au fost utilizate următoarele metode: sinteza unor studii cu privire la Inteligența Artificială și instrumente IA utilizate în agricultură; analiza empirică; formularea de concluzii și raționamente. În calitate de surse de informații au fost folosite o serie de publicații științifice în domeniul aferent, materialele obținute în cadrul cercetărilor *benchmarking* din proiectul *AI-InnoScEnCe* și banca de date a Biroului Național de Statistică al Republicii Moldova.

Resultate și discuții

Agricultura este ramura economică ce cuprinde activități și produse destinate nemijlocit satisfacerii nevoilor (trebunțelor) fundamentale ale oamenilor. La fel, produsele agricole vegetale și animaliere constituie baza unei părți însemnate a industriei prelucrătoare, în special a ramurilor conexe cu fabricarea produselor alimentare. Conform datelor BNS [3], în anul 2024, din 68725 de întreprinderi raportate, 5990 unități sau 8,71% din totalul întreprinderilor activează în agricultură. Totodată, datele BNS referitoare la activitatea agricolă a micilor producători agricoli în Republica Moldova [4] relevă că, în anul 2024, din cele circa 2200 mii ha de terenuri utilizate în agricultură, doar 947,5 mii ha sau 43,05% sunt utilizate de întreprinderi agricole, respectiv 533,7 mii ha (24,25%) – de gospodăriile țărănești (de fermier), 372,3 mii ha (16,92%) – de gospodăriile populației și 346,5 mii ha (15,74%) – de alte categorii. Astfel, buna dezvoltare a acestui sector este de importantă strategică pentru țara noastră.

Conceptul contemporan al dezvoltării se axează pe paradigma Dezvoltării Durabile care urmărește echilibrarea mediului economic, social și natural prin realizarea a 17 Obiective de Dezvoltare Durabilă (ODD), stabilite de ONU în anul 2015 [26, p. 14], din care 5 (cinci) vizează direct dezvoltarea economică:

- ODD 7 - Energie curată și la prețuri accesibile
- ODD 8 - Muncă decentă și creștere economică
- ODD 9 - Industrie, inovare și infrastructură
- ODD 12 - Consum și producție responsabile
- ODD 13 - Acțiune climatică

Urmează să precizăm că în literatura de specialitate sunt utilizate două noțiuni „dezvoltare durabilă” și „dezvoltare sustenabilă” pentru a descrie același concept. Respectiv:

- **dezvoltare durabilă** este termenul cel mai des întâlnit în documentele oficiale și în limbajul academic în limba română, provenind din traducerea raportului Brundtland (Gro Harlem Brundtland – președintele Comisiei mondiale a ONU pentru Mediu și Dezvoltare, 1987) [25],
- **dezvoltare sustenabilă** este o interpretare directă a termenului englezesc "sustainable development".

În cadrul cercetării și argumentării științifice a aspectelor Dezvoltării Durabile, a fost definit și *conceptul circularității*. Mai multe studii științifice îl consideră pe savantul american Kenneth E. Boulding drept inițiatorul „circularității” [19, p. 5], care, în lucrarea sa "*The Economics of the Coming Spaceship Earth*" (rom. - „Economia viitoarei nave spațiale Pământ”), afirmă că „*Pământul a devenit o singură navă spațială, fără rezervoare nelimitate de nimic [...], prin urmare, omul trebuie să-și găsească locul într-un sistem ecologic ciclic, capabil de reproducere continuă a materiei*” [9, p. 3].

Ulterior, cercetarea și sistematizarea cunoașterii despre problemelor dezvoltării economice durabile a generat și dezvoltat conceptul de „*economie circulară*”, menționat pentru prima dată în 1976, de autorii Walter Stahel și Geneviève Reday-Mulvey în raportul "*The Potential for Substituting Manpower for Energy*" (rom. - „Potențialul de a Substitui Forța de Lucru Umană pentru Energie”) și publicat în 1981 în cartea "*Jobs for Tomorrow: The Potential for Substituting Manpower for Energy*" [23], în care au prezentat Comisiei Europene conceptul de „**economie în buclă**” (eng. - *economy in*

loops) sau „**conomie circulară**” (eng. – *circular economy*), efectul ei asupra creării de locuri de muncă, precum și asupra competitivității economice, a economisirii resurselor și a prevenției risipei.

Într-o economie circulară (Figura 1), produsele și materialele sunt păstrate în circulație prin procese precum întreținerea, reutilizarea, recuperarea, recondiționarea, reciclarea și compostarea [17].



Figura 1. Economia circulară – reprezentare grafică

Sursa: adaptare după: [21, p. 70]

Ca parte a Economiei Circulare, **agricultura circulară** este un sistem agricol modern care urmărește *reducerea risipei, reutilizarea resurselor și regenerarea ecosistemelor*, bazat pe principii de economie circulară. **Principiile de bază** ale agriculturii circulare sunt:

- **Sănătatea solului** - se pune accent pe *metode care îmbunătățesc fertilitatea și structura solului, contracarând degradarea provocată de practicile intensive*.
- **Biodiversitate** - se promovează o *diversitate mai mare de plante și animale, care contribuie la un ecosistem agricol mai rezilient și echilibrat*.
- **Reducerea deșeurilor** - se caută *soluții pentru a minimiza risipa de resurse și a valorifica subprodusele agricole, formând astfel ciclul de producție închis*.
- **Practici ecologice** - *utilizarea rotației culturilor, a culturilor de acoperire, a compostării și altor practici care ajută la menținerea sănătății solului și la reducerea dependenței de chimicale*.

Pentru Republica Moldova, țară-candidat pentru aderarea la Uniunea Europeană, este important să se cunoască faptul că, prin **Politica Agricolă Comună (PAC)** UE sprijină dezvoltarea durabilă (sustenabilă) [13] a agriculturii, având ca reper 10 (zece) **obiective-cheie pe perioada 2023-2027**, referitoare la cei trei piloni ai sustenabilității: [15]

1. Sustenabilitate economică:

- Sprijinirea unor venituri agricole viabile.
- Dezvoltarea competitivității sectorului.
- Ameliorarea (îmbunătățirea) poziției fermierilor în cadrul lanțului valoric.

2. Sustenabilitate de mediu:

- Contribuția la atenuarea schimbărilor climatice și protejarea mediului.
- Oprirea și inversarea declinului biodiversității, conservarea peisajelor și a biodiversității.
- Gestionarea eficientă a resurselor naturale.

3. Sustenabilitate socială:

- Reînnoirea generațiilor de fermieri.

- Dinamizarea zonelor rurale, creșterea locurilor de muncă, creșterea economică și egalitatea în zonele rurale.
- Răspunsul la cerințele societății în materie de alimentație și sănătate
- Promovarea în sectorul agricol a cunoașterii și a inovării

Vom menționa că, în cadrul cercetărilor referitoare la Dezvoltarea Durabilă sunt utilizate 2 concepte - agricultura circulară și agricultura regenerativă - ambele fiind abordări sustenabile, dar care diferă prin conținut. **Agricultura regenerativă** se concentrează pe refacerea solului, pe îmbunătățirea gestionării apei și pe crearea unui sistem alimentar mai durabil, folosind practici ale agriculturii de conservare precum rotația culturilor, culturile de acoperire și agricultura fără arătura. Aceste practici contribuie la îmbunătățirea structurii și fertilității solului, la prevenirea eroziunii și la reducerea dependenței de îngrășăminte și pesticide sintetice.

Agricultura circulară, pe de altă parte, se bazează pe principiile economiei circulare, prin valorificarea la maximum a resurselor și eliminarea risipei, concentrându-se pe integrarea tuturor fluxurilor de materiale și energie într-un sistem închis.

Agricultura regenerativă se poate integra în agricultura circulară prin aplicarea practicilor regenerative la nivel de fermă, care contribuie la refacerea solului și la captarea emisiilor de carbon. Agricultura circulară oferă apoi un cadru mai larg pentru integrarea acestor practici într-un sistem sustenabil care minimizează risipa și maximizează utilizarea resurselor.

Actualmente, agricultura se confruntă cu numeroase provocări, cum ar fi schimbările climatice și sărăcirea resurselor naturale, pe de o parte, și diversificarea și creșterea cererii pentru producția agricolă, respectiv, a cererii pentru resursele necesare agricultorilor în procesul de producție, și, implicit, a prețurilor la ele, cauzând, astfel, creșterea costurilor de producție, pe de altă parte. Pe parcursul ultimilor decenii, agricultorii au perfecționat metodele de creștere și cultivare pentru a spori productivitatea, a preveni risipa și a reduce impactul asupra mediului.

Cercetările din domeniu au confirmat că, agricultura modernă este influențată semnificativ de „**Industria 4.0**” – paradigmă contemporană de dezvoltare a industriei sustenabile, iar adoptarea în agricultură a aplicațiilor avansate ale Industriei 4.0 duce la un nou concept - „**Agricultura 4.0**” - un sistem de management agricol care aplică noi tehnologii și culege date relevante pentru a crește producția și a spori eficiența.

Analiza dinamicii dezvoltării sectorului agricol al economiei Republicii Moldova, relevă că în perioada 2016-2024 suprafața terenurilor cu destinație agricolă a crescut cu 362,6 mii ha sau cu 17,88% (Figura 2a) [5].

În același timp, datele Biroului Național de Statistică al Republicii Moldova (BNS) constată, în aceeași perioadă raportată, o reducere a efectivului de animale (Figura 2b), respectiv, bovine cu 300,9 mii capete (- 41,9% față de 2016), porcine cu 102,5 mii capete (- 22,6%), ovine cu 85,1 mii capete (- 45,7%) [6].

Aceste date permit să admitem ipoteza că, pe lângă fluctuațiile pieței, reducerea șeptelului este cauzată și de diminuarea bazei furajere și a suprafețelor de pășunat, fapt ce confirmă intensificarea și extinderea exploatării pământurilor țării noastre.

Totodată, extinderea terenurilor cu destinație agricolă, în perioada 2016-2024, corelată cu producția vegetală și producția animalieră obținute în aceeași perioadă, denotă că, de facto, eficiența utilizării terenurilor agricole este în scădere (Figura 2c).

În același timp, conform datelor BNS, la finele anului 2023, din cantitatea totală de deșeuri generate de toate tipurile de activități, cota majoră, de 75% (275503,4 tone) a revenit celor provenite din agricultura, horticultura, acvacultura, silvicultura, vânătoare și pescuit, prepararea și prelucrarea alimentelor (Figura 3), urmată de deșeurile municipale (16%) și de la instalații de tratare a reziduurilor și tratare a apei (5%) [8].

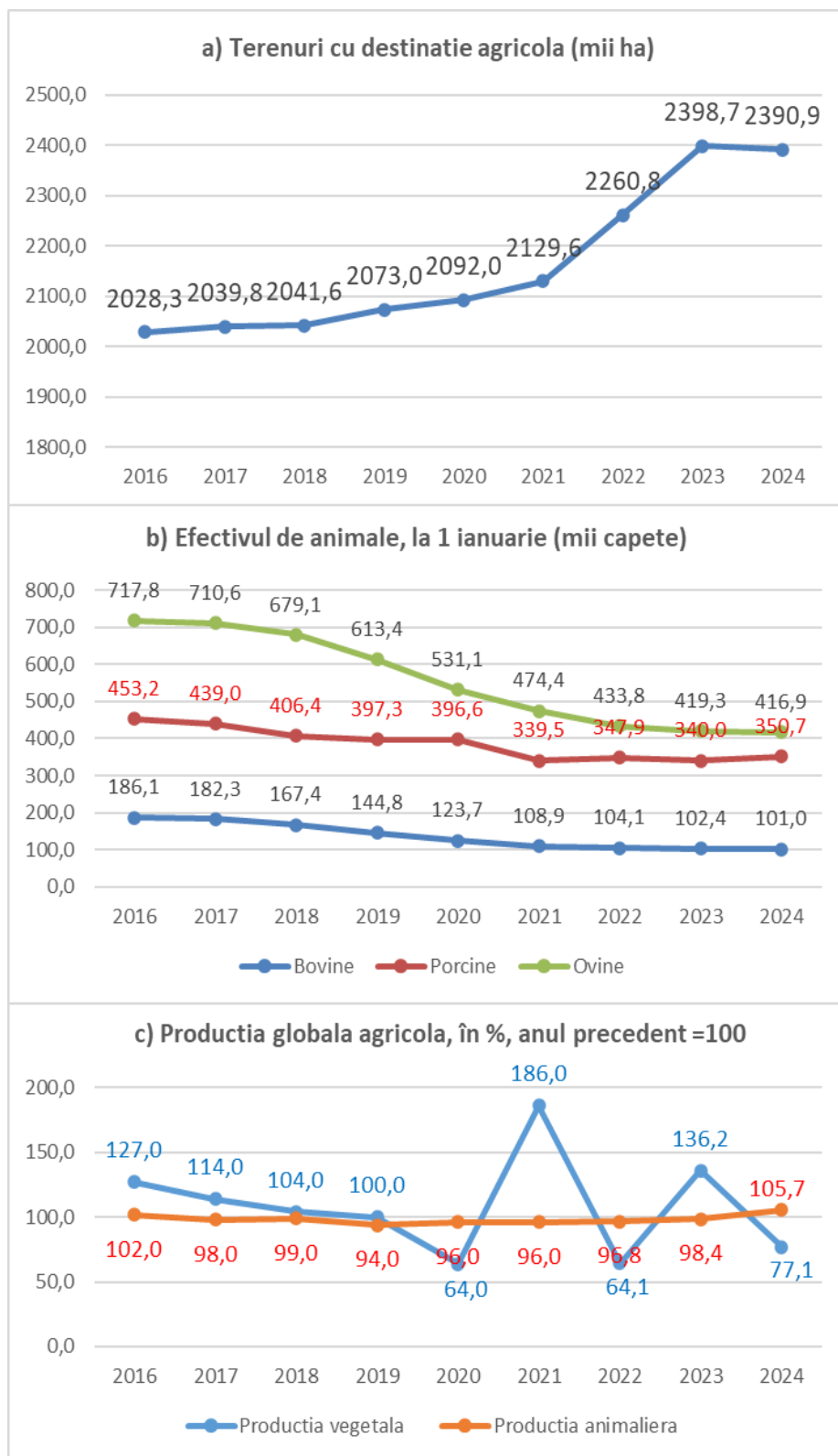


Figura 2. Agricultură Republicii Moldova: eficiența economică
Sursa: întocmit de autor în baza datelor BNS [5, 6, 7]

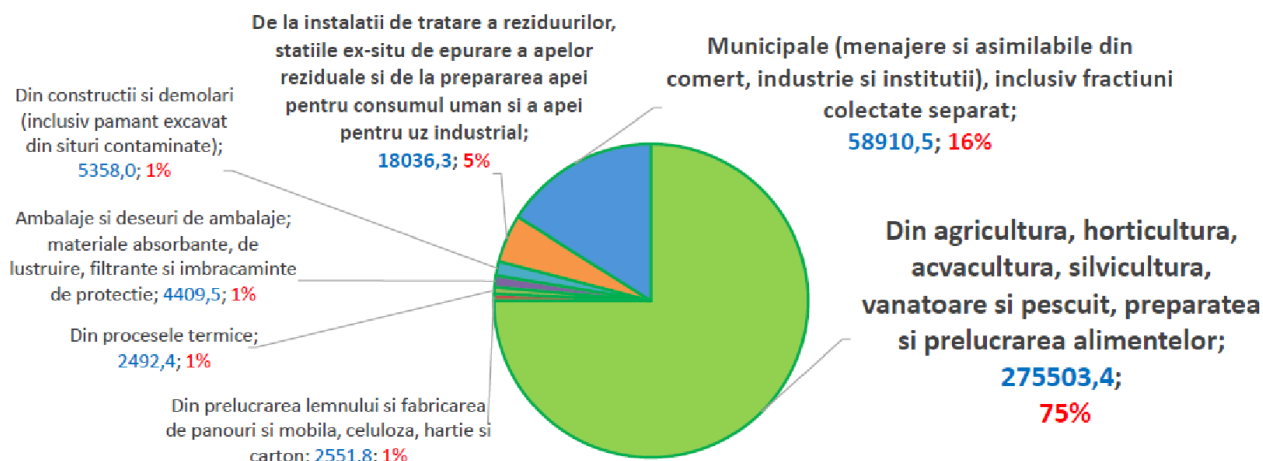


Figura 3. Generarea deșeurilor pe tipuri de activități (tone, % din total), în anul 2023

Sursa: întocmit de autor în baza datelor BNS [8]

Economia Circulară, conform Fundației Ellen MacArthur [14], se bazează pe trei principii care au ca scop:

- 10) Eliminarea deșeurilor și a poluării;
- 11) Returnarea produselor și materialelor cu valoare maximă;
- 12) Restaurarea naturii.

Aceste principii, corelate cu posibilitățile oferite de tehnologiile și practicile digitale, sunt implementate cu succes în agricultura contemporană prin Agriculturii 4.0. Pentru a înțelege de ce Agricultura este 4.0, urmează să menționăm etapele dezvoltării ramurii [24].

- **Agricultura 1.0 sau prima revoluție în agricultură sau începutul agriculturii** - datează de acum 10.000 de ani de când *oamenii au început să cultive plante și au domesticit animalele*. Agricultura 1.0, fiind bazată pe munca manuală și metode tradiționale de cultivare a pământului și creștere a animalelor, este încă păstrată în ferme mici, aflate departe de tehnologiile moderne și de dorința de extindere. Deși sunt bazate pe metode tradiționale, durabile pentru mediu, cum ar fi utilizarea îngrășămintelor naturale și metode naturale de combatere a dăunătorilor și buruienilor, astfel de ferme sunt adesea capabile să-și asigure doar nevoile proprii.
- **Agricultura 2.0 sau a doua revoluție în agricultură** - a fost generată de *reorganizarea terenurilor agricole* în sec. XVIII-XIX, introducerea de tehnici noi precum *rotația culturilor și selecția de soiuri și rase* pe baze științifice. Procesul de industrializare, început odată cu Prima revoluție industrială (Industria 1.0 - tranziția de la economia agrară la cea industrială, mecanizarea, utilizarea puterii apei și aburului, dezvoltarea transportului) în perioada 1780-1840 și continuată cu Industria 2.0 (aparitia și dezvoltarea căilor ferate, descoperirea electricității și electrificarea, organizarea producției în flux bazată pe diviziunea muncii) în perioada 1871-1914, au dus la o mecanizare intensivă a agriculturii și la înlocuirea muncii manuale cu ingineria mecanică. Tendințele de creștere a capacității de producție și a productivității au condus la ameliorarea selectivă activă a culturilor agricole modificate, cu randament ridicat, la utilizarea de noi tehnici de prelucrare a materiilor prime și la stimularea randamentelor culturilor prin utilizarea îngrășămintelor artificiale, a erbicidelor și a pesticidelor.
- **Agricultura 3.0 sau a treia revoluție în agricultură** – începând în anii '1910 - *folosirea utilajelor agricole de mare putere, îngrășămintelor chimice și pesticidelor*, a generat „Revoluția verde” în anii 1950-1960 prin *aplicațiile geneticii*. Agricultura Republicii Moldova se află acum exact în această etapă. Deși nu mai suntem surprinși de sistemele automate de irigare și control al microclimatului din sere sau de mașinile automate de muls, de cipurile implantate la animale folosite pentru a urmări starea și locația acestora, de senzorii de pe utilajele agricole care permit monitorizarea și controlul de la distanță al

semănatului, fertilizării și recoltării, totuși, toate aceste progrese digitale mai sunt utilizate selectiv, optimizând doar sarcini specifice de-a lungul lanțului de producție agricolă.

- **A patra revoluție în agricultură sau Agricultura 4.0** – *folosește tehnologiile de vârf* – senzori, roboți, sateliți și drone – pentru a genera și procesa un *volum uriaș de date accesibile prin dispozitive mobile și diverse platforme*. „Agricultura 4.0” este următoarea etapă de dezvoltare, în care noile tehnologii nu doar că vor optimiza operațiunile prin automatizarea procedurilor individuale, ci și vor introduce un nou model de agricultură în care oamenii vor acționa exclusiv ca coordonatori și observatori. Desigur că aceasta va fi în continuare agricultură, unde sunt utilizate terenurile arabile, iar condițiile naturale și climatice continuă a fi un factor important, dar procesele de producție vor fi conectate la o platformă unică și cuprinzătoare, care va permite colectarea, sistematizarea și schimbul de informații online, de la ferme și câmpuri, permițând ajustarea muncii sectoarelor de producție pe baza informațiilor primite.

Agricultura 4.0 cuprinde toate mijloacele disponibile de mecanizare și automatizare a producției, monitorizarea cu drone și senzori, completate de Internetul Lucrurilor (eng. - *Internet of Things* - *IoT*), big data, automatizarea și robotizarea, care pătrund în toate domeniile producției agricole.

În multe industrii, **dronele** - aparate zburătoare (helicopter, quadcopter) fără pilot la bord, ghidate de la distanță [16] - sunt utilizate pentru supraveghere, cartografiere, controlul traficului, topografie și chiar livrare. Cu aplicații împrumutate din Industria 4.0 în agricultură, dronele sunt capabile să ofere date utile privind condițiile solului, bolile, maturitatea plantelor și multe altele, adesea în timp real. Datele actuale captate de drone pot fi comparate cu datele istorice pentru a îmbunătăți procesul decizional.

Senzorii – dispozitive care măsoară o mărime fizică și o transformă într-un semnal care poate fi citit de către un observator printr-un instrument sau poate fi prelucrat [12] - reprezintă practic raza extinsă de vizibilitate și colectare a datelor pentru ceea ce se întâmplă atât deasupra, cât și sub pământ. Senzorii pot detecta când culturile au nevoie de irigații, pot determina dacă este necesară mai multă forță de apăsare și pot instrui ce substanțe chimice ar trebui aplicate și unde. Capacitatea lor de a măsura viteza vântului, presiunea și debitul de pulverizare, schimbările de teren și multe altele oferă fermierului o imagine precisă a fiecărui colț al fermei sale. Cu ajutorul senzorilor, fermierii obțin capacitatea de a monitoriza variabilitatea pe teren și de a lua decizii respective.

Internetul Lucrurilor (IoT) este o rețea de dispozitive, adesea echipate cu senzori și detectoare, care pot interacționa între ele fără intervenție umană. IoT schimbă viziunea asupra modului de obținere a rezultatelor, deoarece se stabilesc obiective și nu mijloacele pentru a le atinge. **IoT în agricultură** (Agriculture IoT) conectează senzori, drone și utilaje pentru a automatiza procesele la distanță și a oferi informații în timp real despre sănătatea solului, modelele meteorologice și condițiile culturilor. Aceste tehnologii agricole inteligente ajută fermierii să monitorizeze animalele, să automatizeze irigațiile, să urmărească echipamentele pentru a reduce deșeurile și a optimiza resursele și multe altele [20], oferind soluții inteligente care îmbunătățesc eficiența, sustenabilitatea și productivitatea. IoT în agricultură presupune că senzorii din câmpuri, depozite și sere detectează și raportează schimbările condițiilor externe și interne. În continuare, un model de analiză predictivă preia apoi controlul, determinând că, de exemplu, o creștere a temperaturii cu 4 grade promovează eclozarea mai timpurie a insectelor sau că o creștere a umidității peste limita optimă poate duce la o epidemie de boli. Aceste informații sunt apoi verificate de dronele desfășurate pentru a analiza răsadurile folosind camere multispectrale. În continuare, sistemul de monitorizare a stocurilor din depozit „avertizează” fermierul dacă substanțele chimice necesare nu sunt disponibile și, dacă este autorizat, le comandă automat, iar echipamentul reumplut se îndreaptă apoi spre câmpuri. Astfel, monitorizarea și gestionarea diverșilor factori externi creează o valoare reală pentru o fermă. Dacă este vorba de un depozit sau o seră, este posibil să se creeze condiții microclimatice ideale, inclusiv temperatură, umiditate, niveluri de CO₂ etc., iar dacă este vorba de un câmp, acest tip de interacțiune permite acțiuni preventive folosind produse de protecție a plantelor și îngrășăminte [28].

Capacitatea de a colecta și analiza **big data** - seturi de date extrem de mari și complexe, care sunt prea voluminoase și complexe pentru a fi gestionate de software-ul tradițional de procesare a datelor [2] - a jucat un rol revoluționar, practic, în toate domeniile de activitate umană. Agricultură nu face excepție. Provocarea cheie constă în a transforma această cantitate vastă de big data în informații utile care pot fi captate folosind sisteme avansate de analiză pentru a ajuta fermierii să ia decizii mai justificate. Deoarece seturile de date pot proveni din surse diferite, este esențial ca datele să fie ingerate, curățate și armonizate corespunzător folosind inteligența artificială și analizele avansate pentru a obține informații necesare despre soluțiile practice la provocările specifice ale unui agricultor-fermier.

Utilizarea tehnologiilor avansate pentru modernizarea și automatizarea proceselor anterior manuale din agricultură este cunoscută sub numele de **automatizare** a fermelor [11]. Această tehnologie reduce munca și timpul petrecut cu procesele agricole, care au reprezentat întotdeauna o provocare semnificativă pentru fermierii din întreaga lume. Tehnologiile robotizate pot planta semințe, pot monitoriza și analiza sănătatea culturilor și chiar pot recolta culturi.

Robotizarea – înzestrarea cu roboți - proceselor agricole este orientată spre folosirea mașinilor care acționează autonom, fără ghidarea directă sau de la distanță a omului, utilaje care îndeplinesc o varietate de sarcini, de la plantarea și recoltarea culturilor, la monitorizarea sănătății plantelor și aplicarea pesticidelor. Roboții sunt controlați și programați prin intermediul algoritmilor de control, a limbajelor de programare specializate pentru roboți, precum și prin învățarea automată și inteligența artificială [22].

Anume necesitatea de a automatiza, a robotiza, a monitoriza și coordona (inclusiv de la distanță) procesele agricole, a contribuit la conectarea agriculturii la tehnologiile informaționale, și a generat implicarea și încorporarea în Agricultura 4.0 a Inteligenței Artificiale (IA).

Inteligența Artificială (IA) este un domeniu al informaticii care dezvoltă *sisteme capabile să imite gândirea și inteligența umană* pentru a îndeplini sarcini, a învăța din date, a raționa (analiza), a lua decizii și a se îmbunătăți continuu. Conform definiției oferite de Parlamentul European, inteligența artificială reprezintă capacitatea și abilitatea unui program de a reproduce funcții umane de bază – raționamentul, învățarea, planificarea și creativitatea [10]. Inteligența artificială (IA) din industrie permite mașinilor să acumuleze date, să evalueze situații și să ofere informații în timp real. În agricultură, IA ajută la îmbunătățirea calității culturilor, la identificarea bolilor și dăunătorilor plantelor și la determinarea erbicidelor care ar trebui utilizate în fiecare regiune la un moment dat. De asemenea, IA permite folosirea unor practici agricole inovatoare, cum ar fi agricultura verticală - un sistem avansat din punct de vedere tehnologic care maximizează eficiența resurselor și crește producția de alimente pe o suprafață mai mică decât culturile tradiționale pe rânduri.

Aplicațiile IA includ:

- **Asistenți virtuali** - programarea și asistența oferită de asistenții virtuali.
- **Sisteme de recomandare** - servicii care sugerează conținut pe baza preferințelor utilizatorilor.
- **Viziune artificială** - sisteme care permit mașinilor să „vadă” și să interpreteze informații vizuale.
- **Roboți industriali** - roboți care pot îndeplini sarcini repetitive și se pot adapta la schimbări în procesele de producție.

Inteligența artificială poate fi utilizată în Agricultura Durabilă pentru a analiza calitatea solului și a culturilor, aducând un aport important în identificarea zonelor care au nevoie de tratamente, fertilizare sau irigare.

Aplicațiile digitale care le permit fermierilor să își îmbunătățească productivitatea, prin utilizarea unor senzori care măsoară factori externi precum:

- lumina
- nivelul de umiditate din aer și sol
- nivelul precipitațiilor
- temperatura

În acest mod, **fermierii pot monitoriza întreaga recoltă în mod inteligent** și pot realiza anumite **operațiuni** precum irigarea, chiar și **de la distanță**

Aceste tehnologii sunt cheia pentru **eficientizarea activității agricole**, contribuind astfel la reziliență și competitivitate.

Inteligența artificială permite **crearea și integrarea bazelor de date** referitoare la **cele mai potrivite tehnologii** pentru:

- **Protecția și prelucrarea solului**, inclusiv recomandări concrete pentru terenuri concrete
- **Asolamentul** sau rotația culturilor agricole
- **Programarea irigației și stropirii**
- **Regimuri de recoltare și păstrare**
- **Tehnologii de creștere și întreținere a animalelor** din sectorul zootehnic
- **Tehnologii de procesare** a producției agricole și animaliere
- **Metode și tehnologii de reciclare a deșeurilor**

Folosind IA fermierii și agricultorii pot integra dispozitivele, echipamentele și big data Internetului Lucrurilor (IoT) cu sistemele de **planificare** financiară și de afaceri, sistemele de **control** al stocurilor și disponibilitatea informațiilor despre fiecare unitate economică.

Toate acestea creează o bază largă pentru aplicarea IA, care nu numai că oferă fermierilor o imagine de ansamblu asupra afacerii lor, dar poate duce în cele din urmă la apariția unor noi metode agricole bazate exclusiv pe date.

De asemenea, datele colectate pot fi utilizate pentru a planifica mișcarea echipamentelor agricole pentru a reduce compactarea solului, iar campania de recoltare (colectare) propriu-zisă a culturilor poate fi îmbunătățită prin sincronizarea mișcărilor vehiculelor.

La fel, necesitatea de a reduce dependența de combustibili fosili, coroborată cu noile cerințe energetice ale sectorului TI (tehnologii informaționale), roboților și dispozitivelor, inevitabil duce la o creștere a cererii de energie a fermelor și gospodăriilor agricole. În acest context, procesarea și folosirea deșeurilor agricole ca sursă de bio-combustibil va impulsiona producerea de biomasă pentru energia regenerabilă.

Astfel, dacă anterior, fermierii și agricultorii nu aveau datele și analizele necesare pentru a diminua sau chiar a evita epuizarea resurselor, a combate dăunătorii și a activa eficient în condițiile meteorologice în schimbare, atunci **Inteligența Artificială și Agricultura 4.0** rezolvă complet această problemă, oferind o serie de **beneficii**:

- **Creșterea productivității, îmbunătățirea sănătății culturilor și randamente mai mari.** Capacitatea fermierului de a monitoriza și analiza culturile în timp real duce la luarea deciziilor bazate pe date, cu concluzii argumentate, justificate. Cunoașterea exactă a momentului și a locului în care se aplică irigațiile, îngrășămintele și erbicidele contribuie la îmbunătățirea calității și creșterea randamentului culturilor.
- **Gestionarea mai eficientă a costurilor.** Datele concrete oferă un control mai bun asupra cheltuielilor și costurilor. De exemplu, permit fermierilor să planifice mai precis toate etapele de cultivare, plantare și recoltare, precum și cerințele de îngrășămintă și irigații, datorită analizei datelor. Acest lucru nu numai că crește productivitatea, dar reduce și costurile și economisește forță de muncă.
- **Reducerea deșeurilor.** Conform studiilor recente, tehnologiile digitale care susțin „Agricultura 4.0” au redus consumul de apă, combustibil, îngrășămintă și erbicide cu 30%. O gestionare mai precisă a redus, de asemenea, la minimum utilizarea pesticidelor. Capacitatea de a prezice mai precis nevoile culturilor contribuie la creșterea randamentelor și reduce risipa de resurse, timp și forță de muncă.
- **Amprentă de carbon mai mică.** Grupul Consultativ pentru Cercetare Agricolă Internațională (CGIAR) notează că reducerea amprente de carbon a agriculturii este esențială pentru limitarea schimbărilor climatice. Înainte de Agricultura 4.0, o mare parte din îngrășămintele utilizate în ferme se scurgeau în râuri și ape freatice sau erau descompuse de microbii din sol, eliberând în atmosferă protoxid de azot, un gaz cu efect

de seră puternic. Utilizarea celor mai noi tehnologii pentru a aplica cu precizie și a determina cantitatea potrivită de îngrășământ în fiecare locație reduce amprenta noastră de carbon. Suplimentar, îmbunătățirea eficienței operațiunilor agricole și a echipamentelor folosite reduce consumul de combustibili fosili ceea ce, de asemenea are impact asupra amprentei de carbon.

Așa dar, în agricultura modernă, bazată pe principiile Dezvoltării Durabile și a Economiei Circulare, protejarea resurselor noastre naturale este vitală, iar fiecare activitate este evaluată conform datelor referitoare atât la profitabilitate și eficiența, cât și la circularitate, reziliență și sustenabilitate.

Concluzii

Inteligența Artificială (IA) a devenit o parte integrantă a vieții noastre și este văzută ca un instrument care poate fi folosit pentru a îmbunătăți și a dezvolta toate domeniile activității umane.

Agricultura 4.0 a conectat realizările Industriei 4.0 la activitățile agricole. Tehnologiile moderne nu cunosc limitări și hotare, și pot aduce beneficii semnificative. Prin utilizarea big data și automatizarea colectării și analizei datelor privind dezvoltarea culturilor, putem identifica modele interesante și dezvolta noi procese tehnologice. Desigur că, indiferent de disponibilitatea roboților și a Inteligenței Artificiale, utilajele agricole vor continua să se îmbunătățească. Dar, tractoarele moderne sunt deja echipate cu computere de bord avansate pentru procesarea datelor GPS, GIS și teledetecție. Următorul pas ar fi tractoarele complet autonome sau fără șofer, echipate cu senzori și camere pentru a monitoriza sănătatea și starea plantelor.

Conceptul Internetului lucrurilor în Agricultură (IoT în Agricultură) schimbă atât cerințele față de organizarea proceselor agricole, dar și cerințele față de infrastructură. Dacă anterior disponibilitatea drumurilor, a alimentării cu apă și a energiei electrice era crucială pentru fermieri, acum aceștia au nevoie și de baze de date accesibile și rețele de comunicare rapide. Astfel, utilizarea Inteligenței Artificiale permite avansarea cunoașterii și extinderea schimburilor de informații și a comunicării care, la rândul său, vor genera noi tehnologii și abordări, și găsirea soluțiilor care în multe cazuri pot fi realizate doar prin cooperare. Mai mult, IA poate oferi feedback și evaluare continuă. Prin urmare, este important să ne angajăm continuu într-un dialog despre natura IA, beneficiile, riscurile și limitele acesteia, pentru a realiza pe deplin potențialul impactului său pozitiv asupra agriculturii sustenabile.

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INDUSTRIA FABRICĂRII PRODUSELOR TEXTILE DIN REPUBLICA MOLDOVA: TENDINȚE ACTUALE ȘI PROVOCĂRI STRUCTURALE

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Abstract. This study provides an analysis of the structural dynamics and economic-financial evolution of the textile manufacturing industry (NACE Rev. 2, Division C13) in the Republic of Moldova during the 2019-2024 period. Based on aggregated data from the National Bureau of Statistics (NBS), the research explores the evolution of key indicators (number of enterprises, workforce, sales revenue) by size class, and shifts in profitability. The results indicate a notable increase in the number of enterprises (+36.5%), predominantly micro-enterprises, alongside a

decrease in the employed workforce (-10.7%). The sector exhibits extreme economic polarization, where 85.4% of firms (micro-sized) generate only 4.7% of revenues, while a small segment of large firms (2.3%) dominates the market (71.9% of revenues). Financially, there has been an aggregate deterioration in profitability, most visibly affecting large firms (with a 20 percentage point increase in the share of loss-making companies), while SMEs - particularly medium-sized ones - demonstrated unexpected resilience. The production analysis confirms a structural dependence on exports (over 86% of deliveries) and a decrease in the sector's share within the manufacturing industry, from 5.1% to 3.7%. The conclusions highlight the need for targeted strategies to support competitiveness, market diversification, and the consolidation of the SME segment.

Keywords: textile manufacturing, small and medium-sized enterprises (SMEs), manufacturing industry

Introducere

Industria de fabricare a produselor textile reprezintă un sector tradițional de bază în Republica Moldova, având o contribuție importantă la balanța comercială și la piața muncii. Fiind integrată în lanțurile de valoare globale, în special prin sistemul lohn (procesare externă), industria este puternic orientată spre export și, implicit, sensibilă la fluctuațiile cererii din Uniunea Europeană - principalul partener comercial [4].

Contextul economic și geopolitic din perioada 2019-2024 a fost unul deosebit de volatil. Pandemia COVID-19 (2020-2021) a perturbat lanțurile de aprovizionare și a redus cererea. Ulterior, criza energetică și inflația (2022-2023), exacerbate de evenimentele din regiune, au generat presiuni semnificative asupra costurilor de producție (energie, transport, materii prime), punând la încercare reziliența financiară a companiilor.

În acest cadru, înțelegerea modului în care sectorul textil s-a adaptat acestor șocuri este esențială pentru formularea unor politici economice sustenabile. Deși o parte a literaturii se concentrează pe indicatorii industriei prelucrătoare, analiza detaliată a dinamicii structurale interne a sectorului textil, inclusiv distribuția pe mărimi de întreprinderi și evoluția profitabilității la acest nivel, rămâne o zonă de cercetare mai puțin explorată.

Obiectivul principal al prezentei cercetări este de a evalua și de a interpreta tendințele și provocările structurale manifestate în industria de fabricare a produselor textile din Republica Moldova (C13) în perioada 2019-2024.

Surse de date și metode

Analiza sectorului „Fabricarea produselor textile” a fost realizată în conformitate cu clasificarea activităților economice din Republica Moldova (CAEM, rev. 2), în care industria prelucrătoare este încadrată în secțiunea C, iar Diviziunea 13- Fabricarea produselor textile (C13) reprezintă ramura analizată în acest studiu. Fabricarea produselor textile include următoarele subsectoare: Pregătirea fibrelor și filarea fibrelor textile (C13.1), Producția de țesături (C13.2), Finisarea materialelor textile (C13.3), Fabricarea altor articole textile (C13.9).

Datele utilizate provin exclusiv din statisticile oficiale ale Biroului Național de Statistică (BNS), accesate prin platforma *Statbank*. Seturile de date includ informații agregate la nivel de diviziune CAEM 2 și reflectă situația economică a întreprinderilor din doemniul textil pe perioada 2019-2024.

În acest studiu ne-am propus să analizăm și identificăm tendințele structurale și eventualele schimbări intervenite în componența și performanța întreprinderilor textile:

- Analiza structurală a sectorului. A fost evaluată distribuția întreprinderilor pe categorii de mărime (mari, mijlocii, mici, micro), conform criteriilor BNS, pentru a evidenția rolul fiecărui segment în structura industriei textile
- Examinarea principalilor indicatori economici. Pentru perioada 2019-2024 a fost urmărită evoluția: numărului total de întreprinderi, numărului mediu de salariați, veniturilor din vânzări. Acești indicatori permit aprecierea tendințelor de extindere sau contractare a activității sectoriale și pot evidenția presiuni structurale asupra firmelor.
- Evaluarea performanței financiare. Au fost analizate ponderea întreprinderilor care au raportat profit și pierderi. Dinamica acestor valori a fost comparată între categorii de

mărime, pentru a identifica segmentele cele mai vulnerabile sau cele mai performante în industria textilelor.

- Analiza producției industriale fabricate și livrate. Evoluția producției a fost examinată în termeni de volum agregat, cât și prin analiza structurii producției livrate, pentru a identifica eventuale schimbări în orientarea sectorului.

Rezultate și discuții

Evoluția principalilor indicatori ai întreprinderilor din industria fabricării produselor de textile. Datele prezentate în Tabelul 1 reflectă o perioadă de transformare structurală semnificativă în industria fabricării produselor textile între 2019 și 2024. Numărul de întreprinderi a crescut constant pe întreaga perioadă analizată, de la 156 în 2019 la 213 în 2024, reprezentând o expansiune de 36,5%. Accelerarea înființării de noi întreprinderi în ultimii doi ani ai perioadei analizate contrastează cu evoluția celorlalți indicatori și semnalează o modificare a structurii sectorului.

Pe de altă parte, numărul mediu de salariați a înregistrat fluctuații semnificative. După o creștere în 2020, când forța de muncă a atins 5621 de angajați (cu 9,4% mai mult decât în 2019), sectorul a cunoscut o reducere progresivă. Comparativ cu anul de referință 2019, reducerea totală a forței de muncă este de 10,7%. Anul 2024 se remarcă prin cea mai pronunțată scădere anuală, cu 16,8% față de 2023, echivalentul a 928 de locuri de muncă pierdute într-un singur an.

Veniturile din vânzări au prezentat o volatilitate considerabilă. După o creștere moderată în 2020 la 2.717,82 milioane lei, acestea au atins un maxim în 2022 de 3.285,27 milioane lei, reprezentând o creștere de 20,9% față de 2020. Această performanță nu s-a menținut, veniturile scăzând la 3.108,73 milioane lei în 2023 și ulterior la 2.710,22 milioane lei în 2024. Comparativ cu nivelul din 2019, veniturile din 2024 sunt practic identice, înregistrând doar o creștere marginală de 1,8%.

Analiza productivității aparente a muncii, calculată ca raport între veniturile din vânzări și numărul mediu de salariați, oferă o perspectivă suplimentară asupra eficienței sectorului. În 2019, venitul pe angajat se situa la 518,2 mii lei. După o scădere la 483,5 mii lei în 2020, productivitatea a crescut semnificativ la 668,6 mii lei în 2022, atingând maximul perioadei. În 2023 și 2024, indicatorul a înregistrat valori de 563,8, respectiv 590,9 mii lei pe angajat. Astfel, pe întreaga perioadă analizată, productivitatea muncii a crescut cu 14%, de la 518,2 la 590,9 mii lei per angajat, evidențiind o utilizare mai eficientă a forței de muncă.

Datele indică faptul că reducerea ocupării în sector a afectat în mod diferențiat categoriile de întreprinderi. Scăderea forței de muncă a fost mai accentuată la întreprinderile mari și mici, în timp ce segmentul microîntreprinderilor a continuat să se extindă numeric. Această redistribuire sugerează o fragmentare a producției și o reorientare către structuri organizaționale de dimensiuni reduse.

Perioada 2023-2024 prezintă caracteristici distincte față de restul intervalului analizat. Scăderea simultană a veniturilor cu 12,8% și a forței de muncă cu 16,8% în contextul creșterii numărului de întreprinderi cu doar 0,9% indică o contracție economică severă a sectorului. Acest declin nu este compensat de expansiunea numerică a întreprinderilor, sugerând că întreprinderile existente au suferit reduceri semnificative de activitate.

Raportul între evoluția celor trei indicatori principali evidențiază decuplarea între dimensiunea sectorului în termeni de număr de întreprinderi și performanța sa economică măsurată prin venituri și ocupare. În timp ce numărul de întreprinderi a crescut cu 36,5%, veniturile totale au stagnat (+1,8%), iar forța de muncă s-a redus cu 10,7%. Această divergență semnalează o transformare profundă a modelului de organizare a producției în industria textilă, caracterizată prin atomizarea structurilor productive și creșterea ponderii microîntreprinderilor în economia sectorului.

Tabelul 1. Evoluția principalilor indicatori ai întreprinderilor din industria fabricării produselor textile

	2019	2020	2022	2023	2024	2024/2023, %	2024/2019, %
Numărul de întreprinderi, un.	156	166	180	211	213	100.9	136.5
Numărul mediu de personal, pers.	5138	5621	4914	5515	4587	83.2	89.3
Venituri din vânzări, milioane lei	2662.51	2717.82	3285.27	3108.73	2710.22	87.2	101.8
Venituri din vânzări per salariat, mii lei	518.2	483.5	668.6	563.7	590.8	104.8	114.0

Sursa: elaborat de autor în baza BNS

În ceea ce privește structura pe clase de mărime, sectorul este dominat de microîntreprinderi, care reprezintă 85.4% din totalul firmelor, dar generează doar 4.7% din veniturile din vânzări. Acest lucru indică faptul că majoritatea companiilor sunt de dimensiuni foarte mici, cu resurse limitate și capacitate de producție redusă.

Firmele mari, deși reprezintă doar 2.3% din totalul întreprinderilor, angajează 55.6% din forța de muncă și generează 71.9% din veniturile sectorului. Aceasta reflectă o concentrare puternică a producției și veniturilor în câteva întreprinderi mari, care domină piața.

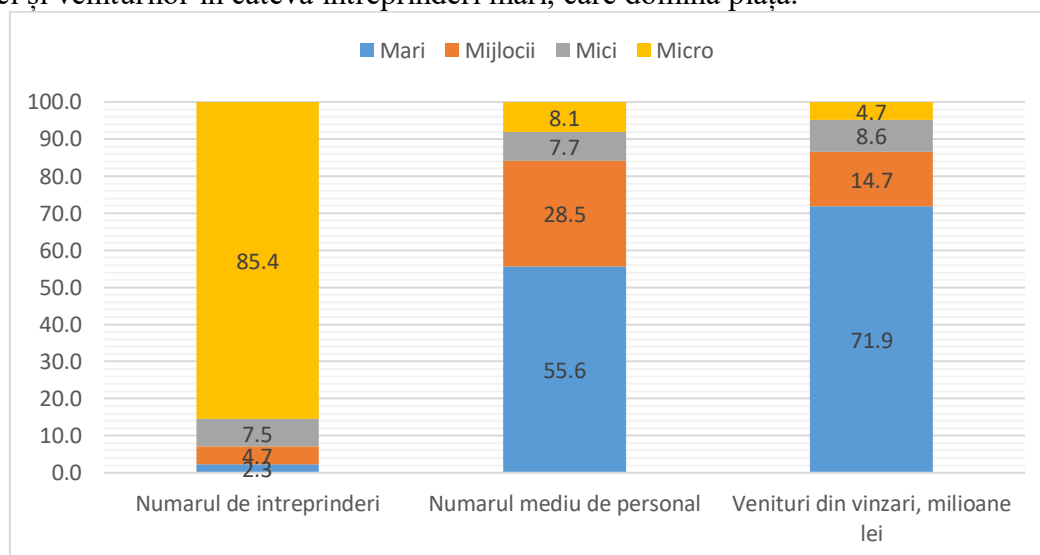


Figura 1. Structura principalilor indicatori ai întreprinderilor din industria fabricarea produselor textile pe clase de mărime, %, 2024

Sursa: elaborată de autor în baza BNS

Firmele mijlocii și mici au o contribuție importantă împreună, deși mai modestă, având împreună 36.2% din angajați și generând 23.3% din venituri. Aceste companii ar putea avea potențial de creștere, dar sunt afectate de concurența firmelor mari.

Evoluția întreprinderilor din industria fabricării produselor textile care au primit profit sau au suferit pierderi. Datele arată o deteriorare moderată a profitabilității în ansamblul industriei fabricării produselor textile în perioada 2021-2024. Ponderea firmelor profitabile a scăzut de la 52,0% la 46,5%, iar cea a firmelor cu pierderi a urcat de la 38,9% la 42,3%. Decalajul nu este unul semnificativ, dar totuși indică asupra unor presiuni crescute asupra sectorului și un climat financiar mai instabil față de 2021.

Întreprinderile mari au avut cea mai semnificativă schimbare. În 2021 toate erau profitabile, iar în 2024 doar 80% mai înregistrează profit. Pentru IMM-uri, tabloul este mai puțin sever, dar totuși situația indică o deteriorare. Ponderea firmelor profitabile a scăzut cu circa 5 puncte procentuale, iar pierderile au crescut cu 3 puncte procentuale. În interiorul IMM-urilor, situațiile diferă puternic pe

categorii de întreprinderi. Întreprinderile mijlocii sunt singurul segment cu o evoluție clar pozitivă: ponderea firmelor profitabile crește de la 60% la 70%, iar cea a întreprinderilor cu pierderi scade de la 40% la 30%. Această evoluție sugerează o consolidare a segmentului firmelor mijlocii, care par să fi devenit mai eficiente și mai competitive.

Întreprinderile mici au avut o evoluție mixtă, însă în general favorabilă. Crește ponderea firmelor profitabile (de la 69,6% la 75%), iar ponderea întreprinderilor care au suferit pierderi a scăzut cu aproximativ 5 puncte procentuale. Segmentul întreprinderilor mici se stabilizează și chiar se întărește ușor. Microîntreprinderile, pe de altă parte, au continuat să fie cele mai vulnerabile din industrie. Ponderea firmelor profitabile scade de la 47,1% în 2021 la 41,8% în 2024, iar cea a firmelor cu pierderi crește de la 41,3% la 45,1%. Degradarea este ușoară, dar confirmă că microîntreprinderile din industria fabricării produselor textile sunt cele mai fragile, având acces limitat la resurse și piețe și fiind expuse mai multor riscuri economice.

Tabelul 2. Structura întreprinderilor din industria fabricarea produselor textile care au primit profit sau au suferit pierderi, 2021- 2024, %

	Numărul de întreprinderi care au primit profit		Numărul de întreprinderi care au suferit pierderi		Schimbare, 2024/2021 (Numărul de întreprinderi care au suferit pierderi)
	2021	2024	2021	2024	
Total	52.0	46.5	38.9	42.3	3.4
Mari	100.0	80.0	0.0	20.0	20.0
IMM	50.9	45.7	39.8	42.8	3.0
Mijlocii	60.0	70.0	40.0	30.0	-10.0
Mici	69.6	75.0	30.4	25.0	-5.4
Micro	47.1	41.8	41.3	45.1	3.8

Sursa: elaborat de autor în baza datelor BNS

Evoluția producției industriale fabricate și livrate a sectorului Fabricarea produselor textile. Evoluția valorii producției industriale a sectorului fabricării produselor textile a fost fluctuantă. Între 2019 și 2021, valoarea producției a crescut constant, atingând un vârf de 3,14 miliarde lei în 2021. Cu toate acestea, după o creștere moderată în 2022, producția a scăzut în 2023 cu 10,2% față de anul precedent, ajungând la 2,98 miliarde lei. Această reducere poate fi explicată printr-o scădere a cererii interne și externe, dificultăți în aprovizionare, creșterea costurilor materialelor și energiei.

Analizând ponderea sectorului fabricării produselor textile în totalul industriei prelucrătoare, se observă o tendință descendentă. Dacă în 2019 acest sector contribuia cu 5,1% la valoarea totală a producției industriale prelucrătoare, în 2024 ponderea a scăzut la 3,7%. Această diminuare indică o creștere mai lentă a industriei textile în comparație cu alte subsectoare ale industriei prelucrătoare, ceea ce poate sugera o pierdere a competitivității sau schimbări structurale în economie.

Deși industria prelucrătoare, în ansamblu, a crescut semnificativ în perioada 2019-2024, industria fabricării produselor textile a avut o evoluție mai volatilă, cu o creștere moderată până în 2021, urmată de o scădere în 2023 și 2024. Reducerea ponderii acestui sector în industria prelucrătoare sugerează necesitatea unor măsuri de sprijin, cum ar fi investiții în modernizare, digitalizare și extinderea piețelor de desfacere, pentru a-i asigura o creștere sustenabilă pe termen lung.

Tabelul 3. Valoarea producției industriale fabricate, mii lei 2019-2024

	2019	2020	2022	2023	2024	Indice, 2024/2023, %	Indice, 2024/2019, %
C Industria prelucrătoare	49862251.5	50034868	73705839.1	73543642.1	71683849.1	97.5	143.8
C13 Fabricarea produselor textile	2531923.2	2704857.6	3314451.3	2975973.3	2632655.1	88.5	104.0
Pondere, %	5.1	5.4	4.5	4.0	3.7		

Sursa: elaborat de autor în baza datelor BNS

Industria fabricării produselor textile din Republica Moldova este puternic orientată către export, iar analiza structurii livrărilor între piața internă și cea externă în perioada 2019-2024 confirmă această tendință. Producția destinată exportului a reprezentat constant peste 85% din totalul livrărilor, atingând un maxim de 88,6% în 2020, iar în 2024 menținându-se la un nivel de 86,7%.

Piața internă a avut un rol secundar, reprezentând doar între 11% și 15% din totalul livrărilor. După o scădere în 2020, când cererea internă a ajuns la cel mai scăzut nivel (11,4%), s-a observat o ușoară redresare în anii următori, stabilizându-se la 13,9% în 2023. Această evoluție indică faptul că industria textilă din Moldova rămâne dependentă de cererea externă, iar piața locală are o capacitate limitată de absorbție a producției.

Dependența ridicată de exporturi poate fi atât un avantaj, cât și un risc. Pe de o parte, demonstrează că producătorii moldoveni sunt integrați în lanțurile internaționale de aprovizionare și că produsele textile fabricate în Moldova sunt competitive pe piețele externe. Pe de altă parte, această expunere ridicată la piețele internaționale face industria vulnerabilă la fluctuațiile cererii globale, crize economice sau modificări ale politicilor comerciale și tarifare în țările de destinație.

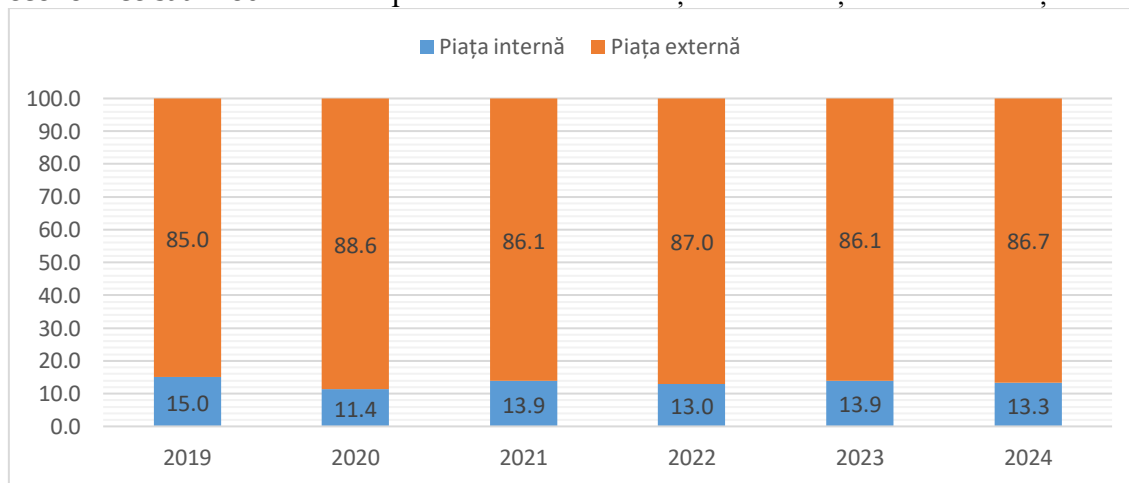


Figura 2. Structura livrărilor producției fabricării produselor textile: piața internă vs. export (%)

Sursa: elaborată de autor în baza datelor BNS

Concluzii

Analiza complexă a evoluției industriei textile din Republica Moldova (2019-2024) relevă o dinamică marcată de schimbări structurale, polarizare economică și reziliență financiară diferențiată.

- Provocarea forței de muncă, reflectată de scăderea numărului de angajați, pe fondul creșterii numărului de firme, indică o presiune acută pe resursa umană și necesitatea de soluții, fie prin automatizare, fie prin politici de reținere a personalului.

- Dominanța firmelor mari (71,9% din venituri) face ca sectorul să fie vulnerabil la șocul de costuri, dovedit de creșterea semnificativă a ponderii firmelor mari cu pierderi. Eșecul câtorva jucători cheie ar putea destabiliza întregul sector.



- Potențialul IMM, reflectat prin reziliența demonstrată de firmele mijlocii și mici indică potențialul acestui segment de a deveni un motor de creștere mai stabil și mai diversificat, oferind o bază solidă de firme competitive.

- Ponderea în scădere în industria prelucrătoare și dependența covârșitoare de export semnalează o erodare a importanței relative a sectorului în economia națională și o vulnerabilitate cronică la șocurile externe. Analiza structurii livrărilor confirmă dependența structurală de export. Piața externă a absorbit constant între 85% și 88,6% din totalul livrărilor (86,7% în 2024), iar piața internă a rămas marginală, cu o pondere medie de sub 14%. Această structură expune sectorul la riscuri majore: orice recesiune sau schimbare de politică comercială în țările partenere (în special UE) poate avea un impact direct și sever asupra stabilității sectorului.

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PRINCIPIILE ȘI METODOLOGIA SUBVENȚIONĂRII AGRICULTURII LA NIVEL GLOBAL

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Abstract. The topicality of the topic is determined by the urgent need to streamline subsidy granting mechanisms, in order to ensure fair distribution and optimal use of budgetary resources. The purpose

of the article is to explore and deepen the theoretical and practical aspects related to the methodology of agricultural subsidies at a global level and to identify the main aspects that underlie the decision to request subsidies by farmers. To achieve the proposed goal, the following objectives were set: analysis and in-depth study of theoretical approaches related to the activity of subsidizing agricultural entities, the methodology of agricultural subsidies at a global level, definition of the main subsidy opportunities. In order to achieve these objectives, a complex research methodology was used, based on documentary analysis of normative acts, official reports and specialized literature, complemented by quantitative and qualitative methods. Reports from agricultural entities and the Agency for Intervention and Payments for Agriculture (AIPA), as well as statistical analysis of available data, allowed for a thorough understanding of the dynamics and challenges in the field of agricultural subsidies in the Republic of Moldova.

Keywords: principles, agriculture, subsidies, opportunities, research, international, development.

Abordările teoretice cât și abordarea legislativă arată subvențiile ca un instrument politic și economic pentru a corecta anumite disfuncționalități ale pieței sau pentru a stimula sectoarele economice considerate esențiale pentru dezvoltarea unui stat. Mai jos vom vedea câteva exemple în care fenomenul subvențiilor în stat își justifică existența:

1. Corectarea eșecurilor pieței: Piețele libere nu funcționează întotdeauna în mod eficient și pot genera inegalități sau alte probleme economice și sociale. De exemplu, în domeniul sănătății sau al educației, unde piața nu poate să asigure în mod echitabil accesul tuturor cetățenilor la servicii de bază, statul intervine prin subvenții pentru a reduce costurile sau a oferi acces gratuit.

2. Promovarea inovației și cercetării: Subvențiile pot fi utilizate pentru a sprijini activitățile de cercetare și dezvoltare în sectoarele care necesită investiții semnificative, cum ar fi tehnologia, sănătatea sau industria aerospațială. Astfel, guvernele pot stimula crearea de noi produse și servicii inovatoare, sprijinind competitivitatea economică pe termen lung.

3. Protejarea mediului: Un alt obiectiv major al subvențiilor este promovarea practicilor sustenabile din punct de vedere ecologic. Subvențiile pentru energie verde, reciclare sau agricultură ecologică sunt exemple de măsuri luate pentru a încuraja o economie mai prietenoasă cu mediul.

4. Reducerea sărăciei și inegalităților: Subvențiile sociale sunt menite să reducă discrepanțele economice dintre diferite grupuri sociale, oferind sprijin financiar direct celor care se află în situații dificile. Această formă de sprijin este esențială pentru menținerea coeziunii sociale și pentru protejarea categoriilor vulnerabile de populație.

Deși subvențiile sunt văzute de economiști ca un instrument benefic pentru dezvoltarea economică și socială, ele nu sunt lipsite de critici și de efecte negative. Una dintre principalele probleme ridicate este distorsionarea pieței. Subvențiile pot crea avantaje artificiale pentru anumite sectoare sau companii, în detrimentul altora, ceea ce poate duce la alocarea ineficientă a resurselor.

Un alt aspect negativ este legat de dependența economică. Beneficiarii subvențiilor pot deveni dependenți de sprijinul financiar oferit de stat, ceea ce descurajează inovația și competitivitatea. Acest lucru poate afecta negativ pe termen lung dezvoltarea sectorului subvenționat.

De asemenea, subvențiile pot încuraja corupția și utilizarea neeficientă de resurse. În absența unor mecanisme de control eficiente, distribuirea fondurilor publice poate deveni o sursă de abuzuri și favoritisme. În acest sens, transparența și monitorizarea riguroasă sunt esențiale pentru a preveni utilizarea inadecvată a subvențiilor. În Uniunea Europeană (UE), subvențiile sunt considerate un instrument important de politică economică și socială, dar sunt strict reglementate pentru a evita denaturarea concurenței pe piața internă. Iată câteva exemple de domenii și practici ale aplicării subvențiilor:

1. Ajutoare de stat reglementate – Subvențiile trebuie aprobate de Comisia Europeană pentru a se asigura că acestea nu conferă avantaje incorecte anumitor companii. Excepții sunt permise pentru sprijinirea dezvoltării regionale, inovării sau a tranziției ecologice, cum ar fi finanțarea proiectelor de energie verde sau transporturi sustenabile.

Agricultura reprezintă o componentă esențială pentru economia globală și pentru securitatea alimentară a fiecărui stat. Însă acest sector se confruntă cu multiple provocări, precum schimbările climatice, volatilitatea prețurilor pe piețele internaționale, creșterea costurilor și presiuni legate de durabilitate. În acest context, subvențiile agricole sunt utilizate de guverne și organizații internaționale pentru a încuraja dezvoltarea sustenabilă, modernizarea fermelor și asigurarea competitivității pe piață.[5], [6]

2. Politica Agricolă Comună (PAC) – Unul dintre cele mai importante mecanisme prin care UE oferă subvenții. PAC asigură subvenții directe fermierilor pentru a sprijini producția agricolă și pentru a asigura securitatea alimentară. De asemenea, aceasta oferă stimulente pentru practicile ecologice și sustenabile.

Uniunea Europeană oferă unul dintre cele mai ample și bine structurate programe de sprijin agricol prin Politica Agricolă Comună (PAC). Acest program este destinat atât sprijinului direct pentru fermieri, cât și dezvoltării rurale durabile. PAC asigură plăți directe care sprijină veniturile fermierilor și finanțează proiecte pentru îmbunătățirea infrastructurii și adoptarea tehnologiilor moderne. [5]

Subvențiile acordate prin PAC sunt structurate în două piloni:

- Pilonul I: Sprijin direct acordat fermierilor pentru menținerea producției și garantarea stabilității veniturilor.

- Pilonul II: Finanțare pentru dezvoltare rurală, sprijinind proiecte ecologice și măsuri de inovare.

Începând cu 2023, PAC pune un accent mai mare pe sustenabilitate și tranziția verde, aliniindu-se cu obiectivele Green Deal ale UE, care promovează reducerea emisiilor de carbon și agricultura ecologică.[6]

3. Subvenții pentru inovare – UE utilizează fonduri, precum Horizon Europe, pentru a sprijini cercetarea și inovarea în statele membre. Aceste granturi sunt direcționate spre tehnologii de vârf, cum ar fi inteligența artificială și producția de semiconductori, pentru a menține competitivitatea globală.

4. Ajutoare de stat în situații de criză – În timpul pandemiei COVID-19, UE a permis derogări temporare pentru ca statele membre să ofere subvenții rapide către sectoare afectate, pentru a preveni falimente și șomaj masiv.

5. Programe internaționale de sprijin pentru tranziția ecologică: Organizații internaționale, precum FAO și Banca Mondială, oferă suport financiar și tehnic pentru statele care doresc să își modernizeze sectorul agricol și să adopte practici ecologice. Aceste inițiative includ:

- Granturi pentru energie regenerabilă: Fermierii primesc finanțare pentru a instala panouri solare sau sisteme de irigare eficiente din punct de vedere energetic.
- Programe de reducere a riscurilor climatice: Prin crearea de fonduri de reziliență, fermierii sunt sprijiniți să își refacă producția în urma calamităților naturale. [8]

De asemenea, Banca Mondială colaborează cu statele pentru a sprijini reformele agricole și dezvoltarea infrastructurii rurale, inclusiv prin împrumuturi preferențiale și granturi pentru fermierii mici și medii. [8]

1. ENPARD – Programul european pentru vecinătate. Un alt exemplu de succes la nivel internațional este ENPARD (European Neighbourhood Programme for Agriculture and Rural Development), destinat statelor din vecinătatea estică a UE, inclusiv Republicii Moldova. ENPARD își propune să reducă sărăcia rurală și să modernizeze agricultura, oferind granturi și asistență tehnică pentru fermieri și întreprinderi agricole mici.[7]

Programul promovează: Inovația agricolă și tehnologiile moderne pentru a îmbunătăți eficiența producției. Parteneriate public-private pentru dezvoltarea comunităților rurale și creșterea calității vieții în mediul rural. Oportunitățile de subvenționare la nivel global sunt esențiale pentru a ajuta fermierii să facă față provocărilor economice și de mediu. Prin programe precum PAC și ENPARD, dar și prin sprijinul oferit de organizații internaționale, sectorul agricol are șansa de a deveni mai competitiv și sustenabil. Accesul la fonduri internaționale și implementarea unor practici inovatoare sunt esențiale pentru ca agricultura să rămână o componentă vitală a economiei globale. [5],[6]

Aceste măsuri reflectă o abordare echilibrată, unde subvențiile nu doar sprijină sectoare cheie al economiei la momentul actual, dar și asigură sprijinul financiar nu afectează negativ piața internă a UE sau competiția internațională. Însă cu toate măsurile și instituțiile ce monitorizează politica de subvenționare a agriculturii în Uniunea Europeană, prin intermediul Politicii Agricole Comune (PAC), ea a fost criticată pentru subvenționarea excesivă a unor producători mari în detrimentul micilor fermieri. Astfel în cadrul reformelor recente (2023-2027), UE a introdus măsuri care prioritizează subvențiile pentru fermele mici și mijlocii, precum și pentru tinerii fermieri. De asemenea, PAC include și scheme ecologice pentru combaterea schimbărilor climatice și protecția mediului, condiționând o parte din plățile directe de adoptarea unor practici favorabile mediului.[5], [6],[8]

Necâtînd la faptul că Uniunea Europeană și membrii au instituții de reglementare comune pentru toată comunitatea în ceea ce privește mecanismul subvențiilor, totuși statele membre oferă subvențiile în dependență de conjuctura economică națională și domeniile economice strategice ale acestei țări.

În Germania se oferă subvenții pentru energia regenerabilă prin intermediul EEG (Erneuerbare-Energien-Gesetz), care compensează producătorii de energie verde pentru fiecare kWh produs și injectat în rețea. De asemenea ei oferă sprijin pentru industria auto: Subvenții pentru achiziționarea de vehicule electrice, inclusiv bonusuri pentru mașini fără emisii de CO₂.

Franța, ca cel mai mare beneficiar al Politicii Agricole Comune (PAC), oferă subvenții directe fermierilor pentru producția agricolă și pentru promovarea practicilor ecologice. Oferă subvenții și ajutoare de stat direcționate către Airbus, pentru a susține inovația și competitivitatea în sectorul aeronautic.

România oferă plăți directe și sprijin pentru investiții în infrastructură agricolă prin fonduri europene și naționale, gestionate prin Agenția de Plăți și Intervenție pentru Agricultură (APIA). Ajutoare pentru IMM-uri: Granturi și subvenții pentru IMM-uri prin programe naționale și europene, cum ar fi Programul Operațional Regional. Spania investește masiv în energie solară și eoliană, oferind subvenții pentru dezvoltarea acestor capacități și subvenții pentru întreprinderile din sectorul turismului afectate de pandemie, pentru a susține redresarea economică. Portugalia încurajează tranziția energetică prin subvenții pentru instalarea de panouri solare și alte surse de energie regenerabilă. Oferă subvenții pentru susținerea fermelor mici și a producției locale, cu scopul de a încuraja sustenabilitatea și combaterea efectelor schimbărilor climatice. Italia se concentrează pe subvenții pentru agricultura durabilă și energie regenerabilă.

De asemenea, acordă sprijin pentru dezvoltarea infrastructurii rurale și promovarea turismului rural. Cehia prioritizează subvențiile pentru dezvoltarea industrială, precum și pentru agricultură și inovații tehnologice. Există și fonduri pentru proiecte ecologice și sprijinirea antreprenoriatului local. Belgia acordă subvenții importante pentru proiectele de energie regenerabilă și combaterea schimbărilor climatice. Agricultură este sprijinită prin programe orientate spre sustenabilitate și reducerea emisiilor. Polonia este axată pe subvenții pentru agricultură și dezvoltare rurală, dar și pe proiecte de infrastructură și energie verde. Polonia oferă de asemenea sprijin pentru modernizarea fermelor și promovarea agriculturii ecologice. Ungaria se concentrează pe sprijinul acordat fermierilor și dezvoltării rurale. Ungaria alocă fonduri pentru energie regenerabilă și infrastructură, precum și pentru proiecte culturale și educaționale. [2],[3],[4].

În Statele Unite, mecanismul de subvenționare implică o gamă variată de programe federale care vizează sectoare critice precum energia, agricultura, și inovația tehnologică. Iată principalele domenii și mecanisme de subvenționare:

1. Energie: SUA oferă subvenții masive pentru tranziția către energie verde, inclusiv pentru dezvoltarea energiei eoliene, solare și electrificării transporturilor. Aceste subvenții sunt incluse în cadrul Inflation Reduction Act (2022), care alocă aproximativ 370 de miliarde de dolari pentru reducerea emisiilor de carbon și promovarea energiilor regenerabile. Subvențiile sunt oferite sub formă de credite fiscale și granturi pentru producători și companii care investesc în tehnologii verzi [1;7]

2. Agricultură: Subvențiile agricole sunt printre cele mai mari și influente, sprijinind în mod special producția de culturi precum porumbul, soia și grâul. Aceste subvenții se acordă pentru a stabili veniturile fermierilor și pentru a încuraja producția de biocombustibili, precum etanolul. În plus, programe precum Low Income Home Energy Assistance Program (LIHEAP) ajută la reducerea costurilor energetice pentru gospodăriile cu venituri mici [7].

3. Inovație și dezvoltare tehnologică: SUA acordă finanțări pentru cercetare și dezvoltare în domenii inovative, inclusiv semiconductori și inteligență artificială, prin subvenții și garanții de credit pentru proiecte care nu primesc finanțare convențională din cauza riscurilor tehnologice ridicate (World Bank, 2024).

Aceste subvenții reflectă atât nevoia de a sprijini economia internă, cât și angajamentul SUA față de schimbările climatice și dezvoltarea sustenabilă. Totuși, politicile de subvenționare ale SUA pot genera tensiuni comerciale, deoarece influențează prețurile și accesul pe piețele internaționale, afectând comerțul global.

În Japonia, subvențiile sunt gestionate de principalele agenții guvernamentale, inclusiv Ministerul Economiei, Comerțului și Industrii (METI) și Agenția pentru Energie. Mecanismele includ scheme complexe de susținere, cum ar fi Contractele pentru Diferență (CfD), prin care guvernul compensează diferența dintre costul producției de combustibili cu emisii scăzute și prețul combustibililor convenționali. Aceste subvenții vizează în special promovarea hidrogenului și a altor combustibili ecologici pentru a stimula tranziția energetică până în 2030.

De asemenea, Japonia folosește Mecanismul de Creditare Comună (JCM) pentru a sprijini proiecte de decarbonizare în colaborare cu alte țări, contribuind astfel la atingerea țintelor climatice globale (sursa: METI, GEC). domeniile de bază a subvenționării în Japonia:

1. Energie regenerabilă și hidrogen – Japonia investește masiv în producția și utilizarea de hidrogen și alte surse regenerabile pentru tranziția către o economie cu emisii reduse.
2. Producția industrială ecologică – Subvențiile sunt direcționate către industrii „greu de decarbonizat”, cum ar fi siderurgia și industria chimică.
3. Inovație tehnologică și energie – Fonduri sunt acordate pentru inovații tehnologice și proiecte internaționale de reducere a emisiilor de carbon [9].

În China, subvențiile sunt parte integrantă a politicii industriale și de mediu, gestionate de ministere precum Comisia Națională pentru Dezvoltare și Reformă (NDRC) și Ministerul Finanțelor. China oferă subvenții generoase în sectoare-cheie pentru a stimula dezvoltarea tehnologică și a reduce dependența de importuri. În cadrul Politicii de Tranziție Verde, subvențiile sunt orientate spre energie regenerabilă, cum ar fi energia solară și eoliană, și sprijin pentru industria semiconductoarelor și a vehiculelor electrice [1].

1. Energie verde și regenerabilă – China este unul dintre liderii globali în promovarea energiei solare și eoliene, oferind subvenții pentru extinderea acestor capacități.

2. Vehicule electrice și tehnologii de stocare a energiei – Subvenții pentru producția de baterii și vehicule electrice, alături de dezvoltarea infrastructurii de încărcare.

3. Agricultură și securitate alimentară – Subvențiile pentru agricultură ajută la garantarea stabilității alimentare și la promovarea practicilor durabile.

Din cele de mai sus observăm că subvențiile reprezintă un instrument esențial în politica economică a a tuturor state moderne, având capacitatea de a influența în mod semnificativ dezvoltarea sectoarelor economice și îmbunătățirea condițiilor sociale. Deși au un potențial considerabil de a promova inovația, de a proteja mediul și de a reduce inegalitățile, acestea nu sunt lipsite de riscuri și provocări. Gestionarea eficientă a subvențiilor, împreună cu o monitorizare atentă a efectelor lor, este esențială pentru asigurarea faptului că ele contribuie cu adevărat la binele comun, fără a genera distorsiuni economice sau a încuraja corupția.

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OPORTUNITĂȚI DE DEZVOLTARE A LOCALITĂȚILOR DIN REPUBLICA MOLDOVA ÎN CADRUL PROGRAMULUI INTERREG NEXT ROMÂNIA

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Abstract. This article analyzes cross-border development opportunities within the Interreg NEXT Romania–Republic of Moldova Programme, considering that cross-border cooperation represents a fundamental strategic instrument of the European Union (EU), aimed at strengthening cooperation among regions and Member States, as well as between these and candidate countries or the Union's external neighboring regions. In this context, Romania and the Republic of Moldova are developing joint initiatives financed through European funds and implemented under the Interreg NEXT Romania–Republic of Moldova Programme. These projects seek to address major contemporary challenges, such as adaptation to climate change, support for digital transformation, and the promotion of social inclusion, thereby contributing to sustainable development and enhancing the resilience of local communities within the cooperation area.

Keywords: cross-border cooperation, cohesion policy, Interreg NEXT Programme, Romania–Republic of Moldova, European funds, sustainable development, etc.

Introducere

În contextul proceselor de integrare europeană și al intensificării interdependențelor economice, sociale și instituționale, cooperarea transfrontalieră a devenit un instrument esențial pentru promovarea dezvoltării regionale echilibrate și pentru consolidarea coeziunii teritoriale. Uniunea Europeană acordă o importanță deosebită acestui tip de cooperare, considerând-o un mecanism strategic de reducere a disparităților regionale și de stimulare a dezvoltării durabile în zonele de frontieră.

Relațiile de cooperare dintre România și Republica Moldova se înscriu în această logică europeană, fiind susținute prin programe de finanțare dedicate, precum Programul Interreg NEXT România–Republica Moldova. Acest program oferă cadrul instituțional și financiar necesar implementării unor inițiative comune menite să răspundă provocărilor actuale, inclusiv schimbările climatice, transformarea digitală și incluziunea socială.

În acest context, prezentul articol își propune să analizeze oportunitățile de dezvoltare transfrontalieră generate de Programul Interreg NEXT România–Republica Moldova, evidențiind rolul acestuia în consolidarea cooperării bilaterale și în sprijinirea dezvoltării durabile și a rezilienței comunităților locale din zona de frontieră.

Scopul prezentei cercetări constă în analizarea oportunităților de dezvoltare transfrontalieră în cadrul Programului Interreg NEXT România–Republica Moldova, cu accent pe rolul cooperării transfrontaliere în promovarea dezvoltării durabile, a coeziunii teritoriale și a rezilienței comunităților locale.

Rezultate. Cooperarea transfrontalieră dintre România și Republica Moldova s-a dezvoltat progresiv, în strânsă corelație cu evoluția politicilor Uniunii Europene în domeniul coeziunii teritoriale și al relațiilor de vecinătate. Apariția și consolidarea Programului Interreg NEXT România–Republica Moldova reflectă adaptarea mecanismelor de finanțare europeană la noile realități geopolitice, economice și sociale din regiunea estică a Uniunii Europene [3].

Într-o primă etapă, cooperarea transfrontalieră a fost susținută prin Instrumentul European de Vecinătate și Parteneriat (ENPI), care a constituit baza instituțională pentru inițierea proiectelor comune între regiunile de frontieră. Aceste intervenții timpurii au urmărit reducerea disparităților de dezvoltare, îmbunătățirea infrastructurii de bază și consolidarea capacității administrative a autorităților locale.

Ulterior, în perioada de programare 2014–2020, cooperarea bilaterală a fost aprofundată prin programele ENI CBC (European Neighbourhood Instrument – Cross-Border Cooperation), care au oferit un cadru financiar mai stabil și o abordare strategică orientată spre rezultate [2]. În această etapă, domeniile de intervenție au fost extinse, incluzând dezvoltarea economică regională, protecția mediului, eficiența energetică, mobilitatea transfrontalieră și cooperarea instituțională, contribuind la creșterea gradului de interconectare între comunitățile de pe ambele maluri ale frontierei.

Reforma politicii de coeziune pentru perioada 2021–2027 a marcat o etapă de tranziție semnificativă, prin integrarea cooperării transfrontaliere cu statele din vecinătatea estică în noul instrument Interreg NEXT [1]. Această schimbare a permis o aliniere mai coerentă a obiectivelor programelor transfrontaliere cu prioritățile strategice ale Uniunii Europene, precum Pactul Verde European, tranziția digitală și consolidarea rezilienței socio-economice.

În prezent, Programul Interreg NEXT România–Republica Moldova reprezintă un cadru matur și integrat de cooperare transfrontalieră, orientat spre promovarea dezvoltării durabile și creșterea coeziunii teritoriale. Programul sprijină implementarea de proiecte care vizează adaptarea la schimbările climatice, transformarea digitală, incluziunea socială și întărirea capacității instituționale, având un impact direct asupra calității vieții populației din zonele de frontieră.

Din perspectivă evolutivă, dezvoltarea Programului Interreg NEXT România–Republica Moldova evidențiază trecerea de la intervenții punctuale la o abordare strategică, multidimensională și orientată spre impact. În viitor, programul este așteptat să contribuie în mod semnificativ la consolidarea relațiilor bilaterale, la sprijinirea procesului de aderare a Republicii Moldova la Uniunea Europeană și la crearea unui spațiu transfrontalier stabil, competitiv și rezilient.

Zona eligibilă a programului Interreg Next 2021-2027 România-Republica Moldova acoperă zona eligibilă a celor patru județe din România: Botoșani, Iași, Vaslui și Galați și întregul teritoriu al Republicii Moldova. Zona se întinde pe o suprafață totală de 54.089,80 km² și o lungime a graniței de 681,4 km. Din totalul zonei de bază eligibile, 37,42% din suprafață este reprezentată de cele patru județe din România și 62,58% de teritoriul Republicii Moldova [9].

Zona Programului are un total de 5.593.810 locuitori, dintre care 36,7% locuiesc pe partea română a frontierei, în timp ce 63,3% pe partea moldovenească.

O mare parte a populației din zona programului locuiește în centre urbane cu densitate mare, precum municipiile Iași, Galați și Chișinău. Aceste centre urbane au devenit centre gravitaționale atât pentru populație, cât și pentru fluxurile economice.

Analiza a arătat că 44,33% din populația din zona centrală eligibilă trăiește în mediul urban și 55,67% în zonele rurale.

Programul Interreg NEXT România-Republica Moldova pentru anii 2021-2027 dispune de un buget total de peste 85.878.268 de euro, din care 77.290.439 de euro reprezintă fonduri europene nerambursabile, iar 8.587.829 de euro este contribuția națională[8].

Potențialii beneficiari ai acestui apel sunt: autorități publice centrale și locale, instituții publice, instituții de învățământ, ONG-uri sau alte organizații relevante pentru fiecare obiectiv specific inclus în apel. Astfel, vor putea primi finanțare proiecte care aduc beneficii comunităților de la frontieră, de pe întregul teritoriu al Republicii Moldova și din județele Iași, Galați, Vaslui, Botoșani (România).

Unele rezultate ale Programului. Începând cu anul 2017 au fost lansate doua apeluri pentru proiecte din cadrul Programului Operațional Comun România-Republica Moldova 2014-2020, bugetul Programului a fost distribuit între proiecte care au avut o componentă importantă de infrastructură, proiecte cu valori mai mici și proiecte mari de infrastructură.

Din totalul celor 241 de propuneri de proiecte depuse, au fost finanțate 81 de proiecte, distribuite astfel:[8]

- Proiecte HARD (care includ o componentă de infrastructură cu valoare de minim 1 milion Euro).

-19 proiecte , cu o valoare totală de 44 milioane de euro. Aceste proiecte au avut un impact direct asupra modernizării infrastructurilor esențiale, cum ar fi drumuri, securitate națională, sănătate sau facilități de frontieră care au îmbunătățit accesul și mobilitatea între cele două țări.

- Proiecte SOFT: 58 de proiecte, cu o valoare totală de 15 milioane de euro.

Aceste proiecte au contribuit la creșterea calității vieții în rândul comunităților din regiunile de graniță din România și din Republica Moldova, la promovarea schimbului cultural și educațional și la îmbunătățirea serviciilor de sănătate.

- Proiecte mari de infrastructură: 4 proiecte, cu o valoare totală de 40,5 milioane de euro.

Aceste proiecte au avut ca scop modernizarea și extinderea unor facilități critice, care sprijină securitatea și gestionarea eficientă a frontierei comune, achiziția de echipamente de comunicații de bandă largă între cele două țări, intervențiile și pregătirea pentru situațiile de urgență, modernizarea unor spitale de o importanță particulară pentru aria programului.

Pe baza datelor disponibile privind tipologia și domeniile de intervenție ale proiectelor finanțate, se poate observa o orientare clară către soluții integrate, cu impact multidimensional asupra comunităților locale.

Un prim domeniu major de intervenție este reprezentat de protecția mediului și adaptarea la schimbările climatice. Proiectele din această categorie au vizat managementul durabil al resurselor naturale, prevenirea și gestionarea riscurilor naturale, precum și dezvoltarea unor sisteme comune de monitorizare a mediului. Rezultatele empirice indică o îmbunătățire a capacității instituționale locale în gestionarea riscurilor de mediu și o creștere a nivelului de conștientizare în rândul populației privind importanța protecției mediului [7,p.34].

Un al doilea domeniu relevant îl constituie dezvoltarea economică și sprijinirea întreprinderilor mici și mijlocii. Proiectele implementate au urmărit stimularea antreprenoriatului, facilitarea transferului de cunoștințe și promovarea cooperării economice transfrontaliere. Analiza rezultatelor arată că aceste inițiative au contribuit la consolidarea rețelelor de afaceri locale și la creșterea competitivității economice în regiunile de frontieră, deși impactul economic pe termen lung necesită evaluări suplimentare.

În ceea ce privește infrastructura și accesibilitatea, proiectele finanțate au avut un impact direct asupra îmbunătățirii conectivității transfrontaliere și a accesului la servicii publice esențiale. Datele empirice sugerează că modernizarea infrastructurii locale a facilitat mobilitatea populației și a bunurilor, contribuind la reducerea izolării teritoriale a zonelor de frontieră.

De asemenea, un număr semnificativ de proiecte a fost orientat către domeniul sănătății, educației și serviciilor sociale. Aceste inițiative au vizat modernizarea infrastructurii medicale, dezvoltarea programelor de formare profesională și promovarea incluziunii sociale. Rezultatele obținute indică o îmbunătățire a accesului la servicii de bază și o intensificare a cooperării instituționale între actorii din România și Republica Moldova[6].

Nu în ultimul rând, proiectele de consolidare a capacității administrative au jucat un rol important în creșterea eficienței instituțiilor publice implicate. Analiza empirică relevă faptul că schimbul de bune practici, digitalizarea proceselor administrative și dezvoltarea competențelor profesionale au contribuit la îmbunătățirea guvernantei locale și la o mai bună absorbție a fondurilor europene.

În ansamblu, rezultatele analizei empirice confirmă faptul că Programul Interreg NEXT România–Republica Moldova a generat efecte pozitive semnificative asupra dezvoltării transfrontaliere. Totodată, acestea evidențiază necesitatea unei abordări orientate spre sustenabilitate și continuitate, astfel încât impactul proiectelor să fie menținut și amplificat pe termen lung.

Concluzii.

În sinteză, analiza evoluției și implementării cooperării transfrontaliere dintre România și Republica Moldova evidențiază maturizarea progresivă a acestui mecanism de intervenție și trecerea de la inițiative punctuale la o abordare strategică, integrată și orientată spre impact. Datele empirice privind aria eligibilă, structura demografică, volumul resurselor financiare alocate și tipologia proiectelor implementate confirmă relevanța Programului Interreg NEXT România–Republica Moldova ca instrument esențial de promovare a dezvoltării durabile și a coeziunii teritoriale în regiunea de frontieră.

Rezultatele obținute demonstrează că proiectele finanțate au contribuit semnificativ la modernizarea infrastructurii, la îmbunătățirea accesului la servicii publice, la consolidarea capacității instituționale și la stimularea cooperării economice și sociale transfrontaliere. În același timp, orientarea programului către domenii prioritare precum protecția mediului, adaptarea la schimbările climatice, transformarea digitală și incluziunea socială reflectă alinierea acestuia la obiectivele strategice ale Uniunii Europene și la nevoile reale ale comunităților locale.

Prin urmare, Programul Interreg NEXT România–Republica Moldova se conturează ca un cadru funcțional și eficient de cooperare transfrontalieră, cu potențial semnificativ de a susține dezvoltarea regională echilibrată și de a contribui la consolidarea relațiilor bilaterale și la apropierea Republicii Moldova de Uniunea Europeană. Continuitatea intervențiilor, consolidarea sustenabilității proiectelor și evaluarea sistematică a impactului pe termen lung reprezintă premise esențiale pentru maximizarea beneficiilor generate de acest program în perioadele de programare viitoare.

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PRINCIPALELE MODALITĂȚI DE SOLUȚIONARE A CONFLICTELOR ÎN ORGANIZAȚII**Curaxina Svetlana**doctor, conferențiar universitar,
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Abstract. Conflict is an inevitable phenomenon in organizational activity, arising from differences in interests, values, perceptions, and communication styles among employees and management. Effective conflict resolution is essential for maintaining a healthy organizational climate, ensuring productivity, and supporting sustainable development. This article examines the principal methods of conflict resolution in organizations, with particular attention to managerial and communicative approaches. The study highlights such methods as negotiation, mediation, collaboration, compromise, and organizational communication strategies. Special emphasis is placed on the role of leadership and managerial competence in preventing and resolving conflicts, as well as on the importance of constructive dialogue and mutual understanding. The findings confirm that the systematic application of appropriate conflict resolution methods contributes to improved organizational performance, reduced tension in the workplace, and the strengthening of cooperative relationships within organizations.

Keywords: conflict resolution; organizational conflict; management; communication; negotiation; mediation; leadership; organizational behavior

Organizațiile moderne funcționează în condiții de dinamism ridicat, schimbări constante ale mediului extern și concurență tot mai intensă. În astfel de condiții, conflictele interpersonale și organizaționale devin un element practic inevitabil al vieții corporative. Acestea pot apărea la diferite niveluri: între angajați individuali, între conducere și subordonați, între departamente structurale, precum și între companie și partenerii săi externi.

Scopul acestei lucrări este analiza cuprinzătoare a principalelor direcții de soluționare a conflictelor în companii, precum și elaborarea de recomandări practice pentru optimizarea acestora.

Obiectul cercetării îl constituie procesele de gestionare a conflictelor în organizații, iar subiectul – direcțiile, metodele și instrumentele de soluționare a acestora. [7 p.30]

Potrivit lui K.A. Radugin, conflictul nu este o anomalie sau o disfuncționalitate în activitățile organizațiilor, ci o normă a relațiilor dintre oameni, un element necesar al vieții care oferă un debușeu pentru tensiunea socio-psihologică și generează schimbări în activitățile organizației. Prin urmare, există două abordări teoretice ale conceptului de conflict.

1. Conflictul este o ciocnire, o contradicție, o luptă, o opoziție (de personalități, forțe, interese, poziții, puncte de vedere). În consecință, conflictul social este o încercare de a obține o recompensă prin subjugarea, impunerea propriei voințe, înlăturarea sau chiar distrugerea unui adversar care încearcă să obțină aceeași recompensă. Astfel, susținătorii acestei abordări descriu conflictul ca pe un fenomen negativ.

2. Conflictul este un sistem de relații, un proces de dezvoltare și interacțiune definit de diferențele dintre subiecții implicați în el (prin interese, valori, activități). Susținătorii acestei abordări consideră conflictul ca fiind o condiție naturală a existenței oamenilor care interacționează, un instrument de dezvoltare a unei organizații, a oricărei comunități, deși are consecințe distructive, dar, în general și pe o perioadă lungă de timp, nu la fel de distructive ca consecințele eliminării conflictelor, ale blocării lor informaționale și sociale. [5 p.10]

Originile și evoluția conflictelor pot fi caracterizate prin următoarea diagramă, figura 1.1.1

Conflictul este un tip special de interacțiune între subiecții unei organizații (adversari), o ciocnire de poziții, opinii, evaluări și idei opuse, pe care oamenii încearcă să le rezolve prin persuasiune sau acțiuni pe fondul emoțiilor. La baza oricărui conflict stau contradicțiile acumulate, obiective și subiective, reale și aparente.

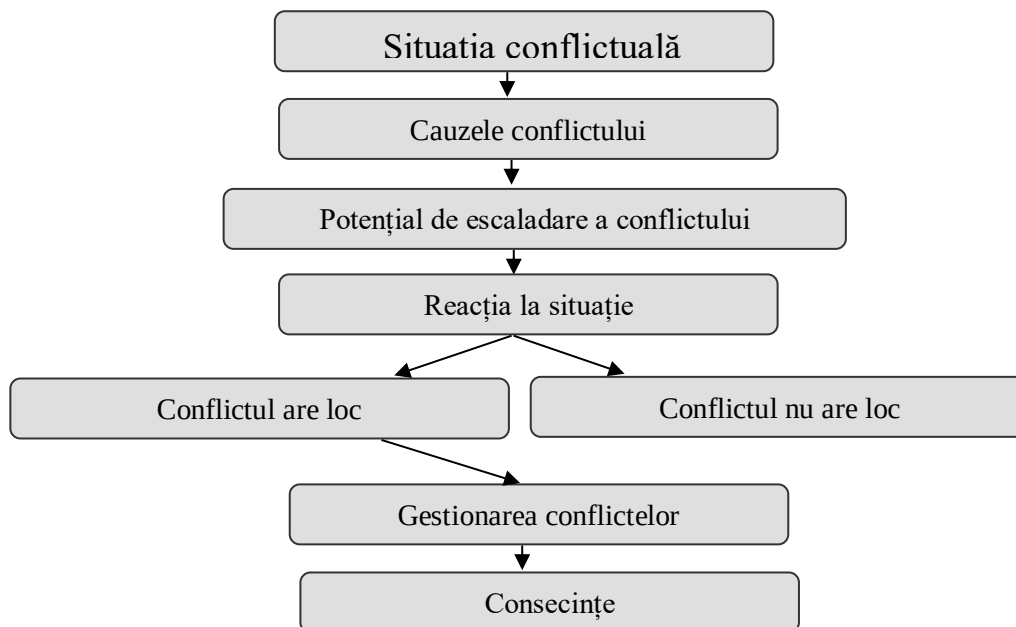


Figura 1.1. Un model de conflict ca proces.

Sursa:12.

În scopul identificării cauzelor conflictelor în întreprinderile situate pe teritoriul unității teritoriale autonome Găgăuzia, a fost efectuată o cercetare aplicată care a vizat întreprinderile mici și mijlocii din localități precum Comrat, Ceadăr-Lunga și Vulcănești. Luând în considerare particularitățile regiunii - componența multinațională a populației, diversitatea limbilor de comunicare, diferențele în abordările manageriale - scopul cercetării a fost de a studia factorii care contribuie la apariția situațiilor conflictuale în activitatea zilnică a organizațiilor. [5 p.68]

Cercetarea a fost realizată folosind o abordare cuprinzătoare. Metodele utilizate au inclus chestionare pentru angajați, interviuri semi-structurate cu managerii, observarea proceselor de lucru și studiul documentației interne a companiei. Ancheta prin chestionar a vizat 50 de angajați din diferite companii care își desfășoară activitatea în sferile comerțului, serviciilor și producției. De asemenea, au fost realizate interviuri cu 10 reprezentanți ai conducerii intermediare. Acest lucru ne-a permis să înțelegem mai bine problemele existente în comunicarea internă, stilurile de management și sistemele de motivare a personalului.

Tabelul 1.1. Chestionarul aplicat angajaților a evidențiat următoarele cauze principale ale conflictelor

Cauza conflictului	% din respondenți
Comunicare internă deficitară (lipsă de informații)	68%
Responsabilități neclare ale postului	52%
Stil de management autoritar	47%
Lipsa de recunoaștere și încurajare	42%
Antipatii interpersonale și diferențe culturale	36%
Concurența și lupta pentru resurse în cadrul întreprinderii	34%
Suprasolicitarea și stresul lucrătorilor	29%

Sursa: compilație a autorului.

Analiza informațiilor colectate ne-a permis să identificăm o gamă largă de motive care contribuie la apariția conflictelor în organizațiile din regiune. Factorul cel mai frecvent menționat atât de angajați, cât și de manageri a fost lipsa unei comunicări interne eficiente. Mulți participanți la sondaj au menționat că nu primesc informații complete și în timp util cu privire la scopuri, obiective sau schimbări în activitatea companiei. Acest lucru duce la neînțelegeri, greșeli și, ca urmare, la conflicte între colegi sau cu conducerea.

Următorul factor menționat cel mai frecvent a fost descrierea vagă sau neclară a posturilor. Adesea, organizațiile nu au instrucțiuni formale sau acestea nu sunt comunicate personalului. Acest lucru duce la transfer de responsabilități, la dublarea funcțiilor și la dispute privind domeniile de responsabilitate între angajații din diferite departamente.

Stilul de management merită o atenție deosebită. Potrivit angajaților înșiși, managerii companiilor recurg adesea la metode autoritare: luarea deciziilor se face fără a ține cont de opinia subordonaților și nu există practic niciun feedback. Această atitudine din partea superiorilor creează o atmosferă de tensiune și nemulțumire, care în cele din urmă degeneratează în conflicte deschise.

Unii lucrători au subliniat, de asemenea, diferențele personale și interculturale dintre membrii echipei. Având în vedere diversitatea etnică și lingvistică a regiunii, neînțelegerile bazate pe diferențe în obiceiurile de comunicare, stilul de interacțiune și valorile pot provoca, de asemenea, situații tensionate.

În cele din urmă, unii angajați au atribuit conflictele lipsei unui sistem de stimulente și recunoaștere nemateriale. Cu sarcini de lucru egale, unii angajați erau recompensați, iar alții nu, iar criteriile de evaluare erau neclare. Acest lucru creează un sentiment de nedreptate și subminează încrederea în management.

Interviurile cu managerii au dezvăluit:

- majoritatea consideră că conflictele sunt cauzate de "lipsa abilităților de comunicare";
- 6 din 10 manageri au recunoscut că în companiile lor nu există reglementări privind gestionarea conflictelor;
- dificultăți în lucrul cu personalul mai tânăr, care are așteptări și abordări diferite ale subordonării.

Interviurile cu managerii intermediari au confirmat că multe întreprinderi nu dispun de proceduri clare de soluționare a conflictelor. Managerii preferă să "păstreze un profil scăzut", ignorând etapele inițiale ale conflictelor și intervenind atunci când situația escaladează. Această abordare duce adesea la dispute prelungite și pline de încărcătură emoțională, la scăderea productivității și la creșterea fluctuației personalului. [5 p.57]

Tabelul 1.2. Analiza SWOT a practicii de management al conflictelor în companiile din UTA Găgăuzia

Puncte tari (Strengths)	Puncte slabe (Weaknesses)
Proceduri și politici clare privind identificarea și gestionarea conflictelor	Lipsa unor programe regulate de formare și perfecționare pentru manageri și angajați
Experiență acumulată în medierea conflictelor și în utilizarea tehnicilor de negociere	Comunicare internă insuficientă între departamente și niveluri ierarhice
Cultura organizațională care încurajează dialogul și colaborarea	Reticența unor angajați față de schimbarea metodelor tradiționale de rezolvare a conflictelor
Implicarea conducerii în soluționarea situațiilor conflictuale	Lipsa unor sisteme eficiente de feedback și monitorizare a impactului soluțiilor aplicate
Oportunități (Opportunities)	Amenințări (Threats)
Implementarea tehnologiilor moderne de comunicare și management al conflictelor	Creșterea factorilor externi de stres economic și social care pot intensifica conflictele
Dezvoltarea unor programe de training și coaching axate pe abilități de comunicare și mediere	Posibilitatea scăderii productivității și a moralului angajaților din cauza conflictelor netratate
Colaborarea cu experți și organizații specializate	Lipsa suportului și implicării conducerii

pentru îmbunătățirea proceselor	superioare în gestionarea situațiilor conflictuale
Crearea unei culturi organizaționale bazate pe respect reciproc și transparență	Apariția unor conflicte de natură culturală, etnică sau intergenerațională dificil de mediat

Sursa: compilație a autorului

Studiul empiric a analizat conflictele apărute în diferite companii care își desfășoară activitatea pe teritoriul UTA Găgăuzia. Această regiune este caracterizată de un mediu multinațional și multilingv, care are un impact asupra particularităților interacțiunii de afaceri și a comunicării în cadrul organizațiilor. Cercetarea a fost efectuată în rândul angajaților întreprinderilor mici și mijlocii din localități precum Comrat, Ceadâr-Lunga și Vulcănești.

Rezultatele obținute confirmă necesitatea unei abordări sistematice a gestionării conflictelor în întreprinderile din Găgăuzia, luând în considerare specificul contextului regional și particularitățile culturii organizaționale a întreprinderilor. [5]

Organizațiile care funcționează în UTA Găgăuzia, precum și întreprinderile din alte regiuni, se confruntă cu diferite forme de conflicte: între angajați, între manageri și subordonați, între subdiviziuni. Aceste conflicte sunt cauzate, de obicei, de diversitatea punctelor de vedere, nivelurile diferite de responsabilitate, suprasolicitarea, resursele limitate, precum și de lipsa unor standarde clar definite de comunicare și gestionare. În acest sens, este necesar să se elaboreze și să se pună în aplicare recomandări specifice pentru optimizarea gestionării conflictelor, adaptate la condițiile socio-culturale locale și la realitățile mediului de afaceri din Găgăuzia.

Primul pas ar trebui să fie introducerea unei abordări sistematice a gestionării conflictelor. Aceasta implică crearea unei proceduri clar definite în cadrul organizației pentru a răspunde situațiilor de conflict. O astfel de procedură ar trebui să includă etapele de diagnosticare a unui conflict, de analiză a acestuia, de alegere a unei metode de soluționare și apoi de evaluare a rezultatelor. Este important ca toți angajații să știe pe cine să contacteze în caz de tensiune sau neînțelegere și ce mecanisme vor fi utilizate.

O componentă importantă a prevenirii conflictelor este formarea și seminariile periodice pentru dezvoltarea abilităților de comunicare și a muncii în echipă. Deosebit de utile sunt instruirile privind gestionarea emoțiilor, ascultarea activă, negocierea și rezolvarea situațiilor dificile fără confruntare. În același timp, ar trebui acordată o atenție deosebită sensibilității interculturale și interpersonale, care este relevantă pentru Găgăuzia ca regiune multinațională.

Directorii executivi din regiune ar trebui să pună în aplicare în mod activ elemente ale unei culturi corporative favorabile, bazate pe respect, deschidere și transparență. Acest lucru se poate realiza prin coduri interne de conduită, întâlniri la primărie, implicarea personalului în procesul decizional și încurajarea unui feedback deschis. O astfel de cultură contribuie la reducerea nemulțumirilor și a tensiunilor, sporește încrederea între membrii echipei și minimizează probabilitatea escaladării conflictelor. [15]

Evaluarea climatului organizațional și monitorizarea periodică a satisfacției angajaților reprezintă, de asemenea, un domeniu important. Conducerea ar trebui să creeze condiții pentru ca angajații să își exprime opiniile, sugestiile și nemulțumirile într-o formă sigură - sondaje anonime, "cutii de încredere", întâlniri cu specialiștii în resurse umane. Acest lucru permite identificarea potențialelor focare de tensiune înainte ca acestea să escaladeze într-un conflict deschis.

Pe baza celor de mai sus, putem face o serie de recomandări care vor contribui la autoreglarea personalității în domeniul interacțiunilor sale în diferite situații, cu diferite categorii de persoane, inclusiv în cazuri extreme legate de conflicte:

1. Crearea de grupuri de formare activă (grupuri T), cu recrutarea constantă de participanți doritori, în cadrul cărora oamenii să fie instruiți în ceea ce privește abilitățile de comunicare interpersonală constructivă, dezvoltarea unor abilități de comunicare precum descrierea comportamentului celuilalt, comunicarea sentimentelor (capacitatea de a transmite în mod adecvat mesaje despre propriile stări interioare), ascultarea activă, confruntarea, permițând oamenilor să își exploreze mai profund comportamentul și să îl schimbe în mod eficient.

Etapele activității managerilor pentru rezolvarea situațiilor conflictuale dintre subordonații lor

pot fi reprezentate sub forma unui tabel.

Tabelul 1.3 Tehnologii de soluționare a conflictelor

Tehnologie	Metode
diagnostic	Comunicarea regulată și profesională cu angajații;
	luarea unei decizii manageriale care poate elimina cauza conflictului;
	să inducă potențialii participanți la conflict să facă concesii reciproce;
prognoză	Cunoașterea și analizarea primelor simptome ale conflictului ascuns, limitarea relației și alegerea unei forme formale de comunicare;
	colaborarea cu liderii din cadrul diviziilor;
	Analiza opiniei publice;
	studiul caracteristicilor psihologice individuale ale angajaților
prevenire	îmbunătățirea continuă a remunerării forței de muncă în conformitate cu evoluția situației;
	distribuirea clară a sarcinilor de producție, a autorității și a responsabilității;
	formarea de relații interpersonale favorabile în cadrul echipei;
	O atenție deosebită ar trebui acordată zvonurilor, bârfelor, certurilor mărunte, care sunt de obicei indicatori ai faptului că angajații nu sunt ocupați și creează un teren fertil pentru conflicte.
avertizare	pedagogice (conversație, explicații);
	administrative (amenzi, etc.);
	schimbarea condițiilor de muncă;
	transferul potențialilor conflictuali către unități diferite
	O preocupare constantă pentru a răspunde nevoilor și cerințelor angajaților;
	selectarea și plasarea angajaților ținând seama de caracteristicile psihologice individuale ale acestora;
	respectarea principiului justiției sociale în luarea deciziilor care afectează interesele colective și individuale;
	Dezvoltarea unei culturi juridice a comunicării în rândul angajaților

Sursa: compilație a autorului

În cursul cercetării efectuate, au fost identificate principalele aspecte ale apariției și rezolvării situațiilor conflictuale în întreprinderile care își desfășoară activitatea pe teritoriul UAT Găgăuzia. Conflictul, ca parte integrantă a oricărui sistem social și de muncă, poate atât să afecteze distructiv activitatea organizației, cât și să devină o sursă de schimbare și creștere, cu condiția să fie gestionat corespunzător.

Analiza a arătat că cele mai frecvente cauze ale conflictelor sunt deficiențele de comunicare între angajați, distribuirea neclară a responsabilităților, inconsecvența deciziilor de management, diferențele de personalitate și factorii de stres legați de volumul de muncă sau de lipsa de recunoaștere. În unele cazuri, conflictele sunt latente și se manifestă printr-o scădere a motivației, o deteriorare a climatului de echipă și o creștere a fluctuației personalului. [5]

Astfel, gestionarea conflictelor în organizațiile din Găgăuzia ar trebui să vizeze nu numai eliminarea consecințelor, ci și identificarea și prevenirea cauzelor apariției acestora. Optimizarea acestui proces necesită o abordare cuprinzătoare: o combinație de metode administrative, psihologice și organizaționale, ținând cont de particularitățile culturale și regionale. Numai în acest caz este posibilă crearea unui mediu de lucru durabil, sănătos și eficient, care să contribuie la dezvoltarea atât a angajaților individuali, cât și a întregii organizații. [1]

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PRODUCTIVITY-WAGE ALIGNMENT ACROSS SECTORS IN THE ECONOMY OF THE REPUBLIC OF MOLDOVA

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Abstract. The relevance of the study is due to the fact that the alignment of the dynamics of productivity and wages lies at the foundation of balanced economic growth: significant deviations may indicate disproportions in income distribution and problems in the competitiveness of the

economy. The aim of this article is to determine the degree of alignment between the dynamics of labor productivity and wages across the main sectors of the economy of the Republic of Moldova in 2015–2024. The objectives include: (1) calculation of labor productivity indicators (revenue per employed person) and average wages by sector based on statistical data; (2) analysis of the growth rates of these indicators and their ratio (“gap”) by sector; (3) identification of sectors with the greatest misalignment between the growth of productivity and remuneration; (4) discussion of possible causes of the identified gaps, taking into account institutional and structural factors (investment, profitability, labor migration, government policy, etc.).

The results of sectoral calculations showed that in 13 out of 16 analyzed sectors (industries), wages grew faster than productivity during the period 2015–2024. In some cases, the gap reaches extreme values: for example, in the information and communication sector the gap amounted to -293 percentage points (p.p.), and in the financial sector more than -250 p.p., while productivity in the latter even decreased. At the same time, in such sectors as healthcare and social protection, almost complete synchronicity is observed: the gap amounted to only +0.5 p.p. In the education sector, the gap was moderate (-48.1 p.p.), and in the sector of arts, entertainment and recreation, productivity significantly outpaced wage growth (+947.1 p.p.), which is likely explained by data instability and uneven development of the sector in recent years.

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Key words: labour productivity, wage growth, sectoral analysis, productivity-wage gap, Republic of Moldova

Introduction. The issue of the relationship between labor productivity and the level of wages is highly relevant for the Republic of Moldova. Our country is characterized by some of the lowest indicators of labor productivity and living standards in Europe, as consistently emphasized in the annual reviews of the World Bank and reports of the European Commission [8, 2]. The aim of this article is to determine the degree of alignment between the dynamics of labor productivity and wages across the main sectors of the economy of the Republic of Moldova in 2015–2024. To achieve this aim, the following objectives were pursued: (1) calculation of labor productivity indicators (revenue per employed person) and average wages by sector based on statistical data; (2) analysis of the growth rates of these indicators and their ratio (“gap”) across sectors; (3) identification of sectors with the greatest misalignment between productivity growth and wage growth; (4) discussion of possible causes of the identified gaps, taking into account institutional and structural factors (investment, profitability, labor migration, state policy, etc.).

Literature Review. In economic theory, the direct relationship between labor productivity and wages is primarily associated with the neoclassical model of income distribution, according to which real wages in long-run equilibrium are determined by the marginal product of labor. Within this model, sustained productivity growth should be accompanied by a comparable increase in real wages. However, empirical studies show that such alignment is far from always observed in the short and medium term.

The European Employment Observatory provides data indicating that deviations of wages from labor productivity dynamics can be explained by institutional and macroeconomic factors such as collective bargaining mechanisms, the role of minimum wage, inflation expectations, as well as cyclical fluctuations in labor demand and supply. As a result, wages may respond to changes in productivity with a time lag or asymmetrically faster during economic upturns and more slowly during downturns [4]. The International Labour Office (ILO), in its analytical reports, highlights globalization, technological changes, rising inequality in productivity levels across firms, and the weakening of workers’ bargaining power (decline in the role of trade unions) as key factors behind the weakening link between productivity growth and wage growth [7].

In applied research, the relationship between wages and productivity is analyzed using several complementary approaches. First, growth rate differentials are assessed to determine whether wage growth outpaces or lags behind productivity growth. This method is especially common in macroeconomic studies. Second, some researchers use panel regressions to estimate wage elasticity with respect to productivity while controlling for fixed characteristics of countries or sectors. Such models are used, in particular, in studies of OECD countries [1]. Some modern research focuses on the fact that the relationship between productivity and wages differs significantly by sector and type of firm. OECD reports show that high dispersion of productivity within individual firms leads to a weakening of the transmission of productivity growth into wages at the aggregate level [6].

Both the ILO and OECD offer methodological guidelines for analyzing the wage-productivity link, emphasizing the importance of distinguishing between nominal and real indicators, as well as the correct choice of deflators. In particular, real wages are typically calculated as the ratio of the nominal wage index to the consumer price index, which allows inflationary shocks to be accounted for [3].

Thus, the literature emphasizes that the relationship between labor productivity and wages is determined not only by the marginal productivity of labor at the microeconomic level, but also by a number of institutional and structural factors. It is especially important to consider sectoral differences and firm heterogeneity, as they shape the extent to which productivity growth is transformed into income growth.

Methodology. To determine the degree of alignment between the dynamics of labor productivity and wages across the main sectors of the economy of the Republic of Moldova in 2015–2024, data from the National Bureau of Statistics (NBS) were used on average monthly wages, as well as sales revenues and the average number of employees by type of economic activity, according to the CAEM-2 classifier.

The key indicator of labor productivity in this article is output per employed person, calculated as the ratio of sectoral sales revenue to the average number of employees in the sector:

$$LP_{s,t} = R_{s,t}/E_{s,t} \quad (1)$$

where:

- $LP_{s,t}$ - labor productivity in sector s in year t ;
- $R_{s,t}$ - sales revenue in sector s in year t ;
- $E_{s,t}$ - average annual number of employed persons in sector s in year t .

To ensure comparability with annual productivity indicators, the average monthly wage was converted into an annual figure:

$$W_{s,t}^{ann} = 12 * W_{s,t}^{mon} \quad (2)$$

where:

- $W_{s,t}^{ann}$ - average annual wage in sector s in year t ;
- $W_{s,t}^{mon}$ - average monthly wage in sector s in year t .

Next, for the analysis of dynamics, index series were calculated using the base year 2015 (=100). The labor productivity index in sector s in year t is defined as:

$$I_{s,t}^{LP} = LP_{s,t} / LP_{s,2015} * 100 \quad (3)$$

The wage index:

$$I_{s,t}^W = W_{s,t}^{ann} / W_{s,2015}^{ann} * 100 \quad (4)$$

It is important to note that the wage indicators are nominal, without adjustment for inflation; the sales revenue indicator is also presented in current prices. Thus, the growth rates of nominal productivity and nominal wages by sector include a component of price changes.

The gap between productivity growth and wage growth ($\text{Gap}_{s,t}$) in each sector is assessed as the difference in the growth rates of the respective indices. Formally, for each sector s and year t (starting from 2016), the gap (in percentage points) can be defined as:

$$\text{Gap}_{s,t} = I_{s,t}^{\text{LP}} - I_{s,t}^{\text{W}} \quad (5)$$

A positive gap means that productivity grew faster than wages (in percentage points), and a negative gap means that wage growth outpaced productivity growth.

Results. General Economic Dynamics. During the period 2015–2024, the economy of Moldova experienced significant growth in both labor productivity and average wages; however, the rates of increase differed. Aggregate nominal productivity (sales revenue per employed person across the entire economy) increased approximately 2.3 times (index for 2024 = 222.5% compared to 2015), while the average nominal wage grew by about 3.2 times (index for 2024 = 316% compared to 2015). The simple difference in growth rates amounts to around +100 p.p. in favor of wages. This indicates an increase in the wage share in GDP and higher unit labor costs. Thus, at the national level, wage growth outpaced labor productivity growth.

Sectoral Trends. Despite overall economic growth, there are significant differences between sectors in the dynamics of these indicators. Figure 1 illustrates the absolute dynamics of average annual labor productivity in monetary terms by sector and allows a visual assessment of the pace and character of growth (or decline) across industries. According to the data presented in the graph, there is steady growth in labor productivity in most sectors, especially after 2020. The most pronounced growth is observed in the “Arts, Entertainment and Recreation” sector, which is linked, on the one hand, to the low base effect during the pandemic period and, on the other hand, to a development boost in recent years. The information and communication, industry, and healthcare sectors also demonstrate a significant increase in output per employed person. At the same time, such sectors as finance and education show more moderate or unstable dynamics (Figure 1).

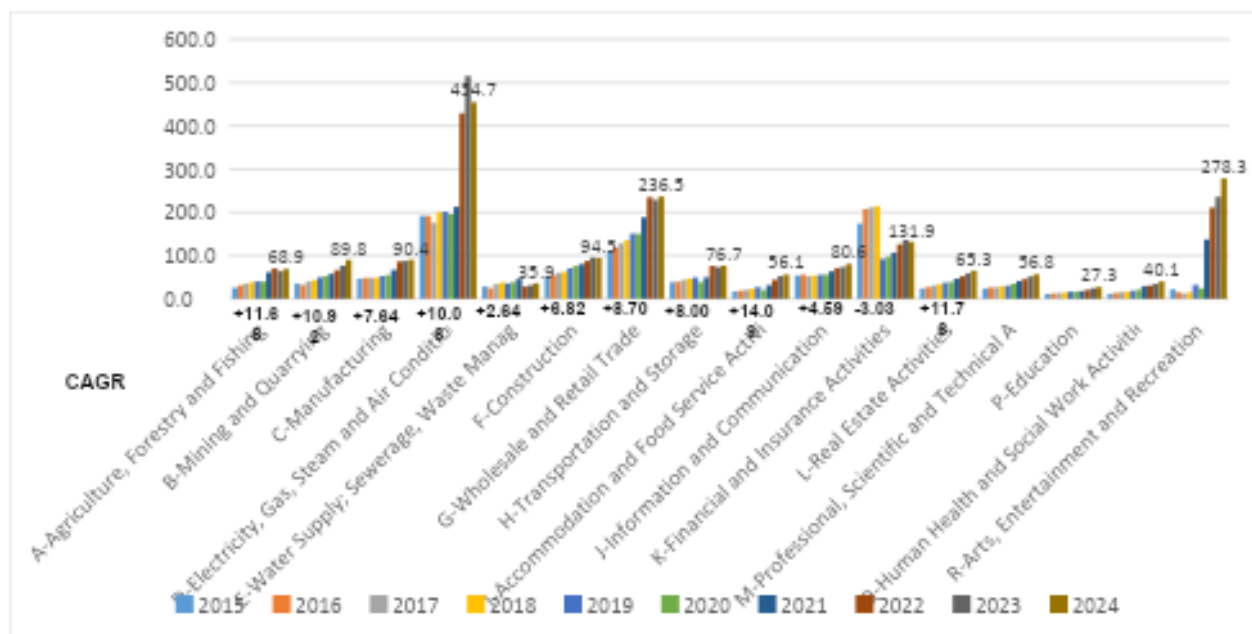


Figure 1. Change in Average Annual Labor Productivity by Sector, 2015–2024, million MDL

Source: calculated by the author based on data bank of the National Bureau of Statistics, https://statbank.statistica.md/pxweb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica__24%20ANT__ANT030/?rxid=9a62a0d7-86c4-45da-b7e4-fecc26003802

Figure 2 presents the dynamics of average annual nominal wages across the main sectors. Wages increased in all sectors without exception during 2015–2024, although the growth rates varied. The most rapid growth in average earnings is observed in the information and communication sector

(J), where by 2024 the nominal wage index reached approximately 442.7% of the 2015 level (i.e., wages increased more than 4.4 times).

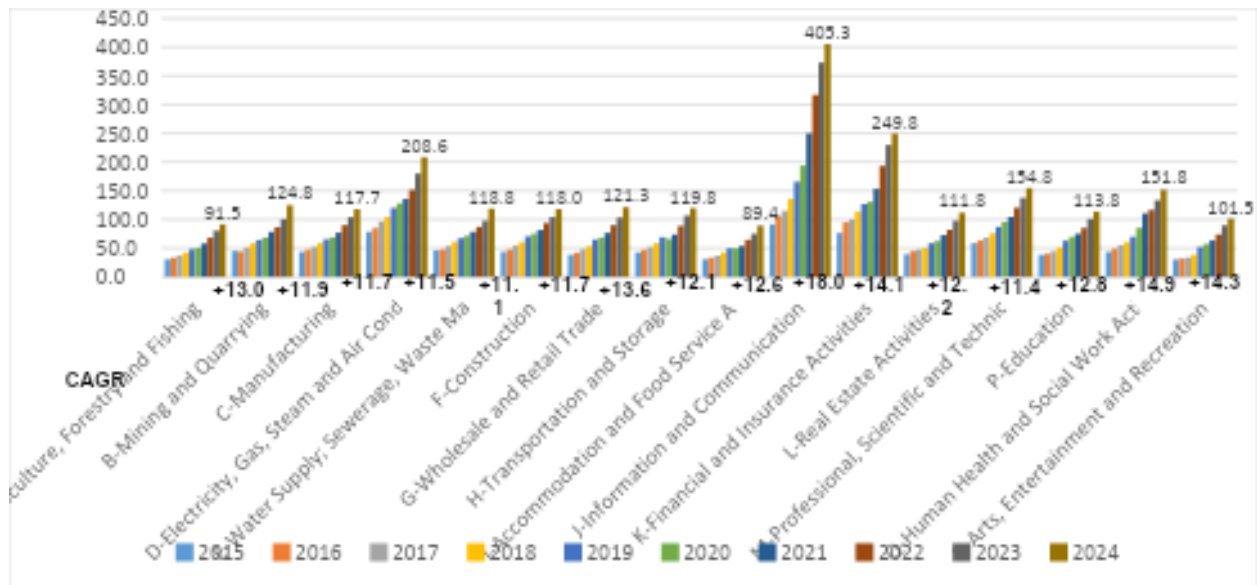


Figure 2. Change in Average Annual Wage by Sector, 2015–2024, thousand MDL

Source: calculated by the author based on data bank of the National Bureau of Statistics, https://statbank.statistica.md/PxWeb/pxweb/ro/30%20Statistica%20sociala/30%20Statistica%20sociala__04%20NIV__NIV010/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774

A similarly high increase is recorded in the financial sector (K) (3.3 times growth), as well as in the healthcare and social assistance sector (Q) (growth of about 3.5 times). In a number of industries, wage growth was more moderate but stable: for example, in construction (F) and trade (G), wages increased by approximately 2.7–3.2 times. Even in sectors with relatively low growth rates (such as mining and quarrying (B)), wages increased significantly, reflecting a general trend of rising labor remuneration in the economy. Overall, nominal wage growth across the economy outpaced productivity growth in most sectors, as illustrated by the comparison of Figure 1 and Figure 2.

For a more detailed analysis, labor productivity and wage indices were calculated by sector for each year, as well as the differences in their growth rates (Table 1). These indicators make it possible to identify in which periods and to what extent the trajectories of these variables diverged. Table 1 presents the values of labor productivity indices (I^{LP}) and wage indices (I^W) for each sector of the Moldovan economy from 2015 to 2024, as well as the corresponding difference (Gap) in percentage points relative to the base year.

Table 1. Labor Productivity Indices (I^{LP}) and Wage Indices (I^W) by Sector of the Economy of the Republic of Moldova, 2024 (2015 = 100%), and Growth Rate Difference (Gap)

	2015	I^{LP} 2024, %	I^W 2024, %	Gap 2015-2024, p.p.
A-Agriculture, Forestry and Fishing	100.0	269.8	300.2	-30.3
B-Mining and Quarrying	100.0	254.2	276.1	-21.9
C-Manufacturing	100.0	193.9	271.0	-77.1
D-Electricity, Gas, Steam and Air Conditioning Supply	100.0	236.9	265.9	-29.0
E-Water Supply; Sewerage, Waste Management	100.0	126.4	257.7	-131.2
F-Construction	100.0	181.0	270.7	-89.7
G-Wholesale and Retail Trade	100.0	211.9	315.0	-103.1
H-Transportation and Storage	100.0	200.0	280.3	-80.4
I-Accommodation and Food Service Activities	100.0	327.4	290.0	37.4

J-Information and Communication	100.0	149.7	442.7	-293.0
K-Financial and Insurance Activities	100.0	75.8	326.5	-250.7
L-Real Estate Activities	100.0	271.9	282.5	-10.6
M-Professional, Scientific and Technical Activities	100.0	238.4	263.2	-24.9
P-Education	100.0	247.7	295.8	-48.1
Q-Human Health and Social Work Activities	100.0	348.4	347.9	0.5
R-Arts, Entertainment and Recreation	100.0	1281.3	334.2	947.1

Source: calculated by the author

According to Table 1, by 2024, in the overwhelming majority of the analyzed sectors (13 out of 16), nominal wages had increased in percentage-wise more than labor productivity. The largest misalignments (negative gaps) are observed in the information and communication sector (J) and the financial sector (K), where the excess of wage growth over productivity growth amounted to approximately 293 and 251 p.p., respectively. Notably, in sector K a unique phenomenon occurred: labor productivity decreased over the decade (index 75.8), while wages rose significantly, resulting in one of the largest gaps.

Significant negative gaps (50-100 p.p. and more) in favor of wage growth were also recorded in major sectors such as manufacturing (C) (77.1 p.p.), construction (F) (89.7 p.p.), trade (G) (103.1 p.p.), and transportation (H) (80.4 p.p.). These industries are characterized by wage growth substantially outpacing productivity throughout the period, with the gap showing a tendency to accumulate year by year.

Only three of the considered sectors did not show wage growth surpassing productivity growth. In the sector of arts, entertainment, and recreation (R), labor productivity increased nearly tenfold more than wages (Gap = +947.1 p.p.). As previously noted, such an unusual result is linked to a low comparative base and a sharp recovery and growth after 2020. In the hotel and restaurant sector (I), productivity also outpaced wage growth (Gap = +37.4 p.p.), which may have been driven by structural changes and increased tourist activity after the lifting of quarantine restrictions during the COVID-19 pandemic. Finally, in the healthcare sector (Q), by 2024, near full alignment was observed: productivity and wage indices almost coincided (Gap = +0.5 p.p.).

It is important to note that the gap dynamics were not linear or unidirectional throughout the period. In some sectors, trend shifts occurred under the influence of external shocks. For instance, in 2020 (COVID-19 pandemic), sectors in services such as transport, hospitality, and arts and entertainment experienced a sharp decline in productivity, while wage reductions were less significant, temporarily increasing the gap in favor of wages. In 2021-2022, as the economy recovered, productivity in some of these sectors grew at a faster pace (especially noticeable in sectors R and D in 2021), reducing or even reversing the gap. Thus, short-term fluctuations (cyclical downturns and upswings) significantly influenced the ratio of indicators in specific sectors. However, over the long-term period of 2015-2024, the dominant trend was that of wage growth outpacing productivity growth in nearly all sectors, except for the few noted cases.

Discussion. The presented results reveal the existence of persistent and significant discrepancies between the dynamics of labor productivity and wages in most sectors of the Moldovan economy. In sectors with a high export orientation or integration into global value chains (J, K), wage dynamics appear to be largely independent of domestic productivity performance. Such discrepancies may be driven by global trends, a shortage of skilled labor, and institutional characteristics. Sectors with centralized wage regulation, such as education and healthcare, show a more balanced dynamic, reflecting government policy implementation. In these areas, a moderate gap in favor of wage growth may be justified by the social importance of these sectors and the state's efforts to reduce the income gap compared to the national average. In industries characterized by uneven capacity utilization, high cyclicity, and a predominance of manual labor (construction, agriculture, manufacturing), the misalignment is more moderate, yet wages often grow faster than productivity. This may be explained

by structural shifts in employment, internal labor migration, and the need to increase the attractiveness of these sectors for workers.

Thus, the data confirm the hypothesis of sectoral specificity in the relationship between productivity and wage growth. Moreover, the identified mismatches may serve as indicators of both weaknesses in the incentive system for productivity and potential constraints in sustainable income growth policy.

Conclusion. The conducted quantitative and comparative analysis revealed that in the economy of the Republic of Moldova, there is no universal or linear relationship between labor productivity growth and wage growth at the sectoral level. Most sectors are characterized by a positive gap in favor of wage growth, which raises concerns about the sustainability of the current income distribution model. The highest alignment between indicators is observed in sectors with a significant degree of state involvement and regulation.

The findings emphasize that when developing strategies to enhance productivity and ensure fair wages, it is essential to rely not only on aggregate indicators but also on detailed sectoral analysis. Particular attention should be given to creating incentives to improve labor efficiency at the microeconomic level. These measures will contribute to the development of a more balanced and sustainable model of economic growth in the Republic of Moldova.

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POSSIBILITĂȚI DE INTEGRARE A ECONOMIEI CIRCULARE ÎN INDUSTRI NUCIFERELOR DIN REPUBLICA MOLDOVA

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Abstract: The circular economy is a restorative and closed economy. Its distinctive feature is the minimization of the consumption of primary raw materials and the volume of recyclable resources, which is accompanied by a reduction in waste sent to landfills, while reducing the area of landfills and unorganized landfills. The world's population is growing every year, and the need for resources is not slowing down. If we leave everything as it is, then some of the Earth's resources will be completely exhausted in 20-100 years, according to various estimates. The solution may be a circular economy, which is based on the principle of „take – make – reuse”. A circular economy involves preserving products, components and materials with maximum benefit and value. Unlike linear economics, it is about optimizing the system, not the components. This includes careful management of material flows in biological and engineering cycles. In addition, it is assumed that economic activity does not exhaust natural systems, but, on the contrary, increases natural capital. A direction, proper to apply, in the current conditions of Moldova, and in the nuts industry where the volume of waste represents a share of over 70% of the production volume.

Keywords: - circular economy, efficiency, risk, optimization, walnut industry.

Odată cu dezvoltarea societății de consum, la sfîrșitul secolului XX și cu creșterea fără precedent a populației la nivel mondial, a procesului de urbanizare și a calității vieții, s-a înregistrat o tendiță continuă de creștere a volumului de deșeuri și diversificarea fluxurilor și sortimenturilor lor.

Din acest motiv în prezent, în condițiile reducerii accentuate a rezervelor de resurse naturale, a deteriorării ecosistemelor naturale, aerului și solului, preocupările la nivel internațional cu privire la posibilitatea gestiunii deșeurilor au căpătat un caracter continuu și dinamic în direcția identificării celor mai bune soluții și tehnologii. Acest fapt, a dezvoltat un consens general, pe plan internațional, *că o dezvoltare social-economică, durabilă impune gestionarea eficientă a resurselor, deșeurilor, produselor secundare, energiei etc., astfel permițînd conservarea cît mai optimă a resurselor naturale limitate și protejarea mediului înconjurător*. În condițiile sus enunțate, tranziția la o nouă formă de organizare a activității economice, în cadrul căreia valoarea materialelor și a resurselor este menținută în economie un timp cît mai îndelungat posibil, iar producerea de deșeuri are o limită redusă, capătă o atenție deosebită a tuturor actorilor din societate. Acest nou model de organizare a activității economice a indivizilor din societate poartă denumirea de economie circulară.

Fiind un fenomen contemporan, interpretarea lui în literatura de specialitate este foarte complexă, fiind întîlnite peste 1000 de definiții, concentrate în jurul unor elemente cheie cum ar fi: - *dezvoltare durabilă, cadrul celor 4R (Reduce, Reuse, Recycle, Recover), abordare sistemică (micro, mezo, macro), ierarhia deșeurilor* [1, pag. 221]. O totalizare a acestor abordări este regăsită în conceptul dat de Comisia Europeană, prin care: - *„în economia circulară, valoarea produselor și materialelor este menținută cît mai mult posibil, iar deșeurile și resursele sunt reduse la minim, prin creșterea duratei de viață a produsului, acesta fiind folosit din nou pentru a crea o valoare suplimentară, lucru care aduce beneficii majore, contribuind direct la inovare, creștere economică, creare de locuri de muncă”*.

Prima mențiune a procesului circular în activitatea economică, apare foarte superficial în anul 1976 în cadrul raportului „*Potențialul de a substitui forța de lucru umană pentru energie*” [2, pag. 69], prin care autorii recomandă activ ideea implementării de strategii de prevenire a deșeurilor prin extinderea duratei de viață a produselor, prin procese de reutilizare, reparare și modernizare tehnologică.

O economie circulară este un model care se opune economiei tradiționale "liniare", (*producție-consum-deșeuri*). Scopul său este de a prelungi ciclul de viață al produselor, de a minimiza deșeurile și de a le folosi ca resursă pentru a crea noi produse și materiale. Importanța unei economii circulare este de a reduce povara asupra mediului, de a stimula inovarea și de a crește competitivitatea economică. Revoluțiile industriale au făcut posibilă apariția unei economii liniare, dar a funcționat cu volume mici de producție și rezerve mari de resurse, în timp ce deșeurile se puteau descompune în siguranță într-un mediu înconjurător. Cu toate acestea, o creștere a ratei de producție și consum și eliminarea deșeurilor a dus la introducerea și popularizarea conceptelor economiei circulare.

Economia circulară se conduce de trei principii fundamentale. Primul principiu arată că *impactul producției și consumului asupra mediului ar trebui luat în considerare deja în stadiul proiectării inițiale a produsului, implicând reutilizarea materialelor, minimizând generarea de deșeuri*. Al doilea principiu vizează *extinderea ciclului de viață al bunurilor și materialelor, care poate fi realizat prin reutilizarea bunurilor, repararea și restaurarea acestora*. Al treilea principiu sugerează că *este necesară îmbunătățirea activă a stării mediului și returnarea nutrienților valoroși în ecosisteme*.

O economie circulară constă în primul rând în păstrarea capitalului și a valorii în sistem datorită prezenței diversității. Diversitatea este cea care ajută sistemele vii să prospere, să se dezvolte și să rămână rezistente. În economia circulară, este important ca economia să primească materiale și resurse la un preț real. În absența concurenței și a piețelor limitate, există prea multe resurse care nu pot fi vândute pe piețele externe. În condițiile unei abundențe de resurse, motivația de a păstra valoarea acestor materiale dispare fapt ce și stimulează consumul irațional al acestora. În condițiile lipsei unor produse, de exemplu, echipamente, eforturile sunt îndreptate nu către inovații și noi tehnologii, ci către găsirea de soluții pentru a asigura că ceea ce există, continuă să funcționeze cel puțin o perioadă cit mai îndelungată. Unele zone pot fi configurate astfel, pentru a utiliza resursele disponibile mai eficient, planificată pe baza principiilor proiectării ciclice și păstrarea valorii materialelor din sistem.

În corelare cu principiul utilizării raționale, eficiente a resurselor , într - o economie circulară, se pot distinge următoarele modele de realizare a activității economice:

- a) **Lanțurile valorice circulare**, resursele limitate sunt înlocuite cu resurse complet regenerabile;
- b) **Extinderea ciclului de viață al produsului**, restaurarea, repararea și modernizarea produsului concomitent cu păstrează beneficiilor economice;
- c) **Produs ca serviciu**, utilizarea produselor prin "închiriere";
- d) **Restaurare și reciclare**, aplicarea inovațiilor tehnologice și a oportunităților de restaurare și reutilizare a resurselor.

La baza implementării economiei circulare contemporane se află două forțe motrice principale: **companiile mari și guvernul**. Desigur, instituțiile guvernamentale contribuie, de asemenea, la promovarea unei economii ciclice. Ele creează un mediu fiscal, legislativ și instituțional favorabil dezvoltării.

Tranziția către o economie ciclică este dificilă, deoarece necesită schimbări nu numai în tehnologiile care ar trebui să reducă la minimum deșeurile, ci și în discipline creative precum designul, publicitatea și tehnologia digitală. Acest lucru permite luarea în considerare a posibilităților de minimizare imediată a consecințelor asupra mediului atunci când are loc crearea sau lansarea unui produs, creând un sistem de activitate economică care să răspundă nevoilor umane și să se încadreze perfect în ecosistem.

Economia circulară din industria nucilor se concentrează pe producția fără deșeuri, transformând subprodusele în resurse valoroase. Principalele direcții includ prelucrarea cojilor în biocombustibili, utilizarea cojilor pentru producerea de furaje sau îngrășăminte, precum și crearea de produse cosmetice și uleiuri din nuci care au o calitate gustativă mai redusă. Acest lucru crește eficiența reciclării și reduce povara asupra mediului.

Astfel, principalele aspecte ale economiei circulare în industria nucilor pot fi următoarele:

a) **Utilizarea cochiliei:** cojile de nuci, care sunt principalele deșeuri, sunt prelucrate în combustibili ecologici (brichete), sorbenți sau utilizate în producția de plăci de lemn.

b) **Prelucrarea deșeurilor auxiliare:** coji, crengi, frunzișul, partiții și sâmburi care sunt utilizate pentru a crea coloranți naturali, extracte, componente pentru produse cosmetice sau hrană pentru animale foarte hrănitoare.

c) **Agricultura ecologică:** industria nucilor implementează activ principiile producției ecologice, folosind deșeuri compostate pentru fertilizarea grădinilor, ceea ce închide ciclul de producție.

Această abordare face posibilă creșterea valorii adăugate a produselor și maximizarea utilizării resurselor, ceea ce este deosebit de important pentru dezvoltarea dinamică a industriilor de nuci.

În contextul celor enunțate, în continuare, voi prezenta un studiu referitor la cultura nuciferelor, cazul Republicii Moldova, și a categoriilor de deșeuri care reies din practicarea activității respective, care ulterior ar servi ca o bază pentru analiza posibilităților de implementare a economiei circulare în acest domeniu.

Desfășurarea activităților de plantare, întreținere, dezvoltare a culturilor nucifere este reglementată de *Legea nr. 658 din 29.10.1999*. Prezenta lege reglementează activitatea legată de cultivarea unor specii nucifere, inclusiv producerea, recoltarea, valorificarea fructelor și produselor derivate, a lemnului și a materialului săditor. Astfel, în sensul prezentei legi, noțiunea de nuc cuprinde următoarele culturi nucifere: *nuc comun, nuc negru, migdal, alun (funduc), castan comestibil, pecan*.

Practicarea acestor activități, în mare parte este impulsionată de avantajele pe care le oferă această cultură atât pentru producător cât și pentru societate

➤ În primul rând, ceea ce ridică și mai mult valoarea culturilor nucifere în alimentație este că se consumă atât în stare proaspătă cât și prelucrate în diferite produse de cofetărie, oferind o valoare energetică destul de mare.

➤ Iar spre deosebire de fructele celorlalte specii pomicole, *nuciferele constituie* un aliment complet și concentrat; ele conțin substanțe grase, substanțe proteice, hidrați de carbon, substanțe minerale și vitamine, din acest motiv conținutul lor în substanțe nutritive este foarte ridicat, fiind considerate un aliment concentrat, cu valoare energetică mare

➤ Din cele expuse se vede, că cultura nuciferelor este una dintre cele mai valoroase specii pomicole ce se cultivă, având o largă arie de răspindire, de la șes până la altitudinea de 700—800 m, iar fructele, păstrate în condiții bune, se conservă bine timp îndelungat, ocupă un volum mic în depozite și rezistă foarte bine la transporturi pe distanțe mari. Fructele Nuciferelor sunt bine plătite și cerute atât pe piața internă cât și la export.

Analiza datelor statistice din domeniu ne reflectă o tendință relativ mică de creștere a suprafețelor cu culturi nucifere cu circa 15 la sută în ultimii 5 ani de activitate, de la 34 mii ha în 2020 la 39 mii în 2024, în contextul reducerii cu 7 la sută a Plantațiilor pomicole pe ansamblul Republicii Moldova. Acest ritm de încetinire a dezvoltării suprafețelor de culturi nucifere este influențat în mare parte de conjunctura economică actuală din Republica Moldova, fapt ce stimulează din ce în ce mai mult procesul de defrișare a plantațiilor de către gospodăriile agricole.

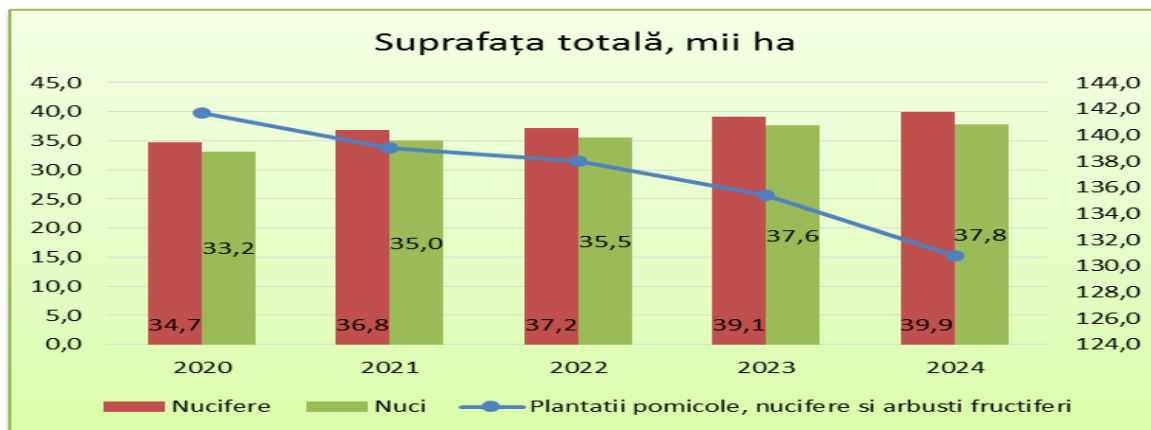


Diagrama 1. Evoluția suprafețelor de culturi nucifere în Republica Moldova

Sursa: Elaborată de autor după [3]

Ineficiența activităților agricole ale gospodăriilor mici, cauzată în mare parte de neînțelegerea intenționată a principiilor economiei de piață de către populație, dar mai ales de către persoanele cu funcții de decizie publică, a creat condiții favorabile haosului și dezvoltării slabe actuale a agriculturii. Mai mult, la baza acestei situații se află în primul rând factorul politic și capacitatea slabă de a organiza structuri administrative publice cu funcții decizionale, a căror activitate este orientată în primul rând spre realizarea intereselor proprii sau de partid. Nu există nicio responsabilitate în domeniul planificării, utilizării și gestionării banilor publici, ceea ce condiționează o iresponsabilitate totală a persoanelor și instituțiilor publice din domeniu. Toate aceste aspecte au și condiționat reducerea numărului de gospodării din mediul rural de la 707 mii în 1998, la 171 mii în 2020, ca în prezent, în 2023 numărul acestora să se reducă cu 80%.

Dacă ne vom referi la recolta globală și exportul a culturilor nucifere, în perioada analizată, putem evidenția că: - recolta globală a înregistrat reduceri de la 19 mii tone în 2021 la 17 mii tone în 2024, condiționate în mare parte de condițiile climaterice precum și de reducerea atractivității practicării activității respective. Iar activitatea de export s-a menținut la nivelul anului 2020, având o valoare de 16 mii tone.

Pentru analiza problemei deșeurilor, proprii culturilor nucifere, s-a luat ca referință cultura nukului, fapt argumentat de ponderea decisivă, circa 95 % din suprafața plantațiilor de culturi nucifere din Moldova sunt ocupate de cultura nukului. Sortimentu de nuci propriu pentru Moldova este unul relativ mare, care cuprinde un număr variat de soiuri **autohtone** (*Cazacu, Codreni, Cogălniceanu, Briceni, Călărași, Corjeuți, Lunguețe, Schinoasa etc.*) și **străine** (*Fernor, Franguette, Lara, Chandler, Fernette, Fercean etc.*).

Deși crește sporadic pe majoritatea tipurilor de sol, nucul necesită anumite caracteristici specifice ale solului pentru a obține o recoltă rentabilă. Caracteristicile restrictive, chiar limitative, ale solului pentru o recoltă de succes de nuci se referă la: adâncimea de explorare a sistemului radicular, trebuie să fie de 1,0 - 1,5 m (mai mult de 50% din rădăcini se află între 20 și 120 cm); conținutul de carbohidrați cu carbonat de calciu activ în zona rădăcinii nu trebuie să depășească 10%; pH-ul favorabil este 6,0-7,5, peste aceste limite apar probleme de toxicitate (la nivel alcalin apare acumularea de Ca, Na); nivelul apei subterane trebuie să fie sub adâncimea de 2,5-3,0 m.

Indiferent de categoria de cultură nuciferă cultivată pe teritoriul Republicii Moldova, practic **tipurile de deșeuri** care pot fi obținute pe astfel de plantație de către producătorii agricoli pot fi reduse la: - cojile verzi ale fructelor, cojile lemnoase / uscate ale fructelor, crengile și lăstarii de la plantație, frunzișul și masa lemnoasă din interiorul fructului.

Aceste categorii de deșeuri sunt condiționate de o multitudine de factori cu acțiune directă sau indirectă asupra valorii și cantității acestor elemente. Printre factorii care condiționează structura, cantitățile, caracterul deșeurilor culturilor nucifere se pot menționa: - **tipul culturi, condițiile climaterice, modul de înființare și dezvoltare a plantațiilor, și alte categorii.** Relieful este un factor

potențial restrictiv, luând în considerare panta terenului, gradul de fragmentare, nivelul de fertilitate al solului etc. Terenurile cu o pantă mai mare de 10-12%, cu toate deficiențele lor, nu pot fi utilizate pentru realizarea de plantații de nuci cu performanțe productive și rentabilitate economică. Sunt de preferat terenurile plane sau cu pante de până la 10%, cu condiția să se atingă un nivel ridicat de mecanizare a lucrărilor. Solul este unul dintre factorii care pot deveni restrictivi pentru realizarea unei plantații de nuci cu rentabilitate ridicată.

Un rol aparte, o ponder determinantă în determinarea volumului de deseuri cu caracter reutilizabil / reciclabil îl deține soiul culturii, acest element, datorită variației de la soi al soi, a productivității plantei, a greutateii și dimensiunii fructului, precum și a ponderii miezului în fruct, influențează în mod direct volumul și categoriile de deșuri înregistrate pe plantațiile de nuc din Republica Moldova, indicatori evidențiați în tabelul ce urmează.

Tabel 1. Caracteristica soiurilor de nuc cultivate în Republica Moldova

Nr.	Denumire Soiului	Caracteristica plantei	Fructul	
			greutate	% miez
1	Cazacu	Soi Autohton, omologat în 2005 Roddește la 4-5 ani de la plantare, W/ha=3-4t	10-12 g	60 %
2	Cogălniceanu	Soi Autohton, omologat în 2005 Roddește la 4-5 ani de la plantare, W/ha=3-3,8t	10,8-12,5 g	50 %
3	Costiujeni	Soi Autohton, omologat în 1980 Roddește la 5-6 ani de la plantare, W/ha=3-3,5t	13-14,5 g	50 %
4	Codrene	Soi Autohton, omologat în 2006 Roddește la 4-5 ani de la plantare, W/ha=2,5-3t	13-14,5 g	50 %
5	Lunguete	Soi Autohton, omologat în 2006 Roddește la 4-5 ani de la plantare, W/ha=3,2-4t	11,2-12,2 g	50 %
6	Pescianski	Soi Autohton, omologat în 2005 Roddește la 4-5 ani de la plantare, W/ha=3-3,5t	10,9-13,3 g	69 %
7	Călărași	Soi Autohton, omologat în 1980 Roddește la 5-6 ani de la plantare, W/ha=3-3,5t	14,5-15 g	55 %
8	Chișinău	Soi Autohton, omologat în 1980 Roddește la 5-6 ani de la plantare, W/ha=2-2,5t	10-11 g	50 %
9	Corjeuți	Soi Autohton, omologat în 1980 Roddește la 4-5 ani de la plantare, W/ha=2-3t	10 g	50 %
10	Fernor	Soi Francez, Roddește la 4-5 ani de la plantare, W/ha=3-4t	10-12 g	48 %
11	Chandler	Soi SUA, Roddește la 4-5 ani de la plantare, W/ha=3,5-5t	14-20 g	55 %

Sursa: Elaborat de autor

Astfel, în tabelul respectiv evidențiem caracteristicile soiurilor de nuc apreciate în plan național, prin care evidențiem o variație a: - *productivității* la ha., de la 2t la 5t; *greutății fructului*, de la 10g la 20g; *ponderii miezului*, în fruct de la 48 % la 69 %. De asemenea putem constata, că valori mai ridicate ale parametrilor menționați, sunt la soiurile de origine străină ele situându-se în intervalul de 4 - 5 t. la ha., la productivitate și la o greutate a fructului de circa 20 de grame. Soiurile autohtone, înregistrează niște valori mai mici la indicatorii dați, de circa 2 – 4 t. la ha., la productivitate și 10 – 14 grame, greutatea fructului.

O astfel de variație a parametrilor menționați, condiționează în mod firesc cantitățile de deșuri care se obțin pe plantațiile de nuc din Republica Moldova. Din acest motiv, este binevenit de a realiza un calcul și o estimare a acestor elemente, de a identifica relațiile care rezultă în timp de la implementarea acestor activități în activitatea reală antreprenorilor locali.

În continuare, în baza parametrilor sus menționați am realizat calculul cantității de deseuri proprii soiurilor de nuc analizate și obținerii unor indicatori medii pe cultură, care ar putea fi ulterior utilizați în previziunile necesare pentru diferite situații și calcule.

Interpretarea datelor din tabelul 2, ne evidențiază faptul că, în medie la 1 ha de nuc, se obțin următoarele rezultate:

a) $W \text{ medie} / ha = 3,22 t$

b) Miezul, reprezintă 53 % din fructul uscat, echivalent a 1 t

c) Coaja verde, reprezintă 42 % din fructul verde, echivalent a 1,351 t

d) Coaja lemnoasă reprezintă 47 % din fructul uscat, echivalent a 0,866 t

Pe lângă aceste deșuri, în plantațiile de nuc se mai pot înregistra și crengi și lăstari care pot atinge o valoare cuprinsă între 200 kg și 1000 kg, acest indicator are tendințe de creștere pentru livezile de alun (de la 500 kg – 1500 kg) unde procesul de creștere a lăstarilor este anual și mult mai intensiv.

Tabel 2. Calculul cantității deșeurilor soiurilor de nuc cultivate în Republica Moldova

Nr.	Denumirea Soiului	W medie la ha., tone	Parametri de calcul, %			Indicatori estimați, tone		
			Coaja verde (% din fruct)	Miez (% din fruct fără coaja verde)	Coajă lemnoasă (% din fruct fără coaja verde)	Coaja verde	Miez	Coajă lemnoasă
1	Cazacu	3,5	42	60	40	1,470	1,218	0,812
2	Cogălniceanu	3,4	42	50	50	1,428	0,986	0,986
3	Costiujeni	3,25	42	50	50	1,365	0,943	0,943
4	Codrene	2,75	42	50	50	1,155	0,798	0,798
5	Lunguete	3,6	42	50	50	1,512	1,044	1,044
6	Pescianski	3,25	42	69	31	1,365	1,301	0,584
7	Călărași	3,25	42	55	45	1,365	1,037	0,848
8	Chișinău	2,13	42	50	50	0,895	0,618	0,618
9	Corjeuți	2,5	42	50	50	1,050	0,725	0,725
10	Fernor	3,5	42	48	52	1,470	0,974	1,056
11	Chandler	4,25	42	55	45	1,785	1,356	1,109
Media pe cultură		3,22	42	53	47	1,351	1	0,866

Sursa: Elaborat de autor

Din cele relatate, putem concluziona că în mediu la 1 ha de nuc se înregistrează circa 2,5 t – 3t de deșeuri, deșeuri care printr-o organizare rațională și eficientă a relațiilor de producție din societate, prin aplicarea principiilor economiei circulare pot aduce o serie de beneficii atît agenților economici implicați în activitatea dată, cît și mediului social și natural.

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FREELANCINGUL CA OPORTUNITATE ANTREPRENORIALĂ PENTRU REPUBLICA MOLDOVA

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Abstract. The article analyzes the role of freelance work in the context of labor market reform in the Republic of Moldova, focusing on the implementation of the National Employment Program 2022–2026 and the impact of the "Freelancer Law" that came into force on January 1, 2026. The study highlights the main problems of the labor market, such as informal work and low employment, and examines how the legalization of self-employment contributes to the creation of opportunities for entry into entrepreneurship. Based on statistical data and Romania's experience, the article outlines the profile of freelancers and highlights the potential of this sector for the development of human and

entrepreneurial capital. The comparative analysis shows that freelancing can become an important tool for stimulating employment, reducing the informal economy, and supporting economic growth in the Republic of Moldova.

Keywords: Freelance, labor market, entrepreneurship, self-employment.

Una dintre principalele provocări ale Republicii Moldova în calea sa de dezvoltare economică este legată de piața muncii și Programul Național de Ocupare a Forței de Muncă 2022–2026 reprezintă una din principalele metode prin care se propune efectuarea reformei pieței muncii.

Una din principalele probleme sesizate în acest domeniu este tendința de angajări neoficiale și o ocupare redusă a populației apte de muncă. În scopul creșterii nivelului de ocupare a forței de muncă și de racordare a pieței la noile realități economice, autoritățile Republicii Moldova au pus baza reformelor care vor contribui la realizarea scopului de „ocupare pentru toți” [1].

Programul Național de Ocupare a Forței de Muncă 2022-2026 pune accent pe îmbunătățirea câtorva aspecte semnificative pe piața muncii:

- *Reducerea muncii informale* - prin întreprinderea măsurilor de reglementare a formelor non-standard de muncă și formalizarea activităților economice;
- *Creșterea participării pe piața muncii* - prin implementarea strategiilor ce vizează integrarea femeilor în câmpul muncii, sprijinirea tinerilor și integrarea grupurilor vulnerabile în câmpul muncii;
- *Digitalizarea serviciilor de ocupare* - prin recunoașterea competențelor non-formale și digitalizarea metodelor de livrare a serviciilor;
- *Corelarea competențelor cu cererea pieței* - prin dezvoltarea programelor de formare și învățare continuă și oferirea mai multor oportunități de învățare a competențelor actuale condițiilor pieței.

O reformă importantă în acest sens, care contribuie la realizarea tuturor aspectelor importante propuse de către autorități spre realizare este “Legea Freelancerilor”. Această lege intrată în vigoare de la data de 1 ianuarie 2026, pentru prima dată în istoria Republicii Moldova “freelancerii au un cadru legal separat, simplificat și adaptat realităților muncii independente” [2].

Conform definiției oferite de către Dicționarul Cambridge, **Freelancerul** este “ Persoana care nu este angajată în nici o organizație, dar prestează muncă într-un mod particular pentru diferite organizații” [3].

În contextul legii cu privire la Freelanceri intrată în vigoare în ianuarie 2026, persoana care desfășoară activitatea de freelance mai este numit și “antreprenor independent”. Activitatea independentă vine ca o modalitate actuală, adaptată cerințelor economice actuale ale Republicii Moldova și contribuie la realizarea obiectivelor propuse în cadrul Programul Național de Ocupare a Forței de Muncă 2022-2026.

În Republica Moldova munca neoficială reprezintă aproximativ 22% din totalul persoanelor ocupate conform datelor raportului International Labour Organization. Din aceste persoane, aproximativ 83% sunt implicate în sectorul informal fără un contract legal de desfășurare a activității. Legea cu privire la reglementarea activității independente contribuie la micșorarea numărului de persoane care nu își desfășoară activitatea într-un context legal [4].

Un prim obiectiv propus de către autorități în Programul Național de Ocupare a Forței de Muncă 2022-2026 este *reducerea muncii informale*. Freelancing-ul legalizat se înscrie ideal în scopul acesta, fiind o metodă prin care persoanele care desfășurau activități informale pot să-și legalizeze activitatea. În acest scop, legea cu privire la freelanceri deschide un număr de 40 activități ce se înscriu în categoria activităților independente.

Din această listă fac parte activități reglementate în Clasificatorul Activităților din Economia Moldovei după cum sunt reprezentate în Tabelul 1

Tabelul 1

Lista domeniilor de activitate eligibile pentru activitatea de freelance

Prestări servicii IT și consultanță în tehnologia informației	Activități de editare software	Dezvoltare software la comandă	Activități de administrare pagini web
Activități de administrare pagini web	Servicii de consultanță în comunicare și PR	Servicii de consultanță în comunicare și PR	Activități de arhitectură și design
Fotografie și videografie	Activități cinematografice și multimedia	Activități de editare și publicare	Activități ale portalurilor web și prelucrarea datelor
Activități ale portalurilor web și prelucrarea datelor	Activități ale agențiilor de știri	Consultanță de marketing	Servicii de traducere
Servicii de traducere și interpretariat	Servicii educaționale și de meditații	Servicii de curățenie	Meșteșugărit
Lucrări de instalații tehnico-sanitare și de încălzire	Reparații de echipamente și lucrări tehnice	activități de consultanță financiară	Activități de organizare evenimente
Servicii de îngrijire personală și animală	Prestări servicii pentru activități de recreere și culturale	Servicii de consultanță pentru relații publice	Activități sportive

Sursa: Elaborat în baza Legii privind antreprenorii independenți [5].

Creșterea participării pe piața muncii este asigurată prin legea cu privire la activitatea independentă datorită facilitării accesului într-un mod simplificat la activități reglementate de lege, fiind o rampă de lansare spre antreprenoriat a persoanelor care doresc să desfășoare o activitate, dar au frica de a iniția o afacere sau consideră că este un proces prea complicat.

Datorită procedurii în totalitate online de înregistrare a activității de antreprenor independent, această măsură facilitează realizarea obiectivului autorităților cu privire la ocuparea populației, și anume, *digitalizarea serviciilor de ocupare*. După cum este indicat chiar în ghidul Freelancerilor, “Înregistrarea în calitate de antreprenor independent (freelancer) o faci EXCLUSIV online, gratuit și rapid în doar 5-10 minute” [6].

Nu în ultimul rând, datorită legalizării activității independente, are loc *corelarea competențelor cu cererea pieței*. Așa cum activitatea de freelancer poate fi înregistrată de către elevi, studenți, pensionari, angajați sau funcționari publici și în acest mod facilitând încadrarea în activitate profesională a persoanelor ce prestează servicii corelate cu cererea pieței.

De la lansarea oficială a acestui tip de activitate, doar în prima lună au fost înregistrate aproape 1000 de înregistrări ale angajaților independenți, asta confirmând interesul și necesitatea acestei forme de reglementare ce facilitează intrarea în domeniul antreprenoriatului [6].

Datorită faptului că acest regim este complet online și este benefic pentru toți cetățenii Republicii Moldova care doresc nu doar să rămână la etapa de activitate pe cont propriu, independentă, dar să devină proprietarii unei afaceri ce va oferi locuri de muncă și dezvoltare economică [7].

Așa cum Republica Moldova este la început de cale în domeniul freelance, în schimb în țara vecină, România, această activitate este reglementată și arată un profil specific al persoanelor care se

regăsesc în categoria de freelancer. În România conform datelor Oficiului Național al Recistrului Comerțului, la finalul anului 2025 activa un total de 450 244 societăți care prestează activități independente [9]. Studiul realizat de Statista (2024) arată că aproape jumătate dintre freelancerii români dețin diplomă de licență, iar o proporție semnificativă au studii de master, fapt ce reflectă un nivel ridicat al capitalului uman implicat în activități independente [8].

Analiza experienței României în baza studiului menționat anterior demonstrează faptul că pentru Republica Moldova există un potențial imens de dezvoltare în acest domeniu. Conform raportului Statista Consumer Insights, numărul de freelanceri și persoane angajate pe cont propriu din România sunt reprezentate în special de persoane preponderent mature, fiind dominați de generațiile adulte.

Conform aceluiași raport, aproximativ 55% din totalul persoanelor care lucrează pe cont propriu aparțin generației cu vârsta între 45-65 ani. Asta demonstrează faptul că persoanele care aleg acest tip de activitate sunt persoane mature, cu o experiență profesională bine consolidată [8].

Din punct de vedere a genului persoanelor ce desfășoară activitate de freelance în România, distribuția este relativ uniformă, 53% fiind bărbați și 47% femei. Această distribuție vorbește despre o implicare activă a femeilor în domeniul activităților independente, fiind un mijloc prin care femeile pot fi implicate într-o ocupație oficială [8].

În studiul menționat anterior, ceea ce privește nivelul educațional, se menționează că aproape jumătate dintre freelanceri (48%) dețin studii universitare de licență, iar circa 16% studii de masterat. Această distribuție confirmă faptul că freelancingul în România are un caracter intelectual, iar persoanele implicate în activități independente dețin studii și calificări în domeniul în care activează.

Analiza valorilor personale ale freelancerilor participanți în cadrul acestui studiu afirmă că succesul profesional reprezintă o prioritate majoră în viață. Această orientare spre succes profesional indică caracterul antreprenorial al persoanelor ce practică activitate independentă. În ceea ce privește activitățile recreative, freelancerii sunt mai predispuși decât media populației să practice lectura, călătoriile și activitățile creative, reflectând un stil de viață orientat spre autoeducație și echilibru personal.

Aceste caracteristici arată că activitatea de freelance este specifică persoanelor cu deprinderi necesare pentru a desfășura activitate de antreprenoriat. Chiar dacă marea majoritate a acestora desfășoară activitatea fără a deține o echipă, obiceiurile antreprenoriale confirmă probabilitatea evoluției ulterioare și creșterii afacerii într-o activitate lărgită cu posibilitatea de creștere a investițiilor și formarea locurilor de muncă.

Pentru Republica Moldova experiența României reprezintă o lecție prețioasă, necesară pentru a stimula cât mai multe persoane care practică activitatea independentă neoficial de a alege calea antreprenoriatului independent ca freelancer.

În România conform datelor Oficiului Național al Recistrului Comerțului, la finalul anului 2025 activa un total de 450 244 societăți care prestează activități independente [9].

Republica Moldova, deși se află într-o etapă incipientă, dispune de premise favorabile pentru dezvoltarea acestui sector, inclusiv prin recentul cadru legal, orientarea economiei spre servicii și integrarea progresivă în spațiul european. Experiența României demonstrează că freelancingul poate deveni un vector important al dezvoltării antreprenoriale și al creșterii economice sustenabile.

În scopul dezvoltării cu succes al antreprenoriatului independent în Republica Moldova se recomandă:

- Continuarea campaniei de informare cu privire la avantajele și posibilitățile pentru persoanele care doresc să înceapă primii pași în domeniul antreprenoriatului, într-un mod mai simplificat.
- Dezvoltarea competențelor digitale și antreprenoriale prin implementarea programelor de formare continuă axate pe competențe digitale, management financiar, marketing online și planificare strategică, necesare desfășurării eficiente a activității de freelance.
- Susținerea tranziției de la freelancing la antreprenoriat clasic prin facilitarea dezvoltării afacerilor independente prin programe de incubare, acces la finanțare, consultanță gratuită și simplificarea procedurilor de extindere a activității.



Conferința internațională științifico-practică în onoarea a 35-a aniversării a Universității de Stat Comrat

- Valorificarea bunelor practici internaționale, prin învățarea în baza experienței României și a altor state europene. Aceste bune practici ar trebui analizate și adaptate la contextul Republicii Moldova, în vederea accelerării dezvoltării sectorului activităților independente.

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ВОЗМОЖНОСТИ ТРУДОУСТРОЙСТВА ЛИЦ С ОСОБЫМИ ПОТРЕБНОСТЯМИ: ОТ СОЦИАЛЬНОЙ ПОДДЕРЖКИ К УСТОЙЧИВОЙ ЗАНЯТОСТИ

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Abstract: Employment of individuals with special needs is a critical driver of social inclusion, economic independence, and improved quality of life. Contemporary labor markets are increasingly guided by principles of inclusion, recognizing that persons with disabilities possess substantial labor potential. With appropriate workplace adaptations, assistive technologies, and flexible employment arrangements, individuals with disabilities can become competitive and valued professionals. Government policies and employer-based support mechanisms play a central role in reducing structural barriers to employment and promoting equal access to the labor market. Inclusive

employment not only benefits individuals with disabilities but also contributes to workforce diversity, innovation, and sustainable socio-economic development.

Key words: inclusive employment, persons with disabilities, workplace adaptation, social inclusion, public employment policy

Обзор ситуации

Согласно данным, опубликованным Национальным бюро статистики Республики Молдова, по состоянию на 1 января 2025 года в стране насчитывалось около 160 тыс. человек с инвалидностью, включая 11,4 тыс. детей, что составляет 6,7% населения с постоянным местом жительства [1]. На региональном уровне АТО Гагаузия демонстрирует один из самых высоких показателей по стране - 8,6% населения, что существенно превышает среднереспубликанское значение и отражает концентрацию структурных уязвимостей в регионе.

Важным аспектом человеческой безопасности людей с инвалидностью остаётся уровень денежных выплат и их соотношение с базовыми социально-экономическими показателями. По данным Национальной кассы социального страхования (CNAS), в 2025 году размеры пенсий для детей с инвалидностью составляют: 2291,74 лея при тяжелой степени инвалидности, 2138,96 лея - при выраженной и 1527,83 лея - при средней степени инвалидности [2].

Дополнительно, с июля 2025 года предусмотрена единовременная помощь в размере 5000 леев для лиц с тяжелой инвалидностью, не получающих пенсию по инвалидности, но получающих другие виды пенсий. В АТО Гагаузия предусмотрены единовременные выплаты за в размере 400 лей получили лица с ограниченными возможностями первой группы, а также дети до 18 лет, а также компенсации в отопительный сезон – 400 леев в месяц. С 2026 года вступил в действие закон о Закон АТО Гагаузия №88 «О материальной помощи жителям АТО Гагаузия для оплаты расходов, связанных с получением медицинских услуг» [3].

Однако сопоставление этих выплат с прожиточным минимумом и средней заработной платой демонстрирует их ограниченную компенсаторную функцию. Прожиточный минимум в Республике Молдова в 2025 году составил 3050 леев на человека в месяц, тогда как среднемесячная заработная в среднем по отраслям составила 13 000-14 000 леев. Таким образом, даже максимальный размер пенсии по инвалидности для ребенка покрывает около 20% средней заработной платы, а минимальный размер выплат при средней степени инвалидности – не достигает 50% прожиточного минимума [2].

Методология исследования

Исследование основано на качественном, партисипативном и интерсекциональном методологическом подходе, направленном на анализ барьеров человеческой безопасности, с которыми сталкиваются лица с инвалидностью в АТО Гагаузия. В работе использовались качественные методы сбора данных, позволяющие выявить пересекающиеся физические, институциональные, социальные и культурные ограничения, а также разрыв между формально закрепленными правами и их фактической реализацией. Партисипативный дизайн обеспечил активное вовлечение лиц с инвалидностью как носителей экспертного знания о собственном опыте и потребностях.

Результаты исследований

Представленные ниже статистические данные свидетельствуют о том, что лица с особыми потребностями в Республике Молдова продолжают находиться в структурно неблагоприятном положении как на рынке труда, так и в системе социально-экономических условий жизни. Несмотря на наличие нормативных гарантий и отдельных программ поддержки занятости, инвалидность остаётся фактором системного исключения, влияющим на доступ к работе, доходам, достойным условиям проживания и человеческой безопасности в целом. Представленные данные отражают территориальную, гендерную и возрастную структуру лиц с особыми потребностями в АТО Гагаузия. В целом по автономии численность

данной группы составляет 9 200 человек, из которых 57% проживают в сельской местности, что подчеркивает выраженное сельское измерение инвалидности и уязвимости.

Таблица 1. Количество лиц с подтвержденной инвалидностью в разрезе районов АТО Гагаузия, чел.

Населенный пункт	Всего лиц с особыми потребностями	Жен	Муж	% женского пола	Распределение по возрасту, лет				
					0-16	16-29	30-54	55-64	65+
Комратский район, в т.ч. проживающие в сельск. местности, чел.	3971 2531	2348	1623	59	346	689	1100	951	885
% в сельской местности	64%								
Чадыр-Лунгский район, в т.ч. проживающие в сельской местности	4223 2241	2407	1816	60	332	732	643	1256	1260
% в сельской местности	53								
Вулканештский район, в т.ч. проживающие в сельской местности	1006 469	441	565	44	58	74	356	252	266
% в сельской местности	46								
ИТОГО АТО Гагаузия в т.ч. проживающие в сельской местности	9200 5241	5196	4004	56	736	1495	2099	2459	2411
% в сельской местности	57								

Источник: Таблица предоставлена территориальными подразделениями CNAS

По районам наибольшая численность лиц с особыми потребностями зафиксирована в Чадыр-Лунгском районе (4 223 чел.) и Комратском районе (3 971 чел.), тогда как в Вулканештском районе показатель значительно ниже (1 006 чел.). При этом доля сельского населения особенно высока в Комратском районе (64%), что указывает на повышенную нагрузку на сельскую социальную и медицинскую инфраструктуру.

Гендерная структура демонстрирует преобладание женщин во всех районах, особенно в Чадыр-Лунгском (60%) и Комратском (59%) районах, что в целом соответствует демографическим и возрастным особенностям региона. Исключением является Вулканештский район, где наблюдается относительное преобладание мужчин (56%), что может быть связано со спецификой занятости и миграционных процессов.

Возрастное распределение показывает, что основная концентрация лиц с особыми потребностями приходится на возрастные группы 55–64 лет и 65+, как на уровне районов, так и по АТО в целом. Это подтверждает устойчивую связь инвалидности с возрастом и хроническими заболеваниями. В то же время значительная численность в группе 30–54 лет указывает на наличие социально и экономически активного населения с особыми потребностями, что усиливает актуальность мер по поддержке занятости, реабилитации и адаптации рабочих мест.

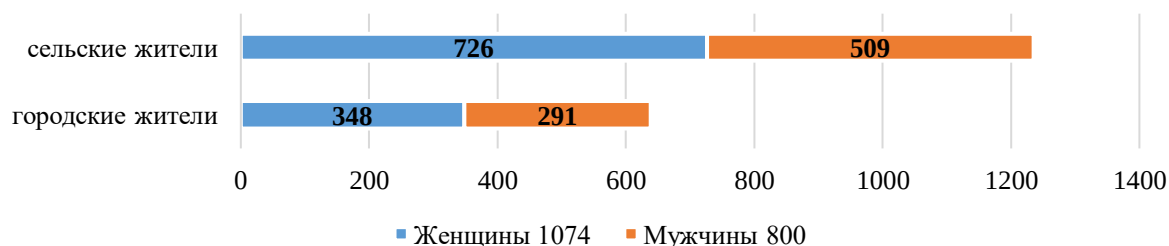


Рисунок 1. Лица в возрасте 18 лет и старше, признанные с ограниченными возможностями первоначально и повторно: гендерная структура.

Источник: составлено автором на базе [2].

Гендерная структура демонстрирует относительное преобладание женщин среди лиц с установленными ограничениями возможностей: 1074 женщины против 800 мужчин. При этом как в городской, так и в сельской местности численность женщин превышает численность мужчин. Данные подчеркивают необходимость применения гендерно-чувствительного подхода при планировании мер социальной защиты, реабилитации и поддержки занятости. Структура функциональных нарушений свидетельствует о доминировании ограничений, связанных с опорно-двигательной системой и мобильностью. Наиболее многочисленной категорией являются нарушения нейромышечной, скелетной и связанных с движением функций - 701 человек, что указывает на значительную потребность в услугах физической реабилитации, ассистивных средствах, адаптации инфраструктуры и доступном транспорте.



Рисунок 2. Лица в возрасте 18 лет и старше, признанные с ограниченными возможностями по типу функциональных нарушений.

Источник: составлено автором на базе [2].

Существенную долю также составляют нарушения функций сердечно-сосудистой, дыхательной, иммунной систем и крови (397 человек), а также пищеварительной и эндокринной систем и нарушений обмена веществ (393 человека), что отражает высокую распространенность хронических неинфекционных заболеваний. Нарушения сенсорных функций представлены в меньшей степени: нарушения зрения зафиксированы у 69 человек, слуха - у 24 человек, а нарушения умственных функций - у 95 человек. В целом представленные данные подтверждают, что проблема инвалидности в АТО Гагаузия имеет выраженное сельское измерение и в значительной степени связана с хроническими заболеваниями и нарушениями мобильности.

Данный факт подчеркивает необходимость комплексного подхода, ориентированного на профилактику, раннюю диагностику, развитие реабилитационных услуг на местном уровне, а также усиление межсекторного взаимодействия между органами власти, медицинскими учреждениями и организациями гражданского общества. Уровень участия лиц с особыми потребностями (ЛсОП) в рабочей силе остаётся крайне низким. В 2024 году лишь 18,4% лиц с особыми потребностями (ЛсОП) участвовали в рабочей силе, что более чем в два раза ниже показателя среди лиц без инвалидности (48,1%) [4].

Данные указывают не только на индивидуальные ограничения, связанные с состоянием здоровья, но прежде всего на структурные барьеры - недоступную инфраструктуру, недостаточную адаптацию рабочих мест, слабое развитие гибких форм занятости и ограниченную готовность работодателей к инклюзивным практикам.

Гендерные различия усугубляют ситуацию: женщины с инвалидностью демонстрируют ещё более низкий уровень участия в рабочей силе (16,9% против 19,6% у мужчин), что отражает пересечение инвалидности с гендерным неравенством и традиционными ролями ухода. Территориальный разрыв также является значимым: в городах участие ЛсОП в рабочей силе достигает 25,0%, тогда как в сельской местности - лишь 15,0%, что подтверждает влияние транспортной недоступности, ограниченного числа рабочих мест и слабой инфраструктуры услуг на возможности экономической активности [2].

- **«Скрытое исключение» за пределами рынка труда**

Относительно умеренный уровень официальной безработицы среди ЛсОП (4,9%) не должен вводить в заблуждение. Он отражает не столько успешную интеграцию, сколько массовое выбытие людей с инвалидностью из рабочей силы. Значительная часть ЛсОП не регистрируется как безработные и не ищет работу, поскольку не верит в реальную возможность трудоустройства или сталкивается с системными барьерами на ранних этапах. Показательно, что в городской среде уровень безработицы среди ЛсОП выше (7,2%), чем в сельской (3,0%), что может быть связано с большей формализацией рынка труда и активным поиском работы в городах, тогда как в сельской местности преобладают неформальные или семейные формы занятости [2].

- **Крайне низкий уровень занятости**

Даже среди занятых ЛсОП наблюдаются **качественные ограничения занятости**: более короткая рабочая неделя (37,8 часа против 39,5); высокая доля низкоквалифицированных рабочих мест (26,0%, почти вдвое выше, чем у лиц без инвалидности). Это указывает на ограниченную вертикальную мобильность и слабый доступ к более продуктивным и высокооплачиваемым видам деятельности.

- **Ограниченная эффективность активных мер занятости**

Данные Агентства занятости показывают, что из 0,8 тыс. зарегистрированных безработных с инвалидностью трудоустроены были лишь 229 человек (27,9%). Хотя этот показатель свидетельствует о частичной результативности активных мер, он также подчеркивает их ограниченный охват и масштаб, особенно для людей с тяжелой и выраженной инвалидностью, которые составляют более трети зарегистрированных безработных. Таким образом, существующие меры занятости носят преимущественно компенсаторный, а не трансформационный характер и не меняют структурные условия доступа к рынку труда.

В Республике Молдова действует ряд механизмов, направленных на расширение возможностей занятости лиц с инвалидностью. Трудоустройство лиц с особыми потребностями в Республике Молдова поддерживается не только на уровне деклараций, но и через конкретные финансовые и правовые инструменты, закреплённые в действующем законодательстве. Ключевым нормативным основанием является статья 38 Закона № 105 от 14.06.2018 о содействии занятости и страховании от безработицы, а также Постановление Правительства № 1276/2018, которым утвержден порядок предоставления субсидий на создание и адаптацию рабочих мест для лиц с инвалидностью [5, 6].

- **Система субсидирования создания и адаптации рабочих мест**

Одним из ключевых инструментов является система субсидирования создания и адаптации рабочих мест, предусмотренная законодательством о содействии занятости. Государство компенсирует работодателям часть расходов, связанных с приобретением оборудования, адаптацией рабочего пространства, использованием вспомогательных технологий или наймом вспомогательного персонала [9]. Размер компенсации может достигать 50–75 % понесенных затрат в зависимости от степени инвалидности работника, что существенно снижает финансовые риски для работодателей и стимулирует их к найму людей с особыми потребностями. При этом размер субсидии не может превышать сумму 10 средних месячных заработных плат по экономике за предыдущий год за одно рабочее место, что делает поддержку предсказуемой и прозрачной для бюджета и бизнеса.

Важным направлением является адаптация существующих рабочих мест, а не только создание новых. В случае адаптации рабочего места средства могут быть направлены на оборудование доступа (пандусы, специальные рабочие поверхности, вспомогательные устройства); адаптацию рабочего пространства под индивидуальные потребности; найм вспомогательного персонала. Это позволяет интегрировать лиц с инвалидностью в уже функционирующие коллективы, используя гибкий график работы, удаленную занятость, частичную занятость или перераспределение функциональных обязанностей. Особенно перспективными являются сферы услуг, административной поддержки, ИТ, образования, ремесленного и социального предпринимательства, где ключевую роль играют навыки, а не физические возможности.

На 2026 год Национальное агентство занятости предусмотрело 54,6 млн. леев на реализацию данной меры, что позволит трудоустроить около 35 безработных лиц с инвалидностью в рамках субсидируемых рабочих мест [9]. Данные наглядно демонстрируют, что данный механизм работает, но при этом остаётся ограниченным объёмом финансирования и требует дальнейшего расширения. Важно подчеркнуть, что трудоустройство лиц с особыми потребностями возможно не только в формате полного рабочего дня. Законодательство допускает частичную занятость; гибкий график; адаптацию должностных обязанностей; удаленную форму работы.

Отдельное значение имеет сопровождаемая занятость, при которой человек с инвалидностью получает поддержку социального ассистента, наставника или консультанта по трудоустройству. Такой подход особенно эффективен для лиц с интеллектуальными, психосоциальными нарушениями и расстройствами аутистического спектра, позволяя им постепенно адаптироваться к рабочей среде и сохранять устойчивую занятость.

Выводы

Для самих лиц с особыми потребностями важно знать, что трудоустройство возможно не только через стандартный рынок труда, но и через социальные предприятия; защищенные рабочие места; программы профессионального обучения и переквалификацию; удаленную и проектную занятость. Роль органов местного публичного управления и ресурсных центров заключается в информировании, профессиональной ориентации, сопровождении и посредничестве между работодателями и соискателями с инвалидностью. Именно на местном уровне формируется практическая доступность информации о вакансиях, субсидиях и услугах поддержки.

Таким образом, трудоустройство лиц с особыми потребностями - это не благотворительность, а инвестиция в человеческий капитал и устойчивое развитие общества. При сочетании государственной поддержки, ответственного подхода работодателей и активного участия самих людей с инвалидностью возможно формирование инклюзивного рынка труда, в котором каждый человек имеет реальный шанс реализовать свой потенциал.

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УДК 330.3

ЭКОНОМИЧЕСКАЯ БЕЗОПАСНОСТЬ КАК ВОПЛОЩЕНИЕ НАЦИОНАЛЬНЫХ ЭКОНОМИЧЕСКИХ ИНТЕРЕСОВ

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In this article, the problem of economic security is viewed through the prism of national interests, which is the ability of a state to protect its national economic interests in specific historical conditions.

In the current conditions of innovative transformations, the system of ensuring the security of economic development through the system of innovative security is theoretically and methodologically substantiated.

Keywords: economy, interests, relations, threats, security, innovation, stability, sustainability

Началом формирования современных *теоретических положений экономической безопасности* с позиции обеспечения *национальных интересов* является, разработка концептуальных положений Гансом Моргентау [18] (1948 г) национального интереса и его предложения о формировании и проведении политики безопасности государства на основе этих интересов – центрального (постоянный) и второстепенного (изменчивый). Данное положение, по его мнению, это то, что является стабильной основой международной политики государства, так как она основана на своеобразии географического положения государства и вытекающих из этого особенностей его *экономического*, политического и культурного развития. Предложение Г. Моргентау рассматривать проблему безопасности через призму национальных интересов позволило в понятие национальной безопасности вкладывать все более широкое содержание, суть которого сводится к способности государства защитить национальные ценности и интересы, в том числе и *экономические* в конкретных исторических внешних и внутренних условиях. На этом теоретическом положении была сформирована концепция политического реализма, представителями которой являются известные ученые: Г. Киссинджер, Г. Моргентау, Дж. Кеннан, У. Липпман, Р. Арон, Б. Бузан и др.

Современный подход к теории национальной безопасности и проблемам по ее обеспечению в контексте безопасности экономического развития характерен для

исследований ряда западных ученых. Так, Б. Бузан в своей работе «Народы, государства и страх. Повестка дня для исследований международной безопасности в эпоху после холодной войны» [15] отмечает, что почти все государства, по его мнению, «подвержены экономическим угрозам <...> страдают от политической и социальной нестабильности» [15]. Особенно это характерно для государств, которые относятся к малым странам и в то же время к слабым государством, их уязвимость в этом случае неограниченна, как изнутри, так и снаружи [15]. Данный вывод ярко подтверждается и практикой экономического развития Республики Молдова.

Важно отметить современное отношение к национальным интересам в условиях глобального и регионального развития и стремления вступления в различные региональные политические и экономические блоки. Конкретно об этом пишет Р. Уллман в своей работе «Переосмысление безопасности», который предлагает рассматривать безопасность в зависимости от ценностей [16]. В современных условиях размывания идентичности, сохранении и защите ценностей и культурных традиций и заключается национальный интерес государств.

Причем, в теории национальной безопасности *экономическая безопасность* является базисом для устойчивого социально-экономического развития, а «...экономические интересы являются исходным пунктом для определения всех других форм интересов» [4]. В этом случае, экономические интересы и экономические отношения как объекты экономической безопасности в теоретическом плане раскрывают сущность экономической безопасности. В практическом плане они реализуются в многообразных формах жизнедеятельности человека и общества, их экономических отношений. Поэтому вычленение *объектов обеспечения экономической безопасности (объектов защиты)* позволяет в теоретическом плане учесть все многообразие функционирования экономических отношений и реализации экономических интересов, в практическом плане, перевести экономический анализ в плоскость исследования конкретных форм, проявлений механизмов обеспечения экономической безопасности [9, с. 21].

Современный подход к теории национальной безопасности и проблемам по ее обеспечению, в том числе и в экономической сфере характерен для исследований ряда западных ученых (Ричард Уллман, Барри Бузан, Дэвид Болдуина, Хедли Булл, Кен Бут, Дж. А. Тикнер, Джессика Такман Мэтьюс, Стивен М. Уолт и др.) [16], Каплан Д. Роберт [7], Киссинджер Генри, Хендерсон Ч., Косиенковски Марчин, Шрайбер Уильям [8].

Следует отметить, что до недавнего времени проблемы экономической безопасности с позиции национальных интересов были предметом рассмотрения в основном западных ученых и специалистов, в первую очередь США. При определении понятия «экономическая безопасность» у ученых западных стран преобладает мнение, что его содержание отражает такое состояние экономики страны, которое обеспечивает способность противостоять неблагоприятным внешнеэкономическим воздействиям. Экономическая безопасность ими раскрывается через такие категории как стабильность, устойчивость; конкурентоспособность и эффективность, саморазвитие и прогресс, которые должны обеспечить прогрессивное развитие государств в соответствии с национальными интересами и приоритетами.

Существенный вклад в понимание сущности, структуры экономической безопасности внесли Altins von Geusau, Westing A.H., Goodwin C.D., Cable V., DeSouza P.J.

В последние годы экономическую безопасность исследовали и ученые постсоветского пространства. Так, безопасность ими трактуется как «защищенность от «неловких» управленческих решений» [13], «надежность социально-экономической системы и защиту экономических интересов» [6], «возможность разрабатывать и реализовать независимую экономическую политику» [1, С. 771–776], «высокий уровень национальной безопасности и конкурентоспособность экономики» [5], «обеспечение социальной и политической стабильности в обществе» [14]. Данные и другие определения объединяют общие характеристики экономической безопасности как «состояние экономики», «защищенность»,

«устойчивость», «надежность», выделяя из этого ряда устойчивость экономической системы к воздействию внешних и внутренних факторов, [17с. 5–18.] а устойчивость, как известно, требует развития экономической системы и устойчивых экономических отношений.

На текущий момент в научной литературе существует множество и других определений экономической безопасности, основанных на различном видении развития объекта исследования: через «*интересы*» (национальные, государственные, жизненно-важные), [6] через «угрозы» экономической безопасности государства [26], через категории стабильности, устойчивости, способности к саморазвитию и прогрессу [1].

Важное место занимает проблематика национальной безопасности в экономической сфере в молдавской науке. Стратан А., Белостечник Гр., Бенюк В., Грибинча А., Рошка П., Киркэ С., Киструга Б., Молдовану Д., Мошняга В., Тэосэ В., Руснак Г., Сака В., Цуркан В., Carolina Bugaian и др. исследовали проблемы региональной интеграции, инновационного развития, экономического сотрудничества, в контексте повышения эффективности реализации национальных интересов. В Молдове разработана методика количественной оценки экономической безопасности малых государств, проведено сравнительное изучение экономической безопасности стран с переходной экономикой.

Вместе с тем, несмотря на существующие различные подходы к пониманию экономической безопасности анализ, проведенный нами сути определений и подходов к экономической безопасности, позволил нам обобщить и систематизировать теоретическую суть экономической безопасности. и выделить в ней пять главных обобщающих понятий, в основе которых лежат следующие ключевые составляющие безопасности:

1. Угрозы – действия (экономические, социальные, политические, природные), направленные на ущемление жизненно важных экономических интересов личности, общества и государства.

2. Экономические интересы – национальные, государственные, жизненно-важные, важные.

3. Независимость. Национальная экономика должна быть независима от внешнего воздействия и экономической политики других стран.

4. Конкурентоспособность национальной экономики на национальном, региональном и глобальном уровнях.

5. Устойчивость, в первую очередь, национальной экономики и социально-экономического развития.

В теории безопасности, такие понятия как «угрозы», «вызовы», «риски», «опасности» являются фундаментальными системными понятиями экономической безопасности и проявляются они когда государство начинает реализовывать свои национальные интересы. Способность государства отстаивать свои экономические интересы зависит от многих факторов: социально-экономического положения, политической системы, истории, культуры, руководства страны, характера взаимоотношений с другими государствами. Следует понимать теоретические отличия между этими категориями. Угроза – реально существующая опасность нанесения вреда; вызов – объективно формирующаяся опасность нанесения вреда; риск – зарождающаяся опасность нанесения вреда.

Важным для практических действий является возможность нейтрализации угроз экономической безопасности, которые в процессе обеспечения экономической безопасности реализуется во всех сферы экономической системы: производственной, продовольственной, внешнеэкономической финансовой, социальной, инфраструктурной, общественных отношений а в современных условиях перехода на инновационный путь развития – в инновационной сфере. Теоретически важно определить значение каждой из них как сферы сосредоточения приоритетных усилий по обеспечению экономической безопасности. Задача национальной политики заключается в том, чтобы отразить объективно наиболее опасные угрозы, не распыляя ограниченные ресурсы для противодействия абсолютно всем угрозам. Вопрос о выборе приоритетов в защите национальной экономической безопасности

определяется, прежде всего, тем, к какой группе принадлежит конкретная страна: более развитые страны (страны ядра капиталистической мир-экономики) или менее развитые (страны периферии и полупериферии).

С того времени, как выдающийся ученый Й. Шумпетер предоставил очень убедительные научные аргументы о принципах формирования инноваций, которые легли в основу теории формирования инновационной экономики, стало принято считать, что инновации являются основными компонентами «умной» экономики Европейского Союза. Более того, европейская политика XXI века ставит акцент на инновации в сфере малого и среднего бизнеса, а социально-политическая сфера уже не рассматривается только лишь с позиции реализации программ поддержки и продвижения этих инноваций, а представляется субъектом и объектом инновационного развития – как концепция, запустившая необратимый процесс положительной трансформации национальной безопасности в экономике.

В различные аспекты теоретического обоснования инновационной экономики, которые легли в основу теории инновационной безопасности как нового вида экономической безопасности в условиях формирования инновационной экономики большой вклад внесли следующие ученые: Н.Д. Кондратьев, П. Друкер, Д. Норт, М. Вебер [3], У. Бек [2], Э. Тоффлер и др.

В их работах диалектически переплетаются экономические науки, политология, социология, международные отношения, традиционные и современные научные школы, теории развития экономики, влияние инновационно-трансформационных процессов на международные отношения и инновационную безопасность. В различных коннотациях исследователи подчеркивают глубокие изменения в мировой экономике, в связи с процессами четвертой промышленной революции, развитием невиданных доселе информационных технологий.

Как показывают исследования профессора В. А. Саковича «Инновационная экономика – это экономика общества, основанного на знаниях, инновациях, позитивное принятие новых идей, систем и технологий и их реализация в различных сферах экономической деятельности. Это тип экономики, основанный на потоке инноваций, постоянном технологическом совершенстве, производстве и экспорте высокотехнологичной продукции и технологий» [11, 12].

В свою очередь, опыт перехода к инновационной экономике, его результаты и опыт обеспечения экономической безопасности данного перехода исторически и экономически детерминированы и специфичны для каждой страны. Особое значение имеют место и роль государства, а также основные механизмы государственного регулирования. В этом процессе весьма важным является обеспечение безопасности инновационного развития. Для этого в рамках системы национальной безопасности стали формироваться во многих государствах система инновационной безопасности. «Инновационная безопасность – это совокупность условий и факторов, которые обеспечивают генерацию инновационных идей, инновационное развитие и саморазвитие, конкурентоспособность результатов науки, технологий, инновационной продукции, независимость национальной экономики, управление ее инновационным развитием, достижение международной конкурентоспособности, при наиболее неблагоприятных внешних и внутренних условиях развития» [11].

Следует отметить, что все разновидности концептов обеспечения инновационной безопасности в условиях инновационного развития, а также значение инновационной безопасности как фактора обеспечения национальной безопасности в инновационно-экономической сфере отражены в совокупности в ряде статей и монографий профессора В. А. Саковича [11,12]. Данный разрез научной литературы, отражающий теоретические аспекты предмета исследования, содержит и ряд методологических элементов. Теоретическая ценность этих работ для исследователей позволяет лучше понимать значение инновационной безопасности в современных условиях инновационных преобразований в качестве основного

элемента системы национальной безопасности, функционирование которой проявляется двояко: с одной стороны она обеспечивает устойчивость экономики, с другой является основным элементом инновационных преобразований и инновационного развития.

В связи с этим, устойчивое и безопасное развитие Республики Молдова в рамках категорий экономической безопасности в значительной степени зависит от того, насколько страна сможет вписаться в экономические и инновационные процессы ЕС. Очевидно, что национальные интересы Республики Молдова, связанные с экономической безопасностью, выходом из экономического кризиса, устойчивым экономическим ростом и значительным повышением благосостояния народа невозможно реализовывать без интеграции в ЕС, с его неоспоримой интеллектуальной и экономической мощью, существующей системой экономической безопасности, перспективными планами и программами инновационного развития.

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АНАЛИЗ СОЦИАЛЬНО-ЭКОНОМИЧЕСКИХ ДЕТЕРМИНАНТ УДОВЛЕТВОРЕННОСТИ ЖИЗНЬЮ В КОНТЕКСТЕ УСТОЙЧИВОГО РАЗВИТИЯ

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Abstract. The article substantiates the argument that subjective well-being represents an important integrative indicator of quality of life and can be regarded as a significant measure of sustainable socio-economic development. Based on the methodology of the World Happiness Report, the study analyzes the dynamics of the Republic of Moldova's position in the international happiness rankings over the period 2011–2024, as well as the contribution of selected economic, social, and institutional factors to the formation of life satisfaction among the population. Particular attention is paid to the relationship between material and non-material components in achieving and sustaining levels of happiness.

Keywords: happiness economy, subjective well-being, sustainable development, life satisfaction, quality of life, GDP per capita, rationality, correlation analysis.

Экономическая теория широко оперирует понятием рациональности в описании поведения субъектов хозяйствования. Данный исходный теоретический посыл, вне сомнения, имеет принципиальное значение для понимания сущности экономических процессов и явлений, поскольку позволяет формализовать поведение экономических агентов, упростить сложную социально-экономическую реальность, построить модели выбора и сделать экономические процессы объяснимыми и предсказуемыми. Справедливо в этом отношении мнение И.Шавкуновой, отметившей, что именно рациональность отделяет экономическое действие от неэкономического, и, по сути, понятие экономического тождественно рациональному [6, с.290].

Максимизация полезности как центральная категория рациональности может рассматриваться в контексте выбора, направленного на повышение ожидаемой удовлетворенности экономического агента. Вместе с тем концепт удовлетворенности носит междисциплинарный характер и предполагает, помимо полезности, включение иных – не только экономических – компонентов. Следует отметить, что в современной экономической науке происходит переосмысление концепции рациональности, выражающееся в переходе к моделям ограниченной и процедурной рациональности, а также в интеграции положений экономики, социологии, психологии и других наук для более полного осмысления моделей принятия решений. В этом контексте особое внимание привлекают исследования на стыке различных областей знаний, в частности, работы в рамках поведенческой экономики и экономики счастья [1].

Расширение трактовки рациональности обуславливает смещение фокуса исследований от результатов рационального выбора в узком экономическом смысле к более комплексным характеристикам индивидуального благополучия. Отсюда актуально обращение к понятию удовлетворенности жизнью как интегральному показателю субъективной оценки индивидом собственной жизненной ситуации и достигнутого качества жизни.

Отметим, что качество жизни человека является объектом исследования с позиции различных подходов – философского, социологического, экономического, экологического и медицинского, что подтверждает сложность и многоаспектность данной категории. Этим и

обусловлена множественность показателей оценки качества жизни, используемых в современных исследованиях. Так, Д.Плетнев отмечает, что «для определения качества жизни необходимо учитывать как объективные показатели — условия жизни общества, так и субъективные оценки самого общества в целом или индивида в частности — степень удовлетворения потребностей (материальных и духовных), выраженная сквозь призму восприятия населением, обществом, человеком собственного положения» [5, с.25]. Н.Лазаревич полагает, что «основными характеристиками качества жизни ... выступают удовлетворенность ей, полнота реализации человеком своего внутреннего потенциала, переживания по поводу процесса и результата своего бытия» [4, с.172]. Важно подчеркнуть, что качество жизни существенно шире своей материальной составляющей, поскольку отражает не только экономические, но и социокультурные, психологические, экологические аспекты жизнедеятельности человека.

В этом контексте качество жизни тесно связано с устойчивостью развития, одновременно выступая как предпосылка долгосрочной стабильности общества и как индикатор успешности реализации принципов устойчивого развития. Оно отражает реальное благополучие населения и результативность экономической и социальной политики, связывая стратегические цели устойчивого развития с достижением конкретных показателей – уровня здоровья, образования, условий жизни, доступа к ресурсам. Устойчивое развитие ориентировано на обеспечение сбалансированного единства экономического, экологического и социального благополучия общества в долгосрочной перспективе, что, в свою очередь, способствует повышению качества жизни и росту удовлетворенности ею.

На наш взгляд, в этой связи особое значение приобретают исследования, в которых оценка результатов социально-экономического развития осуществляется на основе комплексной интеграции объективных показателей и субъективных оценок благополучия. Представляется, что одним из таких подходов, фокусирующихся на анализе трансформации экономического прогресса в повышение качества жизни людей и осознаваемое ими благополучие, выступают исследования уровня счастья. Концепция счастья рассматривается как интегральный показатель субъективного благополучия и важный инструмент оценки эффективности устойчивого социально-экономического развития. Стоит отметить, что термин «счастье» в контексте исследований применяется достаточно условно, более точно следует употреблять термин субъективного самоощущения удовлетворенности жизнью, субъективного благополучия, поскольку речь идет об использовании методик опроса, основанных на субъективной оценке индивидом собственного восприятия изучаемых показателей. Подчеркнем, что в рамках данной статьи понятия «счастье», «удовлетворённость жизнью» и «субъективное благополучие» используются как методологически близкие и соотносятся с показателем life evaluation, применяемым в World Happiness Report.

Начиная с 2012 года, ежегодно публикуется отчет об исследовании уровня счастья и составляется рейтинг стран мира по индексу счастья [2]. Он наглядно демонстрирует достижения социально-экономической политики государств в способности обеспечить своим жителям определенный уровень качества жизни и удовлетворенности ею, служит ориентиром в достижении целей устойчивого развития и благосостояния общества. Методика исследования основана на проведении опросов общественного мнения, при которых респонденты оценивают качество и характеристики собственной жизненной ситуации, определяющей степень их удовлетворенности жизнью. На наш взгляд, значимым является то, что методология оценки счастья базируется на применении комплексного подхода, в котором осуществляется интеграция когнитивных, эмоциональных и поведенческих показателей. Качество жизни и уровень благополучия населения характеризуются через призму субъективной оценки жизни, эмоциональное состояние человека, воздействие социальных и институциональных факторов.

Вызывает интерес исследование соотношения материальной и нематериальной составляющих ощущения удовлетворенности жизнью. Для определения этой взаимосвязи

нами были рассчитаны коэффициенты ранговой корреляции Спирмена между показателями ВВП на душу населения, выраженного в долларах США по паритету покупательной способности, и индексом счастья по итогам 2024 года. Были получены следующие результаты. Коэффициент корреляции между указанными выше величинами, рассчитанный на базе показателей по 147 странам мирового хозяйства составил 0,821. Это значение характеризует наличие высокой положительной связи между экономическим благополучием и удовлетворенностью жизнью. Однако значение того же коэффициента, но рассчитанного на основе данных, характеризующих страны Европейского союза, составил 0,779, что значительно ниже показателя, характеризующего мировое сообщество в целом [3, с. 665-666].

На наш взгляд, причины подобной разницы обусловлены различиями в уровнях экономического и социального развития рассматриваемых совокупностей стран. В мировом рейтинге счастья страны ЕС занимают в большинстве случаев достаточно высокие позиции. В пятерке самых счастливых государств в 2025 году 4 позиции принадлежат членам ЕС, а Финляндия признается лидером рейтинга восьмой год подряд. Зависимость же субъективного уровня счастья и экономического благосостояния носит нелинейный характер. Так, рост ВВП на душу населения на начальных этапах способствует значительному увеличению индекса счастья. Однако при достижении высоких значений ВВП наблюдается замедление темпа роста субъективного благополучия, что указывает на наличие эффекта убывающей отдачи и демонстрирует действие парадокса Истерлина. Это позволяет сделать вывод о том, что экономические факторы важны для счастья лишь до определённого уровня, после чего большую роль начинают играть нематериальные параметры качества жизни.

Полученное значение коэффициента детерминации ($R^2 = 0.6354$), свидетельствует о том, что около 63,5% вариации уровня субъективного благополучия может быть объяснено уровнем экономического благосостояния в странах ЕС. Это указывает на существенную, но не исключительную роль ВВП как фактора, влияющего на восприятие счастья населением. Влияние неэкономических факторов - социальных отношений, свободы выбора, доверия к институтам, уровня образования, здоровье и др. для государств ЕС также существенно.

Для стран Европейского Союза характерно, что, в диапазоне до приблизительно \$60 000–\$80 000 наблюдается рост уровня счастья по мере увеличения ВВП, однако после достижения данного порога дальнейшее увеличение доходов не приводит к значительному повышению субъективного благополучия. Таким образом, можно заключить, что уровень удовлетворенности жизнью растет с увеличением доходов, но после определённого порога рост замедляется, что, в свою очередь, подтверждает ряд концепций поведенческой экономики.

Рассмотрим, какие факторы повлияли на оценку удовлетворенности жизнью в Республике Молдова. Исходные для анализа данные представлены в таблице 1, в которой продемонстрирована динамика оцениваемых показателей с 2011 по 2024 годы. Представленные данные позволяют оценить динамику интегрального показателя оценки удовлетворенности жизнью и вклад отдельных составляющих в ощущение субъективного благополучия жителей Республики Молдова.

Оценка жизни – субъективная оценка респондентами собственной жизни в целом – оценивается с помощью шкалы Кантрила. Этот показатель рейтинга счастья является ключевым. Он отражает не текущее эмоциональное состояние респондента, а дает осознанную, когнитивную оценку жизни. Можно заметить, что в Республике Молдова на протяжении рассматриваемого периода значение индекса счастья колебалось в пределах 5,3–5,9 баллов. Это свидетельствует об относительной стабильности восприятия счастья населением страны. Если говорить о международных мерках, то в данном диапазоне находится большое количество стран, это примерно средний уровень удовлетворенности жизнью. Для сравнения, индекс счастья самой благополучной по данному критерию страны – Финляндии – составил в 2024 году 7,736, а самой несчастливой страны – Афганистана – значение показателя составило 1,364.

Таблица 1. Позиция Республики Молдова в рейтинге счастья за период с 2011 по 2024 годы

год	мес то в рей тин ге сча стья	оценк а жизни	позиция в рейтинге по показателю											
			нер аве нст во	соц иал ьна я под дер жк а	ВВ П над уш у нас еле ния	ожид аемая прод олжи тельн ость здоров ой жизни	свобо да жизн енног о выбо ра	щедр ость	восп рият ие корр упции	поло жите льны е эмоц ии	отри цате льн ые эмоц ии	по же ртв ова ния	вол онтер ство	по мо щ ь нез нак ом цу
2011	75	5,305	77	52	88	87	107	87	132	106	107	87	70	90
2012	53	5,791	60	71	90	86	105	73	125	98	103	73	62	98
2014	52	5,889	40	82	90	83	111	103	126	115	70	103	89	116
2015	55	5,897	22	65	87	87	118	99	127	111	75	99	86	118
2016	56	5,838	41	72	85	81	129	76	130	106	72	76	77	107
2017	67	5,640	44	71	87	77	138	77	135	114	60	77	109	101
2018	71	5,529	48	46	83	76	59	78	131	102	59	78	115	66
2019	70	5,608	72	84	81	76	81	85	119	101	63	85	105	81
2020	65	5,766	44	49	72	70	42	79	108	49	42	79	66	12
2021	62	5,857	51	44	66	81	48	95	97	81	60	95	103	39
2022	63	5,819	75	80	73	81	57	94	122	115	69	94	111	43
2023	71	5,816	64	63	75	81	59	126	110	108	54	126	119	90
2024	80	5,819	60	72	70	81	51	116	125	93	78	116	121	78

Составлено автором публикации по данным World Happiness Report. Режим доступа: <https://data.worldhappiness.report/table>.

Изменения же позиции Молдовы в рейтинге стран (самое высокое 52 место в 2014 году, самое низкое – 80 место – в 2024 году) характеризуют ситуацию, при которой изменение абсолютного уровня удовлетворенности жизнью менее значительно, чем положение страны относительно других национальных экономик. На наш взгляд, подобные колебания рейтинга связаны с более существенными изменениями, произошедшими в других странах, что привело к их подъему в данном списке относительно положения Республики Молдова. Так, например, за два последних года позиция Молдовы в рейтинге счастья переместилась вниз на 17 пунктов – страна занимала 63 строку рейтинга в 2022 году, а в 2024 году переместилась на 80 место. При этом значения индекса счастья в 2022 и 2024 году совпадают и составляют 5,819, разница с 2023 годом незначительна (0,003 балла). Действительно, в диапазоне значений интегрального показателя 5,8-6,0 находится 19 стран из 147 стран рейтинга (почти 13%), поэтому малейшие колебания оценок отражаются в гораздо большей степени на относительной позиции страны в рейтинге.

Проанализируем влияние экономической составляющей на восприятие удовлетворенности жизнью. В рассматриваемой методологии показатель ВВП на душу населения выступает объективным экономическим фактором обеспечения благополучия общества. По приведенным в таблице 1 данным можно заметить, что на протяжении всего периода ВВП на душу населения занимает позиции рейтинга гораздо более низкие, чем место Молдовы в страновом рейтинге счастья. Его значения находятся в диапазоне 81-90 позиции в период с 2011 по 2019 годы, лишь на протяжении последних 5 лет по данному критерию позиция страны несколько улучшилась. Такая динамика подтверждает наличие структурных

ограничений экономического развития Республики Молдова. С одной стороны, экономический фактор является одним из слабых компонентов в формировании удовлетворенности жизнью в нашей стране. С другой стороны, сравнительно более высокие оценки жизни при относительно низком уровне ВВП на душу населения подтверждают приведенные выше расчеты корреляции между индексом счастья и экономическим благополучием – объяснение уровня счастья не ограничивается только экономическими показателями развития общества.

Следующий показатель, условно называемый «неравенство», характеризует степень неравномерности распределения благополучия между социальными группами. Отметим, что этот показатель гораздо шире, нежели показатель неравенства доходов. Можно заметить, что по данному показателю в Республике Молдова наблюдается самая большая волатильность – место в рейтинге колеблется от 22 в 2015 году до 75 в 2022 году.

Важная составляющая оценки удовлетворенности жизнью связана с развитием социальных и институциональных факторов. К этой группе исследуемых показателей относят уровень социальной поддержки, свободы жизненного выбора, восприятие коррупции. Социальная поддержка характеризует уровень социальной интеграции в обществе, и в этом контексте отражает его социальный капитал. Она подразумевает наличие у человека близких ему людей, на помощь которых он может рассчитывать, если окажется в трудной ситуации. Отметим, что в большинстве случаев позиции Молдовы по индикатору социальной поддержки гораздо лучше, чем по экономическим показателям. На наш взгляд, это объясняется особой значимостью неформальных социальных связей, института семьи в восприятии жизни жителями нашей страны, что, в некоторой степени, может компенсировать экономические ограничения.

Свобода жизненного выбора определяет субъективное ощущение контроля над жизнью человека, степень его автономии в принятии важнейших решений, самореализации. Очень низкие показатели свободы жизненного выбора наблюдаются в Молдове в период с 2011 по 2017 годы – в этот период позиция страны в рейтинге находится в диапазоне 105-138 баллов. Значительное улучшение показателя можно отметить с 2020 года по настоящее время.

Восприятие коррупции представляет собой субъективную оценку уровня коррупции в деловой среде и в государственных структурах. Этот показатель развития гражданского общества отражает степень институционального доверия, ощущение справедливости. Из всех составляющих оценки удовлетворенности жизнью в Молдове по данному индикатору наблюдаются самые низкие значения показателей. Это отрицательно влияет на восприятие общего уровня благополучия, характеризует наличие чувства социальной несправедливости и дефицит доверия к институтам жителей страны. Для повышения качества жизни и удовлетворенности ею необходимо повышение транспарентности принимаемых решений в институтах бизнеса и власти.

Щедрость в контексте оценки степени удовлетворенности жизнью отражает не уровень дохода, а социальное поведение респондента, насколько он готов к совершению бескорыстных действий в отношении других людей, к благотворительным пожертвованиям. Значения данного индикатора находятся в средних пределах в Молдове.

Ожидаемая продолжительность здоровой жизни характеризует не только количество лет, которые может прожить человек, но и качество жизни с точки зрения функциональных возможностей и здоровья. По данному показателю страна занимает позиции средние или чуть ниже средних, при этом отсутствует тенденция к улучшению, что может косвенно указывать на наличие проблем в системе здравоохранения и профилактики заболеваний. Отметим, что ожидаемая продолжительность здоровой жизни – весьма значимый показатель качества жизни населения в долгосрочном аспекте. Повышение качества и, главное, доступности медицинских услуг необходимо рассматривать не только как социальную задачу, но и как инвестиции в увеличение благополучия и устойчивости общества.

В оценке уровня счастья используются и эмоциональные показатели, характеризующие частоту переживания положительных и отрицательных эмоций жителями страны. В отличие от рассмотренных выше показателей, они отражают аффективное благополучие. Анализ приведенных данных свидетельствует о том, что между положительными и отрицательными эмоциями наблюдается относительный баланс. Жители нашей страны чувствительны к внешним социально-экономическим потрясениям.

Последняя группа показателей в комплексной оценке удовлетворенности жизнью описывает степень развития социального поведения жителей государства. Эта группа характеризует уровень социальной сплоченности и альтруизма. В нее включаются показатели осуществления пожертвований (в денежной форме), участие в волонтерской деятельности (не предусматривающей материального вознаграждения за труд), факты оказания помощи незнакомому человеку. Динамика данных показателей в Республике Молдова неоднородна – в течение рассматриваемого периода наблюдается как рост, так и снижение позиции страны в мировом рейтинге. Отметим, что показатель «помощь незнакомому человеку» достигла своего максимума для нашей страны в 2020 году (12 место из 147 в рейтинге), именно этот период характеризуется самыми большими потрясениями из-за глобальной пандемии COVID-19.

Проведенный анализ позволяет прийти к выводу, что ощущение удовлетворенности жизнью населения нашей страны формируется в условиях структурного разрыва между экономическими, институциональными и социальными составляющими качества жизни. Для Республики Молдова характерно превалирование роли социальных связей, культурно-психологических факторов в восприятии счастья ее жителями, что свидетельствует о значимости нематериальных компонентов благополучия. Это доказывает целесообразность использования многомерного, комплексного подхода к оценке общественного развития, к пониманию процессов трансформации экономического (материального) прогресса в реальное благополучие граждан.

На наш взгляд, качество жизни и уровень удовлетворенности ею следует рассматривать не только как результат, но и как целевую установку устойчивого развития, наряду с экологической устойчивостью, экономическим ростом и социальной сплоченностью общества. В подобном контексте рейтинги счастья, основанные на опросах общественного мнения, могут качественно дополнить систему индикаторов устойчивого развития, позволят оценить реальные социально-экономические эффекты проводимой государствами политики. Включение показателей удовлетворенности жизнью в государственные стратегии и программы может повысить их ориентированность на удовлетворение реальных потребностей населения и социальную устойчивость в долгосрочной перспективе.

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МАЛЫЙ И СРЕДНИЙ БИЗНЕС – ФУНДАМЕНТ РЫНОЧНЫХ ОТНОШЕНИЙ В МОЛДОВЕ

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Abstract. The article examines the role of small and medium-sized enterprises as a key element of market relations in the Republic of Moldova in recent years. The main indicators of SME development, their contribution to employment and economic growth are analyzed. Special attention is paid to the digitalization of small and medium-sized businesses and its impact on competitiveness and sustainability. The main challenges and development prospects of SMEs in the context of economic transformation and European integration are identified.

Keywords: small and medium-sized enterprises, market relations, Moldovan economy, digitalization, entrepreneurship.

Малый и средний бизнес (МСБ) является важнейшим элементом современной рыночной экономики. В условиях глобализации и цифровой трансформации именно МСБ обеспечивает гибкость экономической системы, стимулирует конкуренцию, способствует инновациям и создаёт рабочие места. Для Республики Молдова, как страны с переходной экономикой, развитие малого и среднего предпринимательства имеет стратегическое значение, поскольку данный сектор формирует основу рыночных отношений и способствует устойчивому социально-экономическому развитию. В последние годы развитие малого и среднего бизнеса в Молдове приобретает особую актуальность в условиях цифровизации, европейской интеграции и воздействия внешних экономических кризисов.

Малый и средний бизнес представляет собой совокупность предприятий, отличающихся ограниченным масштабом деятельности, численностью персонала и объемом оборота. В рыночной экономике МСБ выполняет ряд важнейших функций: формирует конкурентную среду, обеспечивает занятость населения, способствует инновационному развитию и адаптации экономики к изменениям внешней среды.[4].

Экономическая теория рассматривает МСБ как основу рыночных отношений, поскольку именно малые предприятия наиболее чувствительны к сигналам рынка и способны быстро реагировать на изменения спроса и предложения. В развитых странах вклад МСБ в ВВП и занятость населения достигает 50–70 %, что подтверждает его системообразующую роль.[2, 5].

Малое и среднее предпринимательство в Республике Молдова включает предприятия, которые по численности работников, объёму продаж и активам существенно меньше крупных компаний. В соответствии с международной и национальной практикой выделяют три категории: микро-, малые и средние предприятия. Хотя официальные пороговые значения могут варьироваться, основная идея заключается в том, что именно эти предприятия отличаются гибкостью, способностью быстро адаптироваться к изменениям рыночной

конъюнктуры и меньшей зависимостью от централизованных ресурсов по сравнению с крупными корпорациями.

Сектор малого и среднего бизнеса доминирует в структуре предприятий Республики Молдова. По данным Национального бюро статистики, в 2024 году МСБ составили более 99 % от общего числа предприятий страны.[1].

Таблица 1. Основные показатели деятельности МСБ в Республике Молдова за 2022–2024 гг.

Показатели	2022год	2023год	2024гол
Доля МСБ в общем числе предприятий, %.	99.1	99.2	99.2
Занятость в МСБ, тыс. человек	347.3	352	356
Доля занятых в МСБ, %	65.0	65.3	65.5
Доходы от продаж МСБ, млрд леев	285	298	308
Доля МСБ в общем объеме продаж, %	44.9	45.0	46.1
Оценочный вклад МСБ в формирование ВВП, %	45.0 - 46.0	45,0–47,0	46,0–48,0

Источник: Национальное бюро статистики Республики Молдова; OECD; UNDP

По данным Национального бюро статистики Республики Молдова, выручка малого и среднего бизнеса как доля от совокупной выручки экономики выросла с примерно 44,9 % в 2022 году до 46,1 % в 2024 году, что отражает возрастающее значение сектора для национальной экономики. Также вклад малого и среднего бизнеса в формирование валового внутреннего продукта страны в 2022–2024 гг. оценивается в пределах 45–48 %. Рост доли доходов от продаж МСБ в общем объеме экономической деятельности свидетельствует об усилении роли данного сектора в создании добавленной стоимости и обеспечении устойчивости национальной экономики. Анализ занятости показывает, что сектор МСБ остаётся главным источником рабочих мест: численность занятых в нём увеличилась с 347,3 тыс. человек в 2022 году до примерно 356,0 тыс. человек в 2024 году, обеспечивая около 65–66 % всех рабочих мест в экономике страны.

Анализ данных таблицы показывает устойчивый рост показателей деятельности МСБ, что свидетельствует о его возрастающей роли в национальной экономике. Стабильная высокая доля занятости в секторе МСБ в сочетании с ростом его экономического вклада позволяет рассматривать МСБ не только как количественно доминирующий сегмент, но и как структурную основу рыночных отношений в Республике Молдова. Бизнес функционирует в самых разных сферах - от торговли и услуг до производства и информационных технологий - и составляет основу предпринимательской деятельности в стране. МСБ в Молдове сосредоточен преимущественно в торговле, сельском хозяйстве, промышленности и сфере услуг (таб.2) [1].

По данным Национального бюро статистики Республики Молдова, в 2024 году структура малого и среднего бизнеса по видам экономической деятельности характеризовалась доминированием торговой деятельности (около 31,8 % всех субъектов МСБ). Значительная доля предприятий также была сосредоточена в сельском хозяйстве (8,8 %), обрабатывающей промышленности (7,5 %) и профессиональных, научных и технических услугах (9,7 %). Остальные виды экономической деятельности составили около 42,2 % от общего числа субъектов МСБ, что свидетельствует о многоотраслевой структуре сектора.

Таблица 2. Структура МСБ по видам экономической деятельности (2024 г.)

Вид деятельности	Доля, %
Торговля	31.8
Сельское хозяйство	8.8
Промышленность	7.5
Профессиональная и научная деятельность	9.7
Прочие виды деятельности	42.2

Источник: на основе тематического обзора статистики НБС за 2024 год,

Необходимо отметить огромную роль МСБ в формировании конкурентной среды, что способствует развитию фундамента рыночных отношений в Молдове, а также выполняет важную социальную функцию, создавая рабочие места и способствуя снижению уровня безработицы. В условиях экономической нестабильности именно малые предприятия демонстрируют наибольшую гибкость и устойчивость. Особое внимание уделено процессам цифровизации малого и среднего бизнеса, их влиянию на повышение конкурентоспособности и устойчивости предприятий.

Цифровизация является одним из ключевых факторов повышения конкурентоспособности малого и среднего бизнеса. Однако уровень внедрения цифровых технологий в Молдове остается сравнительно низким, об этом свидетельствуют данные таб.3.

Таблица 3. Уровень цифровизации МСБ в Молдове

Показатель	Значение, %
Используют электронную почту и интернет	85
Имеют собственный веб-сайт	32
Осуществляют онлайн-продажи	18
Используют цифровые системы управления	15

Источник: составлено по данным OECD и Программы развития ООН (ПРООН) [2; 5].

Данные таблицы свидетельствуют о том, что процессы цифровой трансформации малого и среднего бизнеса в Республике Молдова находятся на начальном этапе развития и носят фрагментарный характер. Несмотря на относительно высокий уровень базового использования информационно-коммуникационных технологий, выражающийся в широком применении электронной почты и доступа к сети Интернет, глубокая интеграция цифровых решений в бизнес-процессы остается ограниченной. Низкая доля предприятий, имеющих собственные веб-сайты, осуществляющих онлайн-продажи и использующих цифровые системы управления, свидетельствует о том, что цифровые технологии в основном применяются в качестве вспомогательных инструментов коммуникации, а не как стратегический фактор повышения эффективности и конкурентоспособности. Это указывает на недостаточную зрелость цифровой среды МСБ и слабое распространение современных моделей электронного бизнеса [2].

Следует отметить что, в модернизации экономики Молдовы инновационные технологии, такие как сельскохозяйственные дроны, робототехника и искусственный интеллект (ИИ), выступают потенциальными инструментами повышения эффективности и конкурентоспособности. В сельском хозяйстве дроны уже применяются для мониторинга и обработки посевов, наблюдается рост их использования в обучении и исследованиях, но интеграция подобных технологий в бизнес-процессы остаётся ограниченной.

Параллельно государственные стратегии предусматривают расширенное использование ИИ-технологий, включая облачные платформы и анализ данных, а в медицине фиксируются первые примеры применения ИИ для улучшения диагностики и управления информацией. Эти факторы свидетельствуют о значительных возможностях цифровизации, но также подчёркивают существующие препятствия, которые должны быть предметом отдельного анализа проблем цифровизации малого и среднего бизнеса. Основными препятствиями цифровизации МСБ являются недостаток финансовых ресурсов, низкий уровень цифровых навыков работников, а также ограниченный доступ к современным технологиям.

В целом можно кратко отметить, какими основными проблемами сталкивается развития предпринимательства в Молдове. К числу основных проблем развития МСБ в Молдове относятся ограниченный доступ к финансированию, административные барьеры, дефицит квалифицированных кадров и низкий уровень инновационной активности. Вместе с

тем перспективы развития связаны с углублением цифровизации, улучшением бизнес-климата и расширением государственной поддержки.

С учётом проведённого анализа роли малого и среднего бизнеса в экономике Республики Молдова, а также выявленных проблем его развития и цифровизации, представляется целесообразным сформулировать следующие рекомендации, направленные на повышение эффективности функционирования и устойчивости сектора МСБ.

1. Совершенствование институциональной и нормативно-правовой среды

Повышение прозрачности и стабильности нормативно-правовой базы позволит сократить транзакционные издержки и создать более благоприятный предпринимательский климат.

2. Расширение доступа МСБ к финансовым ресурсам

Одним из ключевых факторов развития малого и среднего бизнеса является доступ к финансированию.

В этой связи рекомендуется:

- расширять государственные программы льготного кредитования и гарантий;
- стимулировать развитие альтернативных источников финансирования (микрофинансирование, венчурный капитал, гранты);
- активнее привлекать международные финансовые организации к поддержке МСБ, особенно в регионах.

3. Стимулирование цифровизации и внедрения инновационных технологий

Для повышения конкурентоспособности МСБ необходимо ускорить процессы цифровой трансформации. Рекомендуется:

- разработка и расширение программ государственной поддержки цифровизации малого бизнеса;
- субсидирование внедрения цифровых систем управления, электронных платформ и онлайн-продаж;
- поддержка использования инновационных технологий (дроны в сельском хозяйстве, элементы роботизации, решения на основе искусственного интеллекта), прежде всего в производстве и сфере услуг.

4. Развитие человеческого капитала и цифровых компетенций

Недостаток квалифицированных кадров и цифровых навыков остаётся существенным ограничением для МСБ. В этой связи целесообразно:

- развивать программы обучения предпринимателей и сотрудников МСБ в области цифровых технологий и управления;
- укреплять взаимодействие между образовательными учреждениями и бизнесом;
- стимулировать внедрение программ непрерывного профессионального образования.

5. Поддержка регионального развития МСБ

С учётом того, что МСБ является основным источником занятости в регионах, важно усилить регионально ориентированную политику поддержки:

- развитие бизнес-инкубаторов и центров поддержки предпринимательства в сельских районах;
- создание инфраструктуры для цифрового и инновационного предпринимательства;
- адресная поддержка аграрного и перерабатывающего МСБ.

Выводы.

Малый и средний бизнес является фундаментом рыночных отношений в Республике Молдова. Реализация указанных рекомендаций позволит создать более благоприятные условия для устойчивого развития малого и среднего бизнеса в Республике Молдова, повысить его вклад в формирование рыночных отношений, экономический рост и занятость населения, а также обеспечить более активную интеграцию МСБ в процессы цифровой трансформации и европейской экономической интеграции.

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УДК 338.46

СОВРЕМЕННОЕ СОСТОЯНИЕ И УПРАВЛЕНИЕ ЦИФРОВОЙ ТРАНСФОРМАЦИЕЙ ОБРАЗОВАНИЯ В МОЛДОВЕ

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Abstract: The article examines the current state of digital transformation of the education system in the Republic of Moldova and the specifics of managing this process in the context of the digital economy. The relevance of the research is determined by the growing role of digital technologies in improving the efficiency and quality of educational services, as well as in modernizing management mechanisms in education. The purpose of the study is to analyze the key directions, challenges, and management approaches to the digital transformation of education in Moldova. The methodological framework is based on the analysis of regulatory documents, statistical data, and scientific publications. The study identifies the main constraints in managing digital transformation processes, including institutional, infrastructural, and human resource factors. The article substantiates the need to improve management mechanisms and develop digital competencies to ensure the sustainable development of the education system.

Keywords: digital transformation, education management, digitalization of education, educational policy, ICT, Republic of Moldova

Аннотация: В статье рассматривается современное состояние цифровой трансформации системы образования Республики Молдова и особенности управления данным процессом в условиях развития цифровой экономики. Актуальность исследования определяется возрастающей ролью цифровых технологий в повышении эффективности и качества образовательных услуг, а также в модернизации управленческих механизмов в сфере образования. Целью исследования является анализ ключевых направлений, проблем и управленческих подходов к цифровой трансформации образования в Молдове. Методологическую основу исследования составляют анализ нормативно-правовых документов, статистических данных и научных публикаций. В ходе исследования выявлены основные ограничения в управлении процессами цифровой трансформации, включая институциональные, инфраструктурные и кадровые факторы. Обоснована необходимость совершенствования управленческих механизмов и развития цифровых компетенций для обеспечения устойчивого развития системы образования.

Ключевые слова: цифровая трансформация, управление образованием, цифровизация образования, образовательная политика, ИКТ, Республика Молдова.

В условиях глобальной цифровизации и стремительного развития информационно-коммуникационных технологий система образования становится одной из ключевых сфер, в которых цифровая трансформация приобретает стратегическое значение [6].

Для Республики Молдова цифровая трансформация образования является важным направлением государственной политики в контексте модернизации национальной системы образования, повышения её качества, устойчивости и соответствия современным социально-экономическим и технологическим требованиям. Данные приоритеты закреплены в ключевых стратегических документах, определяющих развитие образовательной сферы в среднесрочной и долгосрочной перспективе.

В Национальной стратегии развития образования „*Educația 2030*” цифровая трансформация образования закреплена в рамках *Цели 6*, которая предусматривает повышение функциональности системы образования путём эффективного внедрения цифровых технологий для обеспечения качества и устойчивости образования [1]. В этом контексте управление цифровой трансформацией образования приобретает ключевое значение, поскольку достижение обозначенной цели напрямую зависит от эффективности стратегического планирования, институциональной координации, нормативно-правового обеспечения, кадрового и ресурсного потенциала, а также от наличия механизмов мониторинга и оценки реализации цифровых инициатив. Несмотря на наличие стратегических ориентиров, процесс цифровизации образования в Молдове сопровождается рядом вызовов, включая неравномерность внедрения цифровых решений, различный уровень цифровых компетенций участников образовательного процесса и ограниченность институциональных ресурсов.

Одним из показателей цифровизации системы образования выступает обеспеченность образовательных учреждений компьютерной техникой, отражающая уровень их технологической готовности. Соответствующие статистические данные, приведенные в таблице 1, свидетельствуют об устойчивой положительной динамике обеспеченности учреждений образования Республики Молдова компьютерной техникой на всех уровнях образовательной системы, что отражает поступательное развитие материально-технической базы цифровой трансформации образования.

Наиболее выраженные количественные изменения наблюдаются в общеобразовательных учреждениях, где общее количество компьютеров за период 2018/19–2024/25 учебных годов увеличилось с 30,5 тыс. до 54,4 тыс. или 78 %. При этом количество компьютеров, используемых непосредственно в учебных целях, возросло с 26,7 тыс. до 49,1 тыс. или 84 %.

Среднее количество учебных компьютеров на одно общеобразовательное учреждение Молдовы выросло с 21 до 41 единицы (на 95 %), а обеспеченность компьютерами на 100 учащихся — с 8,0 до 14,6 единицы (на 82,5 %). Такая динамика демонстрирует существенное повышение доступности цифровых ресурсов для обучающихся и о расширении возможностей интеграции цифровых технологий в учебный процесс.

В системе профессионально-технического образования динамика носит более умеренный, но устойчивый характер. Общее количество компьютеров увеличилось с 5,9 тыс. до 9,1 тыс., или примерно на 54 %, тогда как количество компьютеров, используемых в учебных целях, возросло с 5,0 тыс. до 8,0 тыс., что соответствует росту примерно на 59 %. Особенно показателен рост среднего количества учебных компьютеров на одно учреждение — с 57 до 99 единиц, то есть примерно на 74 %. Обеспеченность компьютерами на 100 обучающихся увеличилась с 11,4 до 16,7 единицы (на 46,5 %). Эти данные указывают на заметное укрепление цифровой инфраструктуры в секторе профессионально-технического образования и постепенное сближение его показателей с уровнем высшего образования.

В учреждениях высшего образования наблюдается более сдержанная и неоднородная динамика. Общее количество компьютеров за анализируемый период увеличилось незначительно — с 11,1 тыс. до 11,5 тыс. или 3,5 %, а количество компьютеров, используемых в учебных целях, практически сохранилось на прежнем уровне (рост около 0,1 %).

Вместе с тем среднее количество учебных компьютеров на одно учреждение увеличилось с 340 до 616 единиц, что соответствует росту на 81 %.

Обеспеченность компьютерами на 100 студентов в целом остаётся стабильной, колеблясь в пределах 16–17 единиц, что подтверждает относительно высокий и устойчивый уровень цифровой обеспеченности высшего образования.

Таблица 1. Динамика обеспеченности учреждений образования Республики Молдова компьютерной техникой

Показатель	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Общеобразовательные учреждения							
Общее количество компьютеров	30 528	32 561	34 440	41 752	45 677	52 959	54 436
в том числе: используемые в учебных целях	26 712	28 503	30 114	37 052	40 841	47 883	49 070
Среднее количество компьютеров, используемых в учебных целях, на одно учреждение	21	23	24	30	34	40	41
Количество компьютеров, используемых в учебных целях, на 100 учащихся	8,0	8,6	9,0	11,0	12,2	14,3	14,6
Учреждения профессионально-технического образования							
Общее количество компьютеров	5 928	6 139	7 008	7 452	7 683	7 960	9 111
в том числе: используемые в учебных целях	5 035	5 217	6 019	6 467	6 636	6 885	7 999
Среднее количество компьютеров, используемых в учебных целях, на одно учреждение	57	57	66	71	74	78	99
Количество компьютеров, используемых в учебных целях, на 100 обучающихся	11,4	12,0	13,4	14,1	14,4	14,9	16,7
Учреждения высшего образования							
Общее количество компьютеров	11 119	10 915	11 115	11 613	10 466	10 533	11 515
в том числе: используемые в учебных целях	9 850	9 632	9 837	10 248	9 027	9 019	9 856
Среднее количество компьютеров, используемых в учебных целях, на одно учреждение	340	357	410	427	430	429	616
Количество компьютеров, используемых в учебных целях, на 100 студентов	16,3	16,9	16,7	17,2	15,9	16,0	16,7

Источник: 3

В целом представленные данные показывают, что цифровая трансформация образования в Республике Молдова в части материально-технического обеспечения развивается поступательно, однако с различной интенсивностью в зависимости от уровня образования.

Так же одним из базовых элементов цифровой трансформации системы образования являются образовательные веб-страницы, поскольку обеспечивают институциональное присутствие образовательных учреждений в цифровой среде, поддержку информационного обмена и доступ к электронным образовательным и управленческим сервисам. Динамика количества образовательных веб-страниц представлен на рис. 1.

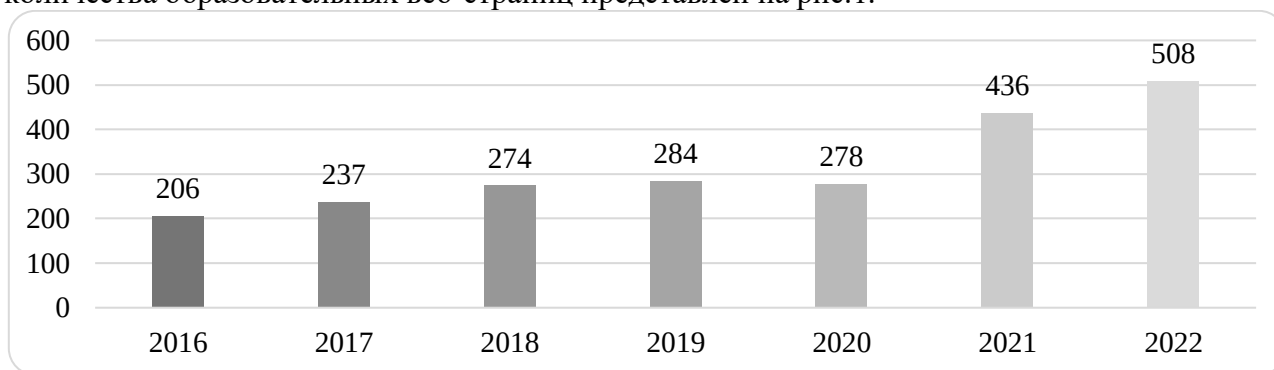


Рис. 1. Динамика количества образовательных веб-страниц в системе образования Молдовы за 2016-22 года

Источник: составлено авторами на основе статистических данных 4.

Данные, представленные на рисунке, отражают устойчивый рост количества образовательных веб-страниц в период 2016–2022 гг. Особенно заметное увеличение наблюдается после 2020 года, когда число веб-страниц возросло почти в два раза по сравнению с предыдущими периодами. Резкий рост количества образовательных веб-страниц после 2020 года во многом обусловлен пандемией COVID-19, которая выступила катализатором ускоренной цифровизации системы образования. В условиях дистанционного и смешанного обучения веб-сайты образовательных учреждений стали ключевым инструментом коммуникации с обучающимися, родителями и педагогическим персоналом, а также основным каналом размещения учебных материалов, расписаний, административной информации и объявлений.

На этом фоне показатель охвата школ доступом к сети Интернет приобретает особую значимость. Так, согласно данным Национального Бюро Статистики Республики Молдова, в 2025 году 98 % школ Республики Молдова были подключены к сети Интернет, что составляет около 1 200 образовательных учреждений [3]. Это означает, что подавляющее большинство школ имеют техническую возможность использовать цифровые платформы, электронные журналы и онлайн-ресурсы.

Наличие устойчивого интернет-подключения создаёт необходимые условия для внедрения и функционирования ключевых цифровых инструментов управления образовательным процессом, одним из которых является электронный журнал. Электронный журнал играет важную роль в цифровизации образования, поскольку обеспечивает централизованный учет учебных результатов, повышает прозрачность образовательного процесса и снижает административную нагрузку на педагогов. Его использование способствует оперативному обмену информацией между школой, учащимися и родителями, а также создаёт основу для дальнейшего внедрения аналитических и управленческих цифровых инструментов.

Применение в школах электронного журнала показано на рис.2.

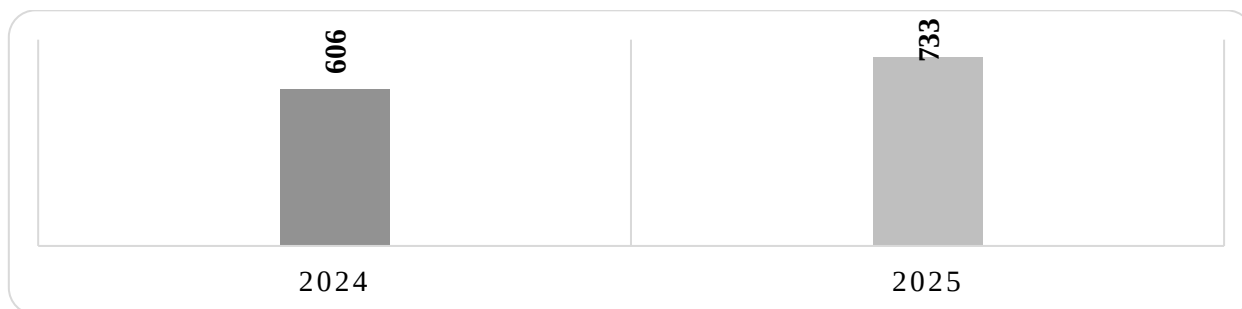


Рис.2. Количество школ, использующих электронный журнал, в 2024–2025 гг.

Источник: составлено авторами на основе статистических данных 4.

В 2024 году электронный журнал использовали 606 школ, а в 2025 году — 733 школы, что означает увеличение на 127 учреждений или примерно на 21 %, отражая расширение практики применения данного цифрового инструмента.

Расширение использования электронного журнала на уровне образовательных учреждений неизбежно приводит к увеличению числа участников образовательного процесса, вовлечённых в работу с данным цифровым инструментом. В этой связи наряду с институциональным распространением электронного журнала важным аспектом является анализ его использования родителями как одной из ключевых групп пользователей (рис.3.)

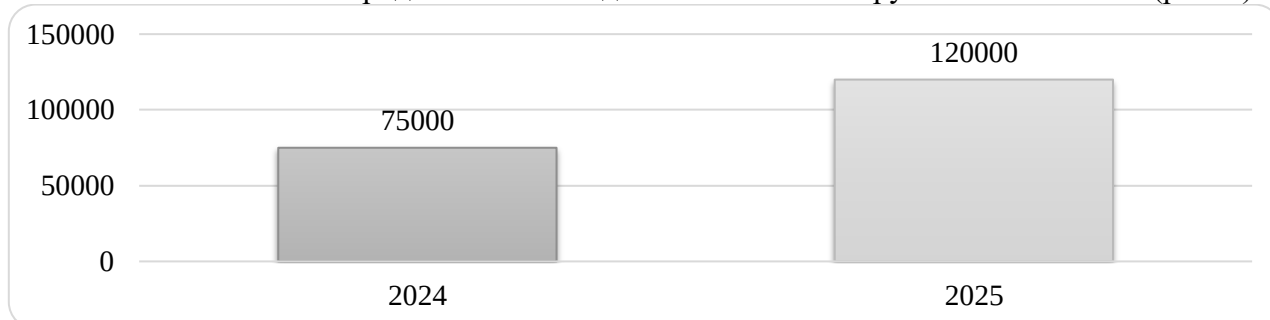


Рис.3. Динамика количества родителей, использующих электронный журнал

Источник: составлено авторами на основе статистических данных 4.

Представленные данные наглядно показывают, что в течение одного года количество родителей, использующих электронный журнал, увеличилось на 60 %, что отражает рост доверия к цифровым решениям и их практическую востребованность в системе образования. Использование электронного журнала способствует формированию устойчивой модели цифрового взаимодействия между школой и семьёй, повышая прозрачность и оперативность обмена информацией.

Практическая эффективность цифровой трансформации во многом определяется уровнем цифровых навыков педагогов [8]. В рамках национальной программы DigiProf более 10 000 учителей, что составляет около 40 % от общего числа педагогических работников страны, прошли практико-ориентированные курсы по развитию цифровых компетенций [4].

Уровень цифровой трансформации системы образования в целом определяется степенью реализации её институционального и ресурсного потенциала. В Республике Молдова Всемирным банком было проведено исследование, направленное на комплексную оценку уровня цифровой готовности системы образования по ключевым направлениям цифровой трансформации (World Bank, 2022). Для этого исследования было использовано структурированное анкетирование экспертов и представителей образовательных учреждений.

Опрос охватывал несколько ключевых направлений, определённых как «столпы» цифровой трансформации:

1. Лидерство и управление — включает видение и стратегию, институциональный потенциал, законодательство, политику и процедуры закупок.

2. Благоприятная инфраструктура — охватывает проектирование и управление инфраструктурой, технологические ресурсы, подключение к сети, стандарты совместимости и управление данными.
3. Цифровизация образовательных услуг и аналитика — изучает готовность учащихся, преподавателей, администраторов, использование цифровых образовательных ресурсов, учебные планы и управление школами.
4. Человеческий капитал — оценивает цифровые навыки, грамотность в области данных и организационную культуру.
5. Рынок EdTech и бизнес-модели — охватывает управление и закупку EdTech-продуктов, поддержку инновационных бизнес-моделей и государственно-частные партнёрства.

Результаты данного исследования представлены на рис. 4.

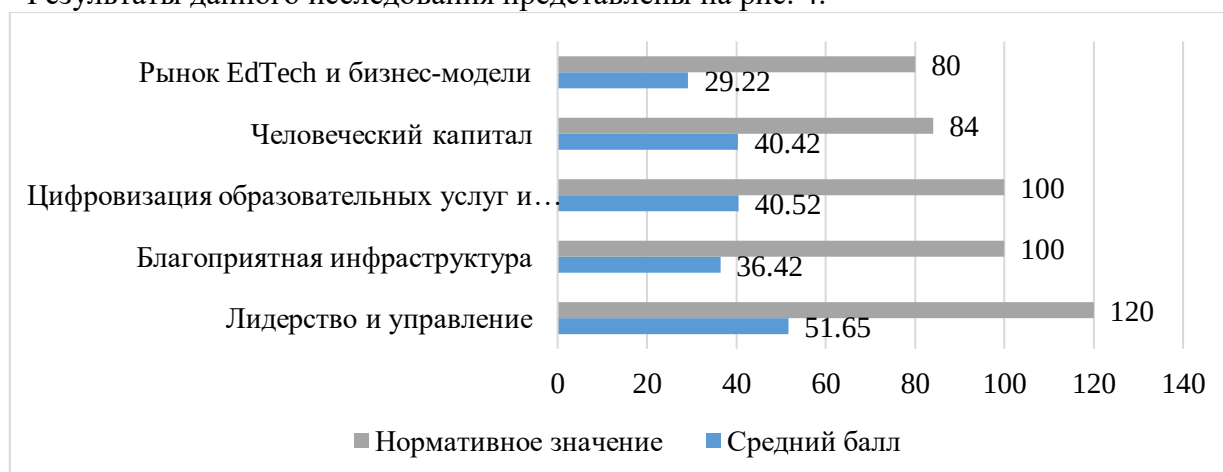


Рис. 4 . Соотношение средних значений показателей цифровой готовности системы образования Молдовы и нормативных значений по ключевым направлениям

Источник: 5

Наиболее выраженные отклонения от нормативных значений наблюдаются в направлениях «Благоприятная инфраструктура» и «Рынок EdTech и бизнес-модели», где фактические средние показатели составляют соответственно 36,42 из 100 и 29,22 из 80. Это свидетельствует о критической недостаточности инфраструктурных и рыночных условий для устойчивой цифровизации образования и указывает на ограничения, связанные с развитием цифровых платформ, управлением технологическими решениями и вовлечением частного сектора.

Направления «Цифровизация образовательных услуг и аналитика» и «Человеческий капитал» характеризуются несколько более высокими средними значениями (40,52 из 100 и 40,42 из 84 соответственно), однако и здесь сохраняется значительный разрыв по сравнению с нормативными уровнями. Это указывает на фрагментарный характер внедрения цифровых образовательных решений и недостаточную системность в развитии цифровых компетенций и организационной культуры.

Относительно более высокий, но всё ещё недостаточный уровень зафиксирован в направлении «Лидерство и управление» — 51,65 при нормативном значении 120, что отражает наличие отдельных элементов стратегического и институционального управления цифровой трансформацией, при отсутствии их комплексной и согласованной реализации.

Проведённое исследование показывает, что цифровая трансформация системы образования в Республике Молдова развивается поступательно, однако носит неравномерный и фрагментарный характер, что связано с различиями в уровне ресурсного обеспечения, институциональной готовности и качестве управленческих механизмов на различных уровнях образования. Выявленные диспропорции и структурные ограничения свидетельствуют о

необходимости целенаправленного совершенствования управления процессами цифровой трансформации.

С учётом выявленных недостатков цифровой трансформации системы образования представляется целесообразным сформулировать рекомендации, направленные на повышение эффективности реализации уже действующих цифровых инициатив.

Таким образом, авторами рекомендуется:

1. В первую очередь необходимо обновление цифровой инфраструктуры с учётом её функционального состояния и совместимости с используемыми цифровыми платформами. Внедрение единых технических стандартов позволит сократить фрагментарность цифровой образовательной среды и повысить устойчивость цифровых решений.
2. Для повышения управленческой эффективности рекомендуется расширить использование образовательных данных в процессе принятия решений, развивая аналитические инструменты и компетенции управленческого персонала на институциональном и национальном уровнях.
3. Целесообразно активизировать взаимодействие с частным сектором в сфере EdTech как инструмент ускорения внедрения инновационных цифровых решений, а также совершенствовать процедуры их отбора, закупки и сопровождения.
4. Необходимо перейти от разрозненных цифровых инициатив к согласованной модели управления цифровой трансформацией образования, обеспечивающей увязку инфраструктурных, кадровых и управленческих решений с целями стратегии «Educația 2030».

Реализация данных рекомендаций позволит повысить согласованность ключевых компонентов цифровой трансформации образования и обеспечить её более устойчивое развитие.

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О СОСТОЯНИИ ПРОДОВОЛЬСТВЕННОЙ БЕЗОПАСНОСТИ РЕСПУБЛИКИ БЕЛАРУСЬ

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Abstract This article examines issues related to ensuring the country's food security. It outlines the key criteria for food security. It presents data on the physical and economic availability of food for the population of the Republic of Belarus over time. It also explores key areas and measures for strengthening national food security.

Keywords: food security, physical accessibility of food, economic accessibility of food, rational nutrition.

В международном пакте по экономическим, социальным и культурным правам, принятом Генеральной Ассамблеей ООН в 1966 г., право на пищу (каждый мужчина, женщина, ребенок обладают неотъемлемым правом быть свободным от голода и недоедания для полного развития и сохранения своих физических и умственных способностей) признано и определено как одно из основных прав человека. В обеспечении права на пищу компромиссы не допустимы [3, с. 5].

Продовольственная безопасность считается достигнутой при наличии у всех людей постоянного физического, социального и экономического доступа к достаточному количеству безопасной и питательной пищи, позволяющей удовлетворять их пищевые потребности и вкусовые предпочтения для ведения активного и здорового образа жизни. Четырьмя основами продовольственной безопасности являются следующие: наличие, доступ, использование и стабильность [2, с. 8].

В перечень сельскохозяйственной продукции, сырья и продовольствия для оценки достигнутого уровня национальной продовольственной безопасности входят: 1) зерно, 2) молоко, 3) мясо, 4) сахар, 5) масло растительное, 6) картофель, 7) овощи, 8) фрукты и ягоды, 9) яйца, 10) рыба [3, с. 155].

Согласно постановлению Совета Министров Республики Беларусь от 15 декабря 2017 г. № 962 «О Доктрине национальной продовольственной безопасности Республики Беларусь до 2030 года» стратегическая цель национальной продовольственной безопасности Республики Беларусь до 2030 года – повысить уровень обеспеченности населения и доступность качественного продовольствия для полноценного питания и здорового образа жизни на основе устойчивого развития конкурентоспособного аграрного производства, а также создания социально-экономических условий для поддержания потребления основных продуктов питания на рациональном уровне [5].

Продовольственная безопасность государства считается обеспеченной, если:

- население страны обеспечено экологически чистыми, полезными для здоровья продуктами отечественного производства по научно-обоснованным нормам с учетом пола, возраста, условий труда, природных условий и традиций;
- цены на продукты питания доступны всему населению;
- созданы стратегические запасы продовольствия;
- агропромышленный комплекс, рыбное и лесное хозяйство развиваются устойчиво и

имеют резервы, позволяющие наращивать производство продовольствия;

- научная сфера находится на уровне высших достижений;
- обеспечивается сохранение и улучшение среды обитания [3, с 159].

Одним из главных критериев достижения цели по развитию национальной продовольственной безопасности до 2030 г. Республики Беларусь является достижение объемов и структуры производства продукции растениеводства и животноводства, позволяющих сбалансировать спрос и предложение по важнейшим видам сельскохозяйственной продукции, сырья и продовольствия, а также обеспечить физическую доступность продовольствия для населения страны [5]. Рассмотрим достигнутый, критический и оптимистический уровни продовольственной безопасности производства сельскохозяйственной продукции, сырья и продовольствия, согласно официальным статистическим данным, в Республике Беларусь (таблица 1).

Таблица 1. Достигнутый уровень собственного производства сельскохозяйственной продукции, сырья и продовольствия в Республике Беларусь, тыс. тонн

Наименование продукции	2022 г. (факт)	2023 г. (факт)	2024 г. (факт)	2030 г. (план)	Уровни продовольственной безопасности	
					критический	оптимистический
Зерно	8701	7666	8341	11500	6000	9000
Картофель	3859	4021	3111	6000	5100	6000
Овощи	2863	2801	2775	1900	1100	1700
Плоды и ягоды	820	643	714	580	700	1100
Мясо (убойный вес)	1670	1711	1794	1517	900	1500
Молоко	7869	8331	8751	10500	4500	7500
Рыба	12,4	12,9	14,8	33	28	33
Яйца, млн. шт.	3462	3439	3713	4200	2000	2900

Источник: [4, 5].

В Республике Беларусь за 2022–2024 гг. отмечается рост производства продукции животноводства: мяса в убойном весе – на 7,4 %, молока – на 11,2 %, рыбы – на 19,4 %, яиц – на 7,3 %. В тоже время объемы производства продукции растениеводства в динамике проявляют тенденцию к снижению: зерно – на 4,1 %, картофель – на 19,4 %, овощи – на 3,1 %, плоды и ягоды – на 12,9 %.

Запланированный объем производства продукции на 2030 г. достигнут в 2024 г. только по овощам, плодам и ягодам, а также мясу в убойном весе. Необходимо обратить внимание на тот факт, что на протяжении периода 2022–2024 гг. объемы производства в хозяйствах всех категорий картофеля и рыбы не превышали критический уровень потребности. Оптимистический уровень продовольственной безопасности в стране в 2024 г. достигнут по производству овощей, молока, мяса в убойном весе и яиц.

Для анализа физической доступности и обеспечения населения страны отечественными продуктами питания рассмотрим объемы производства и потребления отдельных видов сельскохозяйственной продукции на душу населения в Республике Беларусь (таблица 2).

Таблица 2. Производство и потребление основных видов продукции сельского хозяйства на душу населения Республики Беларусь, кг

Наименование продукции	Производство				Потребление			
	2022 г.	2023 г.	2024 г.	2024 г. к 2022 г. в %	2022 г.	2023 г.	2024 г.	2024 г. к 2022 г. в %
Зерно / хлебопродукты	943	835	913	96,8	77	75	74	96,1
Картофель	418	438	341	81,6	161	162	159	98,8
Овощи	310	305	304	98,1	174	176	180	103,4

Плоды (фрукты) и ягоды	89	70	78	87,6	92	90	91	98,9
Мясо (убойный вес)/ мясо и мясопродукты	132	139	149	112,9	97	100	103	106,2
Молоко	853	908	958	112,3	238	240	247	103,8
Яйца, шт.	375	375	407	108,5	265	272	278	104,9

Источник: [1, 4].

В стране в динамике за анализируемый период незначительно снижается потребление населением хлебопродуктов, картофеля, а также плодов и ягод. В то же время жители Беларуси стали больше потреблять в своем рационе овощей, мяса и мясопродуктов, молока и яиц. Как видно, в Республике Беларусь производство основных видов продукции сельского хозяйства на душу населения, за исключением плодов и ягод, значительно превышает потребление (так, по молоку в 3,6-3,9 раза). Это свидетельствует об обеспечении государством физической доступности каждого жителя страны продуктами питания.

Экономическая доступность продовольствия всем категориям домашних хозяйств является важным критерием обеспечения государством продовольственной безопасности. К 2030 г. запланировано достижение оптимального уровня расходов на питание в структуре потребительских расходов населения до 33 процентов [5].

Рассмотрим структуру денежных расходов домашних хозяйств по территории Республики Беларусь (таблица 3).

Таблица 3. Структура денежных расходов домашних хозяйств по территории Республики Беларусь, %

Категория расходов	2022 г.	2023 г.	2024 г.	2024 г. к 2022 г., +/-
Потребительские расходы	73,6	71,9	70,4	-3,2
из них питание (включая общественное питание)	39,7	38,6	37,4	-2,3
в общем объеме расходов домашних хозяйств на покупку продуктов питания				
хлеб и хлебопродукты	14,8	14,2	13,8	-1,0
молоко и молочные продукты	19,7	19,9	19,9	0,2
мясо и мясные продукты	27,6	27,7	27,6	0,0
рыба и рыбопродукты	4,7	5,0	5,1	0,4
масло растительное, маргарин и другие жиры	2,0	1,6	1,5	-0,5
яйца	1,9	1,9	1,9	0,0
картофель	1,2	1,0	1,1	-0,1
овощи и бахчевые	5,5	5,5	5,8	0,3
фрукты и ягоды	7,2	7,8	8,1	0,9
сахар и кондитерские изделия	5,4	5,6	5,3	-0,1
прочие продукты питания	10,0	9,8	9,9	-0,1

Источник: [4].

В течение 2022–2024 гг. происходит снижение доли как потребительских расходов в общем объеме денежных расходов домашних хозяйств (на 3,2 п. п.), так и доли расходов на питание в объеме потребительских расходов домашних хозяйств по территории Республики Беларусь (на 2,3 п. п.). В 2024 г. фактическая доля расходов на питание в объеме потребительских расходов превышает запланированный оптимальный уровень расходов на питание на 4,4 п. п.

Структура расходов домашних хозяйств на покупку продуктов питания в стране по годам колеблется незначительно. Наибольший удельный вес в расходах населения на покупку продуктов питания занимают мясо и мясные продукты (27,6 % в 2024 г.), молоко и молочные продукты (19,9 % в 2024 г.), хлеб и хлебопродукты (13,8 % в 2024 г.).

Республика Беларусь придерживается социально-ориентированной политики и для

обеспечения экономической доступности продовольствия в стране устанавливается бюджет прожиточного минимума в среднем на душу населения и по основным социально-демографическим группам населения, который пересматривается каждые 3 месяца, а также Советом Министров утверждается размер месячной минимальной заработной платы.

Немаловажную роль в обеспечении продовольственной безопасности государства играет уровень и качество питания населения. В 2024 г. энергетическая ценность суточного рациона в расчете на члена домашнего хозяйства в сутки по территории Республики Беларусь 2640 ккал (таблица 4).

Таблица 4. Уровень и качество питания населения Республики Беларусь

Категория расходов	2022 г.	2023 г.	2024 г.	2024 г. к 2022 г. +/-
Калорийность потребленных в домашних хозяйствах продуктов питания в расчете на члена домашнего хозяйства в сутки, ккал	2630	2637	2640	10
Пищевая ценность потребленных в домашних хозяйствах продуктов питания в расчете на члена домашнего хозяйства в сутки, %				
белки всего	17,5	17,5	17,7	0,2
из них продукты животного происхождения	64,5	64,9	65,4	0,9
жиры всего	25,2	26,1	26,6	1,4
из них продукты животного происхождения	78,5	83,0	85,4	6,9
углеводы всего	57,3	56,4	55,7	-1,6
Структура калорийности суточного рациона домашнего питания, %				
хлеб и хлебобулочные изделия	28,4	27,4	27,0	-1,4
молоко и молочные продукты	12,8	13,0	13,2	0,4
мясо и мясные продукты	22,9	23,9	24,5	1,6
рыба и рыбобулочные изделия	1,4	1,4	1,4	0,0
масло растительное, маргарин и другие жиры	8,4	8,2	8,2	-0,2
картофель	4,6	4,6	4,5	-0,1
овощи и бахчевые	2,7	2,7	2,7	0,0
фрукты и ягоды	2,7	2,7	2,7	0,0
сахар и кондитерские изделия	9,8	9,6	9,2	-0,6
прочие продукты питания	4,8	4,8	5,0	0,2

Источник: [4].

Структура рациона белорусов фактически соответствует рекомендованной экспертами Всемирной организации здравоохранения (ВОЗ), в которой доля углеводов должна составлять от 58–63 %, жиров – 26–30, белков – 11–15 % [5]. Наибольший удельный вес в структуре калорийности суточного рациона домашнего питания белорусов занимают хлеб и хлебобулочные изделия (27,0 % в 2024 г.), мясо и мясные продукты (24,5 % в 2024 г.) и молоко и молочные продукты (13,2 % в 2024 г.), наименьший – рыба и рыбобулочные изделия (1,4 % в 2024 г.).

В целях уровня повышения эффективности системы обеспечения национальной продовольственной безопасности до 2030 г. [5] разработаны основные направления и меры по укреплению национальной продовольственной безопасности, заключающиеся в:

- совершенствовании структуры посевных площадей;
- сохранении и повышении почвенного плодородия;
- повышении эффективности производства сельскохозяйственной продукции за счет внедрения ресурсосберегающих технологий;
- максимальной реализации потенциала продуктивности сельскохозяйственных животных и птицы;
- организации системы внутренней продовольственной помощи населению;



- приоритетной поддержке наиболее уязвимых слоев населения, не имеющих достаточных средств для организации здорового питания;
- организации здорового питания беременных и кормящих женщин, детей раннего, дошкольного и школьного возраста, здорового питания в учреждениях социальной сферы;
- снижении уровня малообеспеченности населения;
- обеспечении качества и безопасности продукции с соблюдением ветеринарного, фитосанитарного и санитарно-гигиенического режима;
- стимулировании производства и сбыта качественных продуктов питания, а также продуктов, отвечающих принципам здорового питания;
- развитии импортозамещающих производств и др.

Таким образом, в Республике Беларусь за последние 3 года в динамике наблюдается рост производства продукции животноводства и снижение объемов производства растениеводческой продукции. Производство основных видов продукции сельского хозяйства на душу населения значительно превышает потребление, что позволяет обеспечить физическую доступность каждого жителя страны продуктами питания. Доля расходов на питание в объеме потребительских расходов белорусов в динамике снижается и в 2024 г. составляет 37,4 %. Наибольший удельный вес в расходах населения на покупку продуктов питания и в суточном рационе занимают мясо и мясные продукты, молоко и молочные продукты, хлеб и хлебобулочные изделия. В стране разработаны основные направления и меры по укреплению национальной продовольственной безопасности.

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СОВРЕМЕННОЕ СОСТОЯНИЕ И НАПРАВЛЕНИЯ РАЗВИТИЯ КАДРОВОГО ПОТЕНЦИАЛА В АГРОПРОМЫШЛЕННОМ КОМПЛЕКСЕ РЕСПУБЛИКИ БЕЛАРУСЬ

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Abstract. The article examines the current state of human resources in the agro-industrial complex of the Republic of Belarus, as well as the main directions of its development. One of the conditions for ensuring the country's economic security is the effective functioning of the agro-industrial complex. The growth of food and light industry production, which ensures the livelihood of the population, depends on the functioning of organizations in the agricultural sector and related industries. In turn, the functioning of organizations in the agro-industrial complex is significantly influenced by human resources, among other factors.

Keywords: human resources, labor market, labor productivity, efficiency, development, improvement.

Социально-трудовая сфера является одной из наиболее сложных и многогранных составляющих человеческой деятельности и жизни общества в целом. Сотрудники сельскохозяйственных предприятий являются одной из определяющих составляющих ресурсного потенциала, который обеспечивает взаимодействие средств труда и предметов труда, и тем самым создает готовый продукт.

Проведенные нами исследования позволили установить, что важнейшими факторами, влияющими на развитие рынков труда и трансформацию рабочих мест в Беларуси в условиях цифровизации являются:

- социальные (демографические изменения, главным образом, старение населения; усиление и изменение направлений миграции; нестабильность доходов домашних хозяйств и усиление регионального неравенства; изменение условий труда, обусловленное информационными и коммуникационными технологиями (ИКТ), аутсорсингом, интернационализацией и необходимостью большей гибкости рабочих мест);

- политические (возможности бюджета относительно реализации государственной политики в сфере содействия занятости и повышения доступности обучения);

- технологические (конвергенция технологий и междисциплинарных навыков, в частности сочетание биотехнологий, информационных и коммуникационных технологий, нанотехнологий и когнитивных наук; цифровизация производства: автоматизированные и аддитивные производственные процессы, включая 3D-печать; увеличение мощности цифровых устройств и потенциала для сбора и обработки больших данных);

- организационно-экономические (распространение новых моделей организации и управления бизнесом; изменение в глобальных цепочках создания добавленной стоимости,

международном разделении труда, структуре и динамике внешней торговли в связи с нестабильностью и неопределенностью, вызванных последствиями пандемии Covid-19, перераспределением влияния между региональными «центрами силы», военными конфликтами и санкционным давлением);

– экологические (обострение ресурсных конфликтов; стихийные бедствия (пожары, засухи, наводнения), угрожающие поставкам ресурсов; ухудшение и усложнение логистики; растущая нехватка природных ресурсов и деградация экосистем).

Общие показатели рынка труда АПК Республики Беларусь приведены в таблице 1.

Таблица 1 – Общие показатели рынка труда АПК Республики Беларусь [3]

Показатели	Годы					2024 г. в % к 2020 г.
	2020	2021	2022	2023	2024	
Численность сельского населения, чел.	2069325	2023429	1988212	1957693	1926590	93,1
Удельный вес сельского населения в общей численности населения, %	22,1	21,9	21,6	21,4	21,1	-1,0 п.п.
Из общей численности сельского населения – население в возрасте, чел.						
молode трудоспособного	338637	331692	322859	312541	300565	88,8
трудоспособном	1109603	1097667	1086106	1060299	1034389	93,2
старше трудоспособного	621085	594070	579247	584853	591636	95,3
Списочная численность работников, занятых в сельском хозяйстве, в среднем за год, тыс. чел.	267,4	259,4	251,3	246,5	236,7	88,5
в % к республиканской численности работников занятых в экономике	7,2	7,1	7	6,9	6,7	-0,5 п.п.

Анализ данных, представленных в таблице 1, показывает негативную динамику на рынке труда агропромышленного комплекса (АПК) Республики Беларусь за период с 2020 по 2024 годы. Численность сельского населения снизилась с 2 069 325 человек в 2020 году до 1 926 590 человек в 2024 году, что соответствует снижению на 6,9%. Удельный вес сельского населения в общей численности уменьшился на 1%, достигнув 21,1%, что указывает на уменьшение роли сельского населения в демографической структуре страны. Важным показателем является численность работников, занятых в сельском хозяйстве, которая сократилась с 267,4 тыс. человек до 236,7 тыс. человек, то есть на 11,5%. Доля работников АПК в общей численности занятых в экономике также уменьшилась — с 7,2% в 2020 году до 6,7% в 2024 году. Снижение трудовых ресурсов в сельском хозяйстве приводит к возможному ухудшению производительности и стабильности сектора, что требует разработки целенаправленных мер по повышению привлекательности работы в аграрной сфере и улучшению условий труда.

Показатели производительности и эффективности использования трудовых ресурсов в сельском хозяйстве Республики Беларусь представлены в таблице 2.

Таблица 2 – Показатели производительности труда и эффективности использования трудовых ресурсов в сельском хозяйстве Республики Беларусь [3]

Показатели	Годы					2024 г. в % к 2020 г.
	2020	2021	2022	2023	2024	
Номинальная начисленная среднемесячная заработная плата работников, занятых в сельском хозяйстве, руб.	880,4	1002,1	1200,4	1475,6	1797,1	204,1
Реальная заработная плата работников, занятых в сельском хозяйстве, в % к предыдущему году	110,5	103,9	104	116,9	115,2	4,7 п.п.
Производительность труда в сельском хозяйстве, тыс. руб./чел.	74,69	85,34	105,67	115,52	134,78	180,5
Прибыль от реализации на 1 работника, тыс. руб.	2,99	4,08	7,95	5,92	6,55	219,1
Чистая прибыль на 1 работника, тыс. руб.	3,4	5,87	9,5	8,65	8,75	257,4

Номинальная средняя заработная плата работников выросла с 880,4 руб. до 1797,1 руб., что составляет 204,1% к уровню 2020 года. Реальная заработная плата также показала рост, достигая 115,2% в 2024 году по сравнению с предыдущим годом. Производительность труда увеличилась с 74,69 тыс. руб./чел. до 134,78 тыс. руб./чел., что соответствует приросту на 80,5%. Прибыль от реализации на одного работника возросла с 2,99 тыс. руб. до 6,55 тыс. руб., а чистая прибыль увеличилась с 3,4 тыс. руб. до 8,75 тыс. руб., что составляет 257,4%.

Важность развития кадрового потенциала в сельском хозяйстве Республики Беларусь находит отражение в государственных программах. Так в республике реализовано государственная программа «Аграрный бизнес» в соответствии с которой выполнены мероприятия, которые будут способствовать снижению трудовых затрат и росту производительности труда.

Считаем, что актуальными проблемами, наиболее негативно влияющими на эффективность использования кадрового потенциала аграрной отрасли, являются слабо развитая инфраструктура функционирования субъектов хозяйствования, недостатки стратегического менеджмента в системе формирования и использования кадрового потенциала, несоответствие профессионально-квалификационного ресурса потребностям цифровизации экономики в условиях инновационного прогресса, низкая научная и предпринимательская активность.

Один из самых актуальных вопросов для нашего сельского хозяйства – дефицит кадров. В системе АПК не хватает как руководителей, так и представителей рабочих профессий. Помочь справиться с этой проблемой предприятиям и хозяйствам должны учебные заведения, которые готовят специалистов, в том числе и по целевому направлению. Но способствовать закреплению молодежи должны на местах, создавая комфортные условия труда [1].

Исследования показывают, что для решения этих проблем можно предпринять следующие меры:

1. Развитие сети профессиональных контактов: активное использование профессиональных социальных сетей, участие в профессиональных мероприятиях и семинарах помогут расширить круг общения и увеличить шансы на получение приглашений на собеседования.

2. Повышение квалификации: повышение квалификации и профессиональное обучение могут увеличить конкурентоспособность на рынке труда и расширить спектр доступных вакансий.

3. Использование специализированных ресурсов по поиску работы: активное использование специализированных интернет-платформ для поиска работы, агентств по трудоустройству и карьерных центров может помочь найти больше подходящих вакансий.

4. Улучшение информационной прозрачности вакансий: работа с работодателями и государственными органами для улучшения информационной прозрачности вакансий, включая условия труда и заработную плату, может помочь избежать разногласий между ожиданиями и реальностью.

5. Обратная связь от работодателей: важно стимулировать работодателей к предоставлению обратной связи после отклика на вакансию. Это может быть достигнуто путем разработки стандартов для процесса подбора персонала, а также публичного обсуждения этой проблемы с работодателями [4, с. 450].

Принимая во внимание результаты проведенного анализа, можно предложить следующие ключевые направления деятельности, нацеленные на рост уровня использования человеческого капитала АПК Республики Беларусь:

- совершенствование системы подготовки кадров для АПК посредством создания условий для формирования цифровой компетентности работников (как через включение в образовательные программы отдельных дисциплин, так и через развитие неформального образования на открытых цифровых платформах);

- развитие материально-технической базы учреждений образования и расширение их доступа к программным продуктам, используемым на передовых сельскохозяйственных предприятиях;

- расширение возможностей для профессионального совершенствования работников АПК через систему повышения квалификации и переподготовки;

- разработка актуальных программ повышения квалификации, направленных на формирование готовности использования цифровых технологий при проектировании

технологического оборудования отрасли и его эксплуатации в сельском хозяйстве, а также при реализации современных методов управления агробизнесом;

- сотрудничество с агрохолдингами и агрокомпаниями;
- улучшение социальной инфраструктуры сельской местности;
- формирование системы непрерывного профессионального образования, начиная с дошкольного возраста;
- развитие сети информационно-консультационных услуг и онлайн-платформ в АПК;
- организация занятий по профессиональной подготовке кадров на сельскохозяйственных предприятиях и(или) дистанционное обучение через сеть Интернет [2, с. 79].

Таким образом, можно сделать вывод о том, что в современных условиях социально-экономического развития эффективность кадрового потенциала становится ключевым фактором, влияющим на конкурентоспособность и устойчивость организаций, где важно учитывать и количественные, и качественные аспекты труда. Оптимизация распределения трудовых функций, повышение квалификации работников и создание благоприятных условий труда способствуют максимизации производительных результатов и росту производительности.

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ОЦЕНКА И ПЛАНИРОВАНИЕ ЭКОНОМИЧЕСКОЙ СОСТОЯТЕЛЬНОСТИ СЕЛЬСКОХОЗЯЙСТВЕННОГО ПРЕДПРИЯТИЯ

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Abstract. This article defines the concept of economic independence. Criteria and indicators for different types of economic viability are presented. The performance of agricultural enterprises in the Gorki District is analyzed. Problems are identified and practical recommendations for increasing the level of economic independence of agricultural enterprises are substantiated using economic and mathematical modeling.

Keywords: agricultural enterprises, economic independence, economic and mathematical modeling.

Аннотация. В статье дано понятие экономической самостоятельности. Приведены критерии и показатели видов экономической состоятельности. Проанализированы результаты функционирования сельскохозяйственных предприятий Горецкого района. Выявлены проблемы и обоснованы с помощью экономико-математического моделирования практические рекомендации, позволяющие увеличить уровень экономической самостоятельности сельскохозяйственного предприятия.

Ключевые слова: сельскохозяйственные предприятия, экономическая самостоятельность, экономико-математическое моделирование

Государственная программа «АПК будущего» на 2026-2030 годы ориентирована на построение устойчивого высокопроизводительного сельскохозяйственного производства и промышленной переработки, достаточных для поддержания продовольственной безопасности и независимости, обеспечения населения высококачественными, доступными продуктами питания, расширения экспортного потенциала [1]. В этой связи востребованы разработки, направленные на оценку и повышение уровня экономической состоятельности сельскохозяйственных предприятий.

В научной литературе под экономической состоятельностью понимают способность предприятия устойчиво функционировать, получать прибыль и своевременно выполнять финансовые обязательства за счет эффективного использования имеющихся ресурсов. Г.С. Мерзликина и другие рассматривают данную категорию как некоторый уровень

управления предприятием, который позволяет ему функционировать в бизнесе, как совокупность качественных и количественных характеристик, обеспечивающих ему устойчивую жизнеспособность [2, с. 86; 3-5]. Исследования А.Д. Шеремета и других доказывают, что в основе этого понятия лежит процесс рационального использования предприятием факторов производства [6, 7]. При этом рекомендуется оценивать эффективность использования потенциала предприятия.

Ученые-экономисты сходятся во мнении, что экономическая состоятельность предприятия представляет собой многогранное понятие, в составе которого выделяют следующие элементы: рыночную, финансовую, социальную, экологическую, производственную состоятельность. Производственная состоятельность учитывает материально-техническую, технологическую и организационную состоятельность. Г.С. Мерзликина предлагает новую архитектуру экономической состоятельности, включающую дополнительно инвестиционную, инновационную и цифровую состоятельность [2, с. 88].

Следует подчеркнуть, что качественные и количественные характеристики экономической состоятельности сельскохозяйственных предприятий можно определить на основе выделения ее критериев и показателей оценки (таблица 1).

Таблица 1. Критерии и основные показатели видов экономической состоятельности сельскохозяйственных предприятий

Виды экономической состоятельности	Критерии состоятельности	Показатели состоятельности
1	2	3
1. Социальная состоятельность	Качество и уровень использования (отдача) человеческого капитала работников предприятий	1. Соотношение зарплаты с прожиточным минимумом 2. Уровень травматизма 3. Наличие условий для отдыха и профессионального роста 4. Коэффициент текучести кадров 5. Средний стаж работы 6. Удовлетворенность трудом 7. Наличие социального пакета 8. Обеспеченность квалифицированными работниками 9. Среднемесячные доходы работников 10. Уровень развития социальной инфраструктуры
2. Экологическая состоятельность	Степень соответствия экологического состояния нормативам	1. Расходы на охрану окружающей среды 2. Расходы на повышение плодородия земли 3. Количество и токсичность загрязняющих веществ 4. Использование возобновляемых источников энергии 5. Снижение экологических платежей
3. Производственная состоятельность	Производственная мощность предприятия, его способность добиться планируемого объема производства продукции	1. Землеобеспеченность 2. Качество сельскохозяйственных угодий 3. Соотношение фактического и нормативного производства валовой продукции на 100 га сельскохозяйственных угодий 4. Производительность труда работников 5. Себестоимость продукции 6. Наличие оборотных активов для покрытия текущих производственных расходов

		7. Стоимость основного капитала и его доля в общей сумме активов 8. Коэффициент износа основного капитала 9. Рентабельность капитала
Окончание табл. 1		
1	2	3
4. Финансовая состоятельность	Рентабельность предприятий и доля собственных средств в общей сумме финансовых источников	1. Коэффициенты ликвидности: текущая, срочная, абсолютная 2. Коэффициент автономии 3. Коэффициент финансового левериджа 4. Коэффициент обеспеченности собственными оборотными средствами 5. Вероятность возврата внутренних и внешних долгов 6. Рыночная стоимость собственного капитала предприятия
5. Рыночная состоятельность	Доля рынка основной продукции предприятия	1. Устойчиво занимаемая предприятием доля рынка основной продукции 2. Объем заключенных договоров на продукцию предприятия 3. Доля транзакционных издержек в себестоимости валовой продукции 4. Расходы на маркетинг и их окупаемость 5. Рентабельность продаж 6. Рентабельность производства 7. EBITDA
6. Инновационная состоятельность	Формирование инновационного потенциала и его использование	1. Доля инновационной продукции 2. Затраты на технологические инновации 3. Количество работников с учеными степенями, занятых в НИОКР 4. Количество патентов, лицензий, ноу-хау 5. Прибыль от инноваций 6. Рентабельность инноваций
7. Инвестиционная состоятельность	Эффективное использование собственных и привлеченных инвестиций	1. Чистый дисконтированный доход 2. Внутренняя норма доходности 3. Простой срок окупаемости 4. Дисконтированный срок окупаемости 5. Индекс доходности 6. Рентабельность инвестиций
8. Цифровая состоятельность	Баланс целесообразности цифровизации с затратами на ее внедрение	1. Уровень автоматизации бизнес-процессов 2. Доля цифровых каналов взаимодействия 3. Использование передовых технологий: искусственного интеллекта, машинного обучения, больших данных, робототехники, интернета вещей 4. Уровень кибербезопасности 5. Доля специалистов в области информационно-коммуникационных технологий 6. Доля доходов от цифровых продуктов / услуг 7. Срок окупаемости цифровых решений

Источник: Составлено авторами на основе [2-11]

Анализ литературных источников показал, что для оценки экономической состоятельности предприятия разные авторы рекомендуют проводить постоянный мониторинг текущего состояния дел с использованием: системы сбалансированных показателей, исследования внешней среды, конкурентоспособности предприятия, SWOT-

анализа, моделей Э. Альтмана, Ф. Лиса, Р. Таффлера, Л.И. Маслова, Д.Ф. Чангли, Г.В. Савицкой и других, современного инструментария оценки экономической состоятельности предприятия.

В Республики Беларусь совместным постановлением Министерства экономики и Министерства финансов Республики Беларусь от 7 августа 2023 г. №16/46 «Об оценке степени риска наступления банкротства» сформирована специфическая модель анализа оценки состоятельности предприятий, предполагающая расчет и анализ: 1) коэффициента обеспеченности обязательств имуществом, характеризующего соотношение обязательств и имущества; 2) коэффициента просроченных обязательств, характеризующего соотношение просроченных обязательств и общей суммы обязательств.

При этом первый коэффициент рассчитывается как отношение общей суммы обязательств предприятия к общей стоимости его имущества:

$$K_{об} = (ДО + КО) / A, \quad (2.1)$$

где $ДО$ – долгосрочные обязательства;

$КО$ – краткосрочные обязательства;

A – общая стоимость активов.

Второй коэффициент рассчитывается как отношение суммы просроченных обязательств к общей сумме обязательств предприятия:

$$K_{по} = (П_{клиз} + П_{кз}) / (ДО + КО), \quad (2.2)$$

где $П_{клиз}$ – просроченная задолженность по кредитам и займам;

$П_{кз}$ – просроченная кредиторская задолженность.

Установлены критерии оценки степени риска наступления банкротства предприятий и их значения (таблица 2).

Таблица 2. Критерии оценки степени риска наступления банкротства

Степень риска наступления банкротства	Значение коэффициентов оценки степени риска наступления банкротства			
	1	2	3	4
Низкая	$K_{об} \leq 0,5$, $K_{по} \leq 0,2$	$0,5 < K_{об} \leq 0,7$, $K_{по} \leq 0,1$	$0,7 < K_{об} \leq 0,9$, $K_{по} \leq 0,01$	
Средняя	$K_{об} \leq 0,5$, $K_{по} > 0,2$	$0,5 < K_{об} \leq 0,7$, $0,1 < K_{по} \leq 0,2$	$0,7 < K_{об} \leq 0,9$, $0,01 < K_{по} \leq 0,1$	$K_{об} > 0,90$, $K_{по} \leq 0,01$
Высокая	$0,5 < K_{об} \leq 0,7$, $K_{по} > 0,2$	$0,7 < K_{об} \leq 0,9$, $0,1 < K_{по} \leq 0,2$	$K_{об} > 0,9$, $0,01 < K_{по} \leq 0,1$	
Критичная	$0,7 < K_{об} \leq 0,9$, $K_{по} > 0,2$	$K_{об} > 0,9$, $K_{по} > 0,1$		

Источник: [8, с. 93]

С целью оценки экономической состоятельности сельскохозяйственных предприятий Горецкого района проведен анализ их функционирования за 2022-2024 годы [9; 10, с. 17; 11, с. 28-45; 12, с. 152-153]. Анализ показал, что в Горецком районе совокупная прибыль в сельском хозяйстве за анализируемый период составила 35163 тыс. руб. при уровне рентабельности по конечному финансовому результату – 7,3 %.

Анализ коэффициентов риска банкротства за 2022–2024 годы позволил сделать вывод о неоднородной финансовой устойчивости сельскохозяйственных предприятий (таблица 3).

Таблица 3. Значение степени риска наступления банкротства сельскохозяйственных предприятий Горецкого района

Предприятие	Оценка степени риска наступления банкротства					
	2022 г.		2023 г.		2024 г.	
	$K_{об}$	$K_{по}$	$K_{об}$	$K_{по}$	$K_{об}$	$K_{по}$
РУП «Учхоз БГСХА»	0,23	0,03	0,22	0,05	0,23	0,03
ОАО «Горецкая райагропромтехника»	0,35	0,37	0,34	0,38	0,32	0,37

КСУП «Овсянка им. И.И. Мельника»	0,42	0,38	0,39	0,41	0,76	0,14
ОАО «Маслаки»	0,55	0,11	0,69	0,06	0,64	0,08
ОАО «Племзавод Ленино»	0,33	0,27	0,27	0,28	0,25	0,27
ОАО «Коптевская нива»	0,46	0,51	0,44	0,60	0,44	0,64
СЗАО «Горы»	0,29	0,23	0,25	0,44	0,19	0,43
ОАО «Горецкое»	0,54	0,19	0,63	0,08	0,69	0,05

Источник: Составлено авторами на основе информации годовых отчетов предприятий

Можно выделить предприятия с устойчиво низким уровнем риска, такие как РУП «Учхоз БГСХА», показатели которого стабильны, что свидетельствует о высокой финансовой дисциплине и устойчивом положении. Многие предприятия демонстрируют стабильно сложное или ухудшающееся положение: ОАО «Коптевская нива», СЗАО «Горы», ОАО «Горецкая райагропромтехника». КСУП «Овсянка им. И.И. Мельника» улучшило уровень экономической состоятельности за анализируемый период.

ОАО «Племзавод Ленино» демонстрирует стабильно средний уровень риска на протяжении всего анализируемого периода. Значение коэффициента просроченных обязательств указывает на системную проблему с финансовой дисциплиной и управлением денежными потоками. Коэффициент обеспеченности обязательств имуществом находится на приемлемом уровне и имеет тенденцию к незначительному улучшению. Следовательно, для ОАО «Племзавод Ленино» целесообразно выработать рекомендации, внедрение которых позволило укрепить экономическую состоятельность предприятия.

Аргументированно обосновать комплекс мероприятий можно с помощью экономико-математической модели, позволяющей имитировать функционирование сельскохозяйственного предприятия в различных производственных условиях [12, с. 153-155; 13, с. 147–156].

Решение экономико-математической задачи программы развития ОАО «Племзавод Ленино» Горецкого района позволило установить, что с целью с целью увеличения уровня экономической состоятельности в отрасли растениеводства рекомендуется: 1) оптимизировать структуру посевных площадей сельскохозяйственных культур; 2) создать высокопродуктивные кормовые угодья за счет проведения перезалужения лугопастбищных угодий; 3) организовать сбалансированный зеленый конвейер для обеспечения высокой продуктивности молочного стада; 4) обеспечить посев сельскохозяйственных культур в оптимальные агротехнические сроки с соблюдением регламентов и агротехнологических требований; 5) использовать перспективные, высокоурожайные сорта сельскохозяйственных культур; 6) вносить оптимальные нормы минеральных и органических удобрений под посев сельскохозяйственных культур; 7) проводить уборку культур качественно, без потерь, с использованием соответствующего оборудования.

В отрасли животноводства целесообразно: 1) обеспечить дифференцированное кормление животных согласно их физиологического состояния и продуктивности; 2) обеспечить технологический регламент выращивания телят; 3) провести реконструкцию или рассмотреть вопрос постройки новых молочно-товарных ферм и комплексов с целью снижения себестоимости единицы животноводческой продукции; 4) своевременно проводить плановые профилактические, диагностические и лечебные ветеринарные мероприятия.

С целью повышения экономической состоятельности за счет цифровизации экономики необходимо: 1) организовать проведение оцифровки пахотных и улучшенных луговых земель; 2) обеспечить закупку сельскохозяйственной техники, оснащенной системой навигационного автоуправления; 3) оснастить датчиками учета и контроля расхода топлива сельскохозяйственную технику с целью оперативного мониторинга ее работы; 4) рассмотреть возможности применения различного программного обеспечения для управления в сельскохозяйственных предприятиях, которое позволит управление технологическим процессом осуществлять при помощи цифровых технологий.

Вышеизложенные мероприятия позволят ОАО «Племзавод Ленино» увеличить уровень производства всех видов сельскохозяйственной продукции. Выручка от реализации продукции увеличится с 9,8 до 13,3 млн. руб. Предприятие получит прибыль от реализации продукции в размере 387 тыс. руб. при достижении уровня рентабельности 3,1 %.

Таким образом, вышеизложенные мероприятия позволят увеличить уровень экономической самостоятельности предприятия на основе рационального использования имеющихся ресурсов, перехода к высокотехнологичному и ресурсосберегающему производству, внедрения информационных технологий в АПК, увеличения экономической эффективности сельскохозяйственного производства, получения качественной и конкурентоспособной продукции.

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ВОПРОСЫ ЭНЕРГОСБЕРЕЖЕНИЯ И ЭНЕРГОЭФФЕКТИВНОСТИ: ОЦЕНКА ЖИТЕЛЕЙ СЕЛА КИРСОВО, РЕСПУБЛИКА МОЛДОВА

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Abstract. In this publication, the author presents the results of a study conducted in the village of Chirsovo to assess the opinions of village residents on energy saving and energy efficiency. The representative sample consisted of 130 respondents. Based on the results of the study, the author identified a number of problems related to energy saving and energy efficiency. Based on the results of the analysis, the author formulated recommendations.

Keywords: energy saving, energy efficiency, assessment of the opinions of village residents, village Chirsovo.

Введение. Процессы, происходящие в энергетическом секторе Республики Молдова (РМ) на современном этапе определяют необходимость рационализации потребления энергетических ресурсов экономическими агентами и населением. Внедрение государством политик в области энергетики [1] и диверсификация поставок энергетических ресурсов в стране привели к резкому росту тарифов с 2021 года. Это моментально сказалось на моделях поведения граждан, выраженных в таких направлениях, как энергосбережение и реализация энергоэффективных решений. Для предложения оптимальных решений со стороны органов власти, важно обладать информацией о том, какова реальная картина в области энергопотребления, энергосбережения и внедрения на практике решений/проектов в сфере энергетической эффективности. К сожалению, в публичном пространстве подробной информации на уровне отдельных населенных пунктов практически нет, что выдвигает необходимость применения других форм аккумулирования информации, включая проведение опросов на уровне отдельных городов и сел.

Целью настоящей публикации является представление оценки мнений жителей села Кирсово, автономно-территориального образования (АТО) Гагаузия (Гагауз Ери), Республики Молдова по вопросам энергосбережения и энергетической эффективности по результатам анкетирования, выявление проблем на местном уровне и выработка рекомендаций для последующей реализации на уровне села.

В соответствии с целью исследования были выделены следующие задачи:

- провести объективный анализ общественных настроений среди жителей села Кирсово по вопросам энергосбережения и энергетической эффективности;
- определить наиболее острые проблемы в сферах энергопотребления и энергетической эффективности;
- оценить уровень удовлетворенности жителей села Кирсово ситуацией в области поставки и потребления энергетических ресурсов;
- выработать рекомендации на основе полученных аналитических данных.

Методология исследования включала в себя: определение целей, формирование репрезентативной выборки домохозяйств, разработка структурированной анкеты, проведение очного опроса жителей села Кирсово, а также статистическую обработку данных для разработки рекомендаций.

Результаты исследования. Исследование было проведено в рамках проекта «Энергоэффективные социальные услуги временного размещения для жертв домашнего насилия АТО Гагаузия», реализуемого общественной ассоциацией (ОА) Biaz Gul при финансовой поддержке ЕС в рамках проекта «Местные партнерства для энергоэффективности в социальных услугах», софинансируемого и реализуемого Фондом Сорос Молдова в партнерстве с Keystone Moldova и ОА Фондом Социальных Инноваций Молдовы.

Село Кирсово расположено в долине реки Ялпуг в центральной части Буджакской степи. Село входит в состав АТО Гагаузия (Гагауз Ери), имеющего особый правовой статус в составе Республики Молдова. АТО Гагаузия является отдельным экономическим регионом страны. Расстояние от села до столицы АТО Гагаузия муниципия Комрат 8 км, а до столицы Республики Молдова муниципия Кишинэу 110 км. Общая площадь села составляет 102,7 км². В селе 2222 домов и квартир, из которых 2103 или 94,65% оборудованы централизованным водоснабжением и 1745 или 78,5% газифицированы, 100% имеют доступ к электрической энергии. Канализационная инфраструктура в селе отсутствует.

В рамках исследования были опрошены 130 жителей села (октябрь-ноябрь 2025 года). Интервьюирами выступили 10 волонтеров из числа жителей села Кирсово. Анкета включала в себя 8 вопросов, касающихся личных характеристик респондента и 38 вопросов для изучению общественного мнения по вопросам в области энергетической эффективности и энергопотребления жителями села Кирсово. В данной научной статье приводятся отдельные результаты проведенного исследования. Результаты проведенного исследования заслуживают достаточного уровня доверия так как, при размере выборки 130 человек, генеральной совокупности 5335 человек, и при доверительной вероятности 95,0% предельная ошибка составила 8,0%.

В анкетировании приняли участие жители, проживающие на 11 улицах с.Кирсово (Таблица 1).

Таблица 1. Информация о респондентах принявших участие в опросе

№ п/п	Наименование улицы	Общее количество человек	в том числе					
			мужчин			женщин		
			15-35	36-63	64 и старше	15-35	36-63	64 и старше
1	Ленина	16	2	3	2	2	5	2
2	Юбилейная	10	1	2	2	1	3	1
3	Комсомольская	14	2	2	2	2	5	1
4	Ю. Гагарина	12	2	2	2	2	3	1
5	Садовая	12	2	2	2	2	2	2
6	Мира	2	-	1	-	-	1	-
7	Олимпийская	14	2	3	2	2	4	1
8	Котовского	24	2	3	3	5	7	4
9	М. Танасогло	12	2	2	2	2	2	2
10	28 Июня	12	2	2	2	2	3	1
11	Винзаводская	2	-	-	1	-	1	-
Итого:		130	17	22	20	20	36	15
			59			71		

Источник: составлено автором

По критерию семейное положение, 76 человек или 58,5% дали ответ «женат/замужем», 26 человек или 20,0% «не состоял(-а) в браке», 20 человек или 15,4% «вдова/вдовец» и 8 человек или 6,1% «разведен(-а)».

По уровню образования, 46 человек или 35,4% ответили «высшее образование», 21 человек или 16,1% «неоконченное высшее», 51 человек или 39,2% «среднее специальное», 7

человек или 5,4% «среднее», 5 человек или 3,9% «неполное среднее». Ответы «начальное образование» и «нет начального образования» не были отмечены респондентами.

С точки зрения социального положения, респонденты представлены следующим образом: учащиеся 9 человек или 6,92%, студенты 7 человек или 5,38%, работающие по найму 58 человек или 44,62%, временно не работающие 11 человек или 8,46%, безработный 9 человек или 6,92%, собственник бизнеса/предприниматель 3 человека или 2,31%, пенсионеры 33 человека или 25,39%.

По критерию «Общее количество человек, проживающих в домохозяйстве» получены следующие результаты: 10 человек или 7,69% ответили «проживаю один», 34 человека или 26,15% «проживают 1-2 человека», 61 человек или 46,92% «3-4 человека», 25 человек или 19,23% «5-6 человек». В среднем в одном домовладении проживает более 3 человек.

По критерию «Совокупный среднемесячный доход членов семьи, проживающих в домохозяйстве» получены следующие ответы: «до 5 тыс. леев» 10 человек или 7,69%, «от 5 до 10 тыс. леев» 37 человек или 28,46%, «от 10 до 15 тыс. леев» 29 человек или 22,31%, «от 15 до 20 тыс. леев» 35 человек или 26,92%, «от 20 до 25 тыс. леев» 10 человек или 7,69%, «от 25 до 30 тыс. леев» 6 человек или 4,62%, «от 30 до 35 тыс. леев», «от 35 до 40 тыс. леев», «свыше 45 тыс. леев» по 1 ответу или по 0,77%.

Респонденты, участвовавшие в опросе, отвечая на вопрос «Как Вы оцениваете уровень своего текущего потребления энергии в быту?» дали следующие ответы, представленные на Рис. 1.

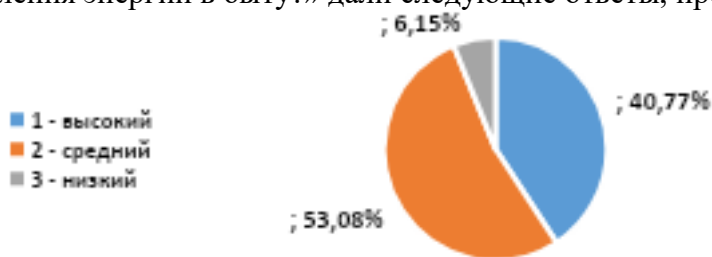


Рис. 1. Оценка уровня текущего потребления энергии в быту респондентами

Источник: составлено автором

Полученные результаты демонстрируют, что в современной жизни рядового гражданина энергия играет важную роль, так 69 человек или 53,08% дали ответ «средний уровень», 53 человека или 40,77% «высокий уровень», и только 8 человек дали ответ «низкий уровень». Если ответы на данный вопрос увязать с ответами на следующий вопрос, то картина становится еще более полной. Отвечая на вопрос «Ваше домовладение имеет подключение к источникам энергии?», все 130 человек или 100,0% отметили подключение к сетям энергоснабжения, и 125 человек или 96,15% указали подключение дома к сетям природного газа.

На вопрос: «Знакомы ли Вы с понятием «энергосбережения»?», были получены еще более значимые результаты, так 120 человек или 92,31% дали ответ «да» и только 10 человек или 7,69% дали ответ «нет».

На вопрос: «Знакомы ли Вы с понятием «энергоэффективность»?», 106 человек или 81,54% дали ответ «да», а 24 человека или 18,46% дали ответ «нет». Это говорит о том, что абсолютное большинство респондентов имеют представление об этом относительно новом термине.

На вопрос «Какие основные цели использования электрической энергии» получены следующие результаты Рис. 2. Всего 499 ответов, т.е. в среднем 1 респондент дал 3,8 ответа.

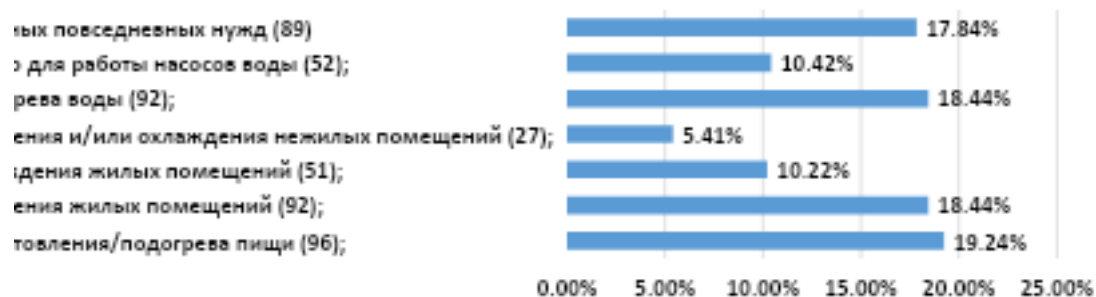


Рис. 2. Основные цели использования электрической энергии респондентами, % полученных ответов (в скобках число полученных ответов, при том, что респонденты могли дать несколько ответов на данный вопрос)

Источник: составлено автором

Отвечая на следующий вопрос «Какие из электрических приборов Вы используете в повседневной жизни?» респонденты могли выбрать все из предложенных вариантов. Всего было получено 1715 ответов, т.е. в среднем 1 респондент дал чуть более 13 ответов (Таб. 2).

Таблица 2. Информация об электрических приборах, используемых респондентами

Наименование	Количество ответов	Наименование	Количество ответов
1 – телевизор	127	14 – мобильный телефон	123
2 – холодильник	130	15 – пылесос	122
3 – стиральная машина	125	16 – электрический гриль	13
4 – сушильная машина	26	17 – микроволновая печь	73
5 – посудомоечная машина	47	18 – электрический чайник	79
6 – кухонная плита	87	19 – кофе-машина	41
7 – духовой шкаф	87	20 – осушитель/очиститель воздуха	5
8 – электрическая вытяжка	62	21 – аэратор воздуха в помещении	6
9 – кондиционер	57	22 – электрический котел	28
10 – персональный компьютер	44	23 – бойлер для нагрева воды	38
11 – ноутбук	55	24 – фен	94
12 – планшет	35	25 – утюг	115
13 – принтер	37	26 – электрические инструменты	59

Источник: составлено автором

На вопрос «При организации системы обогрева собственного домовладения в зимний период, Вы используете» были получены следующие результаты Рис. 3. Всего получено 269 ответов.

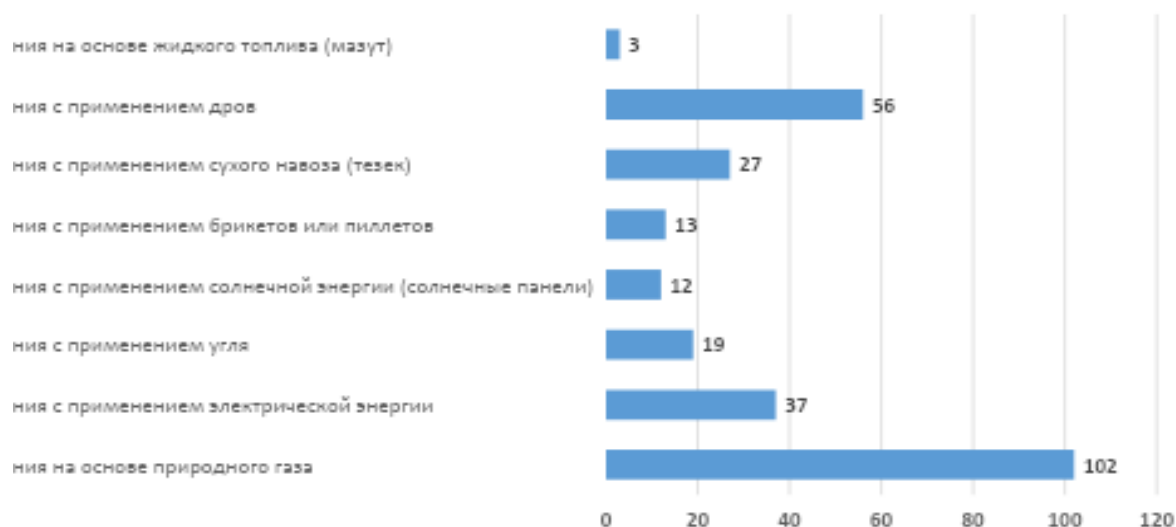


Рис. 3. Использование систем для обогрева домовладений

Источник: составлено автором

Полученные результаты говорят о том, что в среднем 1 респондент дал чуть более 2-х ответов. 36 человек отметили, что отапливают домовладение только на основе использования природного газа, 10 человек указали, что используют отопление только на дровах.

На вопрос «В процессе использования электрической энергии, Вы практикуете экономию электрической энергии?» 78 человек или 60,0% дали ответ «всегда стараюсь экономить», 47 человек или 36,15% «периодически экономлю», 5 человек или 3,85% «не экономлю энергию».

В качестве реализации мер по экономии электрической энергии респонденты назвали: 84 человека – энергосберегающие лампы, 109 человек – не оставляю включенными электрические приборы, когда они не требуются, 45 человек – отказываюсь от использования электрической техники без острой необходимости, 31 человек – использую экономный режим бытовой техники, 17 человек – не использую меры для экономии электрической энергии. Причины по которым не используют меры для экономии электрической энергии: 9 человек – используемые мной электрические приборы и так расходуют минимальный уровень, 4 человека – нет возможности экономить электрическую энергию, 3 человека – не знаю, как экономить электрическую энергию и 1 человек – нет необходимости экономить, тарифы на электрическую энергию не высокие.

Основными источниками информации об энергетике, энергосбережении и энергоэффективности для абсолютного большинства респондентов являются телевидение – 97 человек, сеть Интернет – 94 человека.

На вопрос «Какие основные цели использования электрической энергии» получены следующие результаты Рис. 4. Всего 249 ответов, т.е. в среднем 1 респондент дал 1,92 ответа.



Рис. 4. Основные цели использования электрической энергии респондентами, % полученных ответов (в скобках число полученных ответов, при том, что респонденты могли дать несколько ответов на данный вопрос)

Источник: составлено автором

Оценивая уровень тарифов на электрическую энергию 106 человек отметили как высокий, и 24 человека, как средний, а на природный газ 122 человека, как высокий тариф, и 8 человек, как средний.

На вопрос «В предыдущие годы (2022-2024 годы) Вы пользовались системой компенсаций, предоставляемых государством для пользователей энергии?» 97 человек ответили да, и 33 человека дали отрицательный ответ. На вопрос «В рамках программы поддержки EcoVoucher в области энергосбережения, был ли предоставлен Вам ваучер на замену бытовых приборов?» из 130 человек только 8 человек дали положительный ответ, при этом 6 человек воспользовались предоставленным ваучером (4 человека – холодильник, 2 человека – стиральная машина), а 2 человека не смогли воспользоваться ваучером по причине того, что у них не было в достаточном количестве денежных средств.

На вопрос «Знаете ли Вы о маркировке энергоэффективности бытовой техники?» (А, В, С, Е, F, G)» из 130 человек только 83 человека ответили положительно, из них 30 человек учитывают маркировку всегда при покупке бытовой техники, 34 человека иногда, и 19 человек никогда при покупке техники на неё не обращают внимание.

На вопрос «В целях энергосбережения в личном домовладении, каковы Ваши намерения и желания?» 56 человек уже реализовали меры по энергосбережению, а 74 человека желают их реализовать.

Важным направлением стала оценка вовлеченности или готовности жителей села Кирсово к реализации мероприятий в сфере энергоэффективности. Так, 43,07% от числа опрошенных отметили, что уже начали реализовывать в своем домовладении меры, связанные с энергоэффективностью и сбережением энергии, а 56,93% указали, что обязательно намерены инициировать реализацию мер по энергоэффективности и энергосбережению.

Отвечая на вопрос «Считаете ли Вы, что вопросы энергетической эффективности являются важным элементом для развития села Кирсово?» 105 человек или 80,77% дали ответ «да», 9 человек или 6,92% дали ответ «нет», а 16 человек или 12,31% «затрудились ответить».

В рамках исследования респонденты оценили необходимость Плана мобилизации местного сообщества с.Кирсово в области энергоэффективности для развития села (Рис. 5).

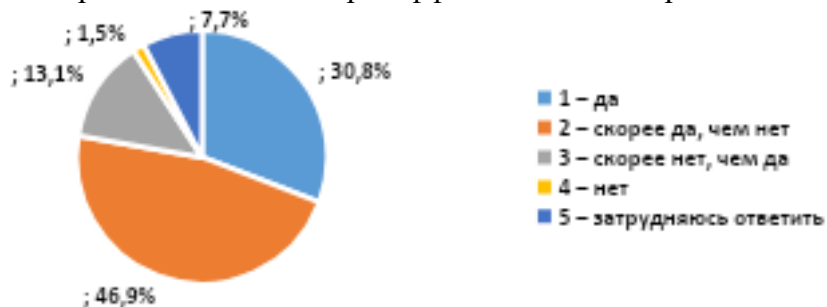


Рис. 5. Информация о мнении респондентов необходимости Плана мобилизации местного сообщества с.Кирсово в области энергоэффективности для развития села

Источник: составлено автором

Полученные результаты свидетельствуют, что абсолютное большинство ответов «да» и «скорее да, чем нет». Только 2 человека дали однозначный отрицательный ответ, а 17 человек ответили «скорее нет, чем да».

Вместе с тем, только 31,5% ответили, что готовы принять участие в публичных слушаниях по обсуждению проекта Плана мобилизации местного сообщества с.Кирсово в области энергоэффективности, что говорит о низком уровне участия жителей села Кирсово в обсуждении документов, представляемых примарией и Советом села.

По результатам проведенного исследования можно выделить следующий круг проблем, которые связаны с сферой энергосбережения и энергоэффективностью в с. Кирсово:

1. Устаревшие коммуникации в домовладениях и изношенность энергетической инфраструктуры.
2. Низкий уровень осведомленности жителей села по вопросам энергосбережения и энергоэффективности.
3. Недостаточный уровень инвестиций в сфере энергоэффективности.
4. Низкий уровень доходов жителей села и дороговизна внедрения решений в сфере энергетической эффективности.
5. Наличие технических сложностей и нехватка квалифицированных кадров для реализации проектов в сфере энергоэффективности.
6. Нет программ поддержки со стороны государства по энергоаудиту частных домовладений.
7. Зависимость получения жителями села коммунальных услуг от обеспеченности энергетическими ресурсами.

Заклучение. По результатам проведенного исследования, можно сформулировать следующие рекомендации:

1. Целесообразно обеспечить вовлечение жителей с.Кирсово в процесс принятия решений на местном уровне, включая по вопросам энергосбережения и энергетической эффективности.
2. Важно повысить уровень информированности жителей села о важности энергоэффективности и доступных способах ее достижения.
3. Необходимо создать условия для снижения энергопотребления путем внедрения мер по экономии энергии в частных домовладениях.
4. На постоянной основе нужно организовать проведение образовательных программ для разных групп пользователей из числа жителей села для развития компетенций в области управления энергией, использования возобновляемых источников энергии.
5. Путем разработки политик на местном уровне важно инициировать внедрение проектов в области энергетической эффективности для повышения устойчивости и доступности энергии.

По результатам исследования можно сделать вывод, что только комплексный и системный подход позволят обеспечить реализацию мер в области энергосбережения и энергоэффективности.

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СОСТОЯНИЕ И ПЕРСПЕКТИВЫ РАЗВИТИЯ СЕЛЬСКОЙ ДЕМОГРАФИИ В РЕСПУБЛИКИ БЕЛАРУСЬ В НАЧАЛЕ XXI В.

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Abstract. This article analyzes the current demographic situation in rural areas of the Republic of Belarus. Based on a summary of statistical data, conclusions are drawn regarding the characteristics of socio-demographic processes in rural settlements. The key challenges in shaping the demographic reproduction of Belarusian villages are identified.

Keywords: population reproduction, demography, migration, rural areas, reduction, urbanization.

Устойчивое социально-экономическое развитие собственного агропромышленного комплекса (АПК) – одна из важнейших стратегических задач большинства стран мира, в том числе и Республики Беларусь. В этом процессе необходимо учитывать стабильную динамику численности сельского населения, а также работников, занятых в сельском хозяйстве, которые представляют собой не только основу демографического потенциала данной местности, но и определяют успешное инновационное развитие агропроизводства. В этой связи особую актуальность представляет изучение демографической ситуации, сложившейся в белорусском селе.

В отечественной научной литературе изучением демографических вопросов в сельской местности занимались такие ученые как Л. Е. Тихонова, Л. П. Шахотко и др. [1,2]. К примеру, исследователь Л. П. Шахотко в работе «Модель демографического развития Республики Беларусь» рассматривает все демографические процессы в разрезе «город – село». Особое

внимание уделено прогнозным сценариям демографических процессов, их перспективам и регулированию [2].

Основным источником данных стали сборники Национального статистического комитета Республики Беларусь и его Интерактивная информационно-аналитическая система распространения официальной статистической информации. При подготовке были использованы материалы открытой печати.

За последние несколько десятилетий общая динамика народонаселения Республики Беларусь отражает тенденцию значительного роста разрыва между городским и сельским населением. Так, согласно статистическим данным на 1 января 2025 года численность городского населения составляла 7182690 человек, а в сельской местности проживало 1926590 человек. В процентном отношении доля городского населения составила 78,9 % и сельского населения – 21,1% от общего числа жителей страны [3].

Ежегодно в сельской местности Республики Беларуси заметно сокращается количество населения. Данный показатель снижается уже много лет подряд. Об этом свидетельствуют данные из официальной статистики. Так, за последние 20 лет количество сельских жителей в стране уменьшилось на 805,5 тыс. человек, или на 29,5%.

Аналитики Белорусского института стратегических исследований (БИСИ) обратили внимание на тот факт, что если в 2005 году в стране проживало 2,73 млн. сельских жителей, то в 2025 году этот показатель снизился до 1,93 млн. человек. При этом доля сельского населения за последние два десятилетия уменьшилась с 28,1% до 21,1% на фоне процессов, связанных с урбанизацией.

Обратим внимание на тот факт, что тенденция сокращения численности сельского населения началась в стране с 1970 года и продолжилась более ускоренными темпами после 1990-х годов. Если в городе демографический кризис стал следствием рыночных реформ в постсоветское десятилетие, был связан с падением уровня жизни, то снижение рождаемости в сельской местности Беларуси началось раньше, и было связано с масштабной урбанизацией в 70-80-х гг. прошлого века

В качестве причин сокращения численности сельского населения можно выделить следующие:

- резкое падение доходов населения в сельской местности;
- развитие промышленности;
- рост числа городов;
- создание конкурентоспособных рабочих мест с более высокими доходами в городах.

Отдельно по степени значимости следует выделить концентрацию высших учебных заведений, интеллектуального капитала и развитой инфраструктуры в столице с одновременной популяризацией высшего образования как гаранта «лучшей жизни». В конечном итоге, в конце XX века престижность жизни в городе явилась основным фактором нежелания жить в сельской местности, поиска лучших условий для реализации потенциала лучшего будущего для молодежи страны.

Еще одно подтверждение тенденции сокращения сельского населения – укрупнение сельских населенных пунктов. Однако при этом наблюдается тенденция роста количества малонаселенных деревень, особенно в Гомельской области. На ее территории из общего числа 2255 сельских населенных пунктов происходит ликвидация малонаселенных пунктов из-за отсутствия жителей, включая населенные пункты в Чечерском (Алексеевка, Безбожник, Заручье, Калинино), Буда-Кошелевском (Мигай) районах. На сегодняшний день наблюдается отрицательная динамика количества сельских населенных пунктов в разрезе регионов.

Следует отметить, что общие тренды динамики сельского населения достаточно сходны во всех регионах республики, что проявляется в стабильном уменьшении населения, уровне старения и высоких показателях смертности. При этом основная часть сельских жителей в 2025 году проживала в Минской области – 661,1 тысяча человек. На втором месте

расположилась Брестская область – 362,9 тысячи человек. Третье место досталось Гомельской области – 293,7 тысячи человек. Меньше всего жителей в сельской местности насчитывается в Могилевской области – 186,7 тысяч человек [3].

Эксперты констатируют, что наибольшее сокращение сельского населения произошло в Брестской, Гродненской и Витебской областях. Однако исключением является Минская область, в которой численность сельского населения оставалась относительно стабильной последние два десятилетия, и снизилась только на 2,5% благодаря маятниковой миграции и развитию агрогородков.

Если рассматривать демографическую ситуацию в долевым разрезе, то численность сельского населения сократилась более чем в три раза: с почти 70 % в 1959 году до 21,1% % в 2025 году. Причем за последний год численность сельских жителей сократилась на 1,58%, что значительно быстрее темпов убыли городского населения (0,2%). Отмечается высокая доля пожилых людей и значительная нагрузка на трудоспособное население. Так, на селе на 1000 работающих приходится 989 нетрудоспособных, тогда как в городе – 692 [3].

Наблюдается устойчивая тенденция старения, которая предполагает сокращение доли трудоспособного населения в деревнях быстрее, чем в городах. При этом средний возраст сельского жителя составляет 41,9 года, а у женщин – 44,3 года, у мужчин – 39,1 года. Численность жителей в 5-летних возрастных интервалах сокращается, а «объем» пирамиды смещается вверх, в более старшие возрастные группы. В связи с этим самой многочисленной группой среди сельского населения являются люди 60-64 лет. В более старших группах, начиная с интервала 55–59 лет уже наблюдается значительный перевес женщин, что связано с мужской сверхсмертностью в трудоспособном возрасте.

На начало 2025 года численность мужчин 65–69 лет составила 68 222, а женщин – 83 836. Наименьшая численность жителей свойственна для 15–19, 20–24 и 25–29 лет.

В аспекте гендерного баланса в сельской местности на 1000 мужчин приходится около 1095 женщин (в городах разрыв больше – 1184). В процентном соотношении мужчин и женщин в общей численности сельской населения – 48,1% и 51,9%.

Согласно данным Национального статистического комитета Республики Беларусь, в сельском хозяйстве официально занято около 246,5 тыс. человек. Несмотря на сокращение численности населения и дефицит кадров, агропромышленному комплексу Беларуси удастся увеличивать объемы производства в 2025 г. по сравнению с 2024 годом. Так, за январь–февраль 2025 года общий объем сельскохозяйственной продукции во всех категориях достиг 3,49 млрд. руб., что на 1,2% больше, чем за аналогичный период прошлого года (по данным). Причем экспорт пищевой продукции входит в тройку ключевых источников валютной выручки наряду с машиностроением и нефтехимической промышленностью. Сельскохозяйственная отрасль – единственная среди лидеров экспорта, которая не зависит от поставок основного сырья из-за рубежа. При этом, отмечают эксперты, развитие крупнотоварного аграрного производства в сельской местности, автоматизация и цифровизация приводит к сокращению занятости.

Согласно демографическому прогнозу исследователей численность сельского населения республики к 2035 году будет снижаться в среднем ежегодно на 1,3%, в том числе моложе трудоспособного возраста – на 1,7%, в трудоспособном возрасте – на 1,9%. В целом демографический прогноз на этот период показывает снижение численности сельского населения по республике на 15,6%, в том числе моложе трудоспособного возраста – на 20,2%, в трудоспособном возрасте – на 20,9%. Наблюдается сильное постарение не только всего сельского населения, но и населения в трудоспособном возрасте, которое быстро сокращается.

Таким образом, в сельской местности Республики Беларусь сложилась весьма неблагоприятная демографическая ситуация, которая характеризуется устойчивым сокращением численности населения и высоким уровнем урбанизации. Все сельские населенные пункты Беларуси уже продолжительное время находятся на стадии демографической старости.



Динамика изменения численности населения страны отражает резкий рост численности населения в городе на фоне сокращения общей численности населения Республики Беларусь. Данной проблеме необходимо уделить особое внимание, особенно в силу сокращения общей численности населения страны.

Статистические данные свидетельствуют о сужении демографической базы воспроизводства трудовых ресурсов села за счет таких основных показателей как старение населения, естественная убыль и миграционный отток молодежи в города, что создает дефицит кадров в агросекторе. Однако несмотря на выше указанные проблемы, сельское хозяйство остается эффективным и обеспечивает продовольственную безопасность страны переходя к автоматизации.

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Section 1.2. Marketing and Tourism

Sektiya 1.2. Pazarlama ve turizm

Secțiunea 1.2. Marketing și Turism

Секция 1.2. Маркетинг и туризм

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CONTINUOUS APPROACH TO MARKETING MANAGEMENT

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Abstract. The article discusses a continuous approach to marketing management as a modern methodological basis for management, focused on ensuring continuity, adaptability, and sustainability of value creation processes in conditions of high external turbulence and digital transformation of the economy. Continuity is interpreted as a dynamic relationship between marketing and management based on the cyclical nature of management decisions, constant feedback from stakeholders, and the system's ability to self-learn and self-correct. The results of the study can be used in the formation of enterprise development strategies, the development of adaptive marketing systems, and the improvement of management decision-making practices. A conceptual view of continuous marketing management as a hybrid, self-learning system capable of ensuring consistency between management and market processes in Industry 5.0 conditions is proposed.

Keywords: marketing, management, sustainable development, environmental marketing, lean manufacturing, continuity, self-learning, self-correction, Industry 5.0.

The continuous approach to marketing management is formed at the intersection of systems theory, process management, sustainable development theories, and modern marketing concepts, reflecting the transition from discrete and linear management models to continuous, adaptive, and self-developing systems. Its theoretical essence lies in viewing marketing and management as interpenetrating continua that function in a mode of constant renewal, coordination, and feedback [1]. From a systemic perspective, continuous marketing management is interpreted as an open socio-economic system in which marketing, management and production processes are not isolated but form a single space for value creation. Management decisions are viewed not as one-off acts, but as a continuous process that is adjusted under the influence of internal and external changes.

Within the framework of the continuous approach, management changes its traditional operating logic and manifests itself not as a hierarchically closed system of one-off decision-making, but as a continuous, adaptive and coordinating process embedded in the dynamics of value creation. Management operates in a continuous rather than a discrete mode. Management decisions do not have a fixed 'end point' but are constantly refined and adjusted depending on changes in the external and internal environment. Planning, control and adjustment are carried out cyclically and in parallel, forming a single management continuum. Management becomes adaptive and self-learning, because continuous management is based on constant data analysis and feedback from the market, staff and stakeholders. Errors and deviations are viewed not as failures, but as sources of learning and

improvement for management models. In the continuous model, management is integrated with marketing and production, and the boundaries between management, marketing and production functions are blurred. Management responds to market signals in real time, ensuring that value creation is synchronised at all stages of the chain. The continuous approach involves engaging staff in improvement processes, distributed decision-making and the development of management competencies, which enhances the motivation and sustainability of the organisation.

An important area for improvement is strengthening the process and coordination functions of management, whereby management focuses not on individual functions or results, but on the coordination of resource flows, information and value over time. This ensures greater flexibility in management decisions and reduces structural and resource losses.

Within the framework of a continuous approach, marketing radically changes the nature of its functioning and manifests itself not as an isolated promotion or sales function, but as a continuously operating, integrating and coordinating process within the organisation's management system. Marketing is transforming from a promotion and sales function into a systemic regulator of value flows, combining strategic, tactical and operational levels of management. Marketing activities are not limited to individual campaigns or stages of the product life cycle, but are carried out in a mode of constant monitoring of the market, consumer behaviour and stakeholder expectations, followed by prompt adjustment of management decisions.

In the continuous model, marketing acts as a “sensitive circuit” that ensures the constant collection, interpretation and transmission of market signals to the management and production system. It records changes in demand, consumer values, technological and institutional conditions.

Continuous marketing blurs the boundaries between functions, actively participating in strategy formation, product management, lean manufacturing processes, and innovation. Marketing decisions are made with resource efficiency and process sustainability in mind. Instead of focusing solely on stimulating demand, marketing ensures the alignment of value creation, transfer, and perception processes at all stages - from consumer value formation to post-consumer interaction and feedback. Continuous marketing takes into account not only economic but also social, environmental and ethical aspects of market interaction, ensuring the alignment of the interests of business, consumers and society.

Thus, within the framework of the continuous approach, marketing acts as a continuous, adaptive and coordinating subsystem that connects the market, management and production in a single value creation cycle and ensures the sustainable development of the organisation in conditions of high uncertainty, while management acts as a living, flexible and self-developing system that ensures continuous coordination of value flows, synergy between marketing and production, and sustainable development of the organisation in conditions of high uncertainty [2].

Within the framework of a continuous approach, marketing management functions not as a set of disparate managerial and marketing activities, but as a unified, continuous and self-developing management cycle that ensures the coordination of strategic goals, market signals and operational processes. The boundaries between marketing and management are blurring: marketing analytics is becoming the basis for management decisions, and management ensures the implementation of market guidelines at all levels - strategic, tactical and operational.

Marketing management synchronises the flow of information, resources and value in the “market - management - production - consumer” chain, ensuring their consistency over time and minimising losses. Marketing management behaviour increasingly emphasises resource efficiency, process optimisation, loss elimination and the alignment of market requirements with the capabilities of the production system.

Thus, within the framework of the continuous approach, marketing management acts as a unified, adaptive, and self-learning system for managing value creation, in which marketing plays a sensory and coordinating role, while management ensures the continuity, consistency, and sustainability of the organisation's development. Particular attention should be paid to the synergy of continuous marketing management with the principles of lean manufacturing, sustainable

development and human-centred management models, which allows for increased resource efficiency, competitiveness and long-term viability of enterprises.

Improving marketing management models within the framework of a continuous approach represents a systemic transformation of management logic, aimed at transitioning from fragmented, linear, and functionally disjointed models to continuous, integrated, and adaptive value creation management systems. In this paradigm, marketing and management are viewed not as autonomous functions, but as interconnected continuums that form a single management flow.

The key essence of such improvement lies in changing the nature of management decisions: they cease to be episodic and reactive and take the form of a continuous, cyclical and context-dependent process. Marketing analytics, management planning, operational execution and control are integrated into a single continuous feedback loop, ensuring timely adjustments to strategies and tactics.

The continuous approach also involves integrating lean manufacturing principles into marketing management models. This is reflected in a focus on eliminating waste, improving resource efficiency, and aligning marketing decisions with production capabilities, which contributes to the formation of sustainable competitive advantages.

As part of the continuous approach, the coordination function of marketing management is strengthened. The models being developed are focused not so much on optimising individual functions as on coordinating the flow of information, resources and value in the “consumer - organisation - partners - society” chain. This makes it possible to minimise structural and resource gaps between the market and the internal processes of the enterprise.

Within the framework of process and cyclical approaches, continuity manifests itself in the repeatability of management cycles: “analysis - planning - implementation - control - adjustment”, which ensures the adaptability of marketing management and its ability to respond to changes in consumer behaviour, market conditions, and the technological environment. In this case, it is not the end result that is of key importance, but the stability and consistency of value flows over time.

The concept of lean manufacturing has a significant influence on the formation of a continuous approach, in which continuity is associated with continuous improvement, reduction of losses and optimisation of resources. The integration of lean principles into marketing management allows continuity to be viewed as a tool for improving both the economic and resource efficiency of management decisions [3].

From the perspective of sustainable development theory and human-centred management models, continuous marketing management is focused on the long-term balance of economic, social and environmental goals. In this context, continuity ensures the alignment of short-term market actions with long-term strategic development goals for the enterprise and society.

The continuous approach transforms management logic by introducing continuous cycles of analysis, decision-making and feedback, enabling timely identification of deviations, adaptation of strategies and adjustment of operational processes.

An important area for improvement is the introduction of adaptive and self-learning management mechanisms based on the use of digital technologies, data analytics and real-time monitoring tools. Such mechanisms ensure the evolutionary development of marketing management models, their ability to self-correct and proactively respond to changes in the market environment.

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MARKETING RESEARCH IN THE ERA OF INDUSTRY 5.0: DIGITAL AND NEUROTECHNOLOGICAL CONVERGENCE

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Abstract. This paper explores transformational changes in the system of marketing research in the context of Industry 5.0 development, which is focused on human-centricity, sustainability, and the synergy between humans and digital technologies. The evolution of marketing research tools is analyzed, ranging from classical and digital methods based on self-reported and behavioral data to contemporary neurotechnological and immersive approaches. Particular attention is paid to the potential of augmented and virtual reality (AR/VR) technologies and eye-tracking methods as instruments for enhancing the objectivity, validity, and analytical depth of marketing research. Key challenges, including technical, methodological, economic, and ethical aspects, are discussed, alongside prospects for integration with artificial intelligence and big data to automate analysis and personalize research scenarios. It is substantiated that the convergence of digital and neurotechnological tools corresponds to the key principles of Industry 5.0 and forms the basis for the development of human-centered, sustainable, and strategically grounded marketing solutions.

Keywords: marketing research, consumer behavior, neuromarketing, digital marketing, Industry 5.0, immersive technologies, behavioral analytics, virtual reality, eye-tracking,

Marketing research has traditionally served as a key instrument for reducing uncertainty in managerial decision-making. It enables companies to better understand consumer needs, motivations, and behaviors, assess market conditions, forecast demand, and develop competitive strategies. However, in the context of rapid technological change, classical approaches to data collection and analysis in marketing increasingly prove to be insufficient.

The current stage of economic development is characterized by accelerated digitalization, exponential growth in data volumes, the increasing complexity of consumer behavior, and higher requirements for the speed and accuracy of managerial decisions [1, p. 130]. These processes are reflected in the concept of Industry 5.0, which shifts the focus from purely technological efficiency (typical for Industry 4.0) to human-centeredness, sustainability, and synergy between humans and advanced technologies [2, p. 157]. In such conditions, marketing research must not only record observable facts but also interpret cognitive, emotional, and behavioral responses of consumers in depth.

A distinctive feature of marketing research in the era of Industry 5.0 is the active integration of interdisciplinary technologies that combine advances in digital marketing, behavioral economics, neuromarketing, and big data analytics. The role of methods capable of capturing actual rather than

self-reported consumer responses—such as visual attention, spatial perception, emotional engagement, and product or brand interaction experience—is increasing [3, p. 103].

In this context, modern technological solutions such as augmented and virtual reality (AR/VR) technologies and eye-tracking systems are of particular importance [4, p. 14]. They open new opportunities for modeling consumer experiences in a controlled environment, testing marketing stimuli before market launch, and obtaining more objective data on consumer behavior. The use of these technologies transforms the methodology of marketing research, enhancing its analytical potential and creating new development perspectives for marketing in conditions of technological acceleration and Industry 5.0.

Various aspects of marketing research have been examined by both global scholars (Alderson W., Bagozzi R., Churchill G., Kotler P., Keller K., Malhotra N., Ortinau D., et al.) and Ukrainian researchers (Baskakova M.Yu., Vankovich L., Vasylyshyna L.M., Horyashchenko Yu.G., Illiashenko S.M., Pauk N.I., Yahielska K.Yu., Kvyatko T.M., Mandich O.V., Sevidova I.O., Babko N.M., Romaniuk I.A., Vitkovskyi Yu.P., Mykitas A.V. etc.) [5-8].

The prospects of implementing digital marketing tools have been explored by Babin B., Black W., Chaffey D., Hair J., Harrison D., Hendrayati H., Hoffmann S., Kannan P., Lemon K., Mai R., Nadeak T., Rahayu A., Verhoef P., Duma O., Honcharova K., Humennna O., Karpenko L., Khrupovich S., Melnyk M., Oklander M., Oklander T., Ostapchuk A., Pedko I., Yashkina O. [9–14].

However, an analysis of the scientific literature on marketing research reveals a significant gap between the pace of technological progress, the real needs of markets, applied research, and the systematic development of methodological frameworks, standards, and the analysis of convergent challenges in applying modern technologies in marketing research. This gap underscores the **need for further investigation**.

The **aim of this study** is to theoretically justify and systematize approaches to the use of augmented and virtual reality technologies and the eye-tracking method in contemporary marketing research, as well as to identify their methodological advantages, limitations, and integration prospects in the context of digitalization and Industry 5.0 marketing development.

The evolution of marketing research is driven by the increasing complexity of the market environment, economic digitalization, and changes in consumer behavior patterns. Traditional marketing research methods, such as surveys, in-depth interviews, and focus groups, have long remained the main instruments for gathering information on consumer preferences. Their key limitation is reliance on subjective, self-reported assessments, which do not always reflect the actual motivational mechanisms underlying decision-making.

The use of web analytics, user behavior analysis in digital environments, A/B testing, and social media monitoring has enabled a shift from studying intentions to analyzing actual consumer behavior. Nevertheless, these methods still capture only external behavioral manifestations, without revealing deeper cognitive and emotional responses.

The current stage is characterized by the active adoption of neurotechnologies (neuro-tech) aimed at studying unconscious perception and decision-making processes. Such methods include eye-tracking, electroencephalography, galvanic skin response, and functional magnetic resonance imaging. Their use reflects a shift from interpreting verbal responses to objectively measuring physiological and behavioral consumer reactions.

Augmented reality (AR) and virtual reality (VR) technologies, as well as eye-tracking methods, occupy an intermediate position between classical marketing research and neuromarketing approaches. Their key feature is the ability to model a controlled yet highly realistic consumption environment. AR/VR allows the simulation of complex market scenarios (retail spaces, interfaces, packaging, advertising media) without creating physical prototypes, while eye-tracking provides objective fixation of consumers' visual attention during interaction with the stimuli. Combined, these tools increase the validity and practical value of marketing research.

Augmented reality (AR) overlays digital elements onto the user's real-world environment in real time. Virtual reality (VR) creates a fully artificial digital environment in which the user interacts

with virtual objects using specialized devices. Mixed reality (MR) combines elements of real and virtual spaces, enabling interactive interaction between them.

The most common applications of AR/VR in marketing research include:

- testing packaging and visual brand identity;
- modeling retail environments and analyzing consumer behavior in retail settings;
- studying user experience (UX/UI) in digital products;
- analyzing brand experience and emotional engagement of consumers.

The use of virtual environments enables experiments to be conducted under standardized conditions and allows testing of various interaction scenarios without significant time or financial costs.

A comparative analysis demonstrates that classical and digital methods provide high representativeness but are limited in their ability to identify deep cognitive and emotional consumer responses. Eye-tracking allows for objective measurement of visual attention, but its interpretive capacity remains constrained outside the context of a real consumption environment (Table 1).

Table 1

Comparative analysis of marketing research methods

Criterion	Classical methods (surveys, interviews, focus groups)	Digital methods (web analytics, A/B testing)	Eye-tracking	AR/VR Research	AR/VR + Eye-tracking (integrated approach)
Data Type	Declared, subjective	Behavioral, quantitative	Physiological , behavioral	Behavioral , Immersive	Physiological + behavioral
Level of Response Awareness	High	Medium	Low	Medium	Low
Objectivity of Results	Low-medium	Medium	High	Medium-High	High
Control of the Research Environment	Limited	Limited	Moderate	High	High
Reproducibility of the Experiment	Low	Medium	High	High	Very high
Ability to Model the Consumption Environment	Virtually absent	Limited (digital environment)	Absent	High	High
Visual Attention Measurement	Indirect	Indirect	Direct	Indirect	Direct
Emotional Engagement Analysis	Subjective	Indirect	Partial	Partial	Advanced
Sample Representativeness	High	High	Limited	Limited	Limited
Implementation Cost	Low	Low-medium	Moderate-High	High	High

Methodological Complexity	Low	Medium	High	High	Very high
Main Limitations	Response bias, social desirability	Limited interpretation of motivations	Interpretation of fixations	Novelty Effect, Technical Barriers	Cost, complexity of analysis
Main Areas of Application	Study of opinions and attitudes	Online behavior analysis	UX, advertising, packaging	Retail, Brand Experience	Comprehensive consumer insights

Source: Created by the author of the publication based on [12-15].

Key advantages of AR/VR technologies include a high level of respondent engagement, the possibility of repeated reproduction of research scenarios, and reduced costs for physical prototyping. At the same time, these technologies have certain limitations, including novelty effects, limited sample representativeness, and the need for specialized equipment and software.

Eye-tracking is an emerging trend as a tool for analyzing consumer behavior. It is a method for recording eye movements, allowing fixation on gaze direction, duration of fixations, and the sequence of visual information perception. In marketing research, stationary, mobile, and VR-integrated eye-tracking systems are used. Key indicators include fixations (reflecting visual attention concentration), heatmaps (visualizing attention distribution), and gaze paths (showing the sequence of perception of object elements).

Eye-tracking is particularly valuable for evaluating advertising effectiveness, testing packaging, analyzing user interfaces, and optimizing merchandising in retail spaces. The collected data helps identify elements that attract or are ignored by consumers.

However, the implementation of AR/VR and eye-tracking technologies also poses convergent challenges. These challenges are not limited to technical aspects (equipment cost, calibration requirements, data quality, cybersecurity) but include methodological (result interpretation, standardization of procedures, ensuring sample representativeness) and managerial issues (investment efficiency assessment, data privacy, adherence to ethical standards when studying unconscious reactions).

Promising directions for development include the integration of AR/VR and eye-tracking with artificial intelligence and big data technologies, which can automate result processing and increase the accuracy of consumer behavior prediction. Another vector is the personalization of research scenarios and adaptation of virtual environments to individual respondent characteristics.

In the context of Industry 5.0 marketing, these technologies are particularly important as tools for a **human-centered approach**, aimed at creating sustainable, emotionally significant, and socially responsible interactions between brands and consumers.

The use of AR/VR technologies expands the methodological toolkit of marketing research by enabling the simulation of realistic interaction scenarios with products and brands. The most promising direction is an integrated approach combining AR/VR and eye-tracking, which allows for the simultaneous analysis of behavioral and physiological responses within a controlled immersive environment.

Conclusions. The study analyzed the theoretical and methodological foundations for applying augmented and virtual reality technologies, as well as eye-tracking methods, within the system of modern marketing research. The analysis demonstrated that the development of marketing research tools is progressively shifting from classical methods, based on self-reported consumer evaluations, toward digital and neurotechnological approaches that provide a higher level of objectivity and reproducibility of results.

It was found that AR/VR technologies have significant potential for simulating realistic consumption scenarios and testing marketing hypotheses in controlled environments without the need to create physical prototypes. This expands the possibilities for studying consumer behavior in retail environments, testing packaging, user interfaces, and brand experiences. At the same time, the effectiveness of AR/VR applications largely depends on the quality of research scenario design and the technological readiness of the infrastructure.

It was demonstrated that eye-tracking is one of the most informative tools for analyzing consumers' visual attention, allowing researchers to capture unconscious elements of perception of marketing stimuli. The use of fixation metrics, heatmaps, and gaze paths provides empirically grounded data that complement traditional research methods and enhance the validity of findings.

A comparative analysis of marketing research methods showed that the greatest research value lies in the integrated approach combining AR/VR and eye-tracking technologies. This approach allows for the simultaneous consideration of both behavioral and physiological consumer responses, facilitating a deeper understanding of decision-making mechanisms and reducing the influence of subjective biases.

Key limitations of implementing AR/VR and eye-tracking were identified, including the high cost of equipment, methodological complexity in data interpretation, as well as economic and ethical issues related to the processing of personal information and the impact on unconscious consumer reactions. These limitations underscore the need to develop unified methodological standards and ethical guidelines for the application of these technologies in marketing research.

Future research prospects are associated with the integration of AR/VR and eye-tracking with artificial intelligence and big data analytics, which will enable automated data processing and improve the accuracy of consumer behavior forecasting. In the context of Industry 5.0 marketing, these technologies are viewed as important instruments for fostering human-centered, empathetic, and sustainable marketing interactions between brands and consumers.

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SOCIAL MEDIA AS A DRIVER OF AUDIENCE ENGAGEMENT AND TRUST: A CASE STUDY OF LAF.MD

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Abstract. Social media have transformed audience behavior, significantly influencing levels of engagement and trust in information sources. This article examines how social networks shape consumer behavior through mechanisms such as social proof and opinion leadership, as well as how these factors can be leveraged to build audience trust. A case study of the regional news portal LAF.MD is presented, analyzing its multi-platform social media strategy, content practices, and audience metrics. The findings highlight innovative approaches to audience engagement and emphasize the importance of media literacy initiatives in enhancing the quality of information education

Keywords: social media, audience engagement, trust, social proof, media literacy, LAF.MD

Introduction.

In the era of digital communication development, social media have become a key tool for interacting with audiences, significantly influencing consumer behavior and the formation of trust in information sources [1][2]. Audiences increasingly obtain news and make decisions based on information from social networks; according to research data, approximately 71% of users in Moldova receive news via social media platforms [3]. Social networks often reach audiences that exceed those of traditional mass media [4] and create new models of engagement in which users are no longer passive consumers but active participants in information exchange. This has led to the growing relevance of studying the impact of social media on audience engagement and trust in media sources.

These aspects are particularly important in the context of improving the quality of education: the development of media literacy and the implementation of innovative approaches to audience engagement through social media are currently regarded as effective tools for enhancing the quality of information education. This article focuses on analyzing the theoretical foundations of the

influence of social media on audience engagement and trust, as well as examining the practical experience of the regional portal LAF.MD (Autonomous Territorial Unit of Gagauzia, Republic of Moldova) in working with audiences on social networks

Theoretical Foundations of the Influence of Social Media on Engagement and Trust

Social Media and Audience Behavior/

Social media (social networks, messengers, blogs, video-hosting platforms, etc.) have become an integral part of everyday life for most people over the past two decades [5]. They have fundamentally changed approaches to communication and marketing by enabling consumers not only to receive information but also to influence its dissemination. Contemporary consumer behavior is closely linked to social networks: more than 60% of active internet users learn about brands through social media [2], and nearly half of them respond to offers seen on Facebook or Twitter [2]. Social media shorten the path from information acquisition to action: according to Deloitte statistics, 29% of users make a purchase on the same day they see a product on a social network [6]. Thus, digital platforms have not only expanded reach but also increased consumer trust in online communications [7], making interactions more personalized and faster

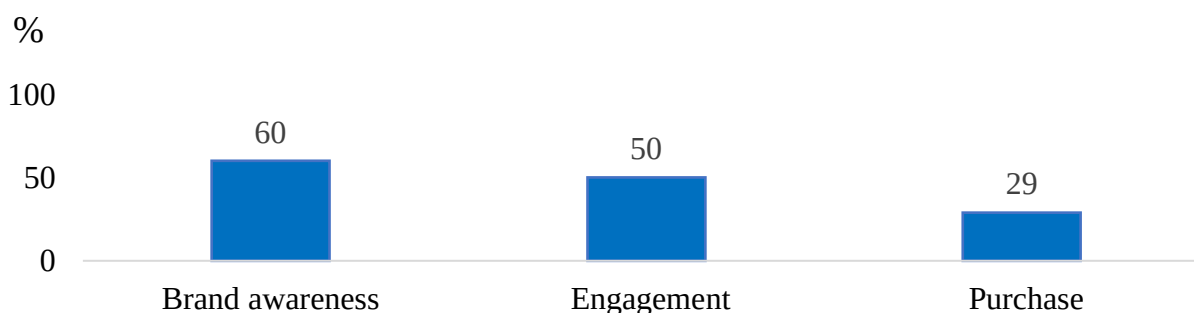


Fig. 1. The Impact of Social Media on Consumers

Source: Compiled by the author based on bibliographic sources [5; 6; 7]

Engagement Mechanisms: The Effect of Social Proof.

One of the key factors influencing audiences in social media is the effect of social proof. According to Robert Cialdini's theory, people tend to make decisions based on the opinions and actions of others, especially in situations of uncertainty [1]. In the context of social media, this means that users are more likely to trust information or content when they observe a high level of approval or activity surrounding it. Companies and media organizations actively leverage this phenomenon: displaying the number of followers, likes, and positive reviews creates an impression of popularity and reliability for new audiences [8].

For example, a large number of subscribers to a YouTube channel is perceived as an indicator of content quality [8]. Positive feedback from real users posted on social media increases audience trust in a brand or information source [9]. Social proof stimulates not only initial engagement but also serves as a signal of trust: according to survey data, 84% of consumers check other users' reviews before making a purchase [10]. A similar principle applies to media consumption: news that is actively commented on and shared is perceived as more significant and worthy of attention. Thus, a high level of audience activity in itself attracts new users, creating a self-reinforcing cycle of engagement

Audience Trust and the Role of Opinion Leaders.

Trust in the information environment is largely built on reputation and social connections. Research shows that generalized trust tends to be higher among individuals who are more deeply engaged in information flows and receive information from diverse sources [11, 12]. Social media make it possible to construct such information channels, where users feel a sense of belonging to a community and engage in direct dialogue with information sources. Opinion leaders—authoritative bloggers, experts, and public figures whose recommendations influence audience perceptions - play a significant role in this process. Influencer marketing has become an integral part of trust-building

strategies: cooperation between brands and popular bloggers leads to increased sales, greater brand awareness, and an improved image [13].

For media outlets, collaboration with opinion leaders (e.g., inviting experts, reposts by influential individuals) can enhance trust in published content. People tend to trust recommendations from acquaintances or respected individuals more than official statements [14]. In addition, the effect of electronic word-of-mouth (e-WOM) on social media strengthens trust: users are more likely to believe news shared by their friends and content that has received a large number of user reactions [15]. As a result, well-structured communication on social media—taking into account the principles of social proof and engagement with opinion leaders—contributes to the formation of a loyal audience and increased trust in media resources [16, 17]

Media Literacy and Information Quality.

Along with new opportunities, social media have brought challenges related to information quality and trust. The crisis of trust in traditional media amid the spread of online platforms has given rise to the phenomenon of post-truth and a surge in disinformation [18,19]. Under these conditions, the need to develop media literacy - critical thinking in relation to consumed media-has become increasingly evident. Experts emphasize that improving media literacy and audiences' ability to verify facts is a key starting point for restoring public trust [20].

Media education must keep pace with technological development, focusing on the influence of social media algorithms, agenda-setting filters, and the viral spread of false information [21, 22]. For media organizations, this means implementing innovative approaches to audience engagement that both entertain users and educate them in critical content perception. Thus, theoretical analysis shows that social media can be a powerful channel for increasing audience engagement; however, audience trust and the quality of the information environment directly depend on the responsible use of these channels and the overall level of media literacy in society

About the LAF.MD Portal.

LAF.MD is an independent information and analytical portal established in the autonomous region of Gagauzia (Republic of Moldova). The website began operating in 2020 and has been developed with the support of the public organization “Media Birlui – Uniunea Media” [23]. The mission of the portal is to provide objective and honest information about key regional events, counter propaganda and stereotypes, and educate the audience [24]. The name “LAF” means “word” in the Gagauz language, symbolically reflecting the editorial team’s belief in the importance of words and information for the development of democracy [25].

A strong emphasis is placed on the educational role of media: the portal participates in media literacy enhancement projects. In particular, LAF.MD implements a project aimed at combating disinformation and developing critical thinking in Gagauzia, with financial support from international media partners [26]. The development of the LAF.MD website has also taken place within European Union initiatives supporting quality journalism in the region [27], underscoring its role in improving information standards. Thus, LAF.MD is engaged not only in news and analysis but also in shaping a media-literate audience, which aligns with the broader objective of improving the quality of education in the information sphere

Presence on Social Media Platforms.

To expand reach and audience engagement, LAF.MD actively employs a multi-channel social media strategy. The portal is present on major platforms, including Facebook, Instagram, YouTube, Telegram, and TikTok. Figure 1 presents the distribution of the LAF.MD audience across key social platforms based on the number of subscribers. The largest share of subscribers is concentrated on YouTube: the official LAF.MD channel has attracted approximately 22,000 subscribers, significantly exceeding its audience on other platforms. This is explained by the editorial focus on video content: news, interviews, and original programs are regularly published on YouTube, attracting both local and broader audiences.

The LAF.MD Facebook page has around 5,000 regular followers; however, content reach on Facebook often exceeds the number of followers due to active reposting and user engagement. On

Instagram, the audience exceeds 2,000 followers, where breaking news, photo reports, and content previews are published. The LAF.MD Telegram channel is currently relatively small (around 300 subscribers), likely due to local audience preferences and the generally lower popularity of Telegram in the region. TikTok adoption began recently, and the number of followers there is still in the hundreds; nevertheless, this platform is viewed strategically by the editorial team due to its growing popularity among young audiences. This diversified approach ensures LAF.MD's presence across all key information consumption environments, enhancing the overall sustainability of its reach

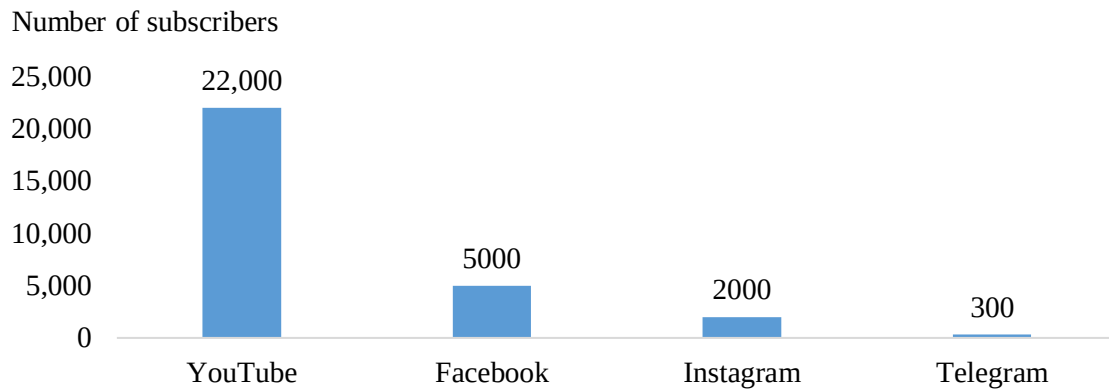


Fig. 2. Distribution of LAF.MD Subscribers across Social Platforms (2025)

Source: Compiled by the author based on the analytical database of the media company LAF.MD
Audience Engagement Dynamics and Trust.

Despite varying audience sizes across platforms, the editorial team strives to maintain active interaction everywhere. Facebook is particularly important as one of the main communication platforms with readers of the regional portal. Notably, the engagement rate on the LAF.MD Facebook page is quite high: the number of users actively interacting with content (commenting, sharing, reacting) often matches or even exceeds the number of page followers. For example, individual publications devoted to high-profile events (elections, social issues) receive hundreds of shares and comments, thereby engaging a significantly broader audience than the regular follower base. Audience trust in the local source is expressed through high activity levels: users not only read but also discuss LAF.MD news and recommend it to others.

This supports the theoretical argument that user engagement in information channels contributes to increased trust [28]. Figure 2 illustrates the dynamics of audience engagement on LAF.MD's Facebook page throughout 2023 (based on a conditional indicator of total monthly interactions with publications). The graph shows a significant surge in activity in April–May 2023, when an election campaign and the election of the Bashkan (head of the autonomy) took place in Gagauzia.

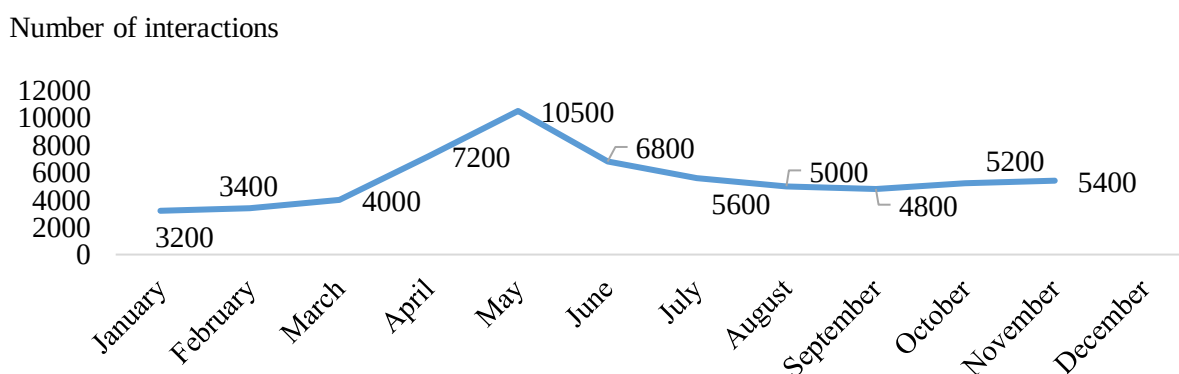


Fig. 3. Dynamics of Audience Engagement on the LAF.MD Facebook Page (2023, number of interactions per month). The graph shows a sharp increase in activity in May 2023 during the Gagauzia Bashkan elections

Source: Compiled by the author based on the analytical database of the media company LAF.MD

During this period, LAF.MD news and videos were widely shared by users, and discussion levels reached peak values (over 10,000 interactions per month in May). After the elections, engagement declined somewhat but remained higher than at the beginning of the year due to sustained audience interest and trust in the source. This surge confirms that during critically important information events, audiences turn to trusted regional media and actively participate in discussions, strengthening horizontal community ties through social media

Content Strategy and Innovative Formats.

LAF.MD's success on social media is driven by a well-designed content strategy adapted to each platform. The editorial team combines news briefs, analytical reviews, video reports, and specialized sections to maintain the interest of different audience segments. For example, the website and Facebook page regularly publish materials in the "Analysis" section—explanatory articles on the most relevant topics that enhance readers' understanding of complex issues [29]. These long reads are accompanied by infographics and multimedia elements, making them attractive to online audiences.

On Instagram, the focus is on visual content: photo news, brief summaries with vivid images, and stories featuring polls and quizzes for followers. A notable practice is the creation of "cards"—series of short tips or facts in a graphic format optimized for social media distribution. One example is the "Financial Culture" card series, which explains everyday financial issues in simple and visual terms. These materials, created within a project aimed at combating disinformation, attract high interest due to their usefulness and viral potential while also serving an educational function [26].

Interactivity is another key element of the strategy: LAF.MD conducts opinion polls on social media, invites audiences to submit questions to experts before interviews, and organizes small contests (e.g., photo contests on cultural traditions). This two-way communication format increases reader loyalty, as users feel they are part of a media-centered community. In addition, the editorial team responds to comments and messages, maintaining dialogue and prompt feedback—an important factor in building trust.

Trust and Outcomes.

Thanks to its comprehensive approach, LAF.MD has managed to establish a reputation as a reliable source of information in the region within a relatively short period. Indicators of audience trust include both quantitative metrics (subscriber growth, high engagement levels) and qualitative indicators such as mentions within the local community, citations by other media outlets, and positive reader feedback. It is important to emphasize that audience engagement through social media is not an end in itself for LAF.MD but a means of strengthening public awareness. By implementing the principle of "inform, educate, and engage," the portal contributes to increasing media literacy among the population.

Users who regularly interact with LAF.MD content on Facebook and other platforms become accustomed to fact-checking, comparing different viewpoints (thanks to the portal's balanced content [30]), and generally adopting a more critical approach to consumed news. This effect is particularly valuable from an educational perspective, as audiences develop critical thinking and information analysis skills in everyday life. Thus, the LAF.MD case demonstrates how a regional media outlet, by applying innovative social media practices, can simultaneously increase audience engagement, build trust, and contribute to public information education

Conclusions.

Social media in the contemporary information environment act as a powerful factor influencing audiences. Theoretical analysis confirms that through mechanisms such as social proof, electronic word-of-mouth, and the activities of opinion leaders, social networks shape consumer behavioral models, enhance engagement, and can increase trust in brands and information sources. At the same time, without the development of media literacy and a responsible approach to content creation, increased engagement may be accompanied by the spread of misinformation.

Therefore, improving the quality of education and public awareness requires combining active media work on social networks with educational initiatives. The practical experience of the LAF.MD portal shows that a regional media outlet, with a well-designed strategy, can successfully compete for audience attention by relying on innovative formats and adapting to the specific features of different platforms. LAF.MD's multi-channel presence has ensured broad reach, while its focus on dialogue with audiences has resulted in high levels of user engagement. By involving readers in discussions of relevant topics while simultaneously providing high-quality, verified content, the portal has achieved increased trust: residents of the region increasingly use LAF.MD as their primary source of news, especially in critically important situations. An important aspect is LAF.MD's integration of media education elements into its activities (debunking disinformation, explaining complex topics, promoting critical thinking).

This serves as an example of how innovative engagement approaches through social media can function not only as marketing tools but also as instruments for improving the quality of information education in society. In conclusion, when used effectively, social media become allies in the development of an educated and active audience. The LAF.MD case demonstrates a synergistic effect: the combination of theoretically grounded engagement methods (social proof, collaboration with opinion leaders, interactivity) with practical implementation at the local level leads to a significant strengthening of audience trust. This contributes to the formation of a sustainable information community in which high engagement goes hand in hand with increased media literacy and, consequently, with improved quality of public dialogue and education

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PROBLEMS AND PROSPECTS OF EVENT TOURISM: REGIONAL ASPECT

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Abstract. The article examines the problems and prospects of rhodium tourism in the regional aspect. The main problems of the development of event tourism in Ukraine are identified. The key directions that determine positive prospects are given. The study conducted a SWOT analysis, which allowed for a comprehensive assessment of strengths and weaknesses, as well as identifying key opportunities and external threats to the development of the tourism industry of the Khmelnytskyi region. It is substantiated that the prospects for the development of event tourism in Ukraine and the Khmelnytskyi region are interconnected and mutually dependent. At the national level, the most promising directions include the digital transformation of events, integration into international festival and event networks, the formation of innovative event formats, support for local cultural initiatives, as well as the renewal and development of tourism infrastructure. In the regional dimension, these opportunities are reflected in strengthening the role of Kamianets-Podilskyi as a leading historical and festival center, developing new gastronomic, ethnocultural and artistic events, activating international partnerships, as well as in the implementation of digital technologies and multimedia solutions aimed at improving the quality of the tourist experience and the competitiveness of the regional event product.

Keywords: tourism, event tourism, event, historical and cultural heritage, regional tourism.

Ukraine is characterized by significant potential for the development of event tourism, which is due to the rich historical and cultural heritage, the diversity of ethnocultural traditions, the presence of unique local holidays, festivals, artistic, sports and gastronomic events, as well as a high level of creative human capital. Regional specificity, the multifaceted nature of cultural and social practices create the prerequisites for the formation of competitive event products aimed at different target audiences.

At the same time, despite the existing potential, the development of event tourism in Ukraine is accompanied by a number of systemic problems, including an insufficient level of strategic planning, fragmentation of state and regional support, limited investment resources, weak integration

of events into the tourism infrastructure of the regions, underdevelopment of marketing and branding tools, as well as external challenges associated with security risks and the consequences of military actions. Taken together, these factors highlight the need for a comprehensive scientific analysis of the problems and prospects for the development of event tourism, taking into account the regional aspect and current conditions for the restoration of the tourism industry in Ukraine.

Event tourism occupies an important place in the structure of modern tourism, as it is based on the desire of people to participate in significant cultural, social or entertainment events. It emerged as a response to global trends in post-industrial society, where the role of emotions, impressions and unique experiences is growing. In scientific research, event tourism is defined as a type of tourist activity, the basis of which is visiting a specific event, which acts as the leading motive for travel and forms the structure of the tourist product. The essence of event tourism is to create short-term, but high-intensity emotional experiences, which makes it one of the most promising areas of tourism development in the world. The uniqueness of the event, its scale, atmosphere and social component provide a strong emotional impact on the tourist, and the event itself acts as a powerful tool for forming loyalty to the tourist destination.

The features of event tourism are the absence of seasonality, the possibility of forecasting, mass, interactivity, innovation, regularity of events, stimulation of repeated visits to destinations and spectacle.

Nowadays, event tourism is rightly mostly oriented towards public, political, economic, historical and cultural, religious, artistic, and sports resources of anthropogenic origin. And only a small part of the segment of event tourism is based on natural spectacles and related activities.

A characteristic feature of event tourism is the dedication of a trip to a certain event, holiday, or spectacle. These can be national festivals, carnivals, international competitions of various types (music, singing, choreography), sports competitions, theatrical performances, events, as well as natural phenomena that attract tourists with their uniqueness and originality.

Also, this direction in tourism makes it possible to solve many socio-economic problems inherent not only to the tourism industry. Events are powerful stimulants of tourist flows. At the same time, event tourism helps to solve the problem of seasonality in tourism, attracting tourists in the off-season. The development of event tourism contributes to the creation of new additional jobs and ensures employment of the population. We believe that event tourism is a promising type of tourism industry in the region with inexhaustible resource potential. They contribute to the socio-economic growth of Ukraine, the popularization of potential tourist resources among the population. Every year, the number of various types of events in the regions of Ukraine is growing, despite the lack of support at the state level and the insufficient development of appropriate marketing measures.

The main problems of the development of event tourism in Ukraine[1, 2]:

1. Military challenges and security threats. Full-scale military aggression against Ukraine has radically changed the conditions for the functioning of the event industry. Key consequences include: a sharp reduction in the number of large mass events; reformatting traditional festivals into volunteer or charitable ones; reducing tourist flows, especially international ones; the need to take into account the risks of air raids, attacks and missile strikes; loss of infrastructure in certain regions. In such conditions, the event industry is forced to adapt, looking for new formats, in particular online and hybrid events, chamber events, events in safer regions.

2. Infrastructure problems and uneven regional development. Key difficulties of an infrastructural nature: lack of large modern venues for holding international festivals, fairs, exhibitions, congresses; insufficient level of transport accessibility in many regions; lack of quality hotels of categories 3-5* outside large cities; weak development of smart infrastructure for events; uneven level of development between western and eastern regions. These factors limit the ability to host large international events and expand tourist flows.

3. Imperfection of legislation and state regulation. The regulatory field of the event industry is fragmented and requires systemic changes. Main problems: lack of a specialized state program for the development of event tourism; Insufficient funding for cultural projects; Complex bureaucratic

procedures for obtaining permits; Imperfect licensing system for organizers of mass events; Inconsistent safety standards. The lack of a comprehensive strategy leads to the lack of systematic event policy at the national level.

4. Financial constraints and low investment attractiveness. Financing problems concern both Organizers and infrastructure facilities: lack of stable state support for festivals and creative projects; low investment attractiveness due to military risks; limited grant funding opportunities; dependence on sponsors and patrons; lack of private investment in modernization of facilities. As a result, many events do not have the opportunity to develop or scale to the international level.

5. Shortage of qualified personnel and weak professional management. Despite the high creative potential of Ukrainians, the labor market in the field of Event Management faces difficulties: lack of a sufficient number of specialized educational programs; insufficient training of specialists in event production, show directing, and technical support; outflow of creative personnel abroad; weak project management culture; insufficient knowledge of organizers of modern technologies and international standards. This limits innovation and the quality of events.

6. Low level of promotion of Ukrainian events on the international market. The problem of insufficient promotion is manifested through: fragmentation of information resources about events; weak tourist branding of cities; lack of a national calendar of events; insufficient integration into international platforms and catalogs; limited digital marketing campaigns. As a result, Ukrainian events often remain unknown to a foreign audience.

Despite the difficult conditions, the future development of event tourism in Ukraine has significant potential. The following are the key areas that determine positive prospects:

1) formation of a state strategy for the development of event tourism. A comprehensive state policy may include: development of a national event support program; creation of funds for financing regional initiatives; simplification of permitting procedures; development of infrastructure (festival parks, congress centers, art hubs); formation of the brand of Ukraine as an event destination. The presence of a single strategic vision will ensure consistency in the development of the industry;

2) strengthening the role of events in cultural sustainability and national identity. Ukrainian events have already become symbols of sustainability: numerous charity festivals in support of the Armed Forces of Ukraine; art platforms aimed at preserving cultural heritage; international tours of Ukrainian artists as a form of cultural diplomacy; revival of local traditions through mass holidays. After the victory, event tourism can become one of the leading tools for the country's recovery;

3) development of digital, hybrid and smart events. Current trends allow us to expect the active implementation of: VR/AR technologies in shows and exhibitions; mobile applications for event navigation; people flow management systems; hybrid formats that combine online and offline; technologies for personalizing the tourist experience. Digitalization opens up access to a wider audience and reduces organizational costs;

4) integration with creative industries. Ukraine is actively developing: the music scene; film and theater industry; contemporary art; design and fashion; gastronomic projects; craft festivals and ethnocultural events. The combination of these areas will create the basis for the formation of world-class events;

5) regional development and formation of new tourist centers. Many regions have significant potential for creating event-based tourism products: Transcarpathia - gastronomic and wine festivals; Lviv region - music and cultural events; Podillia - ethnographic festivals; South - sea festivals and sports competitions; Central Ukraine - historical and patriotic events. Decentralization creates unique opportunities for the growth of local events;

6) international integration. Promising are: Ukraine's involvement in European festival networks; creation of joint Ukrainian-European events; participation in international competitions and exhibitions; development of cultural diplomacy through events; support for UNESCO and European grant programs. Ukraine can become a prominent player in the European event market;

7) rebuilding infrastructure after the war. After victory, the country will have a chance to create: new modern festival venues; congress centers; sports arenas; art clusters; reconstructed cultural objects; innovative tourist routes. This stage can become a point of explosive development of event tourism.

Event tourism in Ukraine, despite the complex challenges, has significant potential for development. Problems of infrastructure, security, financing, staffing and promotion hinder the formation of a full-fledged industry, however, the presence of a rich cultural heritage, high creative resources, the growing role of events in cultural diplomacy and the possibilities of digitalization create powerful prerequisites for future development. In the future, event tourism can become a key element of the reconstruction and international representation of Ukraine, contribute to the growth of tourist flows, economic growth and strengthening of national identity. Khmelnytskyi region has significant potential for the development of event tourism due to cultural traditions, historical locations and numerous festival initiatives, however, there are a number of factors that limit the dynamism of this process. The presented SWOT analysis comprehensively reveals the strengths, weaknesses, potential opportunities and external threats to the industry (Table 1) [2, 4].

Table 1. SWOT analysis of event tourism in Khmelnytskyi region

S – Strengths (Сильні сторони)	W – Weaknesses (Слабкі сторони)
1. Rich historical and cultural heritage (Kamyanetsia-Podilskyi, fortresses, castles, architectural complexes).	1. Uneven development of tourism infrastructure in the region.
2. Presence of well-known festivals and events (historical reenactments, balloon festivals, cultural events).	2. High seasonality and dependence of events on weather conditions.
3. Tourist infrastructure in key cities (hotels, restaurants, tourist information centers).	3. Insufficient level of marketing and information support.
4. Favorable geographical location and good transport accessibility.	4. Limited financial resources for holding large-scale events.
5. Local community activity and support for cultural initiatives.	5. Shortage of qualified personnel in the field of Event Management.
O – Opportunities (Можливості)	T – Threats (Загрози)
1. Development of Kamianets-Podilskyi as a national center of event tourism.	1. Military risks, danger of cancellation or postponement of events.
2. Participation in international festival networks and grant programs.	2. Economic instability and declining purchasing power of tourists.
3. Development of gastronomic and ethnocultural festivals in Podillia.	3. High competition from other tourist regions of Ukraine.
4. Use of digital technologies (VR/AR, multimedia shows, mobile services).	4. Possible loss or neglect of cultural heritage sites.
5. Activation of small communities through local festivals.	5. Labor migration and outflow of personnel to more developed cities or abroad.

Each region of Ukraine has unique natural, historical or cultural resources, which, however, are not always used with maximum efficiency. The development strategy of event tourism allows us to focus attention on identifying, structuring and updating tourism potential. In particular, thanks to events, it is possible to revive forgotten traditions, rethink local holidays, and introduce new formats of interaction with the consumer of the tourism product. In this way, tourism potential is transformed from a passive resource into a source of economic profit.

Khmelnyskyi region has a powerful resource for the development of event tourism, in particular in Kamianets-Podilskyi, which is already a strong festival brand. At the same time, the region needs to strengthen infrastructure, marketing, investment and training. Significant opportunities are opening up through integration with international cultural projects, the development

of gastronomic initiatives, the use of digital technologies and the support of local communities. However, external threats, primarily military risks and economic instability, can hinder the development of the industry.

A comprehensive approach will allow Khmelnytskyi to become one of the leaders of event tourism in Ukraine. A comprehensive analysis of the current state of event tourism in Ukraine makes it possible to identify key trends, problems and prospects for the development of this industry. In the context of military challenges, event tourism has undergone significant transformations: some events were forcibly reduced or postponed, organization formats changed, financial resources and the level of investment activity decreased. The main problems of event tourism development in Ukraine today are security risks, underdeveloped or damaged infrastructure, insufficient state support, lack of qualified personnel, weak promotion and lack of innovative technologies in the field of Event Management. However, despite the difficult situation, the industry demonstrates high adaptability and remains an important tool for cultural sustainability, preservation of national identity and social cohesion.

In this context, Khmelnytskyi region is a prime example of a region that has significant potential for the development of event tourism, but at the same time faces problems typical for Ukraine. SWOT analysis confirmed the strengths of the region: the presence of a unique historical and cultural heritage, established festival traditions, advantageous geographical location, activity of local communities and sufficient tourist infrastructure in key locations, in particular in Kamianets-Podilskyi. These factors allow the region to play the role of one of the leading centers of event tourism in the country.

At the same time, the weaknesses of the Khmelnytskyi region - uneven development of infrastructure, seasonality of most events, insufficient marketing support, lack of financial resources and qualified personnel - are fully correlated with national problems. This indicates the systemic nature of the challenges that require comprehensive state policy and regional development programs. Strengthening coordination between authorities, tourism enterprises, creative industries and public initiatives is especially important. The prospects of Ukraine and the Khmelnytskyi region in the field of event tourism are closely linked. At the national level, the most promising areas are the digitalization of events, integration into international festival networks, the development of new event formats, support for local cultural projects and modernization of infrastructure. In Khmelnytskyi region, these opportunities are manifested in the development of Kamianets-Podilskyi as a powerful historical festival center, in the creation of new gastronomic, ethnocultural and artistic events, in the attraction of international partners, as well as in the implementation of digital technologies and multimedia solutions to enhance the tourist experience.

The threats identified in the SWOT analysis - military risks, economic instability, competition with other regions and risks of loss of cultural heritage - also reflect the general context of the development of the event sector in Ukraine. However, with thoughtful strategic planning, investments in infrastructure modernization, strengthening marketing communications and support for creative industries, both the country as a whole and the Khmelnytskyi region can ensure sustainable growth and the formation of a competitive tourism product.

Thus, the combination of national perspectives with regional strengths creates the basis for the effective development of event tourism. Khmelnytskyi region, with a strategic vision, modern management decisions, and active community participation, has every chance to become one of the key centers of Ukraine's event industry and significantly strengthen the country's position in the international tourism market.

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THE ROLE OF ADVERTISING IN THE FORMATION AND DEVELOPMENT OF TOURIST SERVICES

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Abstract

The article examines the role of advertising in the formation and development of tourism services in the context of the modern tourism market. The study analyzes the impact of advertising communications on consumer behavior and demand formation, with particular emphasis on internet advertising as one of the most effective marketing communication tools in the tourism industry. The key characteristics of tourism advertising are identified, and approaches to evaluating its effectiveness from both communicative and economic perspectives are discussed. The findings confirm the importance of advertising as a strategic instrument for promoting tourism products, enhancing competitiveness of tourism enterprises, and supporting sustainable development of the tourism sector.

Keywords: tourism services; tourism advertising; marketing communications; digital advertising; consumer behavior; tourism market; tourism product promotion; advertising effectiveness.

Historical evidence indicates that advertising emerged alongside the social division of labor, which led to the development and complexity of exchange processes. As economic relations evolved, advertising became an important tool for informing market participants about goods and services. Advances in science and technology, as well as the emergence and improvement of technical media such as print, radio, television, and the internet, significantly influenced the development of advertising. Each of these communication channels began to be used as a means of disseminating advertising messages almost immediately after their inception.

Today, advertising is evolving alongside the development and increasing complexity of market relations. It provides consumers with information about possible choices, and creates conditions for manufacturers and service providers to compete and effectively position themselves in the marketplace.

Due to the specific nature of tourism products, tourism advertising must be accurate, reliable, and visually appealing, as well as provide concise and accessible information. Its primary goal is to generate interest among potential consumers and create a positive image of the tourism service or destination.

Table 1. Main areas of advertising and information activities of tourism organizations

No	Main directions	Characteristic
1.	Advertising of tourist areas	Promotion of countries, regions, and centers of tourist interest
2.	Advertising directed at tourism service providers	Information about a travel agency intended to familiarize partners with its activities and services provided
3.	Advertising for work with intermediaries	Information materials designed for working with a network of travel agencies
4.	Advertising for consumer engagement	Advertising of a company's tourism services, promoted through various tools and aimed at consumers

Source: Developed by the author based on [1,3,4]

Advertising is a powerful means of influencing consumers by stimulating the sale of a good product, thereby accelerating the failure of a poorly provided tourism product.

Depending on the interests of the tourism market participants, it is advisable to classify the tasks of tourism advertising as follows:

Table 2. Objectives of tourist advertising

Tasks performed by tourist advertising in the interests of:		
Tourists	Travel agencies	Tour operators
1. To attract attention to a potential company and its services. 2. Inform about the range of tourist services available for sale. 3. Inform about new tourist services. 4. Remind and inform about discounts and the possibility of making a seasonal tour purchase. 4. To interest clients in purchasing a tour.	1. Promote the company and the range of services sold by the company to consumers. 2. To evoke positive benefits for the consumer in choosing this particular travel agency. 3. Inform about the expansion of the range of tourist services sold. 4. Inform about the improvement in the quality of sales of tourist services in comparison with other travel agencies. 5. Influence supply and demand by studying and forecasting customer requests and wishes.	1. Promote the company, travel packages and generate interest in newly developed products among consumers and travel agencies. 2. To prove, argue and guarantee the benefits of choosing this particular tour operator for the consumer and travel agency. 3. To inform about the expansion of the range of tourist services produced and sold on the market. 4. To inform about the improvement in the quality of developed tourist services in comparison with other tour operators.

	6. Stimulate consumer demand and attract tourists. 7To create a positive attitude towards the brand among consumers and travel agencies.	5.Influence supply and demand by studying and forecasting customer needs and wishes, stimulating consumer demand and generating interest <u>attract tourists and partners.</u>

Source: Adapted by the author based on [1,2,5].

Advertising can be considered appropriate in cases where it attracted the consumer's attention, convinced him, first of all, to buy the advertised product, changed the consumer's views for a long time, and fixed the information received in his memory.

Today, the role of online advertising has grown. However, the basic principles and technologies of online advertising differ significantly from those adopted in traditional media such as television, radio, and the press, as was previously the case with tourism organizations.[2] Unlike television or radio, which are relatively passive media, the Internet requires the active participation of the advertiser, as information must be presented. The exchange of information today and the availability of feedback make the Internet an effective advertising tool in terms of the quality of contact with the consumer. Currently, there are three types of Internet use as an advertising channel:

1. Placement of advertising information on websites.
2. Attracting visitors to a website advertiser.
3. Search for consumers of goods and services among the Internet audience.

The choice of one or another type of online advertising, specific advertising media and their formats depends on the goals of the advertising campaign, technical capabilities advertiser, the advertising platforms they choose, and a number of other parameters. The effectiveness of online advertising is the result of a large number of factors, including, first and foremost, qualitative characteristics advertising and the extent of its coverage, the characteristics of advertising media, as well as the design, context, placement, visual and content features of advertisements.[4]

Advertising has a socio-cultural and psychological impact on society. Advertising provides consumers with new knowledge and experience, and enhances satisfaction with purchases. Through advertising, tourism enterprises develop new markets. As a means of competitive struggle, advertising intensifies it, contributing to an improvement in the quality of tourism services. Advertising helps increase sales. Large-scale distribution of services ensures a tourism company's income growth and adequate wages for its staff. It is important that advertising contain reliable information, which is contained on websites, in the tourism organization's catalogs, in advertising leaflets and announcements related to tour sales. Often, a single advertising message must consider all three components of the promoted product: destinations, types of trips, and differentiated offers by consumer category.

At the same time, it is possible to identify the main features and characteristics of advertising in the tourism market as one of the main means of marketing communications.[5]

The most important are:

1. Impersonal character. The communication signal reaches the potential buyer not directly from the seller, but through various intermediaries.
2. One-way direction of the advertising message from the seller to the buyer.
3. Uncertainty in terms of measuring advertising effectiveness. This quality is a logical continuation of the previous one. Feedback in communication is probabilistic and uncertain.
4. Social character. It is assumed that the advertised product is legal and generally accepted.
5. The advertisement clearly identifies the sponsor., advertiser, the entity at whose expense and on whose behalf advertising is carried out.

6. Strikingness and ability to persuade. Repeated advertising messages exert a certain psychological influence on consumers and encourage them to make a purchase. The primary functions of advertising align with the overall goals of the marketing communications system.[2]

Advertising information must be completely different from competitors' offerings. Its uniqueness must be linked to the exclusivity of either the product, its market purpose, or the advertising itself. Thus, advertising is now an essential component of the tourism business.

The success of the tourism industry depends largely on a successful advertising campaign. Advertising expenditures increase every year, as only through advertising can a product reach consumers. To create effective tourism advertising, it is necessary to consider the specifics of the industry and integrate several advertising aspects into a single complex. Assessing the quality of advertising materials is an important component of advertising activities. The first approach evaluates advertising effectiveness based on the communicative function of advertising. In this case, advertising effectiveness can be measured by assessing the degree of influence it has had on the consumer and examining the qualitative and quantitative aspects of this influence.

The second approach to assessing advertising effectiveness is based on the concept of advertising as a sales tool, the primary goal of which is sales. Advertising effectiveness in this case will be measured based on the sales generated by the advertising, i.e., the economic impact will be assessed.[4]

Conclusion

The conducted research allows us to conclude that advertising is one of the key tools for the formation and development of tourism services in the modern market. It has a significant impact on consumer behavior, contributes to the creation of demand, and increases the recognition of tourism products and the brands of tourism organizations. In the context of digitalization, online advertising becomes particularly important, as it is highly interactive, allows precise targeting, and provides feedback from consumers. This enables tourism enterprises to promote their services more effectively by adapting advertising messages to the needs of the target audience and market conditions. Advertising not only serves as a motivating and informative tool but is also a key competitive factor, contributing to improved quality and expanded range of tourism services. The effectiveness of advertising is determined by both its communicative impact on consumers and its economic results, reflected in increased sales and profitability for tourism organizations.

Thus, advertising is a necessary element for the successful functioning of the tourism business and requires a comprehensive, strategic approach to its planning, implementation, and evaluation of effectiveness, taking into account the specifics of the tourism industry and current market development trends.

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INSURANCE PROTECTION FOR MOTOR TOURISTS AS A FACTOR IN THE SUSTAINABILITY OF THE INTERNATIONAL TOURISM MARKET

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Abstract The article substantiates the role of insurance protection for motor tourists as one of the key factors in ensuring the sustainable development of the international tourism market. Particular attention is paid to motor third-party liability insurance within the international 'Green Card' system as a tool for the financial, legal, and social protection of international road traffic participants. It is proven that the 'Green Card' system performs not only compensatory but also regulatory and behavioural functions, influencing the responsibility of motor tourists and confidence in international travel. The study identifies a high concentration in the insurance services market and the growing role of digital and service-based solutions in enhancing the effectiveness of insurance protection. It is argued that the development of innovative insurance products and the alignment of Ukrainian legislation with European standards create the necessary prerequisites for the sustainable development of international motor tourism.

Keywords: insurance in tourism, motor insurance, liability, risk, travel management, tourism.

In the current conditions of the global tourism market development, international tourism remains one of the most dynamic components of the global economy. International transport plays a crucial role in its functioning, with motor transport gaining increasing importance as a means of ensuring mobility, flexibility, and accessibility of travel.

The transformation of tourism demand is accompanied by a growing consumer preference for independent travel planning, driven by the development of digital booking services, navigation, and information support. As a result, an increasing number of travellers undertake international journeys using their own motor vehicles, which highlights the issues of risk management and the provision of adequate insurance protection during cross-border movements.

For Ukraine, these processes have a particular specificity in the context of full-scale war, which has significantly altered the structure of tourism flows, population mobility, and travel patterns. On the one hand, the role of motor tourism has grown as the most accessible and controlled method of movement; on the other hand, there has been an increase in risks associated with road safety, differences in the legal requirements of states, and the financial liability of international traffic participants.

Under such conditions, motor third-party liability insurance for tourists acquires particular importance as a fundamental element of the safety and sustainability of the international tourism market. The international 'Green Card' insurance system serves as a vital tool for the legal and financial protection of drivers outside their country of vehicle registration, ensuring compensation for

damages in the event of road traffic accidents and compliance with the legislative norms of the host countries.

Compulsory motor third-party liability insurance (CMTPL) is a specific type of insurance aimed at protecting the pecuniary interests of entities (both individuals and legal entities) who own land vehicles in the event of their liability for damage caused to the life, health, and property of third parties as a result of a road traffic accident [1].

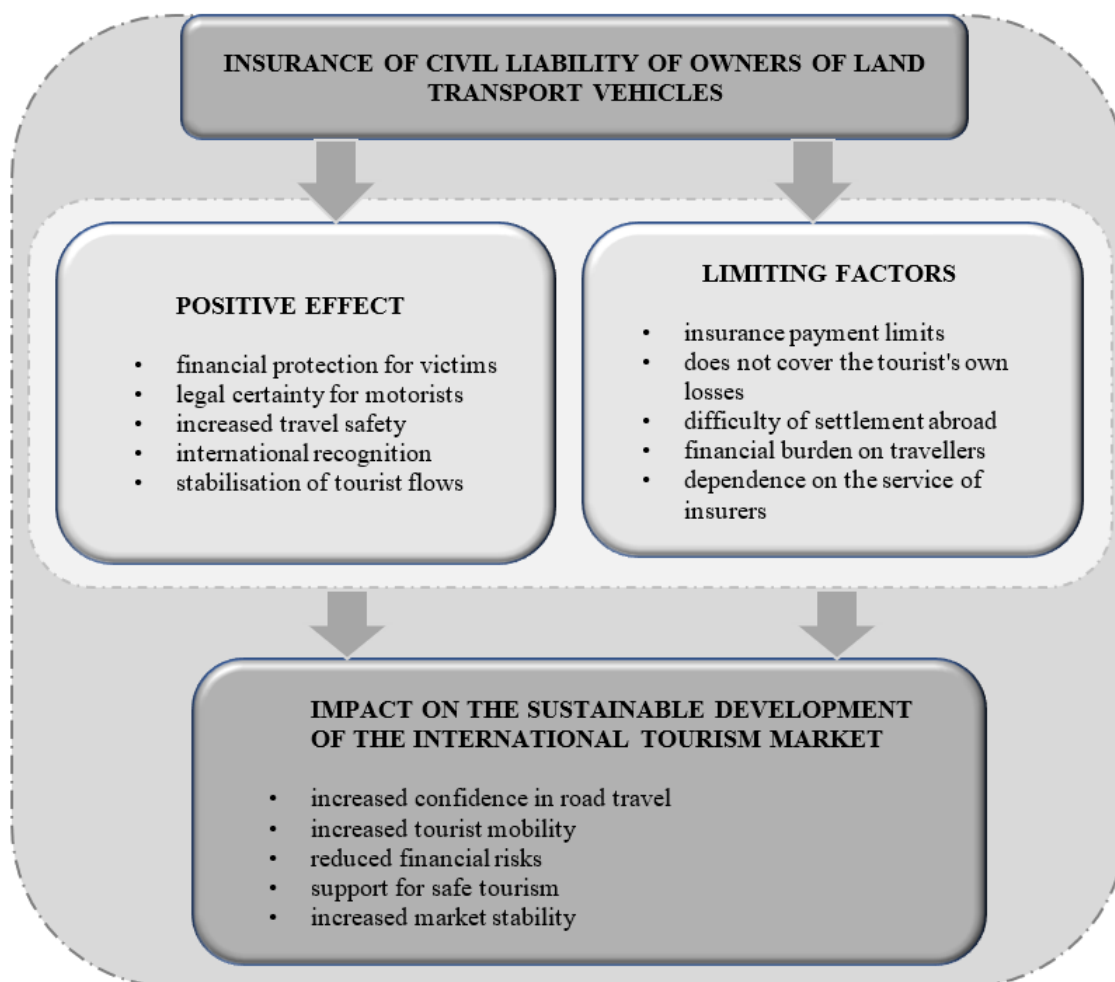


Figure 1. The role of motor third-party liability insurance in ensuring the sustainable development of the international tourism market

Sources: developed by the authors

Motor third-party liability insurance for tourists performs not only a compensatory function but also comprehensive financial, social, and legal functions within the international tourism system. This instrument provides financial protection for victims, establishes legal certainty for international traffic participants, influences tourists' behavioural patterns regarding safe movement, and facilitates the integration of national tourism markets into the international space. The combination of these effects determines the impact of insurance on the stability of tourist flows and market development in the long term. The generalised role of civil liability insurance in the context of international tourism market sustainability is presented in Fig. 1.

The implementation of these functions in Ukrainian practice is based on a clear legislative distinction between types of insurance protection. According to current legislation, two main types of insurance contracts exist in Ukraine: a domestic compulsory motor third-party liability insurance contract, which is valid exclusively within the territory of Ukraine, and an international contract – a

compulsory motor third-party liability insurance contract valid within the territories of the member states of the 'Green Card' international motor insurance system [2].

For policyholders planning cross-border trips, the use of standardised insurance products unified with the requirements of the international insurance system is provided. The validity period of such policies ranges from 15 days to one year, allowing insurance protection to be adapted to the purpose and duration of the motor tourists' stay abroad. A special role in ensuring the accessibility of these products is played by the full digitalisation of the process: according to legislative novelties, the transition to the electronic form of contracts minimises paper-based workflow and simplifies the conclusion procedure. The issuance of contracts is mandatory accompanied by the entry of information into the unified centralised database of the Motor (Transport) Insurance Bureau of Ukraine (MTIBU), which not only guarantees the transparency of operations but also ensures effective real-time control over the existence and validity of insurance coverage.

An analysis of the institutional structure of the market indicates a gradual expansion of the circle of entities: thus, as of January 2026, twelve insurers with full membership in the MTIBU operate within the international 'Green Card' system, which is one company more compared to the previous year. The results of the assessment of key performance indicators of insurers in this segment for 2024 (Table 1) indicate a high level of market concentration, where dominant positions are held by such leading companies as 'TAS' Insurance Group, 'Ukrainian Insurance Group', 'Knyazha Vienna Insurance Group', and 'PZU Ukraine'. It is their share that accounts for the bulk of written insurance premiums and the provided insurance protection.

Table 1. Rating of Insurance Companies in 'Green Card' International Insurance for the 12 Months of 2024*

Insurer	Insurance Premiums, thousand UAH	Insurance Claims, thousand UAH	Claims Ratio, %
TAS IG	1 395 984	430 816	30,86
Ukrainian Insurance Group	759 232	455 901	60,05
Knyazha	605 763	236 775	39,09
PZU Ukraine	542 573	176 273	32,49
Oranta	471 820	99 371	21,06
Persha	432 059	149 710	34,65
Guardian	371 444	286 492	77,13
INGO	368 006	136 804	37,17
UTIC (Ukrainian Transport Insurance Company)	275 039	93 649	34,05
VUSO	152 081	70 847	46,58
ARX	151 159	44 695	29,57

*Sources: compiled by the authors based on data [3]

In terms of the number of settled insurance claims under international 'Green Card' insurance contracts in 2024 (Fig. 2), the leading positions are held by 'TAS' Insurance Group and the Ukrainian Insurance Group (USG). These companies made payments for 3,191 and 3,174 insurance cases, respectively. The market share of each of these insurers is approximately 20% of the total volume of paid claims, which indicates their pivotal role and the high concentration of this segment of the insurance market.

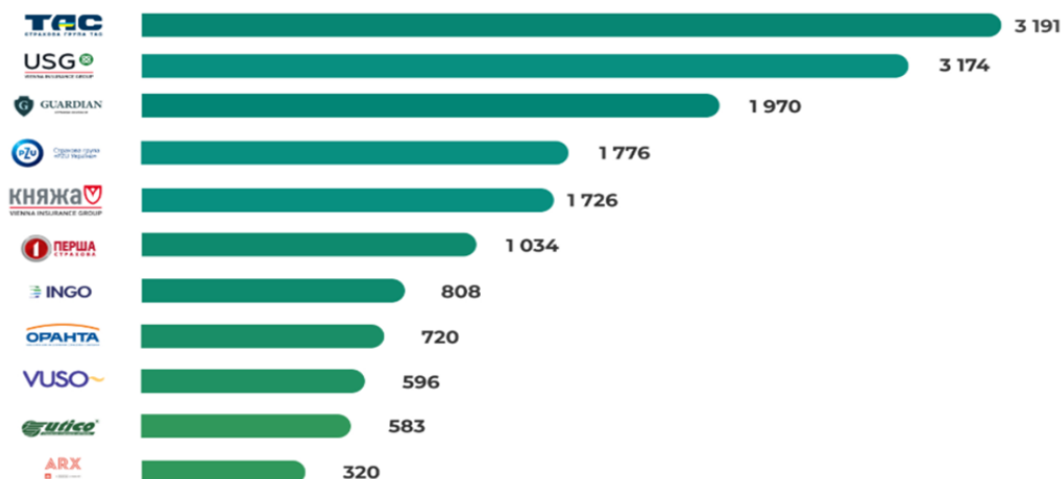


Figure 2. Rating of insurance companies by the number of paid claims under 'Green Card' contracts in 2024, units*

*Sources: [4]

The dominance of leading insurers within the 'Green Card' system has a direct impact on the behaviour of motor tourists, as the stability of claim settlements and corporate reputation shape the level of trust in insurance protection mechanisms during international travel. The awareness of having effective financial and legal coverage reduces the subjective perception of risk, stimulates traveller mobility, and encourages the choice of motor tourism as a form of international travel. Consequently, this reinforces the sustainability of the international tourism market, as insurance acts not only as a tool for loss compensation but also as a behavioural factor ensuring the predictability, safety, and continuity of tourist flows, even in conditions of heightened uncertainty.

Significant volumes of payments under 'Green Card' contracts confirm the high socio-economic importance of this type of insurance for Ukrainian vehicle owners, as it provides genuine financial and legal protection and effective claims settlement outside the country.

In the context of Ukraine's European integration, a priority task remains the completion of the adaptation of national insurance legislation to the requirements of Directive 2009/103/EC. A key stage of this process is Ukraine's accession to the Multilateral Agreement between national bureaux, which provides for the abolition of border controls for insurance certificates at the borders with EU countries. The implementation of this mechanism will contribute to increasing the mobility of motor tourists, simplifying international transport, and creating additional prerequisites for the recovery and development of inbound tourism.

The increasing role of insurance as an element of safe tourism is linked to the implementation of innovative and digital solutions, the development of tourism insurance infrastructure, and the enhancement of insurance product quality. The use of Artificial Intelligence, Big Data analytics, and personalised policies allows for more effective risk management, the mitigation of road traffic accident consequences, and an increase in the level of trust among motor tourists. At the same time, the development of service-oriented insurance remains a vital direction through the expansion of cooperation with assistance companies to provide prompt support for tourists abroad.

Consequently, insurance protection for motor tourists is an essential institutional element of the sustainable development of the international tourism market. The 'Green Card' system performs not only a financial compensation function but also creates the legal and behavioural prerequisites for safe tourist mobility, enhancing confidence in international travel. In the context of European integration and Ukraine's post-war recovery, the development of innovative insurance solutions, the digitalisation of services, and the harmonisation of national insurance legislation with European standards provide the foundation for increasing the competitiveness of Ukrainian motor tourism and its integration into a sustainable model of international tourism development.

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NEUROMARKETING - UNDERSTANDING THE INFLUENCE OF EMOTIONS AND MEMORY ON CONSUMER BEHAVIOR THROUGH THE MEDIATING ROLE OF ARTIFICIAL INTELLIGENCE AND DIGITAL CUSTOMER EXPERIENCE

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Abstract. Historically, companies shouted their message into a void, hoping something would stick. Today, the approach has shifted toward a more intuitive "conversation" between a brand and the human brain. By leveraging advanced data analysis, businesses have moved past guesswork; they now act as architects of Digital Experience (DX), designing virtual environments that mirror how our minds naturally process information. The process begins with Neuromarketing, which acts as the compass. It tells us that for a brand to be successful, it must first spark a positive emotional reaction and then anchor that feeling in the consumer's memory. This engagement acts as a "mediator," turning raw digital interaction into a lasting mental impression. When all these elements align, the digital experience serves as the final, persuasive bridge. It ensures that when a customer is ready to make a choice, the memory of that brand is the most vivid, positive, and trusted option available to them.

Key words: Artificial intelligence, Digital experience, Neuromarketing, Consumer behavior, Memory encoding.

Introduction

Neuromarketing is an innovative approach to marketing those studies how the brain responds to advertising and other marketing stimuli. The term was coined in 2002 by Ale Smidts, but the foundations were laid back in the 1990s. One of the pioneers was Gerald Zaltman, who developed the ZMET method to identify consumers' hidden thoughts and feelings. Companies spend more than 400 billion USD on advertising every year. However, traditional methods are often ineffective because they are based on the words of consumers themselves, who cannot always accurately explain their decisions [1, 2]. Neuromarketing allows us to directly study the brain's response and obtain more accurate data.

This approach has become particularly relevant in the digital age, especially during and after the COVID-19 pandemic. Modern technologies such as artificial intelligence, blockchain, and the Internet of Things make neuromarketing an even more powerful tool. The neuromarketing market is

growing rapidly. In 2023, its volume amounted to 3.32 billion USD, and by 2032, it is projected to reach 6.57 billion USD. The growth of 8.9% per year speaks for itself. Large companies such as PepsiCo, eBay, Daimler, and Frito-Lay are already actively using neuromarketing in their work, confirming its practical value and growing influence in the marketing industry [3].

Neuromarketing is a field at the intersection of marketing, artificial intelligence, and digital experience. Its main goal is to predict consumer behavior. New technologies raise new questions, primarily about data protection and ethics, especially in light of regulations such as the European GDPR.

To understand how the brain responds to advertising, specialists use various tools:

Electroencephalography (EEG): This measures brain activity in real time, allowing us to see which areas of the brain are activated in response to marketing stimuli.

Eye tracking: This technology records where a person is looking and helps assess their attention and engagement.

By combining these methods, companies obtain multidimensional data on consumer responses—from attention and engagement to memory and decision-making processes.

Companies that use this comprehensive approach report significant improvements in key business metrics. A deep understanding of consumer responses to marketing stimuli helps create more effective advertising campaigns and better meet customer needs.

Neuromarketing is becoming increasingly important for companies that want to better understand their customers. Using biometric methods such as EEG, specialists can study how the brain responds to advertising, revealing hidden cognitive and emotional processes that influence choice. This is much more accurate than traditional surveys, where people are not always able to express their true feelings.

Understanding these implicit reactions helps companies create more effective marketing strategies. Research shows that insights from neuromarketing influence:

- ✓ advertising,
- ✓ pricing,
- ✓ branding.

The ability to see the cause-and-effect relationship between marketing stimuli and brain responses allows for the development of more accurate and effective tactics.

In light of this, our research focuses on two key elements of neuromarketing: memory encoding and emotional impact. We analyze how these factors influence consumer behavior and what role artificial intelligence and digital experience play in this process.

Literature review

Essentially, neuromarketing is not just about sales, but about the desire to better understand ourselves and how we interact with the world. This discipline combines marketing with neuroscience to decipher what happens in our minds when we choose a product, transforming complex cognitive processes into meaningful stories. Imagine you are looking at a shelf of products [4]. Although you think you are choosing rationally, your eyes follow a path that neuromarketing can "read." Through eye-tracking technologies and the analysis of micro-facial expressions, researchers can see what catches your eye and what makes you smile involuntarily [5]. They notice subtle details, such as how much your pupils dilate when you are excited or how long you linger on a color. It's all based on two pillars: how strongly something moves us (emotional impact) and how well we retain that information (memory encoding) [6]. The most fascinating part takes place inside. Emotional impact is not just an abstract idea; it has roots in the limbic system, the "command center" of our feelings.

To understand this inner dialogue, tools that seem like something out of the future are used:

Mind mapping: Devices such as EEGs or fMRI scans measure brain activity, showing exactly which areas "light up" with joy or curiosity.

Body echo: Our physical reactions, such as how fast our heart beats (HRV) or that slight sweating of the palms when we are excited (galvanic skin response), are honest indicators of our feelings.

This approach humanizes data. Instead of seeing us as mere statistics, companies can now understand our sincere and hidden reactions. When an advertisement truly moves us, it doesn't just sell us a product, it creates a memory. This invisible connection, measured by heart rate and brain activity, is what transforms a simple viewing into a memorable experience.

The Facial Coding system interprets emotional responses by analyzing micro-expressions and facial movements [1, 2]. At the same time, sentiment analysis methods use natural language processing (NLP) technologies to identify key user preferences and biases towards specific brands and products.

Memory encoding involves transforming a marketing event into a lasting impression in a person's mind. Its main principles include assessing cognitive load, neuroimaging memory centers, testing implicit memory, priming, and the influence of context [7]. One of the most significant capabilities of memory encoding is the ability to assess the cognitive load that people experience when perceiving marketing content. This ability makes it possible to extract an individual's perceptions of the information processing process. In addition, it paves the way for understanding the mechanisms of information encoding by the brain.

Results and discussions

Functional magnetic resonance imaging (fMRI) is a key technique for tracking activity in brain areas associated with memory [8]. In particular, the hippocampus is often activated when perceiving advertising materials.

When it comes to testing implicit memory, neuromarketing uses tools such as the Implicit Association Test (IAT). This tool effectively assesses the quality and consistency of memory encoding processes. At the same time, understanding is achieved without the need for explicit recall, as the method works by assessing unconscious associations [9].

There are many studies devoted to the influence of contextual factors and priming on the memory encoding process in marketing. A number of sources indicate that elements such as musical accompaniment and visual appeal have a significant impact on the quality of memory encoding during advertising campaigns.

The emergence and continuous improvement of artificial intelligence are gradually becoming a hallmark of best practices in e-commerce in the modern business environment. Key areas of application include social networks and product recommendation systems.

Social networks are considered one of the main sources of customer information and have become promising targets for AI modeling with the aim of influencing consumer behavior. AI-driven behavioral analytics is particularly important for training models that analyze vast amounts of data to understand human behavior and identify trends [6].

Machine learning and intelligent data analysis methods are widely used to predict the tastes and preferences of social media users based on their profiles. Artificial intelligence also uses natural language processing (NLP) algorithms to analyze sentiment in social media content [10]. The results provide deep insights into consumer attitudes and emotions toward brands, products, or campaigns (Figure 1).

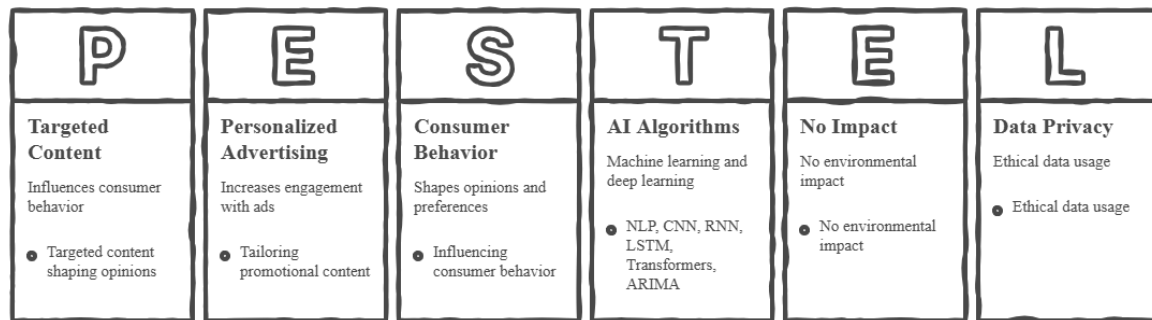


Figure 1. PESTEL analysis of neuromarketing influence for AI modeling with the aim of influencing consumer behavior

Source: Author approach following specialized references [1, 4]

Content on social media also plays an important role in the personalized delivery of advertising material: predictive analytics is used to tailor promotional content in users' feeds. This approach increases engagement with advertising messages [11]. In addition, based on previous interactions with promotional content, systems determine what content to show the user.

AI-based social media platforms significantly influence consumer behavior, shaping their opinions and preferences through targeted content. However, this technique has led to both more informed and impulsive purchasing decisions.

In addition to NLP, other models and frameworks are used to leverage social media data in the creation of AI-based systems and programs. Convolutional neural networks (CNN) and recurrent neural networks (RNN) are examples of such approaches. CNNs are particularly useful for processing image-based content on social media, mainly for understanding and categorizing visual posts. On the other hand, RNNs are effective for analyzing sequential data, such as timestamps of user interactions.

More complex deep learning models, such as long short-term memory (LSTM) networks and transformers, have also proven effective in using social media data for predictive analytics. They provide a more detailed analysis of sentiment in text content and help identify complex patterns in text data.

The ARIMA (Auto-regressive Integrated Moving Average) model also plays a key role in studying the behavioral trends of social media users. It predicts future user actions based on their past behavior. These models can be used individually or in combination with each other to build more powerful hybrid predictive analytics systems.

Product recommendation algorithms are an integral part of artificial intelligence in the business sector, especially in e-commerce. These are machine learning and deep learning technologies that predict user preferences based on their previous purchases and associated emotions [2, 6, 8].

One of the most common approaches is collaborative filtering, which is used to identify potential user intentions when making a purchase. It comes in three forms: user-based, item-based, and hybrid.

- User-based collaborative filtering involves predicting the interests of a specific user based on what other users with similar preferences have purchased, but which the target user has not yet purchased [4].
- Item-based collaborative filtering focuses on the item that the user has shown interest in. The algorithm collects data about other users who have expressed a similar attitude towards this item and forms a list of their preferences.
- The hybrid model combines the advantages of both approaches to create a more accurate predictive algorithm [2].

Other methods used in product recommendations include content-based filtering, the contextual bandit method, and deep learning technologies to improve accuracy.

The digital customer experience can have a significant impact on customer behavior in the marketplace. As Lee (2020) notes, providing customers with a better shopping experience makes them more receptive to promotions and other marketing initiatives.

Modern technologies based on immersive solutions have greatly simplified this process, as they can be adapted without the need for development from scratch. Two striking examples are virtual reality (VR) and augmented reality (AR).

- Virtual reality (VR) is a technology that immerses users in a digital environment where they can interact with objects within it [8].
- Augmented reality (AR) superimposes virtual objects onto the existing environment, allowing the user to interact with them.

Immersive technologies have significantly improved the customer experience, especially in the fashion and cosmetics industry [13]. However, the high cost of implementation remains a deterrent for small and medium-sized businesses.

Consumer behavior is a key component of marketing, as it is the ultimate goal of all marketing initiatives. Other studies [3, 7, 8] show that this is a complex area involving many concepts. To successfully influence the target audience, management needs to consider consumer psychology, the purchase decision-making process, cultural influences, group dynamics, and behavioral economics.

Consumer decision-making behavior is substantially shaped by social variables, among which family unity, reference groups, and social status stratification stand out. Interaction with members of the group to which one belongs and validation from opinion leaders exert a coercive or aspirational influence on the purchasing process. These external determinants restructure the individual's attitude system, conditioning their behavioral trajectory within the market. In-depth investigation of consumer psychology is the foundation for developing successful marketing strategies. This knowledge allows organizations to optimize the marketing mix—price, distribution, product, and promotion—by aligning them with the imperatives and expectations of the targeted market segments. Thus, the effectiveness of advertising campaigns depends directly on the degree of personalization of the message in relation to the psychographic profile of the audience.

At the cognitive level, the architecture of digital experiences directly influences the effectiveness of memory encoding. The use of methods to "humanize" content, by integrating interactive elements and gamification mechanisms, facilitates greater user engagement. These personalized experiences optimize information retention by stimulating selective attention and deep cognitive processing. By generating unique user experiences, digital platforms reinforce resilient impressions over time, which underpin purchase intent and receptivity to brand messages. The process of long-term memory storage, characterized by a "deep immersion" of stimuli, guides future decisions through mechanisms of recall, recognition, and utilization of previously stored experiences.

Digital experiences act as a channel through which people can encode information. In this way, they have a direct impact on consumer behavior. Users associate visual and emotional impressions of a product with subsequent behavior through digital technologies. This represents the condition or background against which perception processes occur, and explains and shapes the relationship between these elements.

Personalized digital experiences that are designed to evoke emotions or enhance memory encoding, which better reflect consumer characteristics, are a tactic that companies can use to achieve more accurate and effective impact.

This study examined the mediating effect of artificial intelligence (AI) and digital experience (DX) on the relationship between neuromarketing (emotional impact and memory encoding) and consumer behavior. The results are expected to have both theoretical and practical significance.

From a theoretical point of view, this study should contribute to the development of a conceptual framework describing the complex network of relationships between emotions, memory, AI, and digital activity, the understanding of which is necessary for a more accurate definition of consumer behavior. Moreover, the digital experience is the result of the mediating role of AI between emotional impact or memory encoding and the corresponding response of the end user. Such integration brings us closer to understanding what exactly happens in the psychological thinking of consumers every time they make a purchase.

From a practical point of view, the study highlights the applied significance of solutions based on personalization driven by artificial intelligence in shaping the digital experience. AI is becoming one of the key tools for businesses in analyzing customer data, preferences, and behavior, enabling the creation of personalized content, recommendations, and offers.

In addition, this study shows the important role of organizing a digital experience filled with positive emotions and a close emotional connection to memory. For entrepreneurs, the key task is to make their interfaces attractive and offer users interactive elements and immersive forms of storytelling that can evoke emotional engagement and contribute to the formation of memorable impressions.

Conclusions

The study confirms that neuromarketing, based on emotional impact and memory encoding processes, has high potential for explaining and predicting consumer behavior. The Convergence of Artificial Intelligence and Neuroscience in Market Strategy Configuration

The implementation of artificial intelligence, coupled with the refinement of the digital experience, acts as a catalyst for strategic personalization. This synergy not only optimizes user interaction but also redefines the fundamentals of brand communication. From a conceptual perspective, the integration of these technologies facilitates the development of an innovative theoretical framework that interconnects emotional processes, mnemonic mechanisms, and technological advancement. In practical terms, neuromarketing is no longer a niche discipline, but a fundamental pillar of the business ecosystem. It provides the tools needed to design high-impact advertising campaigns capable of generating authentic engagement and strengthening organizations' market presence.

In a technological landscape marked by accelerated dynamics, the relevance of neuromarketing becomes undeniable. Organizations that adopt biometric tools and artificial intelligence solutions to analyze subconscious reactions—often imperceptible through traditional methods—gain a superior understanding of the human psyche. This analytical approach opens up new horizons for the development of resilient business strategies. By harmonizing cognitive psychology with the digital habits of modern consumers, companies can build lasting relationships based on a deep understanding of human needs and emotions, transcending the simple analysis of raw data.

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DOMESTIC LEISURE TOURISM IN BULGARIA AND ITS MAIN COMPETITORS

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Abstract: Tourism is an important sector in world's economy. It is important for Bulgaria, as well, as the country is, traditionally, a tourist destination. Domestic tourism plays a significant role in Bulgarian travel market. According to National Statistical Institute [1], during the COVID-19 health crisis it reached 89% of the personal travel spendings of the Bulgarian population and served as a leverage to overcome the crisis in the industry. The current paper aims to present the public attitudes of the Bulgarians toward domestic leisure tourism and its main competitors. The data used is collected from a national representative survey. The results are presented via several indicators: domestic leisure tourism practices, length of stay, satisfaction level, the main reasons for choosing Bulgaria's competitors, etc. Conclusions are made and recommendations are given in the final section of the research.

Keyword: Bulgaria, domestic tourism, leisure tourism, domestic travel, holiday tourism, vacation tourism, public attitudes.

Introduction

Tourism is of high importance in world's and Bulgarian economy. Before the COVID-19 pandemic crisis it consisted in 13% world's GDP [2], as well as almost 13% of Bulgaria's GDP and 40% of the country's service export [3]. Domestic tourism forms a significant part of the travel industry. UN Tourism [4] states that globally, domestic trips are over six times more than international tourist arrivals. In Bulgaria, domestic tourism was a national economic booster during the COVID-19 pandemic. Bulgarian population's travel expenditures reached 86% in 2020 and 89% in 2021, compared to 54% in 2019 [1], which proves its significance, especially during crises. Given this context, analyzing the attributes of the advantages and disadvantages of tourism destinations plays a crucial role in creating adequate marketing strategies for an optimal destination image [5].

Methodology

The current paper presents the public attitudes toward domestic leisure tourism of the Bulgarian residents. The scope of the research are the winter (ski) and the summer (Black sea coast) leisure tourism in Bulgaria. It uses data from two-staged national representative face-to-face tablet survey based on a random sample stratified by the Bulgarian districts (28) and the residence place size (capital, district administrative center, town and village). At the first stage the clusters are the election areas and at the second stage clusters are Bulgarian private households. The survey consists of several main groups of questions - demographic panel, winter leisure tourism, summer leisure tourism, sources of information, tourism practices, etc.

In order to enlighten the specifics of public attitudes towards domestic leisure tourism of the Bulgarian residents a statistical analysis was executed. It includes the following indicators: domestic leisure tourism practices, main reasons for not travelling in Bulgaria for leisure tourism purposes in the last 5 years, frequency of travel, average length of stay, means of transport used, travel arrangement practices, main advantages and disadvantages of Bulgarian leisure tourism, holiday satisfaction degree, competitive advantages of destinations outside Bulgaria for leisure tourism.

Results

Bulgarians travel the most during the summer holidays period (June-August). In this regards, it is of no surprise that 75.8% of the respondents have reported travels for purposes of domestic summer leisure tourism in Bulgaria for the last 5 years and only 34.1% - for winter leisure tourism within the country for the same period. The main reason for not traveling is the lack of financial resources (56%). 2/3 of the residents travel once or several times a year. The average length of stay in winter resorts is 4.37 nights, while the stays in summer resorts are longer (6.86 nights). In Bulgaria people use personal vehicles (82%) of public bus transport (13.9%) to travel domestically and choose the places to stay trusting their friends' and family's recommendations (60.6%). Only 6% of the respondents arrange their domestic holidays using tour operator services.

As per the overall holiday satisfaction degree (using a scale from 1 to 7, where 1 means "absolutely not satisfied" and 7 means "absolutely satisfied"), Bulgarians reports better experience in winter resorts (5.30) than in summer ones (4.89) in the last 5 years. The main advantages and disadvantages of the Bulgarian domestic winter and summer leisure tourism according to country's population are indicated in Table 1 and Table 2.

Table. 1. Main advantages and disadvantages of the domestic winter leisure tourism in Bulgaria

Advantages		Disadvantages	
Attractive natural resources	45.9%	High prices	48.5%
Opportunities to practice different types of tourism	18.5%	Unsuitable natural conditions	11.7%
Close to home	16.1%	Low quality of service	10.8%
Good accommodation facilities	13.9%	Unmaintained road network to and within the resorts	8.5%
Suitable facilities for practicing winter sports	13.0%	Overbuilding	6.1%

Attractive prices	7.4%	Very crowded	4.0%
Good opportunities for entertainment, dating and networking, variety in everyday life, new experiences	6.7%	Insufficient or poor-quality facilities for practicing winter sports	3.9%

Source: Developed by the author of the publication using data from a national representative survey.

Table 2. Main advantages and disadvantages of the domestic summer leisure tourism in Bulgaria

Advantages		Disadvantages	
Attractive natural resources	61.4%	High prices	47.0%
Close to home	17.5%	Overbuilding	27.4%
Attractive prices	11.7%	Very crowded	16.1%
Opportunities to practice different types of tourism	10.4%	Low hygiene	13.3%
Good opportunities for entertainment, dating and networking, variety in everyday life, new experiences	9.7%	Harms the environment	13.2%
Wide choice of destinations	9.1%	Low quality of service	12.9%
Good accommodation facilities	6.6%	Lack of security, safety and medical care in the resorts	4.1%

Source: Developed by the author of the publication using data from a national representative survey.

Only 4.6% of the respondents have travelled abroad for purposes of winter leisure tourism but 31.2% have spent their summer holidays in other countries. The preferred destinations are included in Table 3.

Table 3. Destinations outside Bulgaria for leisure tourism mostly visited by Bulgarians

Winter leisure tourism		Summer leisure tourism	
Austria	52.2%	Greece	66.1%
Italy	19.6%	Turkey	48.9%
Germany	19.6%	Spain	8.3%
France	10.9%	Italy	7.0%
Switzerland	3.7%	Egypt	3.5%
Other	5.2%	Other	3.5%

Source: Developed by the author of the publication using data from a national representative survey.

The main advantages in terms of winter and summer leisure tourism of the foreign destinations according to Bulgarian respondents are shown in Table 4.

Table 4. Main advantages of the foreign winter and summer leisure tourism

Foreign winter leisure tourism		Foreign summer leisure tourism	
Higher quality of service	40.1%	Cleaner beaches and sea water	53.8%
Distinctive features of the destinations visited	34.2%	Higher quality of service	51.7%
More ski slopes available	25.9%	Distinctive features of the destinations visited	39.7%
Better accessibility of the ski slopes	22.4%	Lower prices in accommodations of the same category compared to Bulgaria	38.4%
Lower prices in accommodations of the same category compared to Bulgaria	20.1%	Well-maintained transport network, water supply and sewage system	21.1%
Better transport and communal infrastructure	17.5%	More green spaces available	20.9%
Safer than in Bulgaria	16.3%	Safer than in Bulgaria	16.2%

Source: Developed by the author of the publication using data from a national representative survey.

Conclusions

Bulgarians travel more for summer leisure tourism purposes domestically and abroad than for winter leisure tourism. In Bulgaria they appreciate the most attractive natural resources and the proximity to home. The higher prices, the poor infrastructure, the overbuilding and the low quality of service are amongst the factors that worry them the most. The average length of stay is almost 40% longer in the summer resorts than in the winter ones, which could be explained with the fact that Bulgarians take longer holidays during the summer period. The respondents are more satisfied by their winter holidays in Bulgaria and the percentage of people spending their winter holidays abroad is very low (below 5%). The most preferred destination abroad for winter vacations is Austria while for summer leisure tourism Bulgarian choose mostly Greece and Turkey. The higher quality of services, the better infrastructure, the safety and the ecological factor are amongst the main reasons to do so.

Having in mind the research findings, it can be concluded that Bulgarian residents need to be retained in Bulgarian resorts with competitive pricing campaigns, effective sustainable development and ecological policies and their strict monitoring and adherence, improvement of the quality of service, sanitation and safety in the resorts, modernization of the ski facilities, regular maintenance of the road network to and in the resorts, etc.

Acknowledgment

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ANALYZING THE IMPACT OF MARKETING ACTIONS ON THE PERCEIVED IMAGE OF THE REPUBLIC OF MOLDOVA AS AN ECOTOURISM DESTINATION

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Abstract The perceived image of a tourist destination plays a decisive role in influencing travel decisions, especially in the fast-growing ecotourism segment, where sustainability, authenticity and local involvement are determining factors in the choice of tourists. This article analyzes the impact of marketing actions on the perceived image of the Republic of Moldova as an emerging ecotourism destination. The research examines how destination marketing initiatives, promotional events, and institutional branding efforts contribute to shaping the international perception of Moldova. The analysis fits into contemporary destination image theory and international ecotourism marketing trends. Particular attention is paid to the recent marketing activities coordinated by ANTRIM and the National Tourism Office of the Republic of Moldova. The findings highlight the growing alignment between marketing practices and sustainability narratives, while identifying challenges related to coherence, credibility and long-term positioning in international ecotourism markets.

Keywords destination image, ecotourism marketing, sustainable tourism, destination branding, Moldova

1. Introduction

In recent decades, ecotourism has become one of the most dynamic segments of the global tourism industry, driven by increased awareness of environmental issues, demand for authentic experiences, and increased sensitivity to social and cultural impact. The image of the destination has become a critical factor influencing the choice of destination, the satisfaction and loyalty of tourists, especially in sustainability-oriented markets.

For emerging destinations, such as the Republic of Moldova, building a competitive image in the field of ecotourism is a strategic tool for international positioning. Despite its rich natural landscapes, rural heritage, winemaking traditions, and biodiversity, Moldova remains relatively unknown in global tourism markets. Consequently, marketing actions play an essential role in transforming local tourism potential into recognizable and credible destination images.

This study aims to analyze the impact of marketing actions on the perceived image of the Republic of Moldova as an ecotourism destination, focusing on the interaction between promotional activities, international trends in ecotourism and the destination's branding strategies.

2. Literature review

The image of destination is commonly defined as the totality of beliefs, impressions, and emotional associations that individuals have about a place [1, p. 44]. In ecotourism, the image of the

destination is closely linked to perceptions of environmental responsibility, authenticity and community involvement.

Marketing in the context of ecotourism goes beyond traditional promotion, functioning as a mechanism for communicating the values of sustainability and ethical tourism practices. Research highlights that credibility and consistency between marketing messages and actual destination performance are essential for building trust and competitiveness in the long term [2, p. 97].

International best practices indicate that effective marketing in ecotourism is based on experience-based narratives, stakeholder collaboration and alignment with sustainability frameworks.

3. Methodology

The research is based on a qualitative analytical approach, combining document analysis, review of destination marketing materials, and comparative analysis of international ecotourism marketing practices. Marketing actions implemented between 2022–2025 were analyzed in relation to destination image theory and global ecotourism trends. Secondary data sources include strategic tourism documents, promotional materials, and international tourism literature.[5, p. 215] This methodology allows for an integrated assessment of how marketing actions influence perceived destination image within the ecotourism context.

4. Results and discussions.

Contemporary ecotourism marketing is shaped by several global trends. Firstly, destinations are increasingly placing an emphasis on experience-based storytelling, highlighting local culture, gastronomy, rural lifestyle and nature-based activities. Second, event-based promotion and B2B networking platforms have become central tools for emerging destinations to access niche markets and specialized tour operators.

Third, the integration of sustainability credibility into destination branding has become a key differentiator. Tourists are increasingly evaluating destinations based on transparency, ethical standards, and environmental impact. Finally, digital marketing and niche segmentation allow destinations with limited budgets to communicate targeted messages and compete with more established ecotourism locations [3, p. 112, 4, p. 58].

These trends have been used as a lens for examining Moldova's marketing efforts.

Moldova has intensified its marketing efforts in recent years, focusing on promoting it as a destination based on sustainability, authenticity and unique experiences. Instead of using universal campaigns, it has adopted a more focused approach, aligned with the values of global ecotourism. This shift has come from both the private sector and government-backed initiatives.

A key player in this effort is ANTRIM, which promotes rural tourism, wine experiences and community-based travel. Through international fairs, thematic workshops and business meetings, ANTRIM has helped Moldova attract the attention of tour operators interested in sustainable and immersive tourism. Its online presence, including websites and social media, tells about local hosts, eco-friendly guesthouses, wine trails, and traditional village life, building an image of the destination that feels authentic and rooted in the community.

Experiential events such as DescOpera, organized in picturesque rural settings, combine culture, nature and local food. These events allow Moldova to subtly communicate its commitment to sustainability by providing visitors with immersive, place-based experiences rather than simple slogans or logos. [8]

Another smart move was the orientation towards the Moldovan diaspora through campaigns such as "Come to my home". These efforts appeal to emotional connections, cultural pride, and

nostalgia, encouraging Moldovans abroad to rediscover and promote their homeland, which helps raise awareness and support sustainable tourism through longer stays and repeat visits.

An example of Moldova's penetration into new markets is its participation in the Philoxenia Tourism Exhibition in Greece in 2025. Greece is a strategic choice due to its proximity and common interest in culture, wine and rural tourism. This event helped Moldova connect with key players in Southern Europe and position itself as a nature-based alternative within the wider Mediterranean and Balkan tourism scene.

Meanwhile, Moldova continues to strengthen its image in markets such as Germany, the UK and Italy through major exhibitions such as ITB Berlin and WTM London. These are markets that value authenticity, responsible travel and certified sustainable tourism. Moldova is now focusing on its strengths, such as wine tourism, protected natural areas, and community experiences, to match what these travelers are looking for.

Italy is of particular importance due to its cultural affinity for gastronomy, wines and slow tourism. Moldova's message resonates well here, especially with themes such as viticulture, agrotourism and heritage-based tourism.

The study clearly shows that participation in international exhibitions is not just a matter of visibility, but a rebranding strategy. Successful destinations use these events to demonstrate their commitment to sustainability, showcase governance models, and build trust. [6, p. 12] However, Moldova still faces a challenge: to ensure that the image it presents abroad corresponds to the real experience of tourists. Without this coherence, especially in demanding markets such as Germany and the UK, it risks losing credibility.

Overall, Moldova is making steady progress in its redefinition, moving from a neglected destination to a niche hotspot for ecotourism, focused on sustainability, authenticity, and memorable experiences. The combined use of events, digital storytelling, international engagement and communication with the diaspora reflects a growing harmony between what it promotes and what it represents as a sustainable destination. [7]

5. Conclusions and Implications for Sustainable Destination Marketing

This study shows that well-planned marketing efforts play a key role in shaping how people view Moldova as a destination for ecotourism. When these efforts align with global sustainability goals and target the right markets, they help build a strong and positive image of the country. Consistent messaging, credible sustainability claims, and a strong presence at international tourism events are crucial to this image-building process.

Participating in global tourism fairs and business-to-business platforms gives Moldova opportunities to enter new markets and strengthen its place in existing ones. These events allow the country to promote its unique, value-based tourism offerings instead of simply competing on cost or visitor numbers.

Looking ahead, Moldova's tourism marketing should focus more on including clear sustainability goals, responsible tourism practices, and measurable outcomes in their promotions. It's not just about telling a good story—it's about proving the country's commitment to sustainable tourism through real actions and results.

From an academic perspective, the case of Moldova illustrates how different strategies are needed for new versus existing markets. Engaging with platforms like tourism expos allows emerging destinations to manage their image better, attract diverse visitors, and build long-term credibility in the ecotourism space.

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ВИННЫЙ ТУРИЗМ КАК ИНСТРУМЕНТ УСТОЙЧИВОГО ЭКОНОМИЧЕСКОГО РАЗВИТИЯ СЕЛА (НА ПРИМЕРЕ РЕГИОНА ИМЕРЕТИ, ГРУЗИЯ)

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Abstract. Wine tourism has become an important niche in cultural and rural tourism, offering significant opportunities for sustainable economic development in wine-producing regions. This study examines the role of wine tourism in fostering the rural economy in the Imereti region of Georgia, characterized by rich winemaking traditions, small family-owned wineries, and growing tourist interest. The study aims to assess the economic contribution of wine tourism to rural communities and identify key factors influencing its sustainable development.

The study is based on qualitative and descriptive analysis using secondary statistical data, regional tourism reports, and case studies of family wineries operating in Imereti. Particular attention is paid to job creation, income diversification, support for small and medium-sized enterprises, and the preservation of local cultural heritage as economic assets. Wine tourism can serve as an effective tool for sustainable rural economic development, provided coordinated policies, infrastructure investments, digital promotion, and closer collaboration between local stakeholders, educational institutions, and tourism businesses are in place. The findings may be useful for policymakers, regional planners, and tourism professionals seeking to promote sustainable, tourism-driven economic growth in rural areas.

Keywords: wine tourism, wineries, qvevri, sustainable development, Imereti

Введение

Туризм широко признан важным двигателем экономического развития, особенно в сельских и периферийных регионах, где возможности получения альтернативного дохода ограничены. В последние годы все больше внимания привлекают формы специализированного туризма благодаря их потенциалу в поддержке устойчивого развития при сохранении местной культуры и традиций. Среди них винный туризм стал динамичным сегментом, сочетающим сельскохозяйственное производство, культурное наследие, гастрономию и туристические услуги, создавая диверсифицированные экономические выгоды для сельских районов.

Винодельческие регионы часто обладают уникальными природными, культурными и историческими ресурсами, которые могут быть преобразованы в конкурентоспособные туристические продукты. Винный туризм способствует не только увеличению числа прибывающих туристов, но и продлению туристического сезона, стимулированию местного предпринимательства и укреплению экономической устойчивости сельских общин. Для стран с сильными винодельческими традициями, таких как Грузия, винный туризм представляет собой особенно перспективный путь для устойчивого экономического развития сельских районов.

История виноделия в Грузии насчитывает около 8 000 лет и считается одной из древнейших в мире. Археологические находки свидетельствуют о развитии виноделия на территории Грузии ещё в VI тысячелетии до н. э., где сформировалась уникальная технология производства вина в квеври — глиняных сосудах, зарытых в землю и эта традиция сохраняется до сих пор. Виноделие на протяжении веков играло важную роль в экономике, культуре и религиозных традициях страны. В 2013 году грузинский метод виноделия в квеври был включён в Список нематериального культурного наследия ЮНЕСКО [17].

Виноделие вносит значительный вклад в экономическое укрепление Грузии. В 2025 году из Грузии было экспортировано 11,5 миллионов литров вина на сумму 38,7 миллионов долларов США примерно в 30 европейских стран. Доходы от экспорта вина увеличились на 7%, а объем - на 2% по сравнению с 2024 годом. Нужно отметить, что по официальным данным, в различных регионах Грузии зарегистрировано в общей сложности 3362 винодельческих предприятия и винодельни, из них 1600 в регионе Имерети [14].

Влияние виноделия на экономику села лучше рассматривать вместе с винным туризмом, который в последние годы активно развивается. В этом направлении сделано многое: построено множество новых виноделен, отреставрировано множество исторических виноделен, являющихся сокровищами страны и привлекательных для туристов. Для развития винного туризма Национальная Администрация туризма Грузии реализует проект «Винный путь», объединяющий семейные винодельни из разных регионов. В рамках проекта созданы винные маршруты, облегчающие туристам поиск нужного объекта. [7]

Важным компонентом винного туризма являются туры, которые включают экскурсии по виноградникам, посещения марани (винный погреб), дегустации, знакомство с технологией выдержки вина и т.д. По мнению виноделов, туристов в первую очередь привлекают аутентичные, местные, экологически чистые и основанные на природе предложения.

Регион Имерети, как многие другие регионы Грузии характеризуется давней историей виноделия, традиционными семейными винными погребами и растущим интересом со стороны внутренних и международных туристов. Несмотря на этот потенциал, экономическая роль винного туризма в развитии сельских районов остается недостаточно изученной, особенно с региональной точки зрения.

Цель данного исследования -изучить винный туризм как инструмент устойчивого экономического развития сельских районов, используя в качестве примера регион Имерети в

Грузии. Исследование направлено на оценку экономического вклада винного туризма в развитие сельских общин и выявление ключевых возможностей и проблем, влияющих на его устойчивое развитие.

Методология исследования. Исследование основано на качественном и описательном подходе. Оно опирается на анализ вторичных данных, включая научную литературу, национальную и региональную статистику туризма, политические документы и отчеты, касающиеся туризма и развития сельских районов. Кроме того, для иллюстрации практического экономического воздействия винного туризма на местном уровне используются примеры семейных винных погребов в Имерети. Методологический подход позволяет выявить закономерности, проблемы и перспективы развития, имеющие отношение к устойчивой экономике сельских районов.

Обзор литературы. Взаимосвязь между туризмом и экономическим развитием широко обсуждается в научной литературе. Туризм часто рассматривается как катализатор регионального развития за счет создания рабочих мест, получения дохода и улучшения инфраструктуры [15]. Однако ученые все чаще подчеркивают важность устойчивого развития для обеспечения долгосрочных экономических выгод без ущерба для окружающей среды и социально-культурных ресурсов [3].

Международная организации ООН по туризму отмечает, что винный туризм является одной из наиболее эффективных форм устойчивого туризма, поскольку он сочетает в себе местное производство, культурное наследие и туристические впечатления. Особо отмечается роль малых регионов [16].

Винный туризм обычно определяется как путешествие, связанное с посещением виноделен, дегустацией вин и культурными мероприятиями, посвященными вину [8]. Недавние исследования подчеркивают его растущую роль в развитии сельских районов, поддерживая мелких производителей, улучшая имидж туристических направлений и стимулируя развитие местных цепочек создания стоимости [5; 1]. Винный туризм также связан с потреблением впечатлений, где аутентичность и культурная идентичность играют центральную экономическую роль [4].

Семейные винодельни и малые предприятия получают выгоду от прямых продаж, туристических услуг и дополнительных видов деятельности, таких как размещение и гастрономия [13]. Более того, винный туризм поддерживает занятость в сельской местности и помогает сократить отток населения, создавая экономические возможности на местном уровне.

Национальное управление туризма Грузии назвал Имерети перспективным регионом для развития винного туризма, где туристические продукты основаны на семейных винодельнях, традиционной кухне и местной культуре [7]. Винный туризм в Имерети способствует развитию местной экономики, поскольку является важным источником туристического потока, который увеличивает спрос на услуги (отели, размещение, гиды и т. д.) и способствует развитию малых виноделен, семейных предприятий агротуризма и других секторов услуг [10]. Винный туризм увеличивает доходы в регионе и создает новые рабочие места, что положительно влияет на социально-экономическое положение местного населения [6].

Небольшие семейные винодельни Имерети являются успешным примером органического виноградарства и производства вина с минимальным вмешательством в процесс, ориентированного на защиту окружающей среды посредством управления отходами [12, с.238].

Результаты исследований

Основным фактором для развития сельского туризма в Имерети являются местные традиции виноделия. В исследовании принимали участие небольшие семейные винодельни из различных муниципалитетов Имерети. Анализ их деятельности показывает, что винный туризм стал важным дополнительным источником дохода для сельских домохозяйств. Небольшие винодельни, работающих на семейной основе, интегрировали дегустационные

залы и прямые продажи в свою производственную деятельность. Прямые продажи посетителям позволяют производителям вина получать более высокую выручку по сравнению с оптовой дистрибуцией, одновременно снижая затраты на маркетинг и транспортировку. Семейные винодельни часто нанимают местных жителей в качестве гидов, персонала по обслуживанию или помощников в пиковые туристические сезоны.

Примерами успешной практики винного туризма могут служить: в муниципалитете Багдади винодельни Байи Абуладзе (Baia's Wine), Мириана Иосебашвили (Miriani's Marani) и Иракли Минадзе (Minadze's wine Cellar - Persvi); в муниципалитете Терджола винодельня «Нануа» (Nanua Winery); в Ткибулском муниципалитете- агродом Корена - Agro House Korena. Они используют местные ресурсы и предлагают туристам возможность познакомиться с вином, культурой и сельской жизнью.

Все эти хозяйства ориентированы на продолжение семейной традиции виноделия и виноградарства. Винодельни владеют собственными виноградниками, где выращиваются имеретинские сорта винограда (многие из которых они возродили сами): Цоликоури, Цицка, Крахуна, Врцела, Оцханури Сапере, Дзелшави, Аладастури, Кундза.

Эти винодельни являются биохозяйствами, использующие экологически чистые принципы производства, натуральное виноградарство и виноделие. Их вина активно продаются на местном и 17 международных рынках. Винодельни предлагают туристам: экскурсии по винограднику, посещение марани, история виноделия, дегустация вин; возможность поучаствовать в уходе за виноградниками, получить информацию о процессе виноделия; знакомство с местной кухней.

О большом интересе туристов к таким семейным винодельням свидетельствует рост числа посетителей: в 2025 году услугами «Вино Бая» воспользовались более 30 000 туристов из разных стран мира. Виноделы подчеркивают, что большое значение в развитии винного туризма имеет «семейное погружение» - гостей приглашают в семейный дом, где они разделяют трапезу с гостями, делятся историями и традициями. «Такой личный, практический подход создает глубокую культурную связь, а не просто стандартную дегустацию» (Бая Абуладзе)

Виноделы отмечают, что важным компонентом в винном туризме является «Образование через опыт» - Посетители узнают о виноделии в квеври, местных сортах винограда и устойчивом сельском хозяйстве непосредственно от виноделов, превращая визит в образовательный опыт. Также отмечается важность «сочетания местной еды и вина» - винодельни интегрирует местную имеретинскую кухню со своими винами, подчеркивая гастрономическую самобытность региона и продвигая концепцию «от фермы к столу» в туризме.

Можно заключить, что все эти винодельни демонстрируют уникальность виноделия в квеври и различные вкусовые качества, которые интересны и привлекательны для туристов. Важно, что гости общаются непосредственно с владельцем винодельни, что придает их опыту аутентичность и превращает его в незабываемое воспоминание о винодельне. Кроме того, многие гости впервые знакомятся здесь с местными сортами винограда, что делает их впечатления еще более уникальными. Стоит также отметить, что помимо вина гости знакомятся с традиционной кухней Имерети и пробуют местные блюда.

Семейные винодельческие хозяйства, предлагающие дегустации в сочетании с традиционной имеретийской кухней, сообщили об увеличении расходов посетителей за одно посещение, особенно среди внутренних туристов и небольших международных групп. В общей сложности, доход от винного туризма, по их словам, составляет не менее 25% от общего дохода хозяйства. Это свидетельствует о том, что винный туризм повышает экономическую ценность местной сельскохозяйственной продукции за счет получения впечатлений от потребления.

В деревнях недалеко от Кутаиси развитие винного туризма способствовало открытию гостевых домов и объектов агротуризма, создавая дополнительные источники дохода для

местных семей. Примером может служить Agro House Korena - это семейный эко-гостевой дом, расположенный в селе Гелати (11 км от Кутаиси). Он состоит из двух гостевых домов общей вместимостью 22 гостя и предлагает захватывающие гастрономические впечатления, включая кулинарные мастер-классы в традиционном имеретийском доме-оде, дегустации вин, фольклорные вечера и демонстрации местных сельскохозяйственных практик. Гостевой дом сочетает в себе подлинное грузинское гостеприимство, принципы устойчивого развития и погружение в местную культуру.

Agro House Korena предлагает комплексный опыт, где проживание сочетается с интерактивными эногастрономическими и культурными мероприятиями. Гости участвуют в кулинарных мастер-классах, дегустациях имеретийских вин и фольклорных вечерах с местными артистами. Такой подход превращает гостевой дом в многофункциональный культурный и кулинарный центр. Экологически ориентированная модель использует сезонные продукты местного производства и устойчивые методы ведения сельского хозяйства, связывая туризм с традиционным образом жизни.

Более того, винный туризм стимулировал рост смежных предприятий. Местные производители продуктов питания, ремесленники и транспортные компании получают выгоду от сотрудничества с винодельнями, что иллюстрирует мультипликативный эффект винного туризма на сельскую экономику. Результаты исследований показывают, что винный туризм в Имерети оказывает на развитие региона как социальное так экономическое и экологическое воздействие:

Социальное воздействие: посетители знакомятся с подлинными имеретинскими традициями - семейным гостеприимством, местной кухней и виноделием в квеври - создавая значимые культурные связи; винодельни вовлекают местную молодежь и женщин в туристическую и винодельческую деятельность, создавая чувство гордости и сотрудничества внутри деревни.

Экономическое воздействие: создание рабочих мест и местный доход - винный туризм обеспечивает стабильную занятость для местных жителей и генерирует доход, который поддерживает окружающее сообщество; добавочная стоимость - сочетая производство вина с туризмом, винодельни повышают ценность каждой бутылки за счет рассказывания историй и прямых продаж; развитие сельских районов - успех винодельни привлекает путешественников в Имерети, принося пользу гостевым домам, ресторанам и местным поставщикам.

Экологическое воздействие: устойчивое виноградарство - рассмотренные хозяйства используют экологически чистые методы ведения сельского хозяйства и традиционное виноделие в квеври, которые минимизируют использование химикатов и защищают здоровье почвы; ответственный туризм - винодельни продвигают поездки в небольших группах с минимальным воздействием на окружающую среду, ориентированные на природу и культуру, а не на массовый туризм; поощряют экологически чистые методы ведения сельского хозяйства, приготовление сезонных блюд и мелкомасштабное устойчивое земледелие; образование и повышение осведомленности - гости узнают о биоразнообразии, традиционном сельском хозяйстве и методах устойчивого развития, что вдохновляет на более осознанное поведение в путешествиях.

Однако, несмотря на позитивные изменения, ряд виноделен в отдаленных сельских районах сталкиваются с ограниченной доступностью, недостаточной системой указателей и слабым присутствием в интернете, что ограничивает поток посетителей. Интервью и вторичные источники указывают на то, что у многих семейных виноделен есть необходимость повышения навыков цифрового маркетинга и скоординированного управления туристическими направлениями.

Заключение

В данном исследовании винный туризм рассматривался как инструмент устойчивого развития сельской экономики на примере региона Имерети в Грузии. Результаты подтверждают, что винный туризм представляет собой жизнеспособный механизм повышения

эффективности сельской экономики за счет диверсификации источников дохода, поддержки мелкого предпринимательства и создания рабочих мест в районах с ограниченными экономическими альтернативами. Интегрируя сельскохозяйственное производство с туристическими услугами, винный туризм увеличивает добавленную стоимость местной продукции и укрепляет экономическую устойчивость сельских домохозяйств.

Результаты также показывают, что винный туризм способствует сохранению и экономической ценности культурного наследия, включая традиционные методы виноделия, местные сорта винограда и региональные кулинарные традиции. В Имерети эти культурные ценности играют центральную роль в привлекательности туристического направления и региональном брендинге, укрепляя связь между экономическим развитием и культурной устойчивостью. Кроме того, сотрудничество между образовательными учреждениями и местными туристическими предприятиями способствует развитию человеческого капитала и повышению качества услуг, что имеет важное значение для долгосрочной конкурентоспособности.

Несмотря на эти позитивные результаты, исследование выявляет сохраняющиеся проблемы, ограничивающие полный экономический потенциал винного туризма в регионе. Недостатки инфраструктуры, сезонность, недостаточное цифровое продвижение и ограниченные профессиональные навыки в управлении туризмом остаются значительными барьерами. Устранение этих ограничений имеет важное значение для обеспечения того, чтобы винный туризм способствовал сбалансированному и устойчивому развитию сельских районов.

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ОСНОВНЫЕ НАПРАВЛЕНИЯ УСТОЙЧИВОГО РАЗВИТИЯ И УСТОЙЧИВОГО ТУРИЗМА В РЕСПУБЛИКЕ МОЛДОВА

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Abstract. In recent years, sustainable development has become increasingly important. Moldova is also an active participant in this process. Sustainable development is advancing in many sectors, including tourism. This article examines the key aspects of the application of sustainability principles in the Republic of Moldova.

Key words: sustainable development, tourism, sustainable tourism, ecology, projects, government support, cultural heritage.

Туризм является одной из уникальных сфер деятельности. В последние годы особое внимание получили вопросы устойчивого развития и устойчивого туризма. Устойчивое развитие представляет собой концепцию, направленную на сбалансированное взаимодействие экономического развитие, социальной справедливости и охраны окружающей среды. В отношении туризма устойчивое развитие направлено на сохранение культурного и природного наследия, поддержку местных сообществ и создание экономических выгод без нанесения вреда окружающей среде и социокультурным системам. Республики Молдова богата своей историей, вкусной национальной кухней, винной культурой и красивыми живописными сельскими ландшафтами. Благодаря этому устойчивый туризм становится важным и ведущим направлением будущего развития туристической отрасли.

Роль туризма в национальном развитии Республики Молдова достаточно весома. Туризм является значимым сектором молдавской экономики. Он способствует решению вопросов занятости населения и борьбе с безработицей, стимулирует развитие малого бизнеса и укрепляет связи между регионами. За последние девять месяцев 2025 года местные туристические агентства и туроператоры обслужили более 480 тыс. посетителей, что на 6,5 % больше, чем за аналогичный период предыдущего года, а число иностранных туристов выросло почти на 29 %. Все это подтверждает устойчивую динамику развития туристической отрасли в стране. [1]

Развитие туризма особенно важно для страны с ограниченными природными ресурсами и без выхода к морю, поскольку оно создаёт возможности для диверсификации экономики, особенно в сельских и отдаленных регионах.

Однако рост туризма вызывает вопросы о том, каким образом можно обеспечить его устойчивое развитие, особенно с учетом глобальных тенденций осознанных путешествий и экологической ответственности. Устойчивый туризм — это одна из моделей туризма, которая:

- минимизирует отрицательное воздействие туризма на окружающую среду,
- способствует сохранению культурного наследия и традиций страны,
- укрепляет экономические и социальные структуры местных сообществ,
- приносит выгоду не только туристам, но и принимающим регионам.

Для развития устойчивого туризма необходимо участие и сотрудничество всех заинтересованных сторон, а именно, государственных органов, бизнеса, местного населения и туристов. В европейском контексте устойчивый туризм всё чаще связывается с устойчивым развитием территорий и реализуется через совместные программы и партнерства.

Для успешного устойчивого развития, в том числе в сфере туризма, необходима эффективная государственная политика и международное сотрудничество. Немаловажную роль в данном направлении играют национальные стратегии. Государственные органы Республики Молдова, в частности Министерство Культуры и Национальный туристический офис, активно продвигают идею устойчивого туризма. Одним из важнейших направлений стало подписание Соглашения о сотрудничестве между Национальным туристическим агентством и Национальной сетью сельского развития LEADER, направленное на развитие устойчивого сельского туризма. Цель данного соглашения заключается в внедрении инновационных цифровых инструментов, поддержка местных предпринимателей и продвижение культурно-природных ресурсов сельских территорий. [2]

На сегодняшний день государство уделяет особое внимание следующим направлениям:

- - создание и продвижение экологических маршрутов,
- - способствует укреплению взаимодействия между туристическими организациями и сельскими сообществами,
- - применение и развитие цифровизации туристических сервисов,
- развитию инфраструктуры и информационной поддержки.

Для решения этих вопросов необходима европейская поддержка. Республика Молдова приняла активное участие в нескольких европейских и международных проектах, направленных на развитие устойчивого туризма в республике:

- проект SUSDEST-NET (Sustainable Destinations Black Sea Network) — инициатива, объединяющая страны Черноморского бассейна для создания устойчивых туристических направлений, защиты окружающей среды и социального равенства, стимулирования экономического роста и привлечения ответственных туристов. [13]

- проект SUSTAIN-2, финансируемый ЕС, направлен на разработку моделей устойчивости и инструментов для поддержки малых предприятий в туристическом секторе, в том числе с использованием цифровых и инновационных решений.

- партнёрство с Global Sustainable Tourism Council (GSTC) помогает Молдове адаптировать международные стандарты устойчивого туризма и применять их к национальному контексту. [4]

- европейские проекты по религиозному и культурному туризму (например, RESPECTS) также способствуют устойчивому развитию удаленных и малоразвитых регионов.

Многие международные организации и международные партнёры, поддерживают проекты устойчивого развития в Республике Молдова. В частности, инициатива «Empowering Young Women: sustainable livelihoods through tourism» направлена на обучение и расширение возможностей женщин в туристическом секторе, что способствует достижению Целей устойчивого развития ООН, включая гендерное равенство и инклюзивный экономический рост[5].

В Республике Молдова получили развитие ряд проектов:

- цифровые инструменты. Одним из наиболее значимых достижений является разработка приложения «Есо App Moldova». Это цифровой платформы для применения в сфере устойчивого туризма. Данное приложение предназначено для туристов. Оно помогает им находить экологические маршруты, знакомиться с местными локальными инициативами и принимать участие в экотуристических программах.

Есо App дает возможность связываться с местными предпринимателями и услугами, что стимулирует экономическую активность в сельских районах. [6]

Другим важным направлением является культурные и сельские маршруты. В данном направлении продвигаются маршруты, которые сочетают природные красоты с культурой и традициями: экологические тропы вдоль рек, винные маршруты с посещением виноделен, исторические места.

Данные маршруты, с одной стороны, привлекают туристов, а, с другой стороны, позволяют вовлекать местные сообщества в туристическую сферу, укреплять и развивать их экономическое положение и способствовать сохранению культурного наследия региона.

В Республике Молдова проводятся культурные фестивали. Молдова получила европейское признание за устойчивые культурные инициативы, например фестиваль DescOpera сочетает искусство с местным природным и культурным контекстом и способствует развитию устойчивого культурного туризма. [7]

Развитие устойчивого туризма в мировом масштабе и для Молдовы имеет ряд преимуществ:

1. Способствует экономическому развитию.

Устойчивый туризм помогает туризму преодолеть сезонные колебания и перейти в стабильный сектор экономики. Благодаря этому создаются рабочие места в сельской местности, поддерживается развитие малого и среднего бизнеса, развивается инфраструктура. Помимо роста туристических потоков, устойчивое развитие способствует повышению привлекательности Молдовы для ответственных путешественников.

2 Социальные выгоды.

Участие местных сообществ в разработке туристических продуктов укрепляет чувство принадлежности и гордости за свою культуру. Инклюзивные программы, такие как обучение женщин и молодёжи, стимулируют социальную интеграцию и равноправие.

3 Охрана природы и культурного наследия.

Устойчивый туризм способствует сохранению природных ресурсов и культурных объектов: экологические маршруты, программы по реставрации памятников и сохранению традиций превращаются из изолированных инициатив в комплексную систему развития. Охрана окружающей среды является национальным приоритетом, касающимся непосредственно условий жизни и здоровья населения, реализации экономических и общественно - гуманистических интересов, а также возможностей устойчивого развития общества в будущем. Загрязнение грунтовых вод, отсутствие системы управления отходами, низкий процент лесных насаждений, соответственно малое количество воды в реках и озерах. Это про Молдову и Гагаузию. Создавая удобства для комфортной жизни, человек забыл о том, что ресурсы природы не безграничны. Экологическая ситуация пугает, но еще не поздно признать свою ответственность и изменить свое отношение к природе. Проект EU4Climate играет ключевую роль в поддержке климатической политики Молдовы, способствуя снижению уязвимости страны и выполнению международных обязательств. EU4Climate — это программа Европейского Союза, направленная на поддержку стран Восточного партнёрства в их усилиях по борьбе с изменением климата и переходу к низкоуглеродному, устойчивому развитию. Программа помогает этим странам выполнять международные обязательства, такие как Парижское соглашение, и развивать национальные климатические стратегии и планы.

Молдова крайне уязвима к изменению и изменчивости климата, а социально-экономические издержки изменения климата, связанные с такими опасностями, как засухи, наводнения, поздние весенние заморозки, град, значительны.

Все более неустойчивые погодные условия привели к потере жизни и доходов из-за роста цен на продукты питания и энергоносители [8]. Наиболее уязвимыми секторами являются сельское хозяйство, здравоохранение, водные ресурсы, лесное хозяйство, транспорт и энергетика.

Изменение климата включено в основной стратегический плановый документ страны – Национальную стратегию развития «Европейская Молдова 2030» (2022). В 2016 году Молдова утвердила Стратегию развития с низким уровнем выбросов на 2030 год. Национальный интегрированный энергетический и климатический план Республики Молдова определит меры по смягчению последствий изменения климата в секторе до 2030 года и до 2050 года по горизонтали. Республика Молдова продвигается во втором цикле своего Национального процесса планирования адаптации (НПД2), а Национальная программа адаптации к изменению климата до 2030 года и План действий по ее реализации разработаны и продвигаются.

Стоит отметить, что устойчивое развитие и устойчивый туризм в Республике Молдова сталкивается с рядом проблем:

1 Ограниченная инфраструктура. Недостаточное развитие инфраструктуры (дороги, информационные указатели, доступность транспорта) затрудняет устойчивую экспансию туристических направлений и снижает привлекательность отдаленных районов.

2 Осведомленность и обучение. Отсутствие широкой осведомленности о принципах устойчивого туризма среди работников отрасли, туристов и местных сообществ может тормозить внедрение лучших практик.

3 Стандарты устойчивости и мониторинг. Молдове необходимо разработать и внедрить полноценную систему экологических стандартов и мониторинга, чтобы отслеживать влияние туризма на окружающую среду и общество в целом.[9]

Как положительный момент стоит отметить о ряде перспектив развития устойчивого туризма в Республике Молдова.

- усиление международного сотрудничества. Возможность участия в европейских программах и сотрудничество с международными организациями, что позволит Молдове получить доступ к лучшим практикам, финансовым ресурсам и экспертной поддержке.

- развитие и применение цифровых решений. Цифровизация сервисов (как Eco App) делает туристические продукты более доступными, улучшает информирование и вовлечение туристов, а также стимулирует инновации;

- привлечение инвестиций в развитие устойчивого туризма. Привлечение инвестиций в инфраструктуру, обучение и сертификацию позволит создать высококачественные продукты и соответствовать международным стандартам.

Следовательно, устойчивое развитие и устойчивый туризм являются это не только модными понятиями, а реальная стратегия для будущего развития Республики Молдова. Сотрудничество государственных органов, международной проекты и поддержки, применение цифровых инноваций, участие местных сообществ создают необходимые предпосылки для устойчивого туризма, который приносит пользу стране без ущерба ее природе и культуре. Применение принципов устойчивости уже приносит положительные результаты. Наблюдается рост туристического потока, появляются инновационные продукты, а Молдова становится всё более заметным и узнаваемым направлением для осознанных путешественников. Однако для сохранения долгосрочного успеха от устойчивого развития необходимо продолжать работу над инфраструктурой, стандартизацией и вовлечением населения, чтобы устойчивый туризм стал не исключением, а нормой в развитии страны.

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ТРАНСФОРМАЦИЯ МАРКЕТИНГОВЫХ КОММУНИКАЦИЙ В СФЕРЕ УСЛУГ В УСЛОВИЯХ СНИЖЕНИЯ ЭФФЕКТИВНОСТИ ТЕЛЕФОННЫХ ОБРАЩЕНИЙ И РОСТА ЦИФРОВОГО ПОТРЕБЛЕНИЯ

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Abstract: This study examines the transformation of marketing communications in the service sector under conditions of digitalization. The aim of the research is to evaluate the effectiveness of traditional and digital communication channels. The methodology combines a consumer questionnaire survey with an analysis of the operational statistics of a service company. The findings indicate the dominance of digital communication formats and a decreasing role of telephone calls. The results also demonstrate the effectiveness of adopting an omnichannel approach and CRM systems to improve customer communication management. The study provides practical recommendations for optimizing marketing communications strategies and improving service efficiency.

Keywords: marketing communications, service sector, digitalization, consumer behavior, communication channels, omnichannel strategy, CRM systems, customer experience.

Развитие цифровых платформ, изменение информационных привычек аудитории и распространение многоканальных форм взаимодействия приводят к трансформации традиционных моделей коммуникации между компаниями и потребителями. На протяжении длительного времени телефонные обращения занимали центральное место в системе маркетинговых коммуникаций сервисных компаний. В классических моделях маркетинга услуг голосовая коммуникация воспринималась как ключевая точка взаимодействия между клиентом и организацией, напрямую влияющая на восприятие качества сервиса и уровень удовлетворенности потребителя [6, с. 630; 4, с. 83].

В последние годы телефонные звонки все чаще воспринимаются как требующие немедленного внимания и уступают более гибким форматам взаимодействия, что приводит к

снижению эффективности традиционной телефонии. Параллельно активно развиваются цифровые каналы – мессенджеры, онлайн-чаты, веб-платформы, социальные сети, формирующие коммуникационную среду, ориентированную на доступность, гибкость и удобство для пользователя [5, с. 430; 2]. В этих условиях возрастает значимость омниканального подхода к управлению маркетинговыми коммуникациями.

Несмотря на развитие цифровых технологий, вопросы сопоставления коммуникационных предпочтений потребителей и реальных моделей их взаимодействия с сервисными организациями остаются недостаточно изученными. Это обуславливает необходимость эмпирического анализа трансформации маркетинговых коммуникаций в сфере услуг.

Цель исследования заключается в выявлении изменений коммуникационного поведения потребителей и оценке эффективности традиционных и цифровых каналов взаимодействия. Для достижения этой цели был проведен анкетный опрос потребителей и анализ оперативной статистики сервисной компании.

Практическая значимость работы заключается в разработке рекомендаций по формированию омниканальных стратегий и внедрению CRM-систем для повышения эффективности коммуникаций с клиентами. Исследование носит прикладной характер и основано на использовании смешанного дизайна, сочетающего анкетный опрос потребителей и анализ операционной статистики сервисной компании.

В качестве основного метода сбора первичных данных применялось анкетирование. Опрос был направлен на оценку частоты использования и субъективной значимости различных каналов коммуникации. Первый блок фиксировал социально-демографические характеристики респондентов (пол, возраст). Второй блок был направлен на типологизацию потребителей по характеру использования коммуникационных технологий. Участникам предлагалось определить тип поведения, наиболее соответствующий их повседневному опыту. Третий блок предусматривал оценку каналов взаимодействия по двум критериям: частота использования и субъективная значимость. Оценивание осуществлялось по шкальным показателям. В перечень анализируемых способов коммуникации были включены личное общение, голосовые звонки, мессенджеры, SMS, электронная почта, видеосвязь, онлайн-чаты и почтовые отправления.

В качестве вторичного источника информации была использована операционная статистика компании SRL „MOON PARTNERS”. Были использованы данные клиентских обращений за шестимесячный период, зафиксированные в корпоративной CRM-системе. Учитывались показатели общего количества входящих звонков, доля принятых и пропущенных вызовов, а также распределение заявок по каналам поступления, включая телефонные обращения и онлайн-заявки. Обработка информации осуществлялась с применением методов описательной статистики и графической визуализации результатов.

Маркетинговые коммуникации в сфере услуг традиционно рассматриваются как система управляемых взаимодействий между компанией и потребителем, направленных на формирование ценности услуги, доверия и долгосрочных взаимоотношений. В отличие от товарного маркетинга, где объектом коммуникации является материальный продукт, в сервисной модели ключевое значение приобретает процесс взаимодействия, а качество коммуникации становится неотъемлемым элементом самой услуги [6, с. 692].

В этих условиях коммуникационные каналы выступают не только средствами передачи информации, но и инструментами формирования клиентского опыта и восприятия ценности услуги. Изменение технологической среды и распространение цифровых решений приводят к

постепенной трансформации структуры взаимодействия между компанией и потребителем, расширяя спектр доступных форм контакта.

Коммуникационные инструменты постепенно эволюционируют от единичных форм контакта к многообразию взаимодополняющих каналов, что трансформирует способы передачи информации, характер взаимодействия и ожидания потребителей относительно удобства и доступности сервиса.

В традиционных моделях обслуживания телефон выступал ключевой точкой взаимодействия между клиентом и представителем компании. Телефонные звонки постепенно утрачивают статус удобного и предпочтительного способа коммуникации, особенно в ситуациях, не требующих немедленного решения.

Снижение привлекательности телефонных обращений для потребителей обусловлено восприятием телефонного контакта как навязчивой формы взаимодействия, необходимостью синхронного участия обеих сторон, ограниченными возможностями контроля над временем общения, а также повышенной когнитивной нагрузкой в условиях многозадачности и информационной перегруженности.

Международные исследования подтверждают, что все больше потребителей осознанно избегают голосовых звонков, отдавая предпочтение текстовым и цифровым форматам общения, которые позволяют гибко управлять процессом коммуникации и самостоятельно определять удобный момент для взаимодействия [1].

Дополнительным фактором снижения эффективности телефонных коммуникаций является рост недоверия к неизвестным звонкам. Распространение спама, автоматизированных обзвонов и мошеннических схем сформировало у потребителей устойчивую поведенческую установку на игнорирование входящих звонков, что приводит к сокращению доли успешных контактов, росту числа непринятых обращений и снижению конверсии телефонного канала. Со стороны сервисных организаций телефония также сопряжена с существенными операционными ограничениями: она требует значительных затрат на персонал, обучение и контроль качества, затрудняет масштабирование и во многом зависит от человеческого фактора, что в совокупности увеличивает издержки обслуживания и снижает общую эффективность коммуникационной системы.

Ключевым инструментом реализации омниканального подхода выступают CRM-системы, обеспечивающие централизованное управление коммуникациями и данными о клиентах. Использование CRM позволяет сервисным компаниям аккумулировать обращения, поступающие из различных каналов, в едином интерфейсе, фиксировать историю взаимодействий, отслеживать статус запросов и формировать персонализированные сценарии коммуникации. Это приобретает особую значимость в условиях снижения эффективности телефонных обращений и роста цифрового потребления, когда количество точек контакта с клиентом существенно возрастает [3].

Автором было проведено анкетирование потребителей с целью выявления особенностей использования различных каналов коммуникации и оценки их субъективной значимости в процессе взаимодействия с сервисными организациями. Полученные данные позволили проанализировать структуру коммуникационных предпочтений респондентов.

В анкетном опросе приняли участие 50 респондентов. В гендерной структуре выборки преобладали женщины, доля которых составила (65,5%), тогда как мужчины составили (34,5%) опрошенных. Возрастной состав характеризуется доминированием молодежной аудитории: наибольшая доля респондентов относится к группе 19-23 лет, в то время как другие возрастные категории представлены значительно реже.

Распределение респондентов по типу потребителя коммуникационных услуг свидетельствует о преобладании цифровых моделей поведения. Большинство участников относят себя к пользователям интернет-коммуникаций и цифровым форматам взаимодействия, тогда как доля приверженцев телефонной коммуникации остается низкой.

Оценка частоты использования коммуникационных каналов продемонстрировала выраженное доминирование цифровых форм взаимодействия. Чаще всего респонденты используют мгновенные сообщения в мессенджерах: большинство отметили варианты «часто» и «повседневно». Высокая частота также характерна для общения лицом к лицу и голосовых звонков.

В то же время такие каналы, как SMS, электронная почта и видеосвязь, используются преимущественно эпизодически («иногда» или «редко»). Минимальные показатели частоты использования установлены для традиционной почты, которую большинство участников указывают как редко используемую.

Оценка субъективной важности каналов коммуникации показала, что личное общение и мессенджеры являются наиболее незаменимыми для респондентов, для которых преобладают оценки «скорее незаменимый» и «полностью незаменимый». Напротив, электронная почта, SMS и почтовые отправления чаще воспринимаются как взаимозаменяемые или нейтральные средства взаимодействия.

Результаты анкетирования отражают преимущественно субъективные оценки и декларируемые предпочтения респондентов, что требует сопоставления с фактическими данными коммуникационной активности клиентов. С этой целью был проведен анализ операционной статистики обращений, зафиксированных в CRM-системе сервисной компании за шестимесячный период, что позволило оценить реальную структуру использования каналов взаимодействия и выявить особенности функционирования телефонного канала.

Динамика обработки входящих телефонных звонков в компанию SRL „MOON PARTNERS” представлена на рисунке 1.

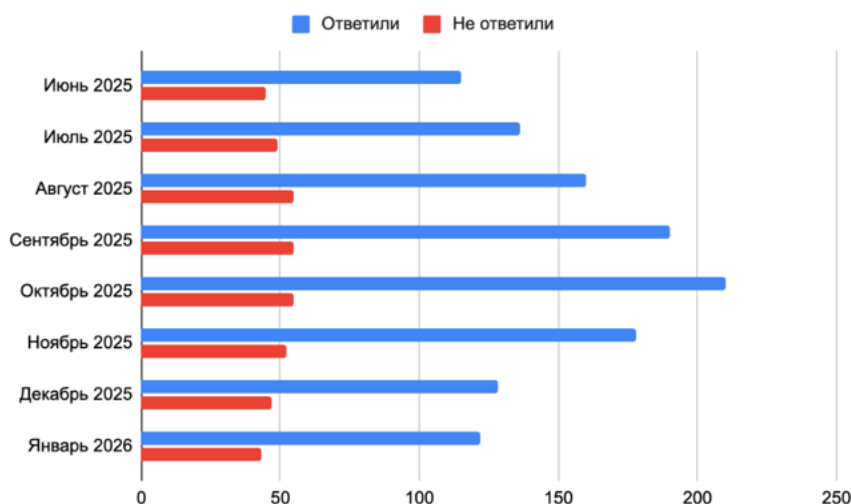


Рис. 1. Динамика обработки входящих телефонных обращений в SRL „MOON PARTNERS” за полугодовой период, 2025 г.

Источник: разработано автором

Данные графика показывают, что во все анализируемые месяцы количество принятых звонков стабильно превышает число пропущенных. При этом общий объем телефонных контактов демонстрирует рост от летних месяцев к осенним, достигая максимальных значений

в сентябре–октябре, после чего в зимние месяцы наблюдается умеренное снижение. Несмотря на преобладание принятых вызовов, доля пропущенных звонков сохраняется на протяжении всего периода, что свидетельствует о сохраняющихся потерях эффективности телефонного канала коммуникации.

Распределение заявок по каналам поступления коммуникации SRL „MOON PARTNERS” представлено на рисунке 2.

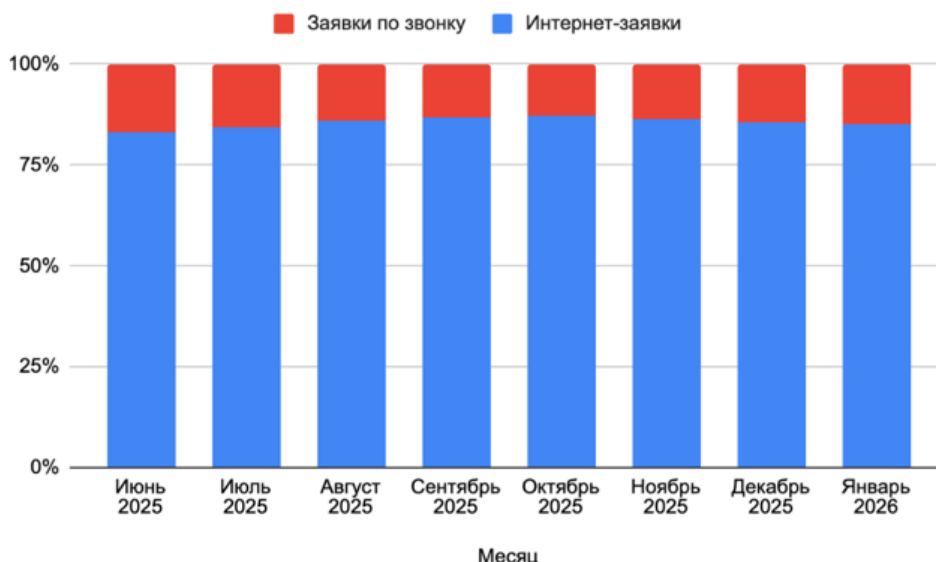


Рис. 2. Структура клиентских заявок в SRL „MOON PARTNERS” по каналам коммуникации (телефон/интернет), %

Источник: разработано автором

Данные, представленные на графике, демонстрируют доминирование цифровых источников взаимодействия. Основная часть клиентских обращений стабильно формируется через интернет-каналы, доля которых значительно превышает телефонные заявки. Телефонные обращения формируют меньшую долю от общего объема заявок, что отражает смещение коммуникационной активности клиентов в сторону онлайн-форматов взаимодействия.

Выявленные изменения структуры обращений свидетельствуют не только о перераспределении клиентских предпочтений, но и о трансформации самой логики коммуникационного взаимодействия в сфере услуг. Снижение доли телефонных контактов и рост цифровых заявок указывают на необходимость адаптации организационных процессов компаний к новым моделям потребительского поведения и пересмотра традиционных инструментов обслуживания.

Полученные результаты указывают на необходимость переосмысления организационных механизмов управления коммуникациями с клиентами. Ключевым инструментом омниканального подхода выступают CRM-системы, обеспечивающие централизованное управление коммуникациями с клиентами и потребительскими данными.

Внедрение CRM-технологий позволяет сервисным организациям систематизировать коммуникационные потоки, объединять обращения из различных каналов в едином информационном пространстве и обеспечивать непрерывность взаимодействия с клиентом на всех этапах обслуживания. Это способствует повышению управляемости процессов коммуникации, сокращению операционных потерь и формированию более устойчивого клиентского опыта.

Практическая реализация омниканального подхода может быть проиллюстрирована на примере компании SRL „MOON PARTNERS”, осуществляющей деятельность в сфере продаж зеркал на заказ. В рамках своей коммуникационной стратегии компания использует CRM-систему Kommo, обеспечивающую интеграцию основных каналов взаимодействия с клиентами, включая мессенджеры, онлайн-заявки с сайта, социальные сети и телефонные обращения.

Все поступающие запросы консолидируются в системе, где формируется полная история взаимодействия с каждым клиентом. Это позволяет сотрудникам оперативно обрабатывать запросы, учитывать предыдущие контакты и адаптировать коммуникацию к индивидуальным потребностям потребителей. В результате снижается зависимость от телефонных звонков как основного канала связи и перераспределяется нагрузка в пользу более удобных цифровых форм взаимодействия.

Интеграция каналов в рамках омниканальной модели также повышает прозрачность внутренних процессов компании, помогает сократить время отклика на запросы и снизить риск потери заявок. Для клиентов это означает более последовательное и предсказуемое обслуживание, а для организации – повышение эффективности управления маркетинговыми коммуникациями и рационального использования ресурсов.

Проведенное исследование подтвердило, что маркетинговые коммуникации в сфере услуг находятся в стадии активной трансформации под влиянием процессов цифровизации и трансформации потребительского поведения.

Зафиксировано преобладание цифровых моделей взаимодействия: большинство респондентов предпочитают мессенджеры и интернет-коммуникации, в то время как традиционные телефонные звонки и офлайн-каналы используются реже и воспринимаются как менее значимые. Это свидетельствует о смещении ожиданий потребителей в отношении асинхронных и более гибких форм взаимодействия.

Анализ операционной статистики SRL „MOON PARTNERS” подтвердил выявленные тенденции на уровне реального поведения клиентов. Основная доля обращений поступает по цифровым каналам, в то время как телефонные звонки составляют меньшую долю коммуникационных потоков и сопровождаются потерями эффективности в виде пропущенных звонков.

Сравнение субъективных предпочтений респондентов и фактических данных компании продемонстрировало соответствие заявленной и реальной моделей коммуникационного поведения, что подтверждает устойчивый характер перехода к цифровому формату обслуживания.

Установлено, что в условиях увеличения числа точек контакта CRM-системы становятся ключевым инструментом управления коммуникациями с клиентами, обеспечивая интеграцию каналов, централизованную регистрацию обращений и повышая прозрачность процессов обслуживания. Использование многоканальных технологий помогает снизить нагрузку на телефонные линии, ускорить обработку запросов и повысить качество обслуживания клиентов.

Практическая значимость исследования заключается в обосновании необходимости приоритетного развития цифровых каналов взаимодействия, автоматизации обработки обращений и внедрения CRM-платформ как основы эффективной коммуникационной стратегии сервисных компаний. Это позволяет сервисным организациям повысить эффективность управления клиентскими коммуникациями, сократить операционные издержки и обеспечить более устойчивый уровень удовлетворенности потребителей.

Полученные результаты могут быть использованы организациями сферы услуг при проектировании омниканальных систем обслуживания, оптимизации структуры каналов коммуникации и формировании клиентоориентированной маркетинговой политики. Практическое внедрение предложенных рекомендаций способствует повышению согласованности взаимодействия с клиентами, снижению операционных потерь, связанных с неэффективностью телефонных каналов, а также более рациональному распределению ресурсов между различными форматами коммуникации.

Использование цифровых инструментов и CRM-технологий обеспечивает прозрачность процессов обработки обращений, ускоряет принятие управленческих решений и повышает качество клиентского сервиса. Тем самым результаты исследования формируют методологическую и практическую основу для дальнейшего совершенствования маркетинговых коммуникаций в сфере услуг в условиях цифровой трансформации рынка, а также могут служить базой для последующих исследований, направленных на разработку эффективных моделей интеграции традиционных и цифровых каналов взаимодействия.

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Section 1.3. Accounting, finance and credit
Sektiya 1.3. Muhasebe, finans ve kredi
Secțiunea 1.3. Contabilitate, finanțe și credit
Секция 1.3. Бухгалтерский учет, финансы и кредит

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**TAX AUDITS AS A COMPONENT OF STATE FINANCIAL CONTROL
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Abstract. The article analyzes the role of tax audits as a key instrument of state financial control management. Their importance in ensuring compliance with tax legislation, preventing violations and forming proper tax discipline is revealed. The author analyzes the problematic aspects of tax control implementation in the context of increasing fiscal pressure and growing number of disputes between taxpayers and regulatory authorities. Based on the data of the Business Ombudsman Council, the author characterizes the main causes of conflicts related to the results of tax audits and outlines the directions for improving tax administration mechanisms in order to achieve a balance between the interests of the state and business.

Keywords: tax audits, state financial control, tax control, budget, state tax policy, tax revenues, tax surcharges, tax administration, tax legislation, taxpayers.

The effective functioning of the system of state financial control is a prerequisite for ensuring the financial stability of the State, compliance with budget discipline and legality in the field of public finance. In the context of transformational changes in the economy, digitalization of financial processes and increased fiscal risks, the improvement of management mechanisms for controlling the formation and use of the State's financial resources is of particular relevance.

Tax audits play an important role in the system of state financial control, as they are one of the key tools for managing the administration of taxes and fees. They help to detect violations of tax legislation, improve tax discipline and generate stable revenues for budgets of various levels. At the same time, the effectiveness of tax audits largely depends on the quality of management, the methods and procedures used, and their alignment with the goals of the state financial policy.

Tax audits occupy a key place in the system of state financial control, performing the function of managerial influence on the processes of formation and timely receipt of tax payments to the budget. They are aimed at assessing the correctness of the determination of tax liabilities, the completeness of their payment, as well as compliance with tax legislation by taxpayers [1].

The legal and regulatory framework in Ukraine provides for the application of various types of tax audits, each of which has its own purpose and management tasks. In particular, desk audits are conducted by tax authorities on the basis of submitted reports without direct contact with the taxpayer. Documentary scheduled audits are conducted in accordance with approved schedules, taking into account a risk-based approach to the activities of business entities. Unscheduled documentary audits are carried out on the basis of statutory grounds, in particular, in cases of detection of possible violations or receipt of relevant information from other regulatory authorities. Actual inspections are aimed at monitoring compliance with the rules of payment transactions, cash circulation, licenses and other mandatory requirements.

Taken together, these types of tax audits form an integrated tax control management system that ensures a comprehensive impact of the state on the financial discipline of taxpayers and contributes to the overall efficiency of state financial control.

The use of tax audits within the framework of state financial control allows the state to implement a number of important management tasks, including ensuring the stability of budget revenues, counteracting tax evasion, identifying and stopping aggressive tax planning practices, and forming the basis for a transparent and predictable tax policy.

In the current environment, tax audits in Ukraine play a systemic role in the financial control management mechanism, as they are aimed not only at recording violations but also at regulating the behavior of taxpayers with regard to the correctness of calculation and timely payment of taxes and fees. At the same time, the effectiveness of control measures largely depends on the level of institutional trust between taxpayers and controlling authorities.

According to the State Tax Service of Ukraine, the level of trust of business entities in the process of conducting tax audits remains low: only 13% of respondents expressed a positive assessment of the activities of regional tax authorities in this aspect, while the figure for the central office of the STS was 19% [2]. This situation leads to an increased level of conflict during the implementation of control procedures and contributes to the growth of administrative and court disputes.

At the same time, statistics show that the vast majority of tax revenues are generated by the voluntary fulfillment of tax obligations by taxpayers. After 2017, the share of revenues received as a result of additional charges based on the results of audits did not exceed 1% of total budget revenues, which confirms the need to reorient tax audits from a fiscal and punitive to a management and preventive function.

In 2017-2023, the public finance system of Ukraine was characterized by a steady positive trend in tax revenues to both the consolidated and state budgets. During this period, the amount of tax revenues of the consolidated budget more than doubled - from UAH 519.2 billion in 2017 to UAH 1,213.6 billion in 2023. A similar trend can be seen in the State Budget, where revenues increased from UAH 335.3 billion to UAH 783.6 billion. Such dynamics is the result of a combination of macroeconomic factors, including inflation, broadening of the tax base, and gradual improvement of tax administration.

The effectiveness of tax audits is one of the key performance indicators of the state financial control system. An analysis of the practice of their implementation shows that control activity has increased in recent years. In particular, according to the State Tax Service of Ukraine, in 2017-2021, on average, about 74% of documentary audits (excluding desk audits) resulted in the issuance of acts on violations. In 2022-2023, this figure increased to 85%, reflecting the strengthening of the fiscal component of tax control and the change in management priorities under martial law [2].

Tax audits are an integral element of the state financial control management system, as they are aimed not only at recording the facts of violation of tax legislation, but also at forming proper tax

discipline and preventing risky behavior of taxpayers. At the same time, the intensification of control measures increases the need to improve management approaches to tax administration, ensure a balance between the fiscal interests of the state and the economic interests of business, and create predictable conditions for conducting business.

The existence of problems in the practice of tax control is also indicated by the materials of the Business Ombudsman Council, which systematically records a high level of tension in the relationship between taxpayers and controlling authorities. A significant number of appeals related to the results of tax audits indicate shortcomings in the application of tax legislation and insufficient quality of control materials. During 2017-2023, the Business Ombudsman Council received 1,430 appeals on the results of audits, of which 1,152 complaints, or 80.6%, were accepted for consideration [3]. As part of the review of such appeals, the Council formed and sent legal positions to the State Tax Service to support taxpayers in the administrative appeal procedure.

An important element in assessing the performance of tax authorities within the framework of state financial control is the performance indicators annually determined by the Ministry of Finance of Ukraine in the passports of budget programs. In particular, in terms of litigation, the key performance indicators of the State Tax Service in recent years have been about 44% in terms of the number of cases resolved in favor of the tax authorities and about 55% in terms of monetary value. The formal achievement of these indicators indicates that the state recognizes the acceptable level of reversal of tax decisions in court and emphasizes the important role of the judiciary in the system of state financial control.

In this context, tax audits retain the status of one of the basic instruments of the state's financial control, as they are used to implement managerial influences aimed at ensuring tax discipline, correcting illegal tax decisions and stabilizing budget revenues [4]. The analysis shows that the effectiveness of control and inspection activities is largely determined by the level of analytical support for inspections, the use of digital tools, transparency of procedures and the ability of tax authorities to build constructive communication with business entities.

In today's environment, the priority area for the development of tax audits is the transition from a formal and punitive model to a risk-oriented management approach, which reduces administrative pressure on bona fide taxpayers and at the same time increases the efficiency of identifying tax risks. This transformation is in line with the principles of good governance and involves the wider use of automated data analysis systems, electronic services and artificial intelligence tools, increased transparency and accountability of tax authorities, as well as harmonization of national practice with the approaches of the European Union and the Organization for Economic Cooperation and Development.

Under martial law, the adaptation of tax control mechanisms to new socio-economic challenges is of particular importance, as ensuring the stability of budget revenues is a critical factor in the financial security of the state. In such circumstances, effective management of tax audits becomes a key prerequisite for maintaining financial stability and supporting the functioning of the public sector.

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SPECIFICITIES OF REMUNERATION IN THE PUBLIC SECTOR AND THEIR IMPACT ON EMPLOYEE MOTIVATION

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Abstract. This article examines how the unitary salary system in the Republic of Moldova’s budgetary sector shapes employee motivation through its legal design and differentiated application across occupational groups. Using a predominantly qualitative approach grounded in documentary and content analysis, the study reviews the regulatory architecture of remuneration, with attention to the fixed and variable salary components, reference values, and sector-specific bonuses. The findings indicate that the system strengthens predictability and formal transparency through standardized calculation rules, but also embeds multiple differentiated regimes through exemptions, ceilings, and conditional payments.

Keywords: public sector pay; unitary salary system; employee motivation.

Introduction

Public sector remuneration remains one of the most sensitive policy areas in contemporary public administration, positioned at the intersection of fiscal sustainability, institutional performance, and social expectations regarding fairness. In the Republic of Moldova, the adoption of a unitary salary system aimed to replace fragmented sectoral arrangements with a coherent framework capable of ensuring predictability, transparency, and greater internal consistency in pay determination. However, even within a formally unitary system, salary policies may generate differentiated outcomes across occupational groups due to exemptions, sector-specific bonuses, and varying institutional capacities to operationalize incentive mechanisms. For this reason, public pay should be approached not only as a technical instrument for calculating wages, but also as a normative and motivational mechanism that communicates what types of work, responsibilities, and risks the state values.

From a motivational perspective, remuneration matters not only through its absolute level, but through the perceived fairness of distribution, the stability of income, and the credibility of rules that justify differentiation. In public organizations—where pay negotiation is limited and performance measurement is often constrained—employees’ motivation is strongly influenced by whether the salary system is perceived as legitimate and consistent. A unitary framework may increase trust by reducing arbitrariness and improving predictability, yet it may also create new tensions if differentiated regimes are perceived as privileges rather than justified compensation for risk, complexity, or strategic importance. Moreover, variable pay instruments (performance bonuses, specific allowances, compensations “on a case-by-case basis”) can motivate only to the extent that allocation criteria are transparent and applied consistently across institutions.

Research methodology

This article applies a predominantly qualitative, document-based approach to examine how public sector remuneration rules shape employee motivation. The analysis draws on official regulatory and policy materials that define pay components, calculation mechanisms, and incentive instruments in the budgetary sector. Methods of synthesis and comparison are used to structure the main salary elements and highlight differences across occupational categories, while content analysis supports the interpretation of their motivational implications in terms of perceived equity, predictability, and the scope for incentives.

Results and Discussion

The introduction of the unitary salary system in the public sector was mainly determined by the need to correct the fragmentation and incoherence of the previously existing remuneration mechanisms, which generated significant and often unjustified salary differences between categories of staff with comparable duties and levels of responsibility.

The previous system was characterized by a multitude of sectoral regulations, uneven increases and distinct salary calculation mechanisms, which affected both internal equity and the transparency of the remuneration process. In this context, the unitary system was designed "in order to increase, clarify and align the salary level for some categories of employees in the public sector".

Another central reason for the reform was to ensure a minimum level of salary protection for public sector staff, while aligning public sector salaries with the evolution of the minimum wage in the economy. The substantiation note emphasizes that the increase in the minimum wage at national level also requires appropriate adjustments in the public sector, in order to prevent situations in which salaries calculated according to the new scales would fall below the minimum required social insurance threshold. In this sense, the introduction and adjustment of the compensatory payment mechanism had the role of guaranteeing the maintenance of wage income at a minimum acceptable level, being explicitly defined as compensatory social protection measures.

At the same time, the wage reform was based on the principle of budgetary sustainability, the official document explicitly stating that the establishment of wage norms without financial coverage could affect the budgetary balance and cannot be admitted in a framework of responsible fiscal governance. Therefore, the unitary system was designed as an instrument for the control and predictability of public spending, in which the evolution of wages is conditioned by the real possibilities of the state budget and the dynamics of macroeconomic indicators [1].

Article 10 of Law 270 of 2018 on the unitary salary system in the budgetary sector establishes the salary architecture in the budgetary sector: "The monthly salary of personnel in budgetary units... consists of: the fixed part and the variable part". The fixed part includes the basic salary, the fixed monthly bonus, the monthly bonus for the professional rank, the monthly bonus for holding a scientific and/or scientific-didactic title, as well as the monthly bonus for holding an honorary title. The variable part of the salary in the budgetary sector includes the bonus for performance and bonuses of a specific nature.

For some occupational groups, especially specialist and executive functions in administration or in institutions where there are more frequently used assessment and incentive instruments, the variable part (performance bonuses and specific bonuses) may have a greater practical relevance in total income. In contrast, for auxiliary, technical or service staff, income is usually more strongly anchored in the fixed part, which determines a more rigid and predictable salary, but with little room for differentiated incentives depending on results.

Secondly, the differences between groups are accentuated by payments granted "on a case-by-case basis", which do not function as universal elements of remuneration, but depend on the specifics of the activity, the concrete working conditions and, sometimes, on the institutional capacity to mobilize additional resources. Bonuses for night work, for work on public holidays or for overtime work, as well as bonuses associated with unfavorable conditions or increased health risk tend to appear more frequently in areas with atypical working regimes and high exposure (e.g., services with continuous activity, operative or medical structures), while in areas such as education, where the activity has a different type of working time organization, these components usually have a lower

weight. Similarly, bonuses for participation in projects financed from external sources or for carrying out priority tasks in the context of accession to the European Union may generate differences between institutions and areas depending on the degree of involvement in such projects and the concrete funding opportunities [5].

Thirdly, the particularities of remuneration are also influenced by the existence of derogations, which modify the standard structure of the monthly salary for certain categories. For some public dignitaries and for the staff in their offices, the monthly salary does not fully follow the general logic of art. 10 para. (1) of Law 270 of 2018 on the unitary salary system in the budgetary sector, being made up of the fixed part and only certain additional payments, if these do not derive from incompatible activities established by special laws. At the same time, for certain institutions with a special regime (such as those in the security or anti-corruption area), the regulatory framework may explicitly include the component of specific bonuses in the structure of the monthly salary, which contributes to the differentiation from other occupational groups where the emphasis remains on the fixed part and the general guarantees of the system.

Article 12 of Law 270 of 2018 on the unitary salary system establishes the logic by which the basic salary is determined. This is not a negotiated amount, but results from a standardized mechanism, based on salary coefficients provided for in the annexes of the law, differentiated according to the position held and its requirements (level of education, qualification, teaching degree or other specific criteria), as well as seniority, reflected in the salary steps. Essentially, for most positions, a system of six salary steps corresponding to seniority tranches is applied, which means that two people in the same position can have different basic salaries, exclusively as a result of their professional career. At the same time, the law also provides for important exceptions to the logic of the steps (for example, for positions of public dignity, staff in their offices, senior management or heads of budgetary units), which indicates the existence of distinct regimes within the same unitary system.

The basic salary in the public sector is determined by a standardized mechanism, established by law, which starts from a single calculation formula: it is obtained by multiplying the reference value by the salary coefficient corresponding to the salary class of the position, determined under the law, the result being rounded up to 10 lei in favor of the employee.

At the same time, the law expressly specifies that the reference value related to the coefficient 1.00 is not fixed in time, but is established annually by the state budget law for the respective year. This regulation gives the unitary system two important features: on the one hand, it ensures predictability and transparency in the calculation of the basic salary, and on the other hand, it allows for the annual adjustment of the salary level depending on economic conditions and budgetary possibilities. Consequently, the reference value becomes a central instrument of public salary policy, since its modification directly influences the basic salaries of budgetary employees, proportionally to the function coefficient [5].

The diversity of reference values (1400–4700 MDL) presented in table 1 and the establishment of exemptions essentially reflect a differentiation of salary policy based on the specifics of the work and the level of institutional exigencies: exposure to greater risks and constraints (e.g., activities with special regime or high sensitivity), increased operational pressure and continuity of the public service, a higher degree of decision-making and legal responsibility, as well as the need to attract and retain personnel in strategic or deficient areas. From a motivational perspective, these exemptions can function as a mechanism for recognizing and compensating for more complex tasks or professional risks, strengthening satisfaction and retention in the targeted segments. At the same time, if this logic is not clearly communicated or if the differences are perceived as disproportionate to the effort and responsibility of other categories, the effect can be the opposite: decreased perceived equity, increased social comparison, and demotivation among employees with lower salaries, even if they themselves face significant professional pressures [6].

Table 1. Reference values for calculating the salary in the public sector in 2026

Reference value (MDL)	1400	2400	2500	2850 — 3000 — 3200 — 3600 — 4300 — 4500 — 4700
Categories	Top officials	All categories except exemptions	• Staff grades 1–25; • Education, research and management in educational institutions; • social assistance; • health; • MIA structures; • numerous agencies; • staff (non-judges) in courts and (non-prosecutors) in prosecutors' offices; • central administrative authorities subordinate to the Government; • Aeronautics and cybersecurity.	Justice and public governance

Source: elaborated by the author based on Law on the state budget for 2026 [6]

Within the occupational group "Education", the key particularity of remuneration is that the differentiation of income was not given only by the basic salary, but especially by the mechanisms for recognizing career and qualifications, applied differently on the sub-segments of the field. For teachers in general education, until 2025, holding teaching degrees effectively generated increases in the salary class (by +5 classes for grade II and +10 classes for grade I, respectively, +15 for the higher grade), which directly translated into an increase in the basic salary through a higher coefficient. From 2025, this recognition was converted into a fixed and substantial monthly payment, maintaining the strict link with the time actually worked in the position/specialty for which the degree was conferred: 1500 lei for grade II, 2800 lei for grade I and 4000 lei for the higher grade [3].

In parallel, for scientific and teaching staff in higher education, until May 2025, the increase for scientific and scientific and teaching titles was relatively modest. A bonus of 1,100 lei were prescribed for doctor habilitat/university professor/research professor and 600 lei for doctor/associate professor, which created a clear discrepancy within the field of education: in relation to the amplitude of the increases applied to teachers in schools, the reward for academic titles in universities had a comparatively smaller impact on total income. After the amendment in May 2025 (with application from 01.09.2025) [4], the increases for academics were significantly recalibrated, by raising the bonuses to the levels of 4500 lei for doctor habilitat/university professor/research professor and 4000 lei for doctor/associate professor, reducing this asymmetry and strengthening the motivational function of salaries in higher education through a much more visible financial recognition of academic capital.

The provisions on performance bonuses outline an important peculiarity of budgetary remuneration: the performance bonus is designed as a stimulating tool, but it is strongly "proceduralized" and budgetary limited, which directly shapes its motivational effect. The framework regulation [2] explicitly sets out the principles that must govern the granting of bonuses – quality of work, contribution, professionalism, objectivity and impartiality – and links it to the employee's contribution to results, which strengthens the meritocratic dimension and the role of feedback (reward for results). At the same time, both the general framework and the specific rules for self-managed educational institutions [3] maintain the same structural constraint: the performance bonus fund is planned annually within the limit of 10% of the annual amount of basic salaries, which means that performance is stimulated within a "finite financial space" (it cannot produce unlimited rewards, and the distribution depends on the institution's resources and managerial decisions). The peculiarity for the field of education is that the norm almost fully reproduces the general logic, but reports it at the institution level (internal planning and allocation), and the conditioning of the absence of disciplinary

sanctions introduces a compliance mechanism (the bonus functions both as a positive incentive and as a disciplinary instrument). From a motivational perspective, the combination of meritocratic criteria and budget cap can have a dual effect: the increase can increase engagement when the evaluation is credible and transparent, but it can generate perceptions of inequity or demotivation if resources are insufficient, the criteria are applied inconsistently, or if employees perceive the increase as "discretionary" rather than strictly correlated with performance.

The diversity of provisions on specific bonuses shows that, within the same "unitary" system, the state operates with different motivational regimes in different areas, depending on risk, complexity, public pressure and strategic importance. First, the differences in ceilings, such as 10% for education/culture/social assistance vs 75% for health vs 20% for defense/security/public order and 40% for certain "sensitive" authorities, indicate that the variable part of income has very different weight between groups: in areas such as education, specific bonuses remain a relatively limited tool (more of a supplement), while in health or in structures with special status they can become a major component of remuneration, with a direct effect on attractiveness and retention. Second, the specific exemptions, for example; 120% for anti-terrorist activities and cybersecurity; 30%/40% for anti-corruption/investigation activities, highlights an important particularity: the specific increase no longer functions only as a "generic recognition of the field", but as a tool for targeting missions with exceptional demands (increased risk, confidentiality, pressure, legal responsibility), which can increase motivation through the feeling of compensation for professional costs and through the signal of institutional valorization. However, this diversification also produces motivational side effects: it can amplify social comparison and equity tensions between fields (especially when the effort perceived in sectors with a low ceiling is considered comparable to that in sectors with a high ceiling), and the "in the manner established by the Government" character introduces a dependence on secondary rules and institutional practices, which can affect predictability and trust if application is uneven. Finally, the provision that for tax and customs authorities and for certification/supervision/control in civil aviation, the limits are approved separately by the Government emphasizes another particularity: there are areas where the salary policy is adjusted "dynamically" through subsequent acts, which can increase the competitiveness and stability of personnel, but also reinforce the perception of the existence of "privileged regimes" if there is no transparent justification related to risk, performance and responsibility [5].

The bonus for unfavorable conditions is, in principle, fair in terms of motivation, being linked to the certification of jobs and the time actually worked, but the dependence on a standard list and on amounts subsequently established by the Government can produce gaps between perceived risk and recognized risk, especially if the assessments are rare, contested or unevenly applied.

The bonus for increased health risk has high motivational potential (up to 100% of the basic salary), because it sends a strong signal of compensation in exceptional situations, but it also introduces a vulnerable point: the specific amount remains at the discretion of the head of the budgetary unit, depending on volume and training, which can amplify the perception of arbitrariness or favoritism in times of crisis, when cohesion and trust are essential. Bonuses for overtime, night work and holidays/rest days are the clearest in terms of motivational logic: they directly reward the sacrifice of time and the atypical rhythm (double for overtime/holidays, 50% for night work), but the exclusion of those salaried by cumulation in the same unit can create situations in which the additional effort is perceived as insufficiently recognized, and the alternative of compensation through free time (where applicable) can reduce the financial incentive effect.

Bonuses for participation in external projects and for priority tasks in the context of EU accession have a motivating dimension through their association with modernization, development and rare skills, but remain "selective" and dependent on the institution's access to projects and the management's decision on the amount, which can produce internal cleavages between those involved in projects and the rest of the staff, with a risk of demotivation for employees who support the core activity without having similar opportunities.

In the case of local public administration, institutional capacity building and managerial/professional capacity building bonuses are explicitly conceived as retention and professionalization tools (including 50% of the basic salary for the mayor/deputy mayor/secretary and up to 50% for executive officers), but their design accentuates structural inequalities: the granting depends on internal regulations approved at local level and, for executive officers, on the financial capacity of the LPA (limit related to its own executed revenues), which can create large differences in motivation and attractiveness between rich localities and localities with a low tax base. Overall, these bonuses function more as compensation and human resource management mechanisms in special contexts than as universal performance incentives; they can increase motivation when applied transparently and predictably, but can undermine motivation and the perception of equity when access and amount depend excessively on discretionary decisions, occasional projects or the different financial capacity of institutions [5].

Conclusions

This study confirms that pay design in the public sector functions not only as a compensation mechanism, but also as a governance tool that shapes employee motivation through signals of value, recognition, and fairness. In a unitary salary system, motivation is influenced less by the existence of formal rules and more by how clearly those rules translate into understandable, credible and consistent outcomes for different categories of staff. When remuneration is predictable and its internal logic is transparent, it supports job security, professional stability and long-term commitment. When remuneration becomes heavily differentiated through multiple special regimes, motivation increasingly depends on perceived legitimacy—whether employees believe differences are justified by responsibility, risk and performance.

The findings also suggest that motivational effectiveness is closely tied to equity perceptions. Differentiation can strengthen attraction and retention in critical or high-pressure areas, but it can simultaneously undermine morale in other areas if the rationale is insufficiently explained or if comparable effort is perceived to be valued unequally. In this context, communication and justification become part of salary policy itself: the same pay gap may be motivating when seen as fair compensation, or demotivating when seen as privilege.

Finally, the study highlights that variable pay and supplementary bonuses can support motivation only when implementation is credible. When incentives are limited by ceilings, dependent on institutional resources, or applied inconsistently, they risk being interpreted as discretionary rather than merit-based, reducing their motivational value. Therefore, strengthening coherence between the stated objectives of the salary system (equity, predictability, sustainability, and motivation) and its practical implementation (clarity, consistency, and transparency) is essential for maintaining trust and supporting motivation across the public workforce.

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INNOVATION AND FINANCE FOR GROWTH: THE MARE GROUP CASE

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Abstract. This study analyses the impact of IPO and private equity (PE) on the economic and financial performance of an Italian small and medium-sized enterprise (SME), Mare Engineering Group S.p. A. The analysis was conducted over 10 years, from 2015 to 2024. The bibliometric framework, conducted on Scopus, confirms that interest in the topic remains fragmented and places greater emphasis on corporate governance than on financial statement analysis.

The results show how opening up to external capital has harmed company profitability, albeit justified by the incurrence of extraordinary costs.

The conclusions lay the foundations for future developments and managerial research regarding the balance between proprietary control and expansion strategies.

Keywords: Family businesses, Private equity, Initial public offering (IPO), Profitability, Financial performance, Corporate governance.

1. Introduction

The current economic environment, characterised by increased competition and geopolitical uncertainty, poses increasingly significant strategic challenges for small and medium-sized enterprises (SMEs). The opening of share capital through listing on the stock exchange (IPO) could therefore represent an important, if not necessary, lever to raise capital, drive growth, and support innovation.

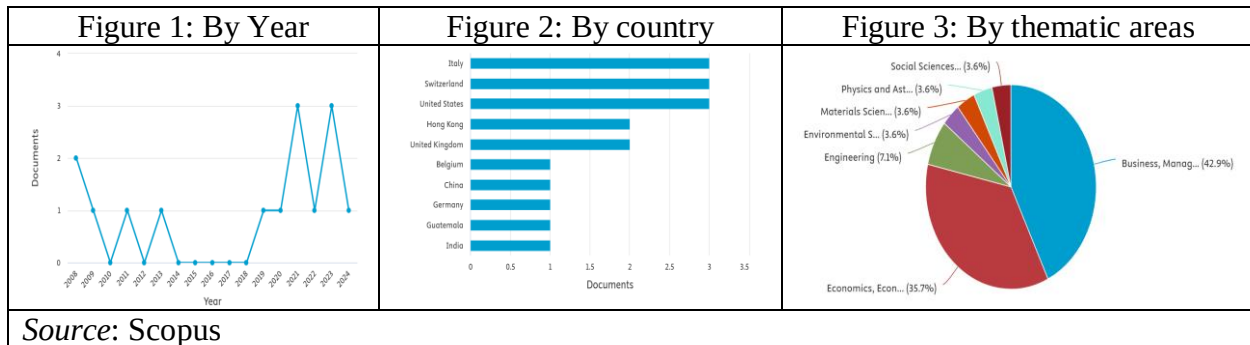
This work stems from the desire to critically analyse these strategic choices, focusing in particular on the case of Mare Engineering Group S.p.A., a representative reality in the Italian business landscape for strategic dynamism and ability to combine tradition and openness to external capital.

2. Literature

A bibliographic search on Scopus (07/04/2025) with the query "family AND private AND equity AND ipo" identified a total of 15 documents: academic interest appears limited but growing in the final part of the observed period, after a discontinuous phase between 2008 and 2013 and a substantial rarefaction between 2014 and 2018, with a recovery from 2019 and an intensification from 2021, followed by a further peak in 2023 (Figure 1).

The geographical distribution of contributions is mainly concentrated in Italy, Switzerland and the United States, followed by Hong Kong and the United Kingdom, while other countries (including Belgium, China, Germany, Guatemala and India) are marginal (Figure 2).

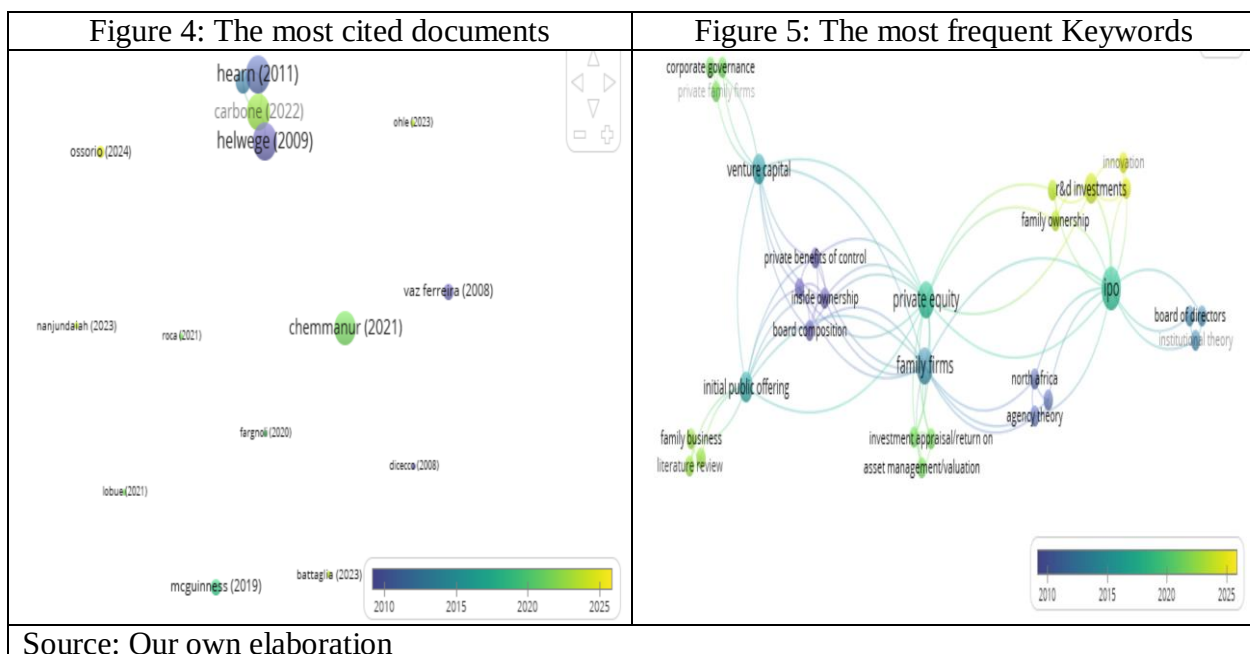
Publications fall mainly in the areas of Business, Management & Accounting (42.9%) and Economics, Econometrics & Finance (35.7%), with smaller presences in Engineering (7.1%) and residual contributions in other disciplines (Figure 3).



The bibliometric mapping (VOSviewer) shows how the most cited works focus on some "foundational" references [1] and on recent contributions that are already influential [2]. At the same time, the keyword network revolves around private equity, family firms and IPO/initial public offerings, with recurring connections to governance and control issues (board composition, inside ownership, private benefits of control), financing (venture capital) and innovation/investments (innovation, R&D investments, family ownership), as well as interpretative frameworks such as agency theory and institutional theory (Figures 4 and 5).

The literature on "family firms, private equity and IPOs" still appears relatively fragmented and numerically contained in the Scopus research considered, without a unitary and fully consolidated tradition; However, the most influential contributions and the network of keywords point to a recurring interpretative core that links openness to external capital to governance changes, incentive realignment, and value creation processes.

The most cited references serve as a conceptual basis for interpreting the IPO and the entry of investors as hubs capable of affecting control [3], board composition, and monitoring mechanisms, while the most recent literature broadens the focus to include innovation, R&D investments, and growth strategies.



At the same time, the emergence of keywords related to *agency theory* and *institutional theory* suggests that the outcomes of opening up to capital depend not only on financial choices, but also on the institutional context and ownership structure [4]. On the other hand, an integrated reading that systematically connects private equity/IPO transitions with the evolution of economic-financial performance and capital structure over time remains less developed, especially for family SMEs; in this sense, the analysis of the Mare Group case allows us to observe these dynamics in a concrete trajectory of growth and transformation.

3. Methodology

The analysis is based on a case study of Mare Engineering Group S.p.A. (hereinafter, Mare Group) and on a pre- and post-economic and financial analysis of the capital opening. The 2015-2023 balance sheet data were extracted from the AIDA database (which limits the observation to 2023), while the 2024 data were retrieved from the official website of Mare Group [5] and reprocessed. The time horizon considered is 2015–2024 and includes the listing on the Stock Exchange and the entry of the private equity fund, which took place at the same time as the IPO in May 2024.

Performance is assessed exclusively through profitability indices (e.g., ROE, ROA, ROS) and, in addition to the internal time comparison, with the sector average for each ratio, to contextualise the company's performance relative to the sector. Since the listing is recent, the evidence is to be considered preliminary and does not yet allow definitive conclusions about the medium- to long-term effects.

4. Results

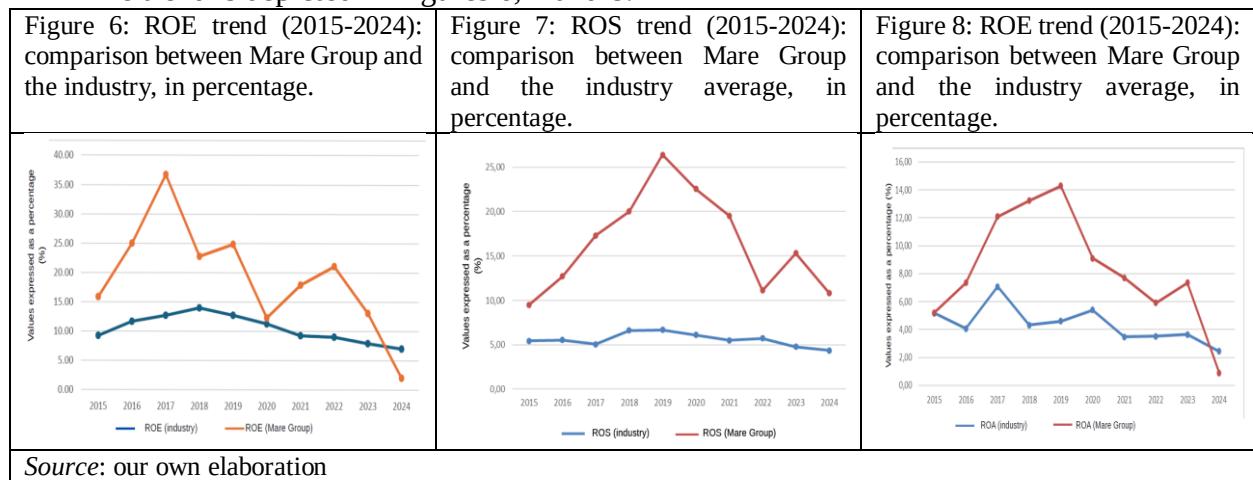
4.1. Profitability ratios

Table 1 shows the evolution of the leading profitability ratios.

Table 1: Average ROA, ROS, ROE values and number of observations.						
Anno	ROA (%)	No. of ROA comments	ROS (%)	No. of ROS comments	ROE (%)	No. of ROE observations
2015	5.17	353	5.44	310	9.24	344
2016	4.06	356	5.54	305	11.66	345
2017	7.08	360	5.05	316	12.7	345
2018	4.33	363	6.6	314	13.97	347
2019	4.59	366	6.68	313	12.71	351
2020	5.4	375	6.11	307	11.26	362
2021	3.49	381	5.5	313	9.25	366
2022	3.52	376	5.71	307	9.02	362
2023	3.65	369	4.78	290	7.92	346
2024	2.43	168	4.36	136	7.02	162

Source: Personal elaboration on AIDA data.

The trend is depicted in Figures 6, 7 and 8.



Mare Group's ROE increased until 2017 (reaching 35%), then fluctuated between 23% in 2018 and 2.5% in 2024. Despite the deterioration in the ability to remunerate equity, Mare Group's ROE remained steadily above the sector average (except for the last year), indicating high margins and efficient equity management.

In the first phase, until 2017, ROE growth was supported by growing economic results and a still limited capital structure. In 2024, on the other hand, the reduction in ROE is attributed to: (i) a reduction in profitability (net income down by approximately 63% compared to the previous year) and (ii) a significant increase in shareholders' equity, from €17.07 million to €40.38 million (+137%). The increase in shareholders' equity is a direct consequence of the listing on the stock exchange (in

May 2024) and the increase in capital reserves (in particular, the share premium reserve, the value of which grew by approximately €18.65 million).

In other words, capital transactions strengthened the capital structure, but also led to a "dilution" of the percentage return on equity, amplifying the effect of the decline in profit.

ROS, which measures the ability to generate operating margins on revenues, remained stable between 2015 and 2024, rising from 10% to 27% in 2019, and then, similarly to ROE, underwent a period of steady deterioration until 2024 (10.8%). Despite the increase in revenues over the last year, operating costs have risen by more than proportionately, leading to a contraction in ROS. Also in this case, however, the value of Mare Group was steadily above the sector average.

The ROA, a ratio of operating income generated relative to total resources employed, followed the same trend as the other ratios: an increasing phase until 2019, followed by a steady deterioration in 2024, while fluctuating around positive values in the 5%-15% range.

In the last year, thanks to the reduction in operating income and the increase in assets (which grew by more than 92 million euros, from around 61 million in 2023), they contributed to compressing ROA.

On the economic side, the reduction in operations is attributable to higher fixed costs, costs for legal, IT and service consultancy (approximately €7.7 million), necessary to enhance the technological infrastructure: in addition, legal-tax expenses, relating to specialist, legal and notary advice were necessary for listing and organisational expansion.

In other words, the simultaneous decline in Mare Group's profitability ratios is attributable to extraordinary costs rather than a loss of competitiveness. The data of the last year, in fact, appear anomalous compared to the historical trend and can, if accompanied by an efficient management of resources and business processes, be recovered over a long-term time horizon.

5. Conclusion

This paper analysed the relationship between the opening of share capital (through IPO and PE) on the economic performance of a small and medium-sized Italian company, Mare Engineering Group S.p.A. Based on a bibliometric analysis that is still limited and which focuses mainly on value creation (rather than on balance sheet analysis), a quantitative analysis of Mare Group's profitability ratios was carried out.

In this context, empirical evidence demonstrates, over a ten-year time horizon (2015-2024), how Mare Engineering Group has gone through two phases: the first was characterised by strong growth in all profitability ratios, culminating in 2018; the second, immediately following, on the other hand, showed a period of progressive deterioration in margins, which lasted until 2024.

This reduction is attributable to a progressive decline in operating income and net income, associated with higher strategic costs related to the listing, and to a simultaneous and significant increase in shareholders' equity and overall corporate assets, both of which are direct effects of the listing.

The dynamics of 2024, therefore, appear plausibly influenced by non-recurring and transitory factors related to the IPO process (e.g., extraordinary costs, organisational strengthening, and growth-related investments), rather than by a permanent decline in the company's competitiveness.

Since the listing took place in May 2024, the results analyse a time horizon that is too short and not necessarily representative of the long-term effects.

Future managerial research could therefore extend the observation period and compare SMEs operating in the same sector to assess the impact of stock exchange listing and private equity.

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TAX CREDIT FROM THE BUILDING SUPERBONUS: ACCOUNTING PROFILES AND BUDGETARY IMPLICATIONS^{2*}

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Abstract: This article examines one of the most influential tax incentive measures that has entered the Italian legal system in recent years, the Decree Law of May 19, 2020, No. 34, having significant implications not only in the construction sector but also the overall impacts on the management and control and tax of companies and the beneficiary subjects. Instead, the taxpayer can have different options to take advantage of the Superbonus 110 per cent tax credit, such as not taking the tax credit directly (through a tax deduction) or using it via credit transfer or invoice discount, which has brought about the issues of regulations, accounting, and budget. Finally, from a tax perspective, the Superbonus tax credit is characterised by a reduction of tax debt. Fiscal discipline includes specific use methods, time limits, and subjective constraints that impact companies' tax planning. This is also illustrated by the fact that the tax credit institution created from the building Superbonus was complex in its integration with tax laws, accounting principles, and the legal framework.

Keywords: Superbonus, tax credit, accounting, financial statements, corporate taxation, tax incentives, credit transfer.

1. Introduction

The tax credit for the building Superbonus is based on Article 119 of Decree-Law No. 34/2020 [1] (the so-called Relaunch Decree), which recognises a deduction of 110% of documented expenses incurred from July 1, 2020, for energy requalification interventions, anti-seismic interventions (the so-called earthquake bonus), the installation of photovoltaic systems, and electric vehicle charging stations.

The incentive is aimed at a diverse group of subjects, including condominiums, individuals

^{2*}This study is the result of collaboration between the two authors. Giuseppe Napoli set up the research, framing it within the scientific context. He is responsible for the sections entitled "Introduction", "Utilisation with credit transfer", "Implications on the financial statements", "Tax profiles" and "Conclusions". Benedetta Pagnotta, on the other hand, set up the methodology, researched the data and processed it. She is therefore responsible for the sections entitled 'Regulatory profiles', 'Accounting profiles', 'Beneficiary company' and 'Utilisation as a discount on the invoice'.

outside the exercise of business activities, public residential building authorities, housing cooperatives with undivided ownership, third sector entities, and amateur sports associations, with specific limitations for IRES subjects [2, pp. 19-24]. The deduction is granted according to the methods described and must be divided, for the expenses incurred, into equal annual instalments, up to the limit of the annual tax capacity as determined by the income tax return. Individuals who incur expenses for the interventions covered by the Decree can opt for a contribution that results in a discount applied to the amount due, up to the maximum amount corresponding to the entire fee provided. This discount is initially advanced by the supplier who performed the work and can subsequently recover it as a tax credit.

This credit, in turn, can be assigned to third parties, including credit institutions and other financial intermediaries [4, pp. 7-10].

The article analyses how the various options for utilising the tax credit should be treated under accounting methods. There are several ways to use the credit that need to be considered: direct utilisation, a discount on the invoice, credit transfer, and, finally, receipt of credit. The implications for how the tax bonus is accounted for have been significant for financial ratios and stakeholders' perceptions of the company's solidity, making proper accounting disclosure even more crucial [7, pp. 33-38].

2. Regulatory profiles

The regulations regarding the Superbonus DL 34/2020 allow you to benefit from a deduction equal to 110% of the expenses incurred, aligning with existing provisions that govern deductions for building renovation works, including anti-seismic and energy requalification of buildings. Specifically, the 110% Superbonus applies to: - Building restoration interventions regulated by Article 16-bis of the TUIR, including anti-seismic interventions (with reference to Article 16 of Decree Law No. 63/2013, known as the "sismabonus") [8, pp. 219-224]. - Energy efficiency renovation works provided for in Article 14 of the same Decree (known as the "ecobonus"). The aforementioned interventions may concern real estate properties held by a company. In such cases, their classification could be determined not only by the urban planning designation but also by the function these properties serve within the economic activity carried out. From this perspective, it is possible to distinguish between the following categories: commodity properties, instrumental properties, and investment properties. With resolution no. 34 June 25, 2020, the Italian Revenue Agency took note of the principles established in the judgments of the Court of Cassation, recognising that the General Accounting Office of the State also supports these principles. Based on this, they clarified that eligibility for deductions is not dependent on the classification of the property, thereby extending the benefit to instrumental and patrimonial properties held within the scope of business activities [3].

The Superbonus can be used for expenses incurred related to interventions carried out by: - Condominiums; - Individuals not engaged in business activities, arts, or professions, for works on buildings consisting of two to four distinctly cadastral real estate units, even if owned by a single owner or jointly by different individuals; - Non-profit organisations of social utility (according to Article 10 of Legislative Decree No. 460/1997), volunteer organisations registered in the registers of Law No. 266/1991, and social promotion associations registered in the national, regional, or autonomous provinces of Trento and Bolzano registers provided for by Article 7 of Law No. 383/2000. The benefit covers interventions carried out by individuals on real estate units within the same condominium or building, as well as work on buildings subject to demolition and reconstruction.

The regulations establish distinct criteria for determining the relevant moment for the incentive, based on the cash basis for individuals and the accrual basis for businesses. As provided for in Article 121 of the Relaunch Decree, taxpayers who incur expenses for interventions eligible for the Superbonus, such as building renovation, energy efficiency, anti-seismic interventions, the renovation or restoration of existing building facades, the installation of photovoltaic systems or electric vehicle charging stations, have the option of choosing between two alternative options instead

of a direct deduction. Specifically, it is possible to choose: a) a contribution in the form of a discount on the fee due; b) the direct assignment of the credit, up to the amount of the deduction due, to third parties, including credit institutions and other financial intermediaries. The possibility of further transfers is only permitted to: - banks and financial intermediaries registered in the register provided for by Article 106 of the Consolidated Banking Act; - companies belonging to banking groups registered in the register pursuant to Article 64 of the same Consolidated Law; - insurance companies authorised to operate in Italy pursuant to Legislative Decree No. 209/2005 [10].

3. Accounting profiles

At the initiative of the Italian Revenue Agency, the Italian Accounting Standards Board (OIC) published a communication on August 3, 2021, containing operational guidelines for accounting for tax bonuses [5]. The official guidelines provided by the OIC suggest treating building bonuses as contributions toward plant and equipment, even when these incentives are utilised in their standard form of tax deductions. According to the information provided, the tax credit, corresponding to the deduction that can be utilised in equal instalments of the gross IRES paid during the tax period in which the expenses were incurred, must be recorded in accordance with the criteria established in OIC document 15. This document, explicitly mentioned in the communication, provides for a distinction in accounting based on the type of financial statements prepared: - companies that prepare their financial statements in the standard format; - companies that prepare their financial statements in an abbreviated form or that fall into the category of micro-enterprises.

4. Beneficiary company

The commissioning company for the subsidised interventions, or, in the case of the “purchase bonus,” the buyer of the real estate units, has the option to access the subsidies in various ways. These are structured as follows:

- Benefit in the form of an IRPEF/IRES tax deduction, used directly.
- Alternatively, in accordance with Article 121, paragraph 1, letter a) of Decree-Law No. 34/2020, through a contribution provided by the supplier in the form of an immediate discount applied to the invoice amount;
- Alternatively, according to Article 121, paragraph 1, letter b) of Decree-Law No. 34/2020, the tax credit corresponding to the due deduction is to be used as consideration.

These options offer flexibility in utilising the tax benefits related to the interventions. When a beneficiary company carries out subsidised interventions and incurs the related deductible expenses, taking advantage of the subsidy through the standard IRPEF/IRES deduction method, the accounting representation of the benefit varies depending on how it is configured. It can be considered:

- a simple tax credit, the actual use of which depends on the gross tax capacity;
- alternatively, a genuine contribution provided by the State, from which the company benefits.

According to the prevailing interpretation before the OIC publicises the communication concerning the accounting treatment of tax bonuses, “the deduction does not represent either a subsidy or a tax credit. This is a technical tool available to the legislator to achieve different objectives, such as implementing the principle of progressive taxation or as an instrument of economic policy to guide investments. The purpose is precisely to reduce the tax burden, therefore it cannot contribute to the formation of the taxable base” (response to an interpellation from the Piedmont Regional Directorate of Revenue, July 31, 2020, no. 901-445/2020).

The guidance from the Italian Accounting Body (OIC) on the accounting treatment of tax bonuses represents a departure from the traditional approach. It establishes that the deduction for eligible expenses incurred by the company should be treated, for accounting purposes, as a capital grant. Treating the deduction as a contribution entails applying the rules outlined in OIC 16, which allows for recognition either by directly reducing the cost of the investment or by recording a deferred liability to be progressively charged to the income statement. For properties classified as inventory, OIC 13 applies, which requires the inventory to be recorded net of the contribution received.

The tax credit is initially recognised at amortised cost, taking into account the present value of future

cash flows, determined based on market rates derived from credit purchase transactions by financial intermediaries. The initial recognition of the contribution at amortised cost allows for the identification of the implicit financial component and the recording of the related financial income in the income statement during the period in which the tax deduction can be claimed, as established by the regulations. The amount of financial income attributable to each financial year, distributed over the recovery period of the benefit (four, five, or ten years), declines. This decrease is due to the progressive reduction in the residual value of the amortised cost of the unused credit, resulting from the use of annual instalments.

Paragraph 11 of the Communication on the accounting treatment of tax credits states that if, after the initial measurement of the tax credit at amortised cost, estimates of both the quantity and timing of its use are revised, the company is required to adjust the carrying amount of the credit. This adjustment must reflect the redetermined financial flows and is accounted for in the income statement, classified as either financial expense or income.

For companies that prepare their financial statements in an abbreviated form pursuant to Article 2435-bis of the Civil Code and for micro-enterprises that follow the provisions of Article 2435-ter of the Civil Code, the option of not adopting the amortised cost method, as provided for in the communication on the accounting treatment of tax bonuses, paragraph 20, remains valid. If the company chooses not to apply this criterion, the tax credit must be recorded in the financial statements at its nominal value. At the same time, a passive accrual, equal to the difference between the cost incurred for the building investment and the nominal value of the credit, must be recognised, as stated in paragraph 20, point (a), first sentence, of the aforementioned communication. In reality, a discrepancy between the cost incurred for the building investment and the nominal value of the credit can only arise if the latter is attributable to the 110% superbonus. In other cases, the two values are perfectly matched. If this condition occurs, the second sentence of point (a) of paragraph 20 of the OIC Communication on the accounting treatment of tax bonuses provides that the deferred income is recognised in the income statement when the commissioning company uses the tax deduction or assigns the credit.

5. Utilisation as a discount on the invoice

For instance, if a company that engaged in subsidised works or purchases opts to use the building bonuses in the form of a discount on the consideration which was applied directly to the invoice by the supplier of goods and/or services as provided for in Article 121 of Decree-Law 34/2020, then it is undeniable that such a discount means the beneficiary company's contribution is to its plant or operating expenses. How this materialises depends on the nature of the interventions and the fact that they are subsidised installations performed on properties that, for the single company, are considered tangible fixed assets or goods for sale.

This contribution does not actually come from private suppliers; it is advanced by the same suppliers who carried out the work and later recoup it through a tax credit. The Communication Paragraph 6 on the accounting treatment of tax bonuses states that if the commissioning firm accepts an invoice discount, the investment will be recorded net of the discount. Thus, assuming the commissioning company wants to use this benefit by applying the discount directly to the amount due, rather than through a tax deduction, it will never note the respective contribution (i.e., the discount) on the invoice.

In contrast, a lower investment cost, computed net of the discount granted (the price of acquiring the asset), is recorded directly. In reality, the agreed terms between the supplier and the customer include payment to the latter for the cost of the invoice discounting operation. It is believed that no financial charges carried over by the supplier to the beneficiary are considered financial charges to be reported in the beneficiary's income statement, but as an expense component that decreases the amount of the contribution. This contribution decreases the investment's costs, in turn.

6. Utilisation with credit transfer

That is, if a company conducting subsidised building interventions chooses to apply building bonuses by transferring corresponding tax credits to third parties, the tax credit transfer must be

recorded in the company's annual statements. For one thing, the beneficiary company must record all the tax credits that would have resulted if this deduction were accepted as an asset. This registration should come before the credit is transferred to third parties such as banks, financial intermediaries, or other entities. In the event of a material difference between the book value of the tax credit, which is listed as part of assets, and the consideration received on the assignment, this disparity assumes a financial nature. In particular, if a return on an excess from the transaction is received, this is financial income.

However, if the sale results in a loss, the charge is financial and will be classified as such in accordance with paragraph 16 in the communication concerning the accounting treatment of tax credits. The market value of the tax bonus is the present value of the future cash flows attributable to the tax credit provided by the bonus. This figure is the market interest rate and is drawn from commercial offers (from the leading banking groups) to purchase credits. In the absence of any ability to ascertain the market value of the tax credit, it can be determined based on the expense incurred, and at least there is an accounting acknowledgement that it matches the invoice discount amount delivered under the applicable accounting documentation.

They also need to consider that the tax credit's carrying value is based as much on market value as on financial statements prepared in a uniform format by companies that prepare them in an abbreviated format, like micro-enterprise companies. If the supplier who applied the discount later transfers the tax credit from the invoice discount to third parties, the costs that were previously implicit are explicitly stated in the supplier's financial and economic system that carries the discount. It should be believed, therefore, that the charge of such fees should be treated not as financial income, but as income intended to "reimburse" the total consideration charged for the sale of goods and services by the supplier company.

7. Implications on the financial statements

At the same time, the 110% Superbonus came into effect, significantly shaping companies' economic and financial positions. The tax incentive has a significant impact on its asset structure, income statement, and key performance indicators, which stakeholders use to assess its health. On the asset side, the disbursement of the tax credit increases assets, which may consist of a tax credit or a capital grant, depending on the case. Notably, credit entry on the balance sheet, particularly if the credit entry is valued at amortised cost, leads to an accelerated time period between the magnitude of the benefit entered into the balance sheet and the financial outcome due to cash flow growth or negative income and, through the same, affects liquidity and net working capital [7, pp. 52-58]. Because the benefit is achieved through a direct tax deduction that represents a recognised tax reduction each fiscal year, it makes financial planning for corporations challenging, as it does not represent cash flow at the start of the year but rather an incremental financial benefit over time. Therefore, based on the above considerations, it should be concluded that credit recoverability is important in order that a proper and fair view of the debtor's financial position can be provided.

More broadly, when different assumptions from the particular case, as in the credit transfer or invoice discounting applied, are made, the financial impact will be realised in a more concrete way later, as a result of the absence of possibilities against the debtor, where the economic value of the benefit is lower than the nominal value [9, pp. 812-818]. Nonetheless, there is a significant difference between the nominal value and the market value of the credit due to the implicit financial aspect. This interest rate difference affects the year's financial results, specifically leading to financial expenses or income.

There are similar implications for financial ratios. After all, only some solvency and capitalisation ratios improve if assets and net worth are taken into account in their consistency with the contribution. With respect to operating ratios, the situation is quite another. If a higher due financial strain is used to make up for the impact, or worse, this cannot be further ignored. In this case, it is evident that "with due selection and evaluation must take place." That is, the ability to critically compare or assess the merit of the budget, say.

8. Tax profiles

Fiscal perspective: The 110% Superbonus tax credit is a strong economic policy instrument that encourages construction-sector investment by reducing tax debt. Based on Decree-Law 34/2020, the intervention is determined by the issuance of specialised ministerial decrees detailing the transfer methods, deadlines and limits, and prohibiting repetition, for a decisive effect on the tax planning of the beneficiaries. The advantage of being directly benefited from it is the ability to spend in equal instalments each year, which should only be used to offset the gross tax. If any surplus is unused, it cannot be carried over to the next year or refunded, and the potential loss of benefit may arise in cases of limited tax capacity.

Such a feature would require companies to think before using this method, given the risk of future tax liability. The option to select a credit transfer or an invoice discount under Article 121 of the Relaunch Decree has expanded the use of the benefit, but it has also established a sophisticated system of credit circulation limitations. Further regulatory changes have increasingly restricted the number of authorised transfers and designated specific types of authorised entities, thereby decreasing liquidity in the tax credit market to counter fraud. From the standpoint of taxable income, the tax credit is not included in the computation of the taxable base for income taxes and IRAP, as its purpose is to reduce the taxpayer's burden and is not a positive income element [8, pp. 241-245].

Given that the capital grant can have the opposite effect, it indirectly affects statutory profit, with implications for deferred and prepaid taxes. The remaining key tax profile concerns the coordination between the Superbonus and other building incentives, as well as compliance with the formal requirements of the law, such as the technical certification, conformity check, and communications to the Revenue Agency [4, pp. 18-25]. Noncompliance will result in the loss of benefits and the recovery of taxes, with penalties and interest [2, pp. 61-65]. However, we can view the Superbonus 110% as a complex and dynamic system within the context of tax law, requiring ongoing interpretation and close alignment with a company's accounting and financial choices.

9. Conclusions

The analysis conducted highlights how the Superbonus 110%, introduced by Decree-Law No. 34/2020, represents one of the most complex and pervasive tax interventions adopted in the Italian legal system regarding incentives for building investments. The measure has significantly impacted not only the construction sector but also the accounting, financial, and tax management of businesses and other parties involved, necessitating a rethink of traditional accounting methods for tax benefits. From a regulatory perspective, the framework has been gradually layered with a range of corrective and restrictive measures aimed at combating fraud and reducing the burden on public finances. This evolution has inevitably reduced the legal certainty of the tax credit, affecting its effective transferability and, consequently, operators' economic choices.

The limitations on the circulation of credits and the tightening of controls have transformed the Superbonus from an instrument of immediate liquidity into a conditional benefit, the usefulness of which depends primarily on regulatory stability and the taxpayer's ability to plan its use properly. From an accounting perspective, the intervention of the Italian Accounting Standards Board marked a turning point, moving beyond the traditional approach that considered tax deductions solely as instruments for reducing tax. Treating the Superbonus as a contribution toward plant and equipment has allowed the benefit to be accounted for within conceptual frameworks more consistent with the principles of economic competence and accurate and fair presentation.

The need to ensure the tax's capacity, the rigidity of the time limits for use, and the irrevocability of the options exercised make the benefit heavily dependent on prospective assessments, increasing the risk of allocative inefficiencies in the event of regulatory changes or economic results below expectations. In light of the critical issues that have emerged, the Superbonus can serve as a test case for the future evolution of tax incentive instruments, highlighting the need for a more systemic, coordinated approach that balances economic effectiveness, accounting transparency, and financial sustainability.



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FINANȚAREA SECTORULUI DE CERCETARE CA FACTOR AL DEZVOLTĂRII ECONOMICE ÎN REPUBLICA MOLDOVA: O ABORDARE ECONOMETRICĂ

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Abstract. The purpose of this research is to assess the impact of internal expenditures on R&D&I on economic development over the period 2010–2024. The methodology is based on the analysis of official statistical data, the application of the ordinary least squares method, and the use of econometric models. The impact of R&D&I funding is examined in relation to gross domestic product, labor productivity, and investment in fixed assets. The results indicate the existence of a positive and significant relationship between R&D&I funding and the main macroeconomic indicators. Econometric estimates show that a 1% increase in R&D&I expenditures leads to a 1.85% increase in GDP, a 1.77% increase in overall labor productivity, and a 1.4% increase in investment in fixed assets, confirming the decisive role of R&D&I in stimulating economic growth.

Keywords: finanțare, cercetare-dezvoltare-inovare, creștere economică.

Introducere

În contextul transformărilor structurale ale economiei mondiale, cercetarea și inovarea se afirmă tot mai clar drept factori determinanți ai creșterii economice durabile. Recunoașterea acestui rol la nivel internațional este reflectată inclusiv prin acordarea Premiului Nobel pentru Economie în anul 2025 lui Joel Mokyr, Philippe Aghion și Peter Howitt „pentru explicarea creșterii economice bazate pe inovație”. Laureatii explică cum inovația oferă impulsul pentru progres continuu, înlocuind produsele și metodele vechi cu cele noi într-un ciclu nesfârșit [7].

În Republica Moldova, sectorul de cercetare-dezvoltare-inovare se află într-un proces amplu de reformare instituțională și financiară, determinat atât de convergența la practicile europene, cât și de necesitatea creșterii eficienței utilizării resurselor bugetare. Deși există o arhitectură instituțională funcțională și un cadru de politici publice dedicat domeniului, evoluția organizațiilor de cercetare și a resurselor umane indică tendințe persistente de modificare. Numărul instituțiilor cu activitate de cercetare s-a diminuat semnificativ, iar procesele de restructurare derulate în ultimul deceniu au influențat atât volumul finanțării, cât și structura pe vârstă a personalului științific. Integrarea institutelor de cercetare în cadrul universităților, precum și modificarea mecanismelor de finanțare, cu accent pe competiția de proiecte, au generat schimbări substanțiale în modul de organizare și funcționare a sectorului [6].

Reducerea numerică a cercetătorilor, îmbătrânirea resursei umane și scăderea ponderii tinerilor specialiști constituie vulnerabilități majore pentru potențialul inovativ al economiei naționale. Datele statistice oficiale (BNS) privind personalul de cercetare relevă nu doar diminuarea efectivului total, ci și schimbarea structurii pe grupe de vârstă, cu implicații directe asupra continuității și performanței activității științifice. Totodată, raportul dintre numărul de cercetători și populația ocupată se situează sub nivelurile asumate prin documentele strategice naționale în domeniul cercetării și inovării, ceea ce sugerează existența unui potențial insuficient valorificat în susținerea creșterii economice [6].

Din perspectivă teoretică și empirică, relația dintre finanțarea cercetării și dezvoltarea economică a fost investigată pe larg atât în literatura internațională, cât și în studiile realizate la nivel național. Cercetările autohtone evidențiază impactul pozitiv al cadrului normativ și al mecanismelor de finanțare competitivă asupra performanței sectorului științific și asupra economiei în ansamblu [2, 3, 5].

Literatura de specialitate subliniază, de asemenea, rolul stimulentei fiscale, al implicării mediului privat și al extinderii finanțării bazate pe competiție de proiecte ca instrumente de sporire a eficienței cheltuielilor pentru cercetare-dezvoltare [1]. Cu toate acestea, cuantificarea riguroasă a efectelor finanțării cercetării asupra principalilor indicatori macroeconomici continuă să reprezinte o provocare metodologică relevantă.

Rezultate și discuții

Analiza cheltuielilor interne ale sectorului de cercetare din Republica Moldova pentru perioada anilor 2010–2024 evidențiază o tendință generală de creștere a volumului resurselor financiare alocate acestui domeniu. În medie, cheltuielile interne totale au constituit 476,8 mil. MDL, înregistrând o majorare de circa 2,2 ori. Structura cheltuielilor interne este dominată de cheltuielile curente, care reprezintă în medie 97,7% din total, în timp ce cheltuielile capitale dețin o pondere modestă, de doar 4,4%, ceea ce reflectă orientarea preponderentă spre susținerea funcționării curente a instituțiilor de cercetare, în detrimentul investițiilor în infrastructură și echipamente.

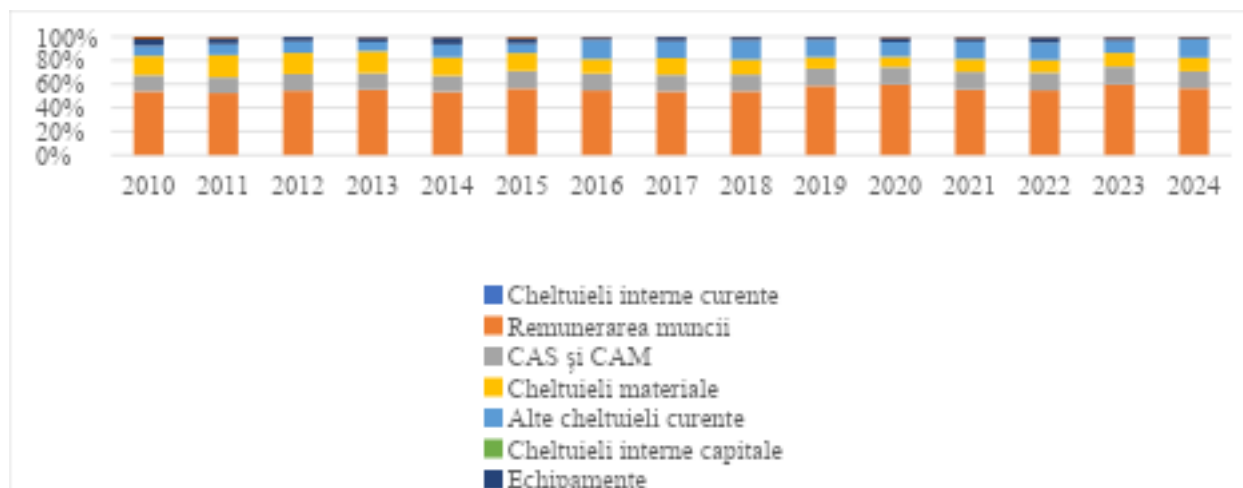


Figura nr.1 Dinamica ponderii cheltuielilor interne ale CDI, pe categorii de cheltuieli, în perioada anilor 2010-2024, în %

Sursa: Elaborat în baza datelor BNS

În structura cheltuielilor curente, componenta principală este remunerarea muncii, cu o pondere medie de 55,5%, urmată de contribuțiile obligatorii de asigurări sociale și medicale (14,3%), cheltuielile materiale (13,6%) și alte cheltuieli curente (12,2%). Creșterea cheltuielilor salariale de circa 2,3 ori pe parcursul perioadei analizate este explicată în principal prin modificările cadrului legislativ privind salarizarea în sectorul bugetar. Totodată, majorarea cheltuielilor pentru contribuțiile sociale urmează aceeași tendință, fiind corelată direct cu dinamica fondului de salarii. Cheltuielile materiale au crescut într-un ritm mai lent, iar diminuarea semnificativă din anul 2019 sugerează existența unor constrângeri bugetare generate de prioritizarea cheltuielilor salariale. Cheltuielile capitale au avut o evoluție descendentă, diminuându-se de circa 1,3 ori pe parcursul perioadei analizate. Reducerea cheltuielilor pentru echipamente și pentru alte active capitale semnalează o subfinanțare cronică a bazei materiale a cercetării, cu potențial impact negativ asupra capacității de realizare a cercetărilor experimentale și tehnologice. Această situație poate afecta competitivitatea sectorului de cercetare și capacitatea acestuia de a genera rezultate aplicabile economic.

Din perspectiva tipurilor de activități de cercetare, se constată o reorientare a resurselor către cercetarea aplicativă, care a crescut de circa 3,4 ori și a ajuns să constituie ponderea cea mai mare în structura cheltuielilor curente. În contrast, cheltuielile pentru cercetarea fundamentală au cunoscut o ușoară diminuare, iar cele pentru dezvoltare tehnologică au crescut modest. Distribuția pe domenii științifice indică faptul că științele naturale dețin ponderea cea mai mare a cheltuielilor interne curente (34,9%), urmate de științele ingineresti și tehnologii (19,1%) și științele agricole (16%). Această structură reflectă prioritățile economice ale țării. Domeniile sociale și umaniste dețin ponderi mai reduse, ceea ce limitează capacitatea de a fundamenta politici publice bazate pe cercetări socio-economice ample.

În ceea ce privește rezultatele activității de cercetare, dinamica cererilor de brevete este pozitivă, cu o creștere de circa 3,5 ori pe parcursul perioadei analizate. Totuși, raportul dintre cereri și titlurile de protecție eliberate rămâne relativ scăzut, ceea ce indică dificultăți în procesul de examinare și validare. De asemenea, numărul titlurilor de proprietate intelectuală eliberate la 1 mil. MDL cheltuieli este în scădere, de la 20 unități în anul 2010 la 7 unități în anul 2024, fapt determinat de eficiența redusă a utilizării resurselor financiare în generarea de rezultate brevetabile. Comparativ cu media Uniunii Europene, nivelul Republicii Moldova este net inferior, ceea ce confirmă existența unui decalaj semnificativ în materie de inovare tehnologică [4].



Figura nr. 2 Dinamica titlurilor de proprietate intelectuală eliberate pe ani, ale cercetătorilor din Republica Moldova la 1 000 000 MDL cheltuieli interne ale sectorului de cercetare, în perioada anilor 2010-2024, titluri

Sursa: Elaborat de autor în baza BNS

În schimb, performanța în domeniul publicațiilor științifice este relativ favorabilă. Numărul publicațiilor la 1 mil. MDL a crescut de aproape două ori, iar nivelul atins depășește semnificativ media UE [4]. Această situație indică o orientare predominant academică a activității de cercetare, cu accent pe diseminarea rezultatelor științifice, mai degrabă decât pe valorificarea lor economică prin brevete și produse inovative.

Pe baza cadrului conceptual analizat, rezultatele evidențiază faptul că evaluarea finanțării sectorului de cercetare nu poate fi realizată eficient prin utilizarea unei metodologii unice sau a unui set restrâns de indicatori. Absența unor orientări metodologice clare la nivel actual confirmă necesitatea integrării mai multor perspective analitice, capabile să cuprindă complexitatea relațiilor economice și sociale implicate. Modelele axate pe costuri, rezultate și beneficii constituie repere fundamentale, însă acestea trebuie corelate într-o abordare coerentă. În acest sens, relația keynesiană dintre venit și consum prevede că sporirea resurselor financiare nu se transpune automat într-o utilizare integrală a acestora, existând o tendință de economisire. Prin analogie, finanțarea cercetării necesită mecanisme de evaluare care să evidențieze volumul resurselor alocate și eficiența reală a utilizării acestora, subliniind importanța calității intervențiilor publice în domeniul științei.

Estimarea parametrilor modelelor elaborate a fost realizată prin aplicarea metodei celor mai mici pătrate. Această procedură presupune determinarea unei forme funcționale care să reproducă în mod adecvat legătura existentă între variabilele analizate. Conform criteriului celor mai mici pătrate, coeficienții modelului sunt aleși astfel încât suma pătratelor abaterilor dintre valorile efectiv observate ale variabilei dependente (y) și valorile calculate pe baza modelului de regresie ($\hat{y}$) să fie minimă. Prin urmare, obiectivul metodei constă în reducerea diferențelor dintre datele empirice și rezultatele estimate, ceea ce permite o calibrare optimă a parametrilor în raport cu variabilitatea reală a fenomenului studiat. Din această perspectivă, metoda celor mai mici pătrate constituie un instrument cu fundament matematic și statistic solid pentru obținerea unor estimări fiabile ale parametrilor modelului de regresie și pentru descrierea riguroasă a relațiilor dintre variabilele investigate.

În analiza proceselor economice este frecventă recurgerea la modele cu structură neliniară, iar o condiție necesară pentru estimarea acestora o reprezintă linearizarea lor prin transformări adecvate. Modelele utilizate în cadrul prezentei cercetări sunt construite în concordanță cu particularitățile mediului economic și cu disponibilitatea datelor statistice din Republica Moldova, iar parametrii obținuți sunt interpretați sub forma coeficienților de elasticitate.

Pentru a evalua impactul cheltuielilor interne destinate sectorului de cercetare-dezvoltare-inovare asupra PIB-ului a fost construit un model econometric:

$$\ln(\text{PIB}) = \ln(A) + \alpha \ln(\text{SC}) / \text{PIB} = e^{0.66} * \text{SC}^{1.85} \quad (1)$$

unde: PIB exprimă Produsul Intern Brut;

SC – cheltuielile interne pentru CDI;

A și α – parametrii necunoscuți ai modelului econometric.

Rezultatul estimării econometrice este prezentat în figura de mai jos.

Dependent Variable: LOG(PIB)

Method: Least Squares

Sample: 2009 2023

Included observation: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.660040	0.868421	0.760046	0.4608
LOG(CH_SC)	1.852089	0.142583	12.98955	0.0000

R-squared	0.928465	Mean dependent var	11.93265
Adjusted R-squared	0.922962	S.D. dependent var	0.450379
S.E. of regression	0.125006	Akaike info criterion	-1.197344
Sum squared resid	0.203145	Schwarz criterion	-1.102937
Log likelihood	10.98008	Hannan-Quinn criter.	-1.198349
F-statistic	168.7285	Durbin-Watson stat	1.363999
Prob(F-statistic)	0.000000		

Figura nr. 3 Rezultatul estimării modelului econometric privind influența finanțării CDI asupra PIB-ului

Sursa: Elaborat de autor în baza soft-ului Eviews 9.0

Coefficientul de determinare, a înregistrat o valoare semnificativă de 0,93, ceea ce ne indică o calitate apreciabilă a modelului propus. În așa fel, factorii ce au fost incluși în model, ne arată că cheltuielile interne pentru CDI au un impact semnificativ asupra PIB-ului. Rezultatul indică relevanța și coerența variabilelor independente în contextul analizei efectuate.

Coefficientul de elasticitate al cheltuielilor interne pentru CDI, înregistrând o valoare de 1,85 și evidențiază o dependență considerabilă între finanțarea CDI și evoluția PIB-ului din republica Moldova. Conform acestui rezultat, se constată că, o creștere de 1% a cheltuielilor pentru CDI contribuie la o majorare proporțională de 1,85% a PIB-ului. Acest rezultat al estimării econometrice ne demonstrează că există o relație strânsă între creșterea economică, exprimată prin creșterea PIB-ului, și evoluția finanțării sectorului de cercetare. Deci, cu cât investițiile în sectorul CDI vor fi mai mari, cu atât se anticipează o creștere mai substanțială a PIB-ului, subliniind astfel importanța unei dezvoltări economice sănătoase în sprijinul progresului științific și tehnologic.

Pentru a evalua *impactul cheltuielilor interne pentru CDI asupra productivității generale a muncii* a fost folosită formula de mai jos:

$$\ln(\text{PROD}) = \ln(A) + \alpha \ln(\text{SC}) / \text{PROD} = e^{-4,38} * \text{SC}^{1,766} \quad (2)$$

unde: PROD exprimă productivitatea muncii;

SC – cheltuieli interne pentru CDI;

A și α , – parametrii necunoscuți ai modelului econometric.

Dependent Variable: LOG(PROD)

Method: Least Squares

Sample: 2009 2023

Included observation: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.382419	0.598357	-7.324083	0.0000
LOG(CH_SC)	1.765878	0.098242	17.97475	0.0000

R-squared	0.961320	Mean dependent var	6.365476
Adjusted R-squared	0.958345	S.D. dependent var	0.422013
S.E. of regression	0.086131	Akaike info criterion	-1.942321
Sum squared resid	0.096442	Schwarz criterion	-1.847914
Log likelihood	16.56741	Hannan-Quinn criter.	-1.943326
F-statistic	323.0917	Durbin-Watson stat	1.837550
Prob(F-statistic)	0.000000		

Figura nr. 4 Rezultatul estimării modelului econometric privind influența finanțării CDI asupra productivității muncii

Sursa: Elaborat de autor în baza soft-ului Eviews 9.0

Coefficientul de determinare, a înregistrat o valoare semnificativă de 0,96, și evidențiază o adecvare înaltă a modelului propus, deci variabilele incluse au un impact semnificativ asupra creșterii factorului: productivitatea muncii. Elasticitatea cheltuielilor interne pentru CDI, manifestă o valoare de 1,77, și indică o legătură semnificativă între creșterea cheltuielilor pentru CDI și evoluția productivității generale a muncii. Rezultatul ne arată că, o creștere de 1% a investițiilor în CDI corespunde unei creșteri proporționale de 1,77% a productivității generale a muncii. Din aceste constatări se deduce importanța influenței creșterii finanțării în activităților CDI asupra dinamicii productivității muncii.

Pentru a evalua *impactul cheltuielilor interne pentru CDI asupra investițiilor în active imobilizate* a fost construită relația:

$$\ln(INV) = \ln(A) + \alpha \ln(SC) / INV = e^{1,45} * SC^{1,41} \quad (3)$$

unde: INV exprimă investițiile în active imobilizate;

SC – cheltuieli interne pentru CDI;

A și α – parametrii necunoscuți ai modelului econometric.

Rezultatul estimării impactului cheltuielilor CDI asupra investițiilor în active imobilizate este prezentat în figura de mai jos.

Dependent Variable: LOG(INV)

Method: Least Squares

Sample: 2009 2023

Included observation: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.447769	0.970573	1.491664	0.1597
LOG(CH_SC)	1.408372	0.159355	8.837959	0.0000

R-squared	0.857315	Mean dependent var	10.01973
Adjusted R-squared	0.846339	S.D. dependent var	0.356407
S.E. of regression	0.139710	Akaike info criterion	-0.974923
Sum squared resid	0.253747	Schwarz criterion	-0.880517
Log likelihood	9.311926	Hannan-Quinn criter.	-0.975929
F-statistic	78.10951	Durbin-Watson stat	0.925101
Prob(F-statistic)	0.000001		

Figura nr. 5 Rezultatul estimării modelului econometric privind influența finanțării CDI asupra investițiilor în active imobilizate

Sursa: Elaborat de autor în baza soft-ului Eviews 9.0

În rezultatul estimării a fost obținut un coeficient de determinare, cu o valoare semnificativă de 0,86, ce ne indică o bună adaptare a modelului propus, iar variabilele considerate au un impact semnificativ asupra dinamicii investițiilor în active imobilizate.

Totodată, elasticitatea cheltuielilor interne pentru CDI, a înregistrat o valoare de 1,4, ce confirmă legătura semnificativă între cheltuielile interne pentru CDI și investițiile în active imobilizate. Prin urmare, se poate deduce că, o majorare de 1% a finanțării CDI contribuie la o creștere proporțională de 1,4% a investițiilor în active imobilizate.

Concluzii

Rezultatele econometrice confirmă existența unor relații pozitive și semnificative între cheltuielile pentru CDI și principalii indicatori macroeconomici: PIB, productivitatea generală a muncii și investițiile în active imobilizate. Astfel, o creștere de 1% a finanțării CDI se contribuie la o majorare de 1,85% a PIB-ului, 1,77% a productivității generale a muncii și 1,4% a investițiilor în active imobilizate, subliniind impactul direct al cercetării și inovării asupra creșterii economice.

Totodată, analiza structurii cheltuielilor interne relevă o orientare predominantă către cheltuielile curente, cu accent pe remunerarea personalului, în detrimentul investițiilor în echipamente și infrastructură. Această distribuție indică o subfinanțare cronică a bazei materiale a cercetării, care poate limita capacitatea sectorului de a genera rezultate aplicabile economic, precum brevetele și inovațiile tehnologice. În contrast, performanța academică, măsurată prin publicațiile științifice, înregistrează creșteri semnificative, ceea ce reflectă o activitate științifică orientată mai mult spre diseminare decât spre valorificarea economică a rezultatelor.

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CZU 338.46:004:657

CARACTERISTICILE ACTIVITĂȚILOR DE INFORMAȚII ȘI COMUNICARE ȘI IMPACTUL ACESTORA ASUPRA SPECIFICULUI ORGANIZĂRII CONTABILITĂȚII MANAGERIALE

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Abstract: An analysis of publications by various economists covering the problems of information and communication activities made it possible to identify the main trends in its development in modern conditions. Further development of these trends places increased demands on the formation of reliable, complete and relevant information on the performance of telecommunications companies, reflected in the management accounting system, therefore this study is very relevant.

Key words: infocommunication services market, management accounting system, cost structure, cost allocation, calculations system.

Astăzi, piața serviciilor de infocomunicații se apropie din ce în ce mai mult de oligopol, deoarece companiile de telecomunicații sunt obligate nu doar să concureze, ci și să negocieze între ele în cadrul diverselor proiecte guvernamentale. Acest lucru se datorează faptului că infrastructura partajată permite implementarea de noi tehnologii și tarife mai mici pentru serviciile de comunicații.

O analiză a publicațiilor diversilor economiști care acoperă problemele activităților de infocomunicații a relevat principalele tendințe în dezvoltarea sa în contextul actual:

1. Rate mai mari de dezvoltare a acestui tip de activitate economică în comparație cu alte sectoare ale economiei;
2. Creșterea cererii pentru volume sporite de informații transmise, precum și viteza și calitatea procesării acestora;
3. Îmbunătățirea tehnică continuă și înlocuirea echipamentelor și dispozitivelor specializate, precum și introducerea de noi tehnologii;
4. Integrarea tehnologiilor și rețelelor de telecomunicații și informație în furnizarea de servicii de comunicații;
6. Extinderea numărului de participanți la piața comunicațiilor și a intermediarilor;
7. Tranziția de la furnizarea de servicii individuale la întreținere și furnizarea unui pachet de servicii de comunicații;
8. Prezența concurenței asociată cu volatilitatea și diversitatea rapidă a serviciilor de comunicații, apariția unor noi tipuri și schimbarea preferințelor consumatorilor.

Dezvoltarea ulterioară a acestor tendințe impune cerințe sporite privind generarea de informații fiabile, complete și relevante privind performanța companiilor de telecomunicații, reflectate în sistemul de contabilitate managerială.

Principalele domenii de dezvoltare în tehnologiile moderne ale informației și comunicațiilor sunt astăzi:

- Convergența rețelelor de comunicații și crearea rețelelor de comunicații de generație următoare;
- Prelucrarea Big Data;
- Inteligența artificială;
- Tehnologii de identificare și autentificare electronică de încredere, inclusiv în sectorul creditar și financiar;

- Cloud- computing și fog- computing;
- Internetul Lucrurilor și Internetul Industrial;
- Robotică și biotehnologie;
- Inginerie radio și bază de componente electronice;
- Securitatea informațiilor [5, p.131].

Activitățile de telecomunicații diferă semnificativ de cele din sectorul producției de materiale, așa cum au subliniat unii autori.

Prin urmare, am sistematizat principalele caracteristici ale acestui tip de activitate economică.

Prima caracteristică este determinată de natura specifică a produsului creat, care nu are o formă tangibilă și predetermină structura de costuri corespunzătoare a serviciilor de comunicații, unde nu există costuri pentru materiile prime și alte consumabile, a căror utilizare este de natură auxiliară.

Materialele și piesele de schimb sunt utilizate în principal pentru menținerea echipamentelor și a echipamentelor de comunicații în stare tehnică bună, precum și pentru lucrări de reparații și întreținere. Prin utilizarea tehnologiilor digitale, serviciile de telecomunicații sunt furnizate într-un mediu virtual cu cerințe minime de resurse.

A doua caracteristică se datorează inseparabilității consumului de servicii de comunicații de procesul de producție, precum și continuității furnizării serviciilor.

Acest lucru impune cerințe ridicate privind automatizarea și calitatea serviciilor (precizie, punctualitate, fiabilitate și consecvență), precum și privind funcționarea echipamentelor de comunicații. Această caracteristică este tipică comunicațiilor telefonice, dar nu se aplică serviciilor precum jocurile interactive, crearea de pagini web, cumpărăturile online, poșta universală și literatura electronică.

A treia caracteristică este legată de convergența telecomunicațiilor și a tehnologiei informației, ceea ce a dus la divizarea procesului unic de producție și consum de servicii de comunicații în două sfere de activitate – producție și servicii.

Activitățile de producție susțin procesarea, acumularea, distribuția, comutarea și transmiterea informațiilor, în timp ce activitățile de servicii sunt concepute pentru a servi clienții și a primi și furniza servicii utilizatorilor. Separarea acestor două sfere de activitate facilitează trecerea de la un transfer bidirecțional de informații la unul multi-nivel, odată cu apariția unor noi participanți la relație – furnizori și integratori de sistem – care modelează mediul de servicii.

A patra caracteristică (consumul în masă al serviciilor de comunicații) necesită o rețea de comunicații cuprinzătoare și fiabilă. Prin urmare, companiile de telecomunicații și diviziile acestora operează în practică toate orașele și localitățile mari, a căror amplasare este legată de diviziunea administrativ-teritorială a țării.

A cincea caracteristică este legată de posibilitatea interacțiunii dintre mai multe companii de telecomunicații în furnizarea de servicii de comunicații. Mai mult, conținutul informațiilor transmise nu trebuie să fie supus distorsiunilor, ceea ce necesită cerințe uniforme pentru tehnologia de transmitere a acestora și pentru regulile de funcționare tehnică a instalațiilor de comunicații, care pot fi împărțite în:

- Multiserviciu - independența tehnologiilor de furnizare a serviciilor față de tehnologiile de transport;
- Bandă largă - capacitatea de a modifica flexibil și dinamic rata de transfer a informațiilor pe o gamă largă, în funcție de nevoile actuale ale utilizatorului;
- Multimedia - capacitatea rețelei de a transmite informații multicomponente (vorbitură, video, înregistrări audio) cu sincronizarea necesară a acestor componente în timp real și utilizarea unor configurații complexe de conexiune;
- Inteligență - capacitatea de a gestiona serviciul, apelul și conexiunea de către utilizator sau furnizorul de servicii;
- Invariantă de acces - capacitatea de a organiza accesul la servicii indiferent de tehnologia utilizată;
- Multioperator - capacitatea mai multor operatori de a participa la procesul de furnizare a

unui serviciu și împărțirea responsabilităților acestora în conformitate cu domeniul lor de activitate [4, p.116].

Această caracteristică duce la necesitatea licențierii activităților și certificării echipamentelor de comunicații pe teritoriul Republicii Moldova.

A șasea caracteristică este determinată de prezența nu doar a marilor operatori de telecomunicații tradiționali, ci și a celor alternativi, care concurează între ei pentru a atrage consumatori.

A șaptea și a opta caracteristică sunt legate de ciclul de viață scurt al serviciilor de comunicații, determinat de ritmul dinamic de dezvoltare a tehnologiei de transmitere a datelor, precum și de apariția unor noi tipuri de servicii, ceea ce necesită o bază tehnologică avansată și actualizarea la timp a producției în conformitate cu progresul științific și tehnologic.

A noua caracteristică este caracterizată de trecerea de la furnizarea de servicii individuale la deservirea unui pachet de servicii bazat pe o platformă universală pentru crearea lor.

Ultima caracteristică este determinată nu numai de natura comercială a activităților de telecomunicații, ci și de semnificația lor socială, ceea ce impune reglementarea acestor activități la nivel de stat.

Aceste caracteristici identificate ale activităților de informare și comunicații formează baza obiectivă pentru specificul contabilității manageriale, pe care le-am sistematizat și prezentat în Tabelul 1 (Tab.1).

În special, absența costurilor materiale în structura costurilor, precum și coincidența în momentul producției și consumului de servicii de comunicații, determină absența lucrărilor în curs de execuție în companiile de telecomunicații. Intensitatea ridicată a forței de muncă și a capitalului în serviciile de comunicații determină predominanța cheltuielilor cu salariile și amortizarea activelor fixe în structura costurilor.

Cerințele ridicate privind calitatea serviciilor necesită o contabilitate adecvată pentru asigurarea calității acestor servicii.

Calitatea serviciilor de telecomunicații depinde de calitatea: mijloacelor de comunicare utilizate (tipul de echipament utilizat), organizării rețelelor de comunicații (scheme de construcție a rețelelor de comunicații și sisteme de comutare), proceselor tehnologice (utilizarea rețelelor și a mijloacelor de comunicare), forței de muncă (calificările personalului), funcționării mijloacelor de comunicare și managementului.

Criteriile de calitate pentru serviciile de comunicații pot fi împărțite condiționat în două grupe: funcționale și pentru consumatori.

Proprietățile funcționale ale serviciilor includ: accesibilitatea, fiabilitatea, serviciul neîntrerupt, promptitudinea și confidențialitatea, în timp ce proprietățile pentru consumatori includ cultura serviciului clienți, timpul de serviciu clienți, orele de funcționare ale companiei și altele [2, p. 233].

Tabelul 1. Influența caracteristicilor activității asupra specificului organizării contabilității manageriale în companiile de telecomunicații

Caracteristicile activităților de infocomunicare	Impactul asupra procesului de formare a informațiilor contabile manageriale
1. Ponderea redusă a costurilor materialelor în structura costurilor serviciilor de comunicații	1. Absența lucrărilor în curs de execuție. 2. Predominanța salariilor și a cheltuielilor cu amortizarea în structura costurilor.
2. Cerințe ridicate privind calitatea serviciilor de comunicații	1. Necesitatea de a reflecta costurile pentru calitatea serviciilor de comunicare și a serviciului clienți. 2. Predominanța costurilor indirecte în costul serviciilor
3. Cerințe ridicate privind funcționarea echipamentelor de comunicații	1. Fezabilitatea colectării de informații despre sarcina echipamentelor de comunicații (pe oră, zi, lună și sezon). 2. Contabilizarea timpilor de nefuncționare în afara orelor de vârf. 3. Contabilizarea echipamentelor de comunicații de rezervă.
4. Grad ridicat de automatizare	Organizarea decontărilor în sistemul de facturare.
5. Prezența intermediarilor în furnizarea serviciilor de comunicații	Necesitatea identificării proceselor de afaceri pentru transferul de informații, ținând cont de costurile și beneficiile tuturor companiilor implicate în furnizarea de servicii de comunicații.
6. Existența unei structuri de rețea	1. Menținerea unui sistem de decontări reciproce între entitățile comerciale pentru resursele rețelei, reflectând cheltuielile pentru serviciile de conectare și serviciile de transmitere a traficului. 2. Redistribuirea veniturilor între mai mulți operatori care participă la același proces de producție.
7. Necesitatea licențierii activităților și certificării echipamentelor de comunicații	Reflectarea cheltuielilor pentru licențierea tipurilor de activități, certificarea echipamentelor de comunicații.
8. Prezența unei concurențe acerbe pe piața serviciilor de comunicații	1. Implementarea cheltuielilor pentru inovare și investiții de capital. 2. Necesitatea menținerii contabilității manageriale pentru procesele de afaceri.
9. Necesitatea unei baze tehnologice avansate și a actualizării la timp a producției în conformitate cu progresul științific și tehnologic	Determinarea corectă a duratei de viață utilă așteptate a echipamentelor și mijloacelor de comunicații.
10. Tranziția la utilizarea unei singure platforme pentru furnizarea serviciilor de comunicații și informare	1. Contabilizarea unui pachet complet de servicii de comunicații. 2. Alocarea corectă a costurilor între tipurile individuale de servicii de comunicații.
11. Reglementarea activităților întreprinderilor de comunicații la nivel național și regional	1. Respectarea legislației în domeniul comunicațiilor. 2. Menținerea unor evidențe separate ale veniturilor și cheltuielilor pe grupuri individuale de operatori de comunicații.

Sursă: elaborată de autor

Aceste caracteristici influențează predominanța generală a costurilor indirecte în costul serviciilor de telecomunicații.

Inseparabilitatea producției și consumului de servicii de comunicații este baza obiectivă a



inegalității încărcărilor echipamentelor (pe parcursul zilei, al zilei lucrătoare, al lunii și al anului), care se datorează ritmului vieții profesionale și personale a oamenilor.

Prin urmare, pentru a îmbunătăți serviciul clienți în perioadele de vârf, companiile sunt obligate să creeze capacități de producție suplimentare și stații de lucru care pot fi utilizate parțial sau lăsate inactive în perioadele de sarcină redusă.

Cerințele ridicate privind funcționarea echipamentelor de comunicații necesită colectarea de informații privind încărcările echipamentelor de comunicații (pe oră, zi, lună și sezon), contabilizarea timpilor de nefuncționare în timpul orelor de sarcină redusă și contabilizarea echipamentelor de comunicații de rezervă.

Un grad ridicat de automatizare necesită organizarea facturării în sisteme specializate. Sistemele de facturare din companiile de telecomunicații sunt tipuri moderne de echipamente care reprezintă sisteme automate de facturare pentru contabilitatea și stabilirea prețurilor serviciilor de comunicații furnizate, permițând colectarea practică a oricăror informații despre conexiunile abonaților.

Apariția de noi participanți pe piață în furnizarea de servicii de comunicații, în special în sectorul serviciilor, necesită identificarea și justificarea noilor procese de afaceri pentru transferul de informații, ținând cont de costurile și rezultatele tuturor serviciilor companiei.

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CZU 338.1

IMPLICAREA CONTABILITĂȚII CA PRIORITATE ÎN GESTIUNEA OBIECTIVELOR FINANCIARE DIN SECTORUL AGRICOL

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Abstract. Accounting represents an important information system for decision-makers, as it is comprehensive, credible, and reflects the actual state of an activity. Accounting information reveals the outcomes or failures of the activities carried out. The integration of accounting into the management process of agricultural activity contributes to the efficient development of this sector.

Accounting reflects the actual economic and financial situation of an enterprise, thereby providing decision-making opportunities, creating value for the operations carried out, and ensuring competitiveness in the business environment. The particularities of agricultural activity also generate

specific characteristics in agricultural accounting. This creates a specialized approach to recording economic transactions related to biological asset transformations, which provides useful information for managing these complex and long-term processes. Accounting information demonstrates the results obtained from managing agricultural production processes. This information enables sector producers to analyze factors with positive or negative influence on the results obtained and to propose solutions for process improvement, thereby also providing decision-making flexibility. The valuation of biological assets in agricultural activity represents the greatest challenge, as they are in the production process undergoing continuous transformation, and their accurate and timely valuation provides useful information to decision-makers.

Keywords: accounting, management, particularities, agricultural sector, biological assets, biological transformations, etc.

Introducere. Sectorul agricol este o ramură importantă pentru economia Republicii Moldova. Importanța agriculturii rezultă și din potențialul favorabil oferit de condițiile naturale. Activitatea agricolă este o activitate antreprenorială, cu probleme generate din lipsa unei gestiuni eficiente asupra particularităților din acest sector. Astfel se impune ca producătorii agricoli să-și traseze obiective clare spre performanță și un succes pe termen lung. Complexitatea proceselor economice din agricultură, impun noi cerințe care să convină schimbărilor actuale, prin implicarea proceselor manageriale ale producătorilor agricoli în activități. Riscurile din sector și crizele din economia națională, obligă producătorii agricoli să caute soluții și modalități pentru a-și menține activitatea cât mai eficientă. Managerii întreprinderilor agricole, trebuie să ia decizii corecte pe baza unor informații fiabile utilizând în acest sens instrumente eficiente precum: contabilitate, planificarea activității, analiza și controlul operațiunilor executate. Informația din contabilitatea managerială reflectă realitatea asupra dezvoltării economice a întreprinderii, constituind o viziune modernă pentru factorii de decizie.

În sectorul agricol autohton, producătorii agricoli estimează procesul de transformare a activelor biologice subiectiv, contribuind astfel la limitarea datelor expuse în situațiile financiare. Evidența contabilă din sectorul agricol trebuie să se axeze pe efectele particularităților specifice, pentru ca informația expusă să reflecte atât valoric cât și calitativ efectul acestora asupra rezultatelor.

Activele biologice în procesul de producție sunt în permanență transformare, iar când condițiile climatice nu corespund unui mediu normal de dezvoltare, se intervine prin costuri adăugătoare de îmbunătățire a acestor condiții. Aceste transformări trebuie ghidate, îmbunătățite și evaluate corect pe întregul proces de producție. Evaluarea corectă a elementelor de cost suportate de întreprinderi la diverse etape este o provocare pentru orice producător. De aceea SNC „Particularitățile contabilității în agricultură”, propune abordări esențiale de evaluare a activelor biologice.

- evaluare inițială, când activul biologic și produsele agricole se evaluează la cost de intrare, care se determină în funcție de sursa de intrare;

- evaluare la cost planificat, când activele biologice și produsele agricole pot fi evaluate la cost planificat cu ajustări ulterioare la data raportării la cost efectiv;

- evaluare justă, conform IAS 41 întreprinderile agricole stabilesc în politicile contabile evaluarea acestora la valoarea justă minus costurile de vânzare [1, pag.108-109].

Abordarea acestor evaluări oferă stabilitate informației contabile. Informația contabilă este utilă și reflectă rezultatul economico-financiar la o dată anumită. Această informație este postoperațională, deaceia toate modificările prin decizii de intervenție se pot face prin planificarea măsurilor pe viitor, anticipând și unii factori rezultativi ce pot spori rentabilitatea. În acest caz informația contabilă reprezintă punctul inițial pentru un nou ciclu de producție, mai dirijat de factorii de decizie. Aceste practici vor spori încrederea în informațiile contabile, oferind flexibilitate în selectarea surselor de finanțare.

Acest articol își propune ca scop să sublinieze importanța contabilității asupra modificărilor activelor biologice printr-o evaluare corectă. Evaluarea activelor biologice trebuie adaptată specificului fiecărei întreprinderi, deoarece tipul activului biologic și durata unui ciclu biologic de producție influențează disponibilitatea fluxului de numerar și profitabilitatea.

Gradul de investigare a problemei la momentul actual, scopul cercetării:

Contabilitatea este o activitate importantă, care înregistrează informația economică, o prelucreează și o păstrează, prezentând-o factorilor de decizie. Informația din evidența contabilă este importantă pentru proprietarii întreprinderilor, investitori, instituții financiare, angajați, etc. Informația contabilă este destinată astfel pentru utilizatori interni și externi. În sectorul agricol, evidența contabilă se exercită ținând cont de particularitățile activității agricole. Particularitățile sunt reprezentate de transformările pe etape a activelor biologice sub acțiunea condițiilor naturale, care dacă nu sunt prielnice procesului de dezvoltare este necesar de intervenții artificiale generatoare de costuri adăugătoare. Conform SNC, întreprinderile țin evidența contabilă după două criterii:

- în partidă simplă, specifică întreprinderilor mici, care reflectă operațiunile economice fără să aplice simbolurile conturilor contabile, doar prin metoda de intrare-ieșire;
- în partidă dublă, specifică întreprinderilor mari și mijlocii – cu utilizarea simbolurilor conturilor contabile și întocmirea situațiilor financiare.

SNC, prevăd reguli de evidență pentru activitatea din sectorul agricol.

SNC, „Particularitățile contabilității în agricultură” reglementează modul de contabilizare și prezentare a situațiilor financiare privind activele biologice, produse agricole și costurile aferente acestora. Sectorul agricol include două sectoare de activitate:

- fitotehnia, care se ocupă de cultivarea plantelor;
- zootehnia, care se ocupă cu creșterea animalelor, apicultură, avicultură, etc.

Contabilitatea acestor sectoare include operațiunile economice aferente particularităților de transformare biologice. Transformările de modificare și producere sunt documentate, evaluate și contabilizate. Activele în sectorul agricol sunt incluse în conturile:

- 131 „Active biologice imobilizate în curs de execuție”,
- 132 „Active biologice imobilizate”,
- 133 „Amortizarea și deprecierea activelor biologice imobilizate”,
- 212 „Active biologice circulante”.

Scopul acestui studiu este de a informa producătorii din sectorul agricol despre esența evidenței contabile a operațiunilor desfășurate, pentru a gestiona mai eficient procesele de transformare a activelor biologice pe perioada de producție și de a interveni la timp asupra factorilor cu efect negativ asupra rezultatului.

Rezultate obținute și discuții: În contextul situației actuale din sectorul agricol, se simte în prezent nevoia de a institui prioritar un sistem de organizare a contabilității în agricultură. Întreprinderile agricole simt nevoia de a organiza evidența contabilă în activitatea desfășurată, conform reglementărilor legale. Standardul internațional de contabilitate 41, definește activitatea agricolă ca o dirijare a transformărilor biologice și a recoltării activelor biologice pentru a le vinde sau a le converti în produse agricole.

SNC „Particularitățile contabilității în agricultură” reglementează contabilitatea și prezentarea informației în situațiile financiare privind:

- activele biologice, care reprezintă animale și plante vii;
- produsele agricole, care reprezintă produsele recoltate din activele biologice;
- costurile aferente activelor biologice și produselor agricole, suportate de întreprindere aferente înțrării, creșterii și îngrijirii activelor biologice și produselor [1, pag.109].

Contabilitatea **activelor biologice** se reflecta și se distinge în funcție de durata obținerii de beneficii economice și de utilizare după destinație :

a) active biologice imobilizate (mature, care asigură obținerea multiplă a produselor agricole, precum și imature - care se află în perioada de pregătire spre utilizare), se reflectă la conturile de activ: 131 „Active biologice imobilizate în curs de execuție” și 132 „Active biologice imobilizate”.

b) active biologice circulante, care se contabilizează la contul 212 „Active biologice circulante”.

La crearea activelor biologice imobilizate se utilizează contul 131, „Active biologice imobilizate în curs de execuție”, în debitul căruia se cumulează toate elementele de cost, care participă la formarea unui activ biologic nou. Principalele înregistrări contabile în acest caz pot fi următoarele:

Se reflectă majorarea activelor biologice imobilizate în curs de execuție, cu elemente de cost utilizate la crearea noului activ

Dt 131,, Active biologice imobilizate în curs de execuție,,

Ct 211.7 ,, Materiale cu destinație agricolă,, - cu diminuarea materialului săditor utilizat,

Ct 531.1 ,,Datorii față de salariați, 533,, Datorii privind asigurările sociale și medicale,, -cu majorarea datoriilor curente privind îngrijirea plantațiilor în primii ani de dezvoltare,

Ct 124 ,,Amortizarea mijloacelor fixe,, - reflectarea amortizării mijloacelor fixe utilizate în procesul de îngrijire a plantației.

În momentul când activul biologic imobilizat în curs de execuție s-a dezvoltat și transformat ajungând în categoria de rod, în contabilitate se înregistrează:

Se reflectă trecerea activului biologic imobilizat în curs de execuție în categoria pe rod,

Dt 132 ,, Active biologice imobilizate”,

Ct 131 ,, Active biologice imobilizate în curs de execuție”.

La înregistrarea prăsilii obținute de la animalele de producție la costul efectiv:

Dt 212,, Active biologice circulante”,

Ct 811,, Activitate de bază”.

Contabilitatea **produselor agricole** rezultate din active biologice se reflectă la contul de activ 216 ,, Produse ”. Drept exemple de produse agricole sunt laptele obținut din cireada de bază, cereale obținute din culturile cerealier, diverse legume obținute din culturi leguminoase, struguri obținuți din plantațiile de vii, diverse fructe obținute din livezi, etc. Pentru evidența produselor agricole se utilizează costul planificat, care ulterior la raportare se ajustează cu costul efectiv. Evidența elementelor de cost se generalizează astfel:

Se reflectă costul direct al produsului agricol privind creșterea și îngrijirea acestui produs pe întreaga perioadă:

Dt 811,, Activitate de bază”

Ct 211 ,,Materiale”, 213 ,, Obiecte de mică valoare și scurtă durată”, 216 ,,Produse”, 521 ,, Datorii comerciale curente”, 531 ,, Datorii salariale”, 533 ,, Datorii privind asigurările sociale și medicale”, etc.

Când se obține produsul agricol, se contabilizează:

Se reflectă costul efectiv al produselor obținute:

Dt 216 ,, Produse”,

Ct 811 ,,Activitate de bază”.

Contabilitatea costurilor aferente activelor biologice și produselor agricole se ține pe sectoare, pe subdiviziuni structurale, tipuri de culturi și se disting:

- costuri directe;
- costuri repartizabile;
- costuri indirecte de producție.

Costurile directe reprezintă costurile atribuite creșterii și îngrijirii culturilor sau animalelor pe fiecare tip.

Costurile repartizabile reprezintă costurile care se referă la cultivarea/ creșterea câtorva tipuri de culturi/ animale, care pe parcursul perioadei de gestiune se contabilizează cu total cumulativ. La finele perioadei costurile repartizabile se repartizează în raport cu baza stabilită de întreprindere pe fiecare cultură.

Costurile indirecte de producție se înregistrează de obicei în cadrul unei subdiviziuni a întreprinderii și nu se raportează direct la costul unui produs. Acestea se acumulează iar apoi se repartizează pe obiecte de evidență a costurilor [1, pag.110-111].

În cazul când, în urma unor calamități naturale sau boli, nu sau obținut produse agricole, elementele de costuri privind creșterea și îngrijirea culturilor/ animalelor se trec la cheltuieli și se reflectă:

Dt 723 ,, Cheltuieli excepționale”,

Ct 811,, Activitate de bază”.

Calculația costului se efectuează în baza documentelor specifice sectorului. Costul unitar de producție se determină prin însumarea tuturor elementelor de cost pentru producția respectivă și se împarte la cantitatea de producție obținută.

În agricultură e posibil ca o parte din produsele agricole să fie utilizate într-un nou ciclu de producție în calitate de material semincer, hrană pentru animale, etc. și se contabilizează:

Dt 811, „Activitate de bază”,

Ct 216 „Produse”.

Evaluarea corectă a activelor biologice este influențată de factori ce nu depind de întreprindere precum:

- transformarea biologică modifică substanțial activul biologic, generând și modificarea valorii activului;

- transformările biologice depind de vârsta activului biologic(de exz. plantații perene, animale din turma de bază, etc.);

- calitatea genetică selectată pentru procesul de producție, influențează productivitatea și calitatea, care au efecte asupra valorii producției;

- condițiile climaterice cu impact direct asupra valorii producției.

Concluzii și recomandări: În scopul unei viziuni complete asupra situației create în sectorul agricol este nevoie de o evidență contabilă corectă a activităților integrale corelate cu cerințele legislative aplicabile domeniului agricol și în funcție de particularitățile acestui sector; selectarea unor metode de determinare a costurilor cu rol determinant în procesul de luare a deciziilor în cadrul entităților.

Evaluarea corectă a activelor biologice redă eficiență informației contabile și poate servi drept bază în deciziile celor antrenați în sectorul agricol. Aplicarea corectă a reglementărilor contabile cu referire la SNC, precum și standardelor de contabilitate internaționale ajută la crearea unui tablou informațional mai practic și mai transparent. Însă subiectivitatea cu care tratează unii producători agricoli evidența și complexitatea transformărilor biologice provoacă limitări în acest context, fac mai dificilă înțelegerea proceselor de evaluare și provoacă distorsiuni în evidența contabilă.

Aplicarea regulilor de evidență din SNC „Particularitățile contabilității în agricultură”, permite contabilitatea proceselor biologice și economice corect, sporind calitatea informațiilor și performanța contabilă. Este de remarcat, că practicile contabile variază în dependență de capacitățile echipei din contabilitate, de disponibilitatea datelor, evidențiind o discrepanță între cerințele SNC și practica aplicată.

Evidența contabilă în sectorul agricol reprezintă nu numai o informare despre efortul și efectul valoric, dar și impactul riscurilor climaterice, și efectul de incertitudine a ciclurilor biologice cu activele biologice.

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УДК 657.1

**ФИНАНСОВЫЕ И УПРАВЛЕНЧЕСКИЕ АСПЕКТЫ УЧЕТА РАСХОДОВ И ЗАТРАТ
НА АВТОТРАНСПОРТНЫХ ПРЕДПРИЯТИЯХ МОЛДОВЫ****Герасимов Михаил**

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Abstract. This article examines the issues of accounting for expenses and costs at Moldovan motor transport enterprises: recognition, assessment, and differentiation. Motor transport enterprises (MTEs), using material, labor, and financial resources, calculate the cost of services provided. This cost has a significant impact on their financial performance. Optimizing the cost of transportation is a key factor determining the effectiveness of MTEs.

Keywords: costs, expenses, recognition, evaluation, differences, accounts, accounting entries.

В Республике Молдова главным нормативным актом, определяющим учет операционных расходов автотранспортных предприятий (АТП), выступают: «Закон о бухгалтерском учете и финансовой отчетности» [1], а также Национальные Стандарты Бухгалтерского Учета: НСБУ «Расходы» [2]. Помимо себестоимости продаж, к операционным расходам АТП относятся коммерческие, общие и административные расходы, а также другие операционные издержки. Перечень таких расходов установлен НСБУ «Расходы». Тем не менее, проведенные исследования выявили разнообразие подходов к их учету среди автотранспортных предприятий страны. В качестве примера можно привести компании служб такси, где заработная плата водителей, а также обязательные взносы на социальное страхование, материальная поддержка и другие издержки, связанные с коммерческой службой (диспетчерские подразделения), включаются в общую структуру административных расходов таких предприятий.

Также на данных предприятиях в составе административных расходов учитывается заработная плата с отчислениями на социальное страхование начальников колон. Исследования показали, что предприятия напрямую учитывают по счету 711 «Себестоимость продаж» [3] расходы, связанные со страховкой, техосмотром и амортизацией АТС, износом аккумуляторов, услуги связи, затраты на оплату труда с отчислениями на социальное страхование водителей такси.

При исследовании учета расходов операционной деятельности автовокзалов (автостанций), необходимо отметить, что предприятиями используются счета расходов, кроме 711 «Себестоимость продаж» и таких, как: 713 «Административные расходы», 714 «Другие расходы операционной деятельности». На наш взгляд, такие расходы по дезинфекции и санитарии, связанные с содержанием санузла в зале для пассажиров, должны быть исключены из состава общих и административных расходов, поскольку они относятся к основной деятельности автовокзалов (автостанций), т.е. к обслуживанию пассажиров и должны быть отнесены к косвенным производственным затратам. Но так как автовокзалы (автостанции) счет управленческого учета 821 «Косвенные производственные затраты» закрывают ежеквартально, а не ежемесячно, то можно сделать вывод, что автовокзалы вообще не интересуют этот вопрос. Следовательно, на наш взгляд указанные предприятия нарушают принципы осмотрительности и осторожности.

Необходимо отметить, что АТП должны вести учет с применением счетов управленческого учета.

Затраты АТП подразделяются на прямые и косвенные. К прямым относятся затраты, непосредственно связанные с оказанием услуг по перевозке. Сюда должны быть включены: оплата труда водителей, обязательные отчисления на социальное страхование, затраты на горюче-смазочные материалы, техническое обслуживание, ремонт и т. д. Прямые затраты состоят из двух составляющих: переменные, непосредственно зависящие от пробега автомобиля (расходы на топливо, смазочные и другие расходные материалы), и постоянные, не зависящие от общего пробега автомобиля (заработная плата, износ АТС, аренда помещений)

Косвенные (накладные) затраты – это затраты, связанные с управлением и обслуживанием производства (оказание услуг грузоперевозки). Их должны включать в себестоимость пропорционально пробегу автотранспорта. Необходимо отметить следующее: если заработная плата водителей начисляется в форме фиксированного оклада – это постоянные затраты, если применяется сдельная (повременная) оплата труда – переменные.

Под себестоимостью транспортных перевозок понимают выраженную в денежной форме величину эксплуатационных расходов транспортного предприятия, приходящихся на одну транспортную единицу. На автомобильном транспорте себестоимость должна определяться для каждого вида транспортной работы, за единицу которой принимают: для грузовых автомобилей, работающих по тарифу за количество перевезенного груза, – 1 ткм, работающих по часовому тарифу – 1 авто/ч.

Рыночная экономика заставляет поддерживать тарифы на перевозки на конкурентоспособном уровне, то есть постоянно снижать себестоимость перевозок. Конечно, затраты на аренду, налоги, фонд заработной платы уменьшить не удастся, они будут только увеличиваться в связи с существующей инфляцией. В целях снижения себестоимости автоперевозок необходимо использовать следующие методы, доказавшие свою эффективность:

- использование оптимальных норм расхода горюче-смазочных материалов для каждого автомобиля, учитывающих категорию транспортного средства, выполняемую работу, условия эксплуатации и еще ряд факторов;
- повышение коэффициента использования транспортного средства, включающего в себя оптимальную загрузку каждого конкретного автомобиля, установление оптимального маршрута и скорости движения;
- снижение затрат на техническое обслуживание и ремонт автомобильного парка без потери качества работы;
- совершенствование и автоматизация методов погрузки/выгрузки машин, что значительно позволяет сократить простой автотранспорта;
- повышение производительности труда на всех уровнях;
- повышение квалификации работников предприятия за счет дополнительного обучения и различных тренингов;
- постоянное материальное стимулирование работников, направленное на обеспечение бережного и компетентного использования материальных ценностей предприятия.

Любой производственный процесс требует грамотного управления, ведь от этого зависит объем и качество перевозок, а как следствие – финансовое благополучие АТП. Поэтому важнейшую роль играет управленческий и финансовый учет, в котором непрерывно и взаимосвязанно отражаются все документально подтвержденные хозяйственные операции. Правильная организация учета затрат обеспечивает действенный контроль за эффективным использованием на предприятии материальных, трудовых и финансовых ресурсов, позволяет выявить фактическую себестоимость оказанных услуг.

Для учета всех затрат на АТП должна быть использована единая информационная система, которая позволяет:

- своевременно и достоверно отражать фактические затраты на оказываемые услуги по доставке;

- исчислять фактическую себестоимость отдельных видов и всего объема перевозок;
- предоставлять менеджменту предприятия информацию, необходимую для принятия решений и оперативного управления производственными процессами;
- осуществлять контроль за экономным и рациональным использованием материальных, трудовых и финансовых ресурсов.

Как показали исследования, АТП начисляют и уплачивают в сроки, установленные VII разделом Налогового Кодекса, сборы за предоставление услуг по автомобильной перевозке пассажиров и за парковку автотранспорта.

Начисление указанных сборов АТП учитывают по счету 713 «Административные расходы», субсчету 7133 «Налоги, сборы и платежи, за исключением подоходного налога» согласно Плану счетов. Возникает вопрос: почему указанные сборы должны учитываться в составе общих и административных расходов, ведь они относятся к основной деятельности предприятия? [3]

Муниципальный автобусный парк, оказывая услуги по мойке автотранспортных средств, согласно VIII раздела Налогового Кодекса сбор за использование воды учитывает также в составе общих и административных расходов.

На наш взгляд, необходимые сборы, связанные с деятельностью АТС предприятия должны учитывать на счетах управленческого учета. В связи с этим, считаем необходимым к счету 821 «Косвенные производственные затраты» открыть субсчет 8211 «Обязательные сборы с АТС» и предложить номенклатуру аналитических счетов [3]:

- 82111 «Сбор за предоставление услуг по автомобильной перевозке пассажиров»;
- 82112 «Сбор за парковку автотранспорта»;
- 82113 «Сбор за использование воды»

Информация с предложенной номенклатурой счетов повлияет на объективное отражение в учете себестоимости продаж (оказанных услуг) и будет полезна как менеджерам, так и пользователям финансовой отчетности.

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ПЕРСПЕКТИВЫ РАЗВИТИЯ РЫНКА ЦЕННЫХ БУМАГ РЕСПУБЛИКИ БЕЛАРУСЬ

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Abstract. The Belarusian securities market is a vital component of the financial market. This segment enables issuers and investors to manage their financial resources. The domestic financial market

operates within the framework of policy documents developed by the relevant governing bodies. Currently, the Strategy for the Development of the Securities and Insurance Market until 2040 has been adopted, which forecasts the key goals for the development of the stock market.

Keywords: securities, shares, bonds, issue, stock market, strategy

Неотъемлемым атрибутом рыночной экономики, наряду с развитой банковской системой, четкой институциональной сферой, эффективно действующими законодательной и судебной системами, является наличие финансового рынка, а особенно его важного сегмента – рынка ценных бумаг. Товаром на рынке ценных бумаг являются ценные бумаги, иначе называемые фондовыми ценностями, фондовыми активами. Отсюда рынок ценных бумаг называют фондовым рынком. Более глубокое исследование показывает, что выделяют два типа ценных бумаг: денежные (акции, облигации и их производные) и товарные (закладные, коносаменты, складские свидетельства, товарный вексель), не являющиеся инструментами фондового рынка. В той части, в какой рынок ценных бумаг основывается на деньгах как на капитале, он называется фондовым и является составной частью рынка ценных бумаг. В силу того, что объемы сделок с денежными ценными бумагами значительно превышают сделки с товарными инструментами, рынок ценных бумаг отождествляют с понятием фондового рынка. Отечественный фондовый рынок традиционно принято характеризовать его долевым (рынком акций) и долговым сегментами (рынком облигаций), при этом в текущих условиях именно рынки государственных и корпоративных облигаций призваны обеспечить национальную экономику достаточным количеством финансовых ресурсов [1, С. 26].

Несмотря на то, что в настоящее время отечественный фондовый рынок функционирует в условиях общей геополитической напряженности и санкционного давления, следует отметить его стабильность. Так, показатель объема торгов ценными бумагами в Республике Беларусь в 6,3 млрд долл. по сравнению со странами-членами ЕАЭС свидетельствует о развитости отечественного фондового рынка, который уступает лишь рынкам Российской Федерации и Республики Казахстан. Для сравнения, в Кыргызстане данный показатель составляет 0,6 млрд долл., в Армении – 0,4 млрд долл. [рис. 1].

Рынок ценных бумаг Республики Беларусь является развивающимся сегментом белорусского финансового рынка. На 01.01.2025 на рынке функционируют 45 профессиональных участников, в т. ч. 42 брокера, 43 дилера, 24 доверительных управляющих, ОАО «Белорусская валютно-фондовая биржа», выполняющая функции организатора торговли и оператора расчетно-клиринговой системы, РУП «Республиканский центральный депозитарий ценных бумаг» и 24 депозитария второго уровня. Совокупные активы небанковских профессиональных участников⁸ рынка ценных бумаг составили 155,5 млн рублей, увеличившись за пять лет в 4,2 раза, активы по доверительному управлению ценными бумагами составили 3,7 млн рублей. Работает достаточно многочисленный институт специалистов, имеющих квалификационный аттестат специалиста рынка ценных бумаг. По состоянию на 1 октября 2025 г. их количество составило 2372 человека [2].

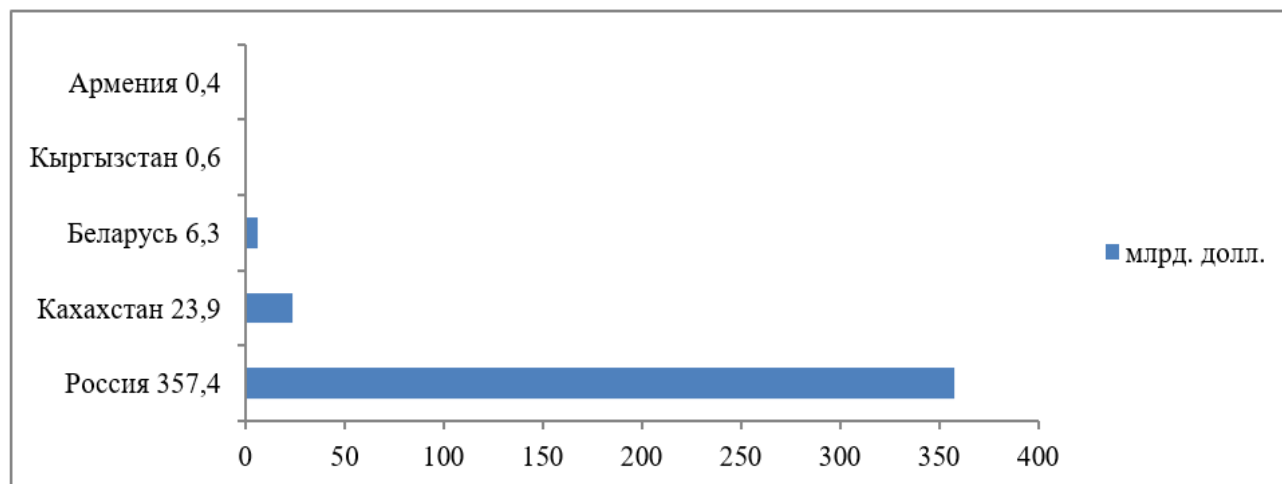


Рис. 1 Объем торгов ценными бумагами стран-членов ЕАЭС в 2023 году

Источник: составлено автором на основании источника [3, С. 4]

Дальнейшее развитие отечественного рынка ценных бумаг определено в контексте целей, задач и ключевых индикаторов, предусмотренных Стратегией развития рынков ценных бумаг и страхования Республики Беларусь до 2040 года. Цель программного документа заключается в увеличении уровня инвестиционной, эмиссионной активности рыночных участников, активном использовании инструментов, ориентированных на экологические, социальные и управленческие инвестиции в ценные бумаги.

Для достижения цели предусмотрены три категории задач: задачи, направленные на увеличение спроса; задачи, направленные на увеличение предложения на рынке ценных бумаг, а также комплексные задачи.

Для увеличения спроса на рынке ценных бумаг планируется подготовить «дорожную карту» по выходу белорусских эмитентов на российский фондовый рынок; завершить работу над проектами соглашений о допуске ценных бумаг и рыночных посредников на рынки партнеров по ЕАЭС; содействовать активному вовлечению розничного инвестора в инвестиционные процессы путем упрощения доступа населения к инструментам белорусского фондового рынка, стимулирования внедрения дистанционного обслуживания розничных инвесторов как обязательного стандарта деятельности профессионального участника рынка ценных бумаг и расширения перечня иностранных рыночных участников, которые смогут признаваться квалифицированными инвесторами.

Задачи, направленные на увеличение предложения на рынке ценных бумаг, призваны расширить линейку финансовых инструментов в соответствии с актуальными потребностями рыночных участников. Среди них развитие системы «зеленого» финансирования в контексте общемировой ESG-трансформации. В данном контексте потребуется реализация следующих направлений: завершение работы по внедрению национальной «зеленой» таксономии, регламентирующей критерии и требования к системе верификации проектов и финансовых инструментов «зеленой» направленности, в т. ч. стимулирующей развитие рынка «зеленых» инвестиций в Республике Беларусь посредством эмиссии «зеленых» облигаций и создание на базе ОАО «Белорусская валютно-фондовая биржа» универсальной «зеленой» торговой площадки, предусматривающей возможность торговли «зелеными» облигациями и другими инструментами ответственного финансирования, формирование условий и набора преференций, предоставляемых инвесторам и эмитентам.

Среди комплексных задач следует отметить создание института универсальных финансовых посредников, в т. ч. путем интеграции цифровых и традиционных финансов. В частности, планируется возможность оказания услуг профессиональными участниками рынка ценных бумаг не только в отношении традиционных финансовых инструментов, но также в отношении цифровых активов, что обеспечит предоставление равных условий для оказания



услуг участниками рынка, будет способствовать наращиванию клиентской базы и, как следствие, повышению ликвидности посредников, упрощению процесса инвестирования.

В соответствии со Стратегией развития рынка ценных бумаг предусмотрены следующие индикативные показатели:

- отношение активов небанковских профессиональных участников рынка ценных бумаг к ВВП – 0,155 % в 2040 году (против 0,08 % в 2025 году);

- увеличение объема выпусков акций акционерных обществ и облигаций на уровне роста ВВП (рост ВВП в 2025 году – 1,3 %);

- отношение объема выпуска облигаций юридических лиц к объему выдачи банками кредитов юридическим лицам в национальной валюте – 10 % в 2040 году (против 5 % в 2025 году);

- доля сделок купли-продажи, совершенных с использованием систем дистанционного обслуживания, – не менее 50 % в общем объеме сделок купли-продажи, совершенных с ценными бумагами в течение года (против 0,6 % в 2025 году) [2; 3, С. 27].

Результатом реализации целей и задач, предусмотренных Стратегией, станет рынок ценных бумаг Республики Беларусь – 2040, где: увеличивается число активных участников фондового рынка, в т. ч. универсальных финансовых посредников; рынок привлекает все больше как индивидуальных, так и институциональных инвесторов благодаря увеличению финансовой грамотности граждан и доступности инвестиционных инструментов; участники рынка активно используют информацию для анализа тенденций и принятия инвестиционных решений; реализуются экологические, социальные и управленческие (ESG) инвестиции в ценные бумаги, что ведет к появлению новых инструментов и фондов, ориентированных на устойчивое развитие.

Таким образом, программный документ принят на долгосрочный период и сконцентрирован на многих важных для государства задачах, реализация которых позволит разнообразить рынок привлекательными инструментами, соответствующими различным потребностям рыночных участников, тем самым, предоставив возможность белорусским инвесторам приумножить и сохранить капитал внутри страны. А благодаря целевым индикаторам будет осуществляться мониторинг выполнения отдельных мероприятий в рамках пятилетнего срока действия Стратегии развития рынка ценных бумаг, что станет мощным драйвером инвестиционной активности и развития белорусской экономики.

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ЭКОНОМИЧЕСКИЕ АСПЕКТЫ ФОРМИРОВАНИЯ ЦЕН И ПОТРЕБИТЕЛЬСКОГО ВЫБОРА НА РЫНКЕ БРИЛЛИАНТОВ**Батищев Руслан**

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Abstract. The article examines the key economic and gemological factors that determine price formation in the diamond market, as well as the characteristics of consumer choice when purchasing gemstones. Particular attention is paid to the “4C” quality assessment system, the role of institutional market participants (GIA, Rapaport Diamond Report), price discounting factors, and issues of diamond liquidity as a specific durable good and a store of value. The material is based on a combination of theoretical analysis and practical recommendations..

Key words: diamonds, gemstone market, pricing, 4C system, liquidity, consumer choice.

Рынок бриллиантов занимает особое место в системе мировых товарных рынков, сочетая в себе черты рынка предметов роскоши, инвестиционных активов и ювелирного сырья. С одной стороны, бриллианты выступают как символ статуса и социального капитала, с другой — как товар, цена которого формируется под влиянием объективных и субъективных факторов. В условиях глобализации и высокой информационной доступности возрастает роль рационального потребительского выбора, основанного на понимании механизмов ценообразования и оценки качества.

Целью данной статьи является анализ основных факторов, влияющих на стоимость бриллиантов, а также обоснование практических рекомендаций по их приобретению с экономической точки зрения.

К теоретическим основам оценки качества бриллиантов относят:

1. систему «4C» как базовый стандарт рынка: в международной практике ключевым инструментом оценки качества бриллиантов является система «4C», включающая четыре группы характеристик: масса (carat), огранка (cut), цвет (color) и чистота (clarity). Данная система выступает унифицированным языком взаимодействия между добывающими компаниями, ограночными центрами, ювелирами и конечными потребителями. Масса бриллианта измеряется в каратах (1 карат = 0,2 г) и оказывает прямое влияние на его стоимость. Однако зависимость цены от массы носит нелинейный характер: с увеличением веса возрастает цена одного карата, что обусловлено редкостью крупных камней и повышенным спросом на них;
2. цвет и его влияние на потребительскую ценность. Цвет бриллианта является одной из наиболее заметных характеристик для покупателя. В рамках шкалы, разработанной Геммологическим институтом Америки (GIA), цвет оценивается в диапазоне от D (абсолютно бесцветные камни) до Z (выраженный желтый оттенок). Экономическая ценность камней убывает по мере усиления цветового оттенка, за исключением фантазийных цветов, которые формируют отдельный сегмент рынка и могут стоить значительно дороже классических бесцветных бриллиантов.
3. чистота и внутренняя структура камня. Чистота характеризует наличие включений и дефектов, формирующихся в процессе природного образования алмаза. С экономической точки зрения чистота влияет не только на визуальные характеристики, но и на долгосрочную ликвидность камня. Бриллианты с

минимальным количеством включений являются более востребованными на вторичном рынке. [2]

Качество огранки играет ключевую роль в формировании визуального эффекта бриллианта и его способности отражать и преломлять свет. В отличие от массы и цвета, огранка является результатом человеческого труда и технологий, что позволяет рассматривать ее как фактор добавленной стоимости. Даже при одинаковых характеристиках массы, цвета и чистоты различия в пропорциях огранки могут приводить к значительным ценовым отклонениям.

С экономической точки зрения потребитель может сознательно выбирать камни с неидеальными пропорциями, если эстетический эффект остается приемлемым, что позволяет снизить цену приобретения без существенной потери потребительской полезности.

К институциональным механизмам ценообразования следует отнести:

1. Роль сертификации GIA. Сертификация бриллиантов Геммологическим институтом Америки выполняет функцию институционального доверия на рынке. Наличие сертификата снижает информационную асимметрию между продавцом и покупателем и способствует формированию более прозрачных цен.
2. Rapaport Diamond Report как ценовой ориентир. Прейскурант Rapaport Diamond Report является наиболее распространенным ориентиром оптовых цен на бриллианты. Однако он не представляет собой фиксированный прайс-лист, а отражает цены на эталонные камни. Реальная рыночная цена формируется с учетом системы скидок, зависящих от совокупности характеристик конкретного бриллианта.

Факторы дисконтирования и отклонения от эталонной цены.

Факторы, снижающие цену бриллианта по сравнению с эталонной, перечислены на рис.

1.

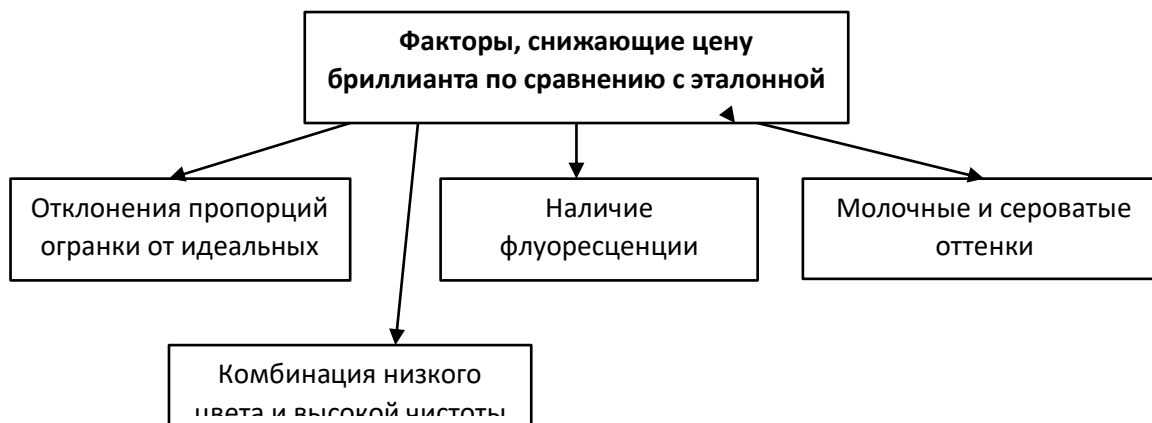


Рис. 1. Факторы, снижающие цену бриллианта по сравнению с эталонной.

Источник: разработано автором на основе [1].

Совокупный размер дисконта, как правило, не превышает 40–50 % от цены Rapaport, что отражает пределы рыночной корректировки стоимости.

Ликвидность бриллиантов и потребительский выбор. С позиции экономического анализа бриллианты можно рассматривать как низкодоходный, но относительно устойчивый актив. Наибольшей ликвидностью обладают камни со средними характеристиками, поскольку именно они формируют основной объем спроса. Камни с экстремальными характеристиками (очень высокая чистота при низком цвете или наоборот) менее универсальны и, соответственно, менее ликвидны.

Ключевыми мировыми центрами огранки и торговли бриллиантами являются Израиль, Бельгия и Китай. Концентрация производства и торговли в данных регионах позволяет

минимизировать транзакционные издержки и сократить количество посредников, что положительно сказывается на конечной цене для покупателя. [3]

Динамика и эволюция цен на бриллианты в 2025 году. В 2025 году формирование цен на бриллианты происходит в условиях замедления глобального экономического роста, сохранения относительно высоких процентных ставок и перераспределения инвестиционных потоков. В отличие от золота, бриллианты не являются классическим биржевым активом, однако их стоимость опосредованно реагирует на изменения инфляционных ожиданий, валютных курсов и уровня потребительского доверия.

Снижение реальных доходов населения в ряде стран ограничивает спрос на предметы роскоши, что оказывает понижающее давление на цены в массовом сегменте ювелирных бриллиантов. В то же время камни с редкими характеристиками сохраняют устойчивость благодаря ограниченному предложению и инвестиционному спросу.

Ключевой особенностью 2025 года является дальнейшая поляризация спроса. С одной стороны, наблюдается рост интереса к бриллиантам со средними характеристиками, которые обеспечивают оптимальное соотношение цены и потребительской полезности. Именно данный сегмент демонстрирует наибольшую ценовую стабильность и ликвидность.

С другой стороны, снижается спрос на камни с экстремальными характеристиками — либо очень высокой чистотой при низком цвете, либо наоборот. Такие бриллианты сталкиваются с расширением дисконтов по отношению к эталонным ценам, что отражает изменение предпочтений покупателей в сторону рационального потребления.

Со стороны предложения рынок в 2025 году характеризуется ограниченным ростом добычи природных алмазов. Крупные добывающие компании придерживаются стратегии контроля объемов поставок, стремясь избежать резких ценовых колебаний. Дополнительную роль играют институциональные механизмы ценообразования, включая использование прејскурантов Rapaport Diamond Report, которые продолжают выполнять функцию ценового ориентира, но всё в большей степени дополняются гибкой системой индивидуальных скидок.

Покупка бриллианта представляет собой сложное экономическое решение, требующее учета не только системы «4C», но и институциональных, рыночных и поведенческих факторов. Рациональный подход к выбору камня позволяет оптимизировать соотношение цены и потребительской полезности, а также минимизировать риски информационной асимметрии. В условиях развитого рынка бриллианты продолжают сохранять значение специфического товара, сочетающего эстетическую, символическую и экономическую ценность.

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ПРИДНЕСТРОВСКИЙ ПЛАН СЧЕТОВ БУХГАЛТЕРСКОГО УЧЕТА ФИНАНСОВО-ХОЗЯЙСТВЕННОЙ ДЕЯТЕЛЬНОСТИ ОРГАНИЗАЦИЙ

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Аннотация. Раскрыты сущность и значение бухгалтерского учета и его счетов в управлении субъектами рыночной экономики. Впервые в научном информационном пространстве Республики Молдова подробно и всесторонне представлен важный нормативный акт – План счетов бухгалтерского учета финансово-хозяйственной деятельности организаций приднестровского региона. Указаны и обоснованы его отдельные недостатки и предложены способы их устранения.

Ключевые слова: информация, таблицы, определение, кодирование, виды и План счетов.

Abstract. The essence and significance of accounting and its accounts in the management of market economy entities are revealed. For the first time in the scientific information space of the Republic of Moldova, an important regulatory act – the Chart of accounts for the financial and economic activities of organizations in the Transnistrian region – has been presented in detail and comprehensively. Its individual shortcomings are indicated and justified, and ways to eliminate them are proposed.

Key words: information, tables, definition, coding, types and Chart of accounts.

После распада Союза Советских Социалистических Республик и парадов суверенитетов новообразованных государств в некоторых из них стали возникать межнациональные вооруженные конфликты. Один из них имел место в Республике Молдова в 1992 г. с участием ее вооруженных сил и Приднестровья. В результате этого конфликта образовалась новая так называемая Приднестровская Молдавская Республика. На ее территории уже многие годы (больше 30) успешно осуществляют разнообразную финансово-хозяйственную деятельность различные предприятия и организации (заводы, фабрики, строительные и автотранспортные фирмы, оптовые склады, магазины, рестораны, кафе и др.). И эта деятельность по единой методологии комплексно и постоянно отражается в системе бухгалтерского учета. Он изучает количественную сторону хозяйственных явлений и процессов во взаимосвязи с их качественной характеристикой.

Бухгалтерский учет является основным источником наиболее достоверной экономической информации для внутренних и внешних пользователей с целью исчисления и оценки различных показателей, выработки и принятия обоснованных оптимальных управленческих решений. Он – важнейшая функция управления хозяйственно-финансовой деятельностью предприятий (организаций) и обязательный инструмент успешного развития бизнеса в рыночной экономике [9-11].

Бухгалтерский учет формирует большой объем достоверной и разнообразной экономической информации и для этого широко используются счета. Они представляют собой способ группировки, текущего отражения и контроля в денежной оценке активов, капитала, обязательств, доходов, расходов, затрат и хозяйственных операций предприятий; являются признаками классификации и носителями учетно-экономической информации, а также способом ее получения.

В самом общем виде счета бухгалтерского учета – это особые, специфические и, как правило, двухсторонние (двухграфные) и *n*-строчные таблицы различных форм, в которых группируется и отражается различная информация об активах, капитале, обязательствах, доходах, расходах и затратах субъектов (предприятий): об их остатках на определенную дату, изменениях (увеличениях и уменьшениях) после хозяйственных операций в отчетном периоде и др.

Иначе говоря, бухгалтерские счета есть таблицы различных форм и состоящие из двух частей (сторон, граф), в которых отдельно отражается информация об остатках учитываемых объектов на определенную дату и их изменениях (увеличениях и уменьшениях) в результате совершения хозяйственных операций [5-8, 13].

Учетных объектов, как правило, всегда очень много и они весьма разнородны по своему экономическому содержанию. Поэтому для постоянного и систематического отражения остатков и движения этих объектов формируется система счетов, которая в Приднестровской Молдавской Республике представлена в виде Плана счетов бухгалтерского учета финансово-хозяйственной деятельности организаций (далее – План счетов). Он разработан в соответствии с Законом «О бухгалтерском учете и финансовой отчетности» от 17 августа 2004 г. № 467-З-III на основе стандартов бухгалтерского учета, международных требований составления финансовых отчетов и потребностей управленческого учета, утвержден приказом Министерства финансов этой Республики от 19 октября 2011 г. № 182 и введен в действие с 1 января 2012 г. [1, 2]. Форма, структура и содержание этого Плана счетов в сокращенном виде следующие (табл. 1).

Таблица 1. План счетов бухгалтерского учета финансово-хозяйственной деятельности организаций

Код группы счетов	Код группы счетов 1-го порядка	Код группы счетов 2-го порядка	Наименования классов, групп счетов и субсчетов
Класс 1. Долгосрочные (внеоборотные) активы			
11			НЕМАТЕРИАЛЬНЫЕ АКТИВЫ
	11	1	<i>Нематериальные активы</i>
		1111	Организационные расходы
		1112	Патенты
		1113	Товарные знаки
		1114	Лицензии
		1115	Программное обеспечение
		1116	Прочие нематериальные активы
		1117	Долгосрочно арендованные нематериальные активы
	11	2	<i>Незавершенные нематериальные активы</i>
			
12			ДОЛГОСРОЧНЫЕ МАТЕРИАЛЬНЫЕ АКТИВЫ
	12	1	<i>Незавершенные материальные активы</i>
		1211	Незавершенное строительство
		1212	Оборудование к установке
		1213	Оборудование и другие объекты до ввода в эксплуатацию
		1214	Последующие капитальные вложения
		1215	Незавершенные биологические активы
	12	2	<i>Земельные участки и природные ресурсы</i>
		1221	Земельные участки
		1222	Природные ресурсы
	12	3	<i>Основные средства</i>
		1231	Здания
		1232	Сооружения
		1233	Машины, оборудование и передаточные устройства
		1234	Транспортные средства



			1235	Прочие основные средства
			1236	Основные средства, полученные в финансируемую аренду (финансовый лизинг)
			1237	Малоценные основные средства
12	4			Износ основных средств
			1241	Износ зданий
			1242	Износ сооружений
			1243	Износ машин, оборудования и передаточных устройств
			1244	Износ транспортных средств
			1245	Износ прочих основных средств
			1246	Износ долгосрочно арендованных основных средств
			1247	Износ малоценных основных средств
				
Класс 2. Краткосрочные (оборотные) активы				
21				ЗАПАСЫ
	21	1		Материалы
			2111	Сырье и основные материалы
			2112	Покупные полуфабрикаты и комплектующие изделия
			2113	Топливо
			2114	Тара и тарные материалы
			2115	Запасные части
			2116	Прочие материалы
			2117	Материалы, переданные в переработку
			2118	Строительные материалы
			2119	Материалы сельскохозяйственного назначения
	21	2		Незавершенное производство
			2121	Незавершенное производство продукции
			2122	Незавершенное производство работ (услуг)
	21	3		Продукция
			2131	Готовая продукция
			2132	Полуфабрикаты собственного производства
			2133	Побочная продукция
	21	4		Товары
22				КРАТКОСРОЧНАЯ ТОРГОВАЯ И ПРОЧАЯ ДЕБИТОРСКАЯ ЗАДОЛЖЕННОСТЬ
	22	1		Краткосрочная дебиторская задолженность по торговым счетам
			2211	Счета к получению внутри страны
			2212	Счета к получению из-за рубежа
			2213	Векселя полученные
				
	22	7		Краткосрочная дебиторская задолженность персонала
			2271	Краткосрочная дебиторская задолженность по оплате труда
			2272	Краткосрочная дебиторская задолженность подотчетных лиц
			2273	Краткосрочная дебиторская задолженность по товарам, проданным в кредит
			2274	Краткосрочная дебиторская задолженность по возмещению материального ущерба
			2275	Краткосрочная дебиторская задолженность персонала по прочим операциям
				
24				ДЕНЕЖНЫЕ СРЕДСТВА И ДЕНЕЖНЫЕ ЭКВИВАЛЕНТЫ
	24	1		Касса
			2411	Касса в национальной валюте
			2412	Касса в иностранной валюте
			2413	Связанные наличные денежные средства
	24	2		Текущие счета в национальной валюте
			2421	Несвязанные денежные средства
			2422	Связанные денежные средства
	24	3		Текущие счета в иностранной валюте
			2431	Валютные счета внутри страны
			2432	Валютные счета за рубежом
			2433	Связанные валютные средства

Составлена автором статьи на основе [2]

План счетов – это систематизированный перечень синтетических счетов бухгалтерского учета и их субсчетов, объединенных в экономически однородные классы и группы. Он предназначен для текущего ведения бухгалтерского учета, обеспечения пользователей необходимой экономической, финансовой и управленческой информацией, а также для составления финансовых и других отчетов.

План счетов основан на классификации счетов по экономическому содержанию и включает классы и группы счетов синтетического учета (их еще часто называют кратко и просто счетами и редко – счетами первого порядка), сами счета и субсчета (их еще иногда называют счетами второго порядка). Он представляет собой информационную модель развития и основу формирования информационных систем субъектов рыночной экономики, является сложной иерархической структурой и включает следующие элементы (рис. 1).

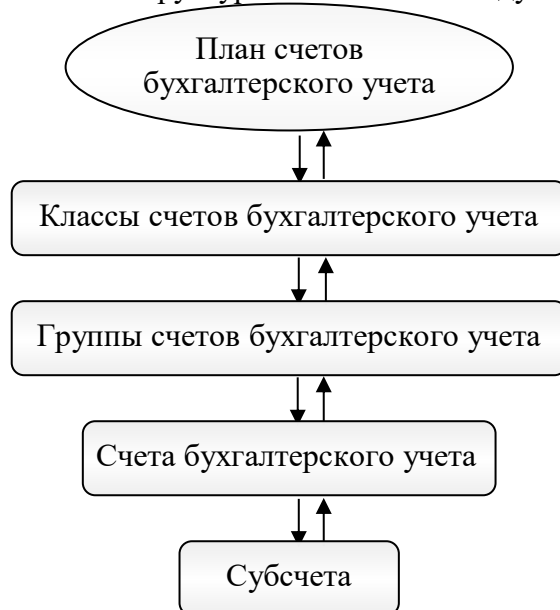


Рис. 1. Структура Плана счетов бухгалтерского учета

План счетов бухгалтерского учета финансово-хозяйственной деятельности организаций содержит:

✓ 9 классов счетов – 1 «Долгосрочные (внеоборотные) активы», 2 «Краткосрочные (оборотные) активы», 3 «Капитал и резервы», 4 «Долгосрочные обязательства», 5 «Краткосрочные обязательства», 6 «Доходы», 7 «Расходы», 8 «Счета управленческого учета», 9 «Забалансовые счета»;

✓ 45 групп счетов – 11 «Нематериальные активы», 12 «Долгосрочные материальные активы», 21 «Запасы», 22 «Краткосрочная торговая и прочая дебиторская задолженность», 24 «Денежные средства и денежные эквиваленты» и др.;

✓ 142 счета – 123 «Основные средства», 124 «Износ основных средств», 211 «Материалы», 214 «Товары», 221 «Краткосрочная дебиторская задолженность по торговым счетам», 241 «Касса» и др.;

✓ 249 субсчетов – 1231 «Здания», 1232 «Сооружения», 2111 «Сырье и основные материалы», 2113 «Топливо», 2411 «Касса в национальной валюте», 2412 «Касса в иностранной валюте» и др.;

✓ и всего 445 позиций (начиная с классов счетов и по субсчета включительно).

Для удобства пользования и сокращения учетных работ бухгалтерским счетам присваиваются коды (номера) по системе, в соответствии с которой:

а) классы счетов обозначены одной цифрой – от 1 до 9;

б) группы счетов обозначены двумя цифрами: первая показывает код класса, в которую входит данная группа, а вторая – номер группы;

в) счета первого порядка обозначены тремя цифрами: первые две – составляют код группы, к которой относится данный счет, третья – номер счета первого порядка;

г) счета второго порядка (субсчета) обозначены четырьмя и (или) более цифрами: первые три показывают код счета первого порядка, четвертая и (или) последующая – номер счета второго порядка соответствующего синтетического счета.

Все счета вышеуказанных классов, кроме девятого, подразделяются на активные и пассивные. Активными являются счета классов 1, 2, 7, 8 (за исключением регулирующих), а пассивными – счета классов 3-6 (за исключением регулирующих). Забалансовые счета класса 9 не являются активными или пассивными счетами, так как учитываемые на них объекты, а, следовательно, и сальдо этих счетов не отражаются в активах и пассивах бухгалтерских балансов. Применение активно-пассивных счетов не разрешается из-за того, чтобы недопускать взаимопогашения активов и обязательств, а также взаимное списание доходов и расходов организации.

Счета классов 1-7 являются счетами финансового учета. Они используются для обобщения информации, подлежащей отражению в финансовых отчетах и предназначенной для внутренних и внешних пользователей.

Счета управленческого учета (класс 8) предназначены для обобщения информации о производственных затратах, себестоимости продукции (работ, услуг) используемой только для внутренних нужд организации, в целях принятия оптимальных эффективных управленческих решений.

Счета забалансового учета (класс 9) применяются для обобщения информации о наличии и движении активов, не принадлежащих организации, но временно находящихся в ее владении или пользовании, об условных правах и обязательствах, а также для контроля за отдельными хозяйственными операциями.

Счета первого порядка классов 1-7 являются обязательными для всех организаций; счета первого порядка классов 8-9 и счета второго порядка всех классов применяются по мере необходимости исходя из особенностей деятельности организации, требований по раскрытию информации в финансовых отчетах, а также для целей экономического анализа и контроля.

Для учета специфических операций организации могут вводить дополнительные группы счетов и счета первого порядка для финансового учета по согласованию с исполнительным органом государственной власти, осуществляющим функции государственной политики в сфере бухгалтерского учета.

Организации могут вводить дополнительные счета второго порядка для финансового учета и счета первого и второго порядка для управленческого и забалансового учета в соответствии с их потребностями без дублирования и искажения Плана счетов.

Счета бухгалтерского учета используются для правильного и своевременного отражения всех хозяйственных операций, осуществляемых в различных организациях. Это их основное, главное предназначение. При этом под хозяйственной операцией понимается факт хозяйственной жизни, а именно сделка, событие, операция, которые оказывают или способны оказать влияние на финансовое положение организации, финансовый результат ее деятельности и движение денежных средств.

Порядок применения счетов и отражения на них хозяйственных операций регламентируется Инструкцией по применению счетов бухгалтерского учета. Отражение хозяйственных операций на счетах классов 1-8 осуществляется на основе принципа двойной записи, а на счетах класса 9 – по принципу простой (однократной) записи.

План счетов обязаны применять все юридические лица, которые занимаются финансово-хозяйственной деятельностью и зарегистрированы в Приднестровской Молдавской Республике, а также их филиалы, представительства и другие структурные подразделения, расположенные в этой Республике и за ее пределами независимо от формы собственности,

отраслевой принадлежности и организационно-правовой формы (кроме организаций кредитных, бюджетных и использующих упрощенную систему налогообложения).

И в заключение отметим и обоснуем отдельные недостатки данного нормативного акта и предложим способы их устранения.

Во-первых, План счетов бухгалтерского учета финансово-хозяйственной деятельности организаций Приднестровской Молдавской Республики определяется как «систематизированный перечень синтетических и аналитических счетов бухгалтерского учета, установленных в соответствии с государственными и международными требованиями к подготовке и представлению информации о финансовом положении и результатах деятельности организации». По нашему мнению, это определение ошибочно в части аналитических счетов (они полностью отсутствуют в данном нормативном документе), не полное из-за пропуска субсчетов и очень громоздкое за счет указания в нем не нужных и неуместных соответствий.

Во-вторых, методологически ошибочно объединять в одной выше представленной табл. 1 две совершенно разнородные по экономическому содержанию совокупности счетов бухгалтерского учета классов 1-8 (1 «Долгосрочные (внеоборотные) активы», 2 «Краткосрочные (оборотные) активы», 3 «Капитал и резервы», 4 «Долгосрочные обязательства», 5 «Краткосрочные обязательства», 6 «Доходы», 7 «Расходы», 8 «Счета управленческого учета») и класса 9 «Забалансовые счета». Правильно будет, если счета последнего, девятого класса дать в отдельной таблице приложением.

В-третьих, четыре графы табл. 1 озаглавлены по сути неправильно и вот почему:

~ в графе 1 представлено много кодов многих групп счетов, а в ее названии эти понятия даются в единственном числе; не указываются уровни счетов, приведенные в графах 2 и 3;

~ в графе 2 приведены **коды** счетов 1-го порядка, а не **код** их группы;

~ аналогичная ошибка в названии графы 3 – она включает **коды** счетов 2-го порядка, а не **код** их группы;

~ графа 4 не включает наименования самого важного и главного элемента Плана счетов – самих счетов, которых 142, не указывает уровни счетов и содержит новое понятие субсчетов, хотя в графе 3 они именуются счетами 2-го порядка.

Поэтому считаем, что соответствующие графы этой таблицы следует озаглавить так: Коды групп счетов, Коды счетов, Коды субсчетов, Наименования классов и групп счетов, счетов и субсчетов.

В-четвертых, с большой уверенностью предполагаем, что План счетов бухгалтерского учета финансово-хозяйственной деятельности организаций Приднестровской Молдавской Республики разработан на основе Плана счетов бухгалтерского учета финансово-хозяйственной деятельности предприятий Республики Молдова [3]. А последний:

- состоит из четырех разделов (I. Общие положения, II. Терминология, III. Перечень счетов бухгалтерского учета, IV. Методологические нормы применения счетов бухгалтерского учета);

- в разделе III включает очень сложную и неграмотно составленную таблицу, макет которой позаимствован из **румынского** Общего плана счетов бухгалтерского учета, введенного в действие с 1994 г.;

- утвержден приказом молдавского Министерства финансов от 25 декабря 1997 г. № 174 и вступил в действие с 1 января 1998 г.

В-пятых, реальный научно-практический интерес представляет сравнительный анализ содержания (позиций) ныне действующих приднестровского Плана счетов бухгалтерского учета финансово-хозяйственной деятельности организаций и Общего плана счетов бухгалтерского учета Республики Молдова [4]. Он должен показать существенные, принципиальные различия между ними, выявить их причины, способствовать сближению и совершенствованию этих двух нормативных актов с целью улучшения информационного

обеспечения эффективного управления субъектами рыночной экономики. Знание первого из них необходимо для лучшего понимания второго, его структуры и ее обоснованности.

В процессе подготовки данной статьи недостатки приднестровского и молдавского Планов счетов нами полностью устранены в новом недавно подготовленном справочнике на двух (государственном и русском) языках [13, 14]. В нем дана глубокая и всесторонняя характеристика счетов и субсчетов бухгалтерского учета. Очень подробно и в новой, наиболее простой, ясной, совершенной и наилучшей табличной форме представлен весь их перечень, действующий в настоящее время.

При этом для удобного пользования впервые бухгалтерские счета указываются в одной, первой графе, а их субсчета – в другой, второй, то есть отдельно. Это поможет легко и быстро изучить все счета и правильно использовать их в современной теории и практике бухгалтерского учета, финансового аудита, контроля, экономического анализа и управления.

Справочник такого содержания подготовлен впервые и предназначен для студентов и преподавателей колледжей и университетов. Он также поможет в практической работе многим бухгалтерам, экономистам, аудиторам, финансистам, налоговикам, менеджерам и руководителям различных предприятий и организаций Приднестровья и Республики Молдова.

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**ВОПРОСЫ ПРИМЕНЕНИЯ НДС ПРИ ОСУЩЕСТВЛЕНИИ
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Abstract. This article examines the impact of value added tax on the size of budget expenditures in public procurement. The main directions for reducing the above-mentioned costs are outlined. Legal norms regulating the mechanism of calculation, presentation and offset of value added tax in the framework of public procurement have been developed.

Keywords: Tax law, value added tax, state budget, public procurement

Функционирование любого современного государства неразрывно связано с осуществлением государственных расходов, направленных на содержание органов власти, обеспечение межгосударственных и дипломатических отношений, расходов, связанных с обороной суверенитета, социальных расходов, направленных на финансирование образования, здравоохранения и др. При этом расходы не осуществляются непосредственно государством, финансирование происходит путем открытия планов финансирования через республиканский и местные бюджеты субъектам хозяйствования, осуществляющим те или иные функции для удовлетворения соответствующих потребностей государства. Другими словами, государство является только источником финансирования. Субъекты хозяйствования, для выполнения поставленных перед ними задач, осуществляют текущие и капитальные расходы через систему государственных закупок.

На протяжении последнего десятилетия в Республике Беларусь принят ряд нормативно-правовых актов, регулирующих порядок проведения государственных закупок, обеспечивающих прозрачность их проведения [1]. Помимо прозрачности проведения, государственные закупки должны обеспечить оптимальное удовлетворение потребностей при минимальном расходовании бюджетных средств. Размер расходования бюджетных средств напрямую зависит от количества необходимых ресурсов и цены за единицу ресурса. Повлиять на количество практически невозможно, поэтому экономия бюджетных средств при осуществлении государственных закупок может быть достигнута регулированием ценообразования и, в частности, за счет льготирования либо освобождения от налога на добавленную стоимость при реализации продукции, выполнении работ, оказании услуг в рамках государственных закупок.

Поэтому вопрос регулирования обложения налогом на добавленную стоимость операций, возникающих при исполнении обязательств в рамках проведения государственных закупок является актуальным.

На современном этапе развития экономики, государство является активным участником рыночных отношений и через систему государственных закупок оказывает непосредственное влияние на производственные, инновационные, инвестиционные и социальные процессы.

Законодательно понятие государственной закупки закреплено ст.1 Закона Республики Беларусь «О государственных закупках» №419-З от 13.07.2012 года (с изменениями и дополнениями) [2]. Под государственной закупкой понимается – приобретение товаров (работ, услуг) полностью или частично за счет бюджетных средств и (или) средств

государственных внебюджетных фондов получателями таких средств, а также отношения, связанные с исполнением договора государственной закупки.

По мнению Соркина Г.С. «развитие экономических отношений объективно требует постоянного совершенствования юридических норм, позволяющих усилить динамику современных общественных процессов. Исходя из этого государственные и частные организации, юристы и экономисты уделяют самое пристальное внимание вопросам правового регулирования государственных закупок. Соблюдение юридических процедур размещения заказов, их прозрачность напрямую связаны с эффективностью государственного управления и целевым расходованием бюджетных средств, и вместе с тем являются действенными мерами противодействия коррупции» [3]. При этом под эффективностью следует понимать экономическую категорию. Рассматривая эффективность осуществления государственных закупок А.В. Запольский определяет ее как «достаточно полное удовлетворение потребности покупателя (получателя бюджетных средств) в товаре, работе или услуге в процессе совокупности последовательно выполняемых торгово-организационных операций, при оптимальном (минимально возможном) использовании бюджетных средств [4].

Для эффективного осуществления государственных закупок необходимо разработка юридических норм, способных оказывать влияние на экономическую эффективность. Разработанные юридические нормы должны способствовать наименьшему расходованию бюджетных средств. При этом снижение стоимости приобретаемых материальных ценностей (работ, услуг) не должен влиять на качественную составляющую предмета государственных закупок. Так как количество и качество приобретаемых материальных ценностей, работ (услуг) при осуществлении государственных закупок определяется в результате обоснованных расчетов, под определенные задачи, поставленные перед хозяйствующими субъектами, то, как правило, при попытке уменьшения объемов наблюдается снижения качества либо возникает невозможность в удовлетворении той или иной государственной потребности.

Следовательно, в качестве объекта правового регулирования необходимо избрать цену на товары, работы (услуги). Для воздействия на цену путем юридического механизма регулирования, необходимо объект разбить на составляющие и определить правовые нормы, которые приведут к повышению экономической эффективности государственных закупок. Цена — это экономическая категория, которую в упрощенном варианте можно представить в виде: себестоимости произведенных материальных ценностей, выполнения работ (оказания услуг); наценки; налога на добавленную стоимость.

Себестоимость (затраты на производство) и наценка — это процессы, происходящие на уровне предприятий и правовое регулирование с целью их уменьшения на этом уровне не принесет положительных результатов. Несмотря на то, что налоговое законодательство не регулирует вопросы ценообразования, косвенные налоги, к которым относится налог на добавленную стоимость, оказывают существенное влияние на размер отпускных цен. Дерюжков А.В. определяет косвенные налоги как, «обязательные, индивидуальные, безвозмездные платежи, взимаемые с конечных потребителей материальных ценностей (работ, услуг) в доход государства через посредников, на размер которых влияет вид товара (работы, услуги) и его цена» [5]. Соответственно плательщиком налога на добавленную стоимость при осуществлении государственных закупок будет являться государство, и уплачиваемый налог будет увеличивать расходы республиканского и местных бюджетов. В то же время на протяжении всего периода исчисления и взимания в государственный бюджет налог на добавленную стоимость является основным налоговым доходом.

Налог на добавленную стоимость при осуществлении государственных закупок это обязательный платеж республиканского либо местного бюджета в доход республиканского бюджета через посредника. При этом посредником является, как правило, коммерческая

организация, выполняющая роль поставщика (исполнителя) товаров, работ (услуг) в рамках исполнения договора государственной закупки.

Учитывая вышеперечисленные аналитические исследования, можно с уверенностью сказать, что с одной стороны налог на добавленную стоимость это расходы бюджета при осуществлении государственных закупок, а с другой стороны это основной источник налоговых доходов бюджета. И если за все время существования суверенной Республики Беларусь не известно случаев, когда государство не выполнило свои обязательства по финансированию расходов, осуществляемых в рамках государственных закупок, то учитывая судебную практику, практику рассмотрения административных материалов инспекциями Министерства по налогам и сборам Республики Беларусь, можно с уверенностью сказать, что налог на добавленную стоимость является одним из наиболее «проблемных».

Проблемность налога на добавленную стоимость выражается в сокрытии (занижении) налоговой базы, применение неправильных ставок налога, неуплата (неполная уплата) налога в бюджет. Таким образом, государство при исполнении обязательств в рамках осуществления государственных закупок осуществляет реальное расходование бюджетных средств, в том числе и на оплату налога на добавленную стоимость, как конечный потребитель и в то же время, учитывая практику применения налога на добавленную стоимость, существует вероятность не поступления данного налога обратно в республиканский бюджет по причине недобросовестности поставщиков (исполнителей) являющихся одной из сторон договоров государственных закупок.

Так как государство при осуществлении государственных закупок является одновременно и плательщиком и получателем налога на добавленную стоимость наиболее целесообразным и экономически эффективным считаем необходимость правового регулирования финансового механизма направленного на корректировку существующего порядка исчисления и перечисления данного налога в Республиканский бюджет. А именно добавить текстуальную часть Налогового Кодекса Республики Беларусь (Особенная часть) изменения следующего содержания:

- государственным органам, бюджетным организациям и иным организациям при осуществлении оплаты через органы государственного казначейства за счет средств республиканского и (или) местного бюджетов расчеты производить за минусом причитающегося налога на добавленную стоимость
- при реализации товаров, работ (услуг) обеспечить отдельный учет выручки, полученной в рамках исполнения договоров, заключенных в результате государственных закупок
- при расчете сумм налога на добавленную стоимость, подлежащую перечислению в республиканский бюджет, суммы предъявленные покупателям (заказчикам) считать оплаченными – произвести зачет.

Данные изменения позволят применять ранее установленные ставки налога на добавленную стоимость, уменьшает риски недопоступления налога на добавленную стоимость в республиканский бюджет, обеспечит равные условия участия в государственных закупках как плательщиков налога на добавленную стоимость, так и юридических лиц и индивидуальных предпринимателей, которые в соответствии с налоговым законодательством таковыми не признаются. Кроме того, устоявшаяся система ценообразования при этом не изменится.

Для обеспечения потребностей необходимых для функционирования государства на современном этапе развития экономики наиболее эффективным механизмом является механизм государственных закупок. Одним из основополагающих принципов государственных закупок признается качественное и количественное удовлетворение потребностей государства при минимальных затратах республиканского и (или) местного бюджетов. Добиться минимизации затрат бюджета возможно за счет цены, так как экономия на качественной и количественной составляющей приводит к негативным результатам. В ходе

анализа было установлено, что при осуществлении государственных закупок государство выступает в роли как плательщика (конечный потребитель) так и получателя налога на добавленную стоимость. Несмотря на то, что налоговое законодательство не оказывает прямого влияния на существующую систему ценообразования, посредством косвенных налогов, к которым относится и налог на добавленную стоимость, путем разработки норм права, направленных на регулирования экономических отношений возникающих при осуществлении государственных закупок, возможно оптимизация расходов бюджета.

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СПЕЦИФИКА УЧЕТА ДОЛГОСРОЧНЫХ МАТЕРИАЛЬНЫХ АКТИВОВ В НЕКОММЕРЧЕСКИХ ОРГАНИЗАЦИЯХ

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Abstract

The article examines the specific features of accounting for long-term tangible assets in non-profit organizations, taking into account the targeted nature of their activities, sources of financing, and requirements for transparency in financial reporting. Particular attention is paid to the recognition and accounting of transactions related to the acquisition, use, and depreciation of fixed assets purchased with earmarked funds, as well as to the interrelation between financial and management

accounting. Based on the practical experience of non-profit organizations, the necessity of a project-based approach to accounting for long-term assets is substantiated.

Keywords: non-profit organizations, long-term tangible assets, fixed assets, earmarked financing, project-based accounting, accounting.

Аннотация В условиях развития гражданского общества и расширения сферы деятельности некоммерческих организаций (НКО) возрастает значимость достоверного и прозрачного бухгалтерского учета. Существенную долю активов НКО составляют долгосрочные материальные активы (основные средства), используемые для реализации уставных и проектных целей. В отличие от коммерческих организаций, учет таких активов в НКО имеет ряд специфических особенностей, обусловленных целевым характером финансирования, многоисточностью поступлений и необходимостью контроля за эффективным использованием ресурсов.

Актуальность исследования определяется необходимостью совершенствования методических подходов к учету долгосрочных материальных активов в НКО, а также гармонизации национальных правил учета с международной практикой.

Цель статьи – раскрыть специфику учета долгосрочных материальных активов в некоммерческих организациях и обосновать особенности их отражения в бухгалтерском и управленческом учете.

Долгосрочные материальные активы в некоммерческих организациях представляют собой активы, используемые в деятельности организации в течение периода, превышающего один отчетный год и по стоимости свыше лимита, установленного законодательством Республики Молдовы для отнесения в категорию основных средств, и предназначенные не для извлечения прибыли, а для достижения уставных целей.

К таким активам в рамках некоммерческих организаций чаще всего относятся:

1. здания и сооружения;
2. оборудование и техника;
3. транспортные средства;
4. инвентарь длительного использования.

В отличие от коммерческих структур, в НКО основные средства не формируют доход в классическом понимании, а обеспечивают реализацию социальных, образовательных, культурных и иных общественно значимых программ. Следовательно, учет долгосрочных активов должен быть тесно связан с учетом целевых средств и проектной деятельности. Если параллельно выполняются несколько проектов, то основные средства учитываются в разрезе проектов.

Учет долгосрочных материальных активов в некоммерческих организациях регулируется:

1. национальными стандартами бухгалтерского учета;
2. положениями налогового законодательства;
3. методическими рекомендациями для НКО;
4. международными стандартами финансовой отчетности (в частности, IAS16 «Основные средства» – в адаптированной форме).

Согласно как национальной, так и международной практике, актив признается основным средством при наличии вероятности получения будущих экономических выгод или полезного потенциала, а также возможности достоверной оценки его стоимости. Для НКО ключевым является понятие «полезного потенциала», а не экономической выгоды.

Для более глубокого понимания темы, следует разобрать источники формирования долгосрочных материальных активов в НКО. Основные средства в некоммерческих организациях могут формироваться за счет:

- целевых поступлений от доноров;
- грантов международных организаций;
- бюджетных ассигнований;

- безвозмездных поступлений (в частности членских взносов);
- собственных средств организации.

Особенностью учета является необходимость четкого разграничения источников финансирования и привязки каждого объекта основных средств к конкретному проекту или программе.



Рисунок 1 – Источники формирования долгосрочных материальных активов в некоммерческих организациях.

Источник: разработан и составлен автором.

Поступление основных средств в НКО оформляется стандартными первичными документами (акт приема-передачи, накладные, договоры). Однако при приобретении за счет целевых средств дополнительно указывается проект и источник финансирования.

На практике используется следующий подход:

1. отражение поступления объекта основных средств;
2. одновременное признание использования целевых средств;
3. закрепление объекта за конкретным проектом.

В учетных системах НКО применяется проектная аналитика, позволяющая формировать отчетность в разрезе проектов и доноров.

Вопрос начисления амортизации в НКО является дискуссионным. С одной стороны, основные средства физически и морально изнашиваются, с другой – амортизация не формирует себестоимость продукции или услуг.

На практике применяются следующие подходы:

1. начисление амортизации с одновременным признанием доходов целевого финансирования;
2. отражение амортизации в рамках проекта, за счет которого приобретен актив;
3. использование линейного метода как наиболее прозрачного и обоснованного.

Записать и закрыть

Обновить

Еще ▾

?

☐ Ручная корректировка (разрешает редактирование движений документа)

Бухг...

Место...

Начис...

Начис...

Парам...

Парам...

Перво...

Перво...

Событ...

Состо...

Специ...

Спосо...

Счета ...

Еще ▾

Дата	Дебет	Кредит	Сумма
02.01.2021	123.1	121.2 Кол.: 1,000	10 000,00
	1 Основное подразделение	Основное подразделение	Принят к учету объект ОС
	Принтер Canon	Принтер Canon	
02.01.2021	537.1	341.2	10 000,00
	2 Основное подразделение	Основное подразделение	
	3.5.PAS:Printed Materials (бюджетная линия)		
	CENTRUL PAS (донор)		

Рисунок 2 – Механизм отражения амортизации основных средств, приобретенных за счет целевых средств.

Источник: 1С Бухгалтерия, конфигурация НКО.



Одной из главных особенностей учета в НКО является параллельное ведение финансового учета (для формирования отчетности) и управленческого учета (для контроля исполнения проектов и бюджетов).

В зависимости от учетной политики может применяться:

- кассовый метод;
- метод начисления.

При этом расходы по долгосрочным активам отражаются в регистрах управленческого учета в разрезе проектов и бюджетных линий, что обеспечивает прозрачность и контроль использования средств.

Некоммерческие организации обязаны раскрывать информацию о долгосрочных материальных активах:

1. по видам активов;
2. по источникам финансирования;
3. по проектам и программам;
4. по остаточной стоимости и степени износа.

Такая детализация повышает доверие доноров, государственных органов и иных заинтересованных сторон, в частности членов НКО.

Учет долгосрочных материальных активов в некоммерческих организациях имеет выраженную специфику, обусловленную целевым характером деятельности и источников финансирования. Применение проектного подхода, интеграция финансового и управленческого учета, а также корректное отражение амортизации позволяют обеспечить прозрачность и достоверность учетной информации. Совершенствование методологии учета основных средств в НКО способствует повышению эффективности использования ресурсов и укреплению доверия доноров.

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ПРОБЛЕМНЫЕ ВОПРОСЫ УПРАВЛЕНЧЕСКОГО УЧЕТА В ЖИВОТНОВОДСТВЕ

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Abstract: To make timely, accurate, and informed management decisions, a manager must have the necessary analytical data on costs and revenues. Management accounting is the source of this information.

Keywords: управленческий учет, животноводство, затраты, калькуляция, молоко, крупный рогатый скот, себестоимость.

Ведение управленческого учета выступает ключевым условием для принятия обоснованных решений со стороны руководства сельскохозяйственной организации. Бухгалтерский учет в целом – является языком бизнеса и деловой активности. Во многих государствах учетная система дифференцируется на финансовый, управленческий и налоговый учет. Управленческий учет ориентирован на аккумуляцию данных о затратах и доходах, их планировании, мониторинге и аналитической обработке в разрезе категорий затрат, центров их возникновения и объектов калькулирования с целью оптимизации управления производственными операциями.

Управленческий учет включает производственный учет и используется при осуществлении внутренних хозяйственных операций организации. В отличие от финансового учета, управленческий учет носит субъективный и конфиденциальный характер, однако именно он служит основой для принятия стратегических управленческих решений.

В организации управленческого учета особое внимание уделяется калькулированию себестоимости продукции (работ, услуг), системе учета полной стоимости, «директ-костинг», «стандарт-кост».

Животноводство является одной из важнейших отраслей сельского хозяйства. На долю животноводства, включающего молочное и мясное скотоводство, приходится более 50 % в структуре стоимости валовой продукции сельского хозяйства. Знания о количестве, направлениях движения животноводческой продукции, ее стоимости, напрямую влияют на точность и своевременность принятия управленческих решений. В этих условиях повышается значимость бухгалтерского учета как основы информационной базы для принятия эффективных управленческих решений.

Данные управленческого учета используются внутри организации руководителями различных уровней. Особую значимость в рамках производственного и управленческого учета занимает учет затрат и выхода продукции животноводства. Учитывая особенности функционирования различных подотраслей животноводства, учет расходов варьируется в зависимости от направления деятельности, что порождает необходимость применения индивидуальных подходов к исчислению себестоимости продукции. Аналогичная ситуация складывается при учете затрат и калькулировании себестоимости продукции скотоводства.

При организации учета затрат на производство и исчислении себестоимости продукции животноводства в сельскохозяйственных организациях следует руководствоваться Методическими рекомендациями по учету затрат и калькулированию себестоимости сельскохозяйственной продукции (работ, услуг), утвержденных письмом Министерства сельского хозяйства и продовольствия Республики Беларусь от 14 января 2016 г. № 04-2-1-32/178 [2]. Затраты, которые относятся к производству сельскохозяйственной продукции, группируются в соответствии с их экономическим содержанием по пяти элементам:

- 1) материальные затраты (за вычетом стоимости возвратных отходов);
- 2) затраты на оплату труда;
- 3) отчисления на социальные нужды;
- 4) амортизация основных средств и нематериальных активов;
- 5) прочие затраты.

Затраты, связанные с производством продукции, группируются в соответствии с типовой номенклатурой калькуляционных статей производственных затрат.

Учет затрат и выхода продукции в животноводстве осуществляется по видам или технологическим группам животных.

Объектами исчисления себестоимости продукции основного стада молочного скота является молоко и приплод. Для исчисления себестоимости 1 ц молока и 1 головы приплода из общей суммы затрат на содержание основного молочного стада исключается стоимость побочной продукции (навоза). Оставшаяся сумма затрат распределяется в соответствии с расходом обменной энергии кормов: 90 % – на молоко, 10 % – на приплод.

Себестоимость прироста живой массы молодняка всех возрастов и взрослых животных, выбракованных из основного стада и поставленных на откорм, определяется затратами на их содержание за вычетом стоимости побочной продукции.

В таблице приведены основной макроэкономический и отдельные производственные и финансовые показатели по скотоводству в Беларуси.

Таблица. – Динамика отдельных показателей животноводства в Республике Беларусь

Показатели	2010 г.	2015 г.	2020 г.	2022 г.	2023 г.	2024 г.	Отклонение 2024 г. от		
							2010 г.	2015 г.	2020 г.
Удельный вес продукции с. х-ва в структуре ВВП, %	8,9	6,3	7,1	8,1	7,3	6,9	-2	0,6	-0,2
Удельный вес в структуре продукции сельского хозяйства, %									
Продукция животноводства	48,7	55,2	52,3	52,1	53,4	53,2	4,5	-2	0,9
в том числе: производство (выращивание) скота и птицы (в живом весе)	24,6	26,2	20,2	19,6	18,7	18,5	-6,1	-7,5	-1,7
молоко	20,9	26,0	29,4	29,8	32,5	32,5	11,6	6,5	3,1
Производство основных видов продукции животноводства, тысяч тонн									
Реализация КРС (в живом весе)	495,4	575,4	555,8	557,4	581,7	607,6	112,2	32,2	51,8
Производство молока	5731,4	6637,5	7498,2	7647,5	8120,5	8544,6	2813,2	1907,1	1046,4
Средние цены производителей сельскохозяйственной продукции, рублей за тону:									
КРС (в живом весе)	421,9	1792,0	2593,24	3447,88	3676,05	3766,91	3345,01	1974,91	1173,67
Молоко сырое коровье	85,4	424,4	733,90	1027,24	1057,15	1102,85	1017,45	678,9	368,95

Источник: Составлено авторами публикации по данным источников [3; 4].

Данные таблицы показывают изменения в структуре стоимости продукции животноводства. Так за анализируемый период удельный вес молока в структуре продукции сельского хозяйства увеличился на 11,6 п. п. за счет сокращения на 6,1 п. п. удельного веса производства (выращивания) скота и птицы (в живом весе). Не одинаковы темпы роста основных видов продукции животноводства со средними ценами производителей сельскохозяйственной продукции. При рассмотрении динамики средних цен (с учетом деноминации 2016 года) видно, что цена на молоко возросла в 12,9 раза (1102,85 / 85,4), тогда как цена на КРС (в живом весе) увеличилась в 8,9 раза (3766,91 / 421,9).

Сегодня почти каждый второй рубль выручки сельхозпредприятий Беларуси формируется за счет реализации продукции скотоводства и за последнее десятилетие эта доля значительно выросла. Основную роль здесь сыграл рост производства и сбыта молока, сопровождавшийся повышением рентабельности его реализации и увеличением убытков от откорма крупного рогатого скота на убой.

Вместе с тем в результате декларирования высокой рентабельности производства молока порождает ложное представление об успехах всей отрасли. Так, многие полагают, что сельхозпредприятия зарабатывают больше, чем переработчики, игнорируя убыточность откорма КРС.

В последние годы цены определяются преимущественно рыночными условиями, тогда как формирование и учёт затрат остается прерогативой отдельных хозяйств.

Учет затрат и их распределение являются одним из трудоемких и важных этапов расчета себестоимости продукции. При этом вопросы калькуляции и учёта часто остаются за рамками внимания исследователей, которые сосредотачиваются преимущественно на факторном анализе и конкретных примерах реализации существующих методик, хотя

большинство используемых подходов было разработано еще советскими экономистами и не претерпели существенных изменений.

Анализ действующего подхода к калькулированию затрат в животноводстве позволяет выделить ряд проблемных аспектов, влияющих на достоверность аналитических данных к которым можно отнести необходимость калькуляции стоимости приплода и целесообразность начисления амортизации на животных основного стада [1, С. 417].

Таким образом, действующая методика расчета себестоимости молока приводит к искажению финансовых результатов, поскольку в состав прибыли от реализации молока необоснованно включается прибыль, полученная от выращивания ремонтного молодняка (нетелей). При этом, значительная часть затрат переходит на продукцию КРС через завышенную стоимость приплода и списанных (по стоимости полученных нетелей) коров.

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SECTION II. INFORMATION TECHNOLOGY, MATHEMATICS AND PHYSICS
SEKŬIYA II. INFORMACIŬN TEHNOLOGIYALARI, MATEMATIKA HEM FIZIKA
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СЕКЦИЯ II. ИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ, МАТЕМАТИКА И ФИЗИКА

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ТРАНСФОРМАЦИЯ РЫНКА ТРУДА ДЛЯ НАЧИНАЮЩИХ
ИТ-СПЕЦИАЛИСТОВ В ЭПОХУ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

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Abstract Artificial intelligence and automation have significantly reduced the number of entry-level positions in the IT sector, resulting in a global employment crisis among engineering graduates. This article analyzes the key transformations in the recruitment of entry-level specialists, as identified in international research and analytical reports.

Keywords artificial intelligence, information technology, education, career in the IT industry.

Современные тенденции развития искусственного интеллекта (ИИ) оказывают значительное влияние на рынок труда в сфере информационных технологий. Если еще несколько лет назад выпускники инженерных специальностей могли рассчитывать на стабильное трудоустройство в крупных технологических компаниях, то сегодня ситуация кардинально изменилась. Автоматизация рутинных процессов и внедрение ИИ привели к сокращению стартовых вакансий, а традиционные методы оценки кандидатов утратили свою эффективность.

По данным издания Rest of World [1], за последние три года количество нанятых выпускников в крупных технологических компаниях сократилось более чем на 50%. В Индии компании уменьшили число позиций начального уровня на 20–25%, а в Европе падение составило около 35%. Причиной стало то, что задачи, ранее выполняемые молодыми специалистами (джуниорами) – отладка, тестирование и поддержка программного обеспечения – теперь автоматизируются с помощью ИИ.

На платформе Handshake количество вакансий для студентов и выпускников снизилось на 16% за год. При этом среднее количество заявок на одну вакансию выросло на 26%, что означает: даже при сокращении числа позиций конкуренция становится значительно выше. В результате выпускники вынуждены подавать сотни заявок, чтобы получить хотя бы несколько предложений на собеседование [2].

В 2024 году лишь 7% новых сотрудников в крупных компаниях были недавними выпускниками. До 37% менеджеров заявили, что предпочли бы использовать ИИ вместо найма представителей поколения Z. Таким образом, даже при наличии вакансий работодатели все чаще отдадут предпочтение автоматизированным системам, а не молодым специалистам [3].

Как отмечается в [2], традиционные метрики – средний балл, сопроводительные письма и результаты собеседований – перестали быть надежными индикаторами компетентности кандидатов. Инфляция оценок в университетах и массовое использование генеративных моделей для написания писем делают эти показатели практически бессмысленными. Например, ранее средний балл считался ключевым индикатором академической успеваемости и дисциплины. Однако в последние десятилетия наблюдается инфляция оценок, так, например, в Гарварде 20 лет назад менее 25% оценок были «А». Сегодня этот показатель вырос до 60%, что делает средний балл малоинформативным для работодателей [2].

В результате диплом с высоким средним баллом перестал быть надежным критерием отбора, так как большинство студентов демонстрируют «отличные» результаты только на бумаге. ИИ радикально изменил процесс найма: традиционные метрики перестали работать, конкуренция выросла, а компании вынуждены искать новые способы проверки навыков. В результате работодатели все чаще прибегают к альтернативным методам отбора: тестовым заданиям, стажировкам и проверке реальных навыков.

С другой стороны, начинающие IT-специалисты сталкиваются с апокалипсисом на рынке труда. Так в настоящее время происходит трансформация традиционной модели профессионального становления инженеров, при которой выпускник, получив базовое высшее образование, начинал карьеру с выполнения относительно простых технических задач и постепенно накапливал профессиональный опыт. Сейчас данная модель стремительно утрачивает устойчивость в условиях массового внедрения инструментов автоматизации и генеративного ИИ. Компании ожидают от выпускников не только технических знаний, но и развитых навыков управления проектами, взаимодействия с заказчиками, а в ряде случаев – участия в продажах и бизнес-развитии. Таким образом, инженерная роль все чаще дополняется или даже замещается функциями, не связанными напрямую с традиционной инженерной подготовкой. При этом сами работодатели признают, что университетские учебные программы не успевают адаптироваться к стремительным изменениям технологической среды [1].

Таблица 1 показывает, что рынок труда сместился от формальных академических показателей к практическим и междисциплинарным навыкам. Выпускники должны быть не только инженерами, но и универсальными специалистами, способными работать с ИИ и приносить ценность в разных сферах.

Таблица 1 – Эволюция требований к выпускникам

Категория	Старые требования	Новые требования
Технические навыки	Базовое знание языков программирования (C, Java, Python)	Умение интегрировать и использовать ИИ-инструменты для автоматизации задач
Оценка кандидата	Средний балл (GPA), диплом, сопроводительные письма	Реальные проекты, портфолио, стажировки, практические кейсы
Коммуникация	Умение пройти собеседование, базовые soft skills	Навыки переговоров, работа с клиентами, командная координация
Роль в компании	Узкая специализация: программист, тестировщик	Междисциплинарность: управление проектами, маркетинг, продажи наряду с технической работой
Образование	Университетский диплом считался достаточным	Постоянное самообучение, освоение новых дисциплин вне академической программы
Карьерные перспективы	Линейный рост: джуниор → мидл → сеньор	Гибкая траектория: возможные переходы в смежные сферы (продукт-менеджмент, маркетинг, бизнес-аналитика)

В качестве реакции на происходящие изменения часть выпускников рассматривает возможность перехода в смежные или нетехнические сферы, такие как продажи, маркетинг или управление продуктами. Другие приходят к выводу, что полученное инженерное образование не в полной мере соответствует актуальным запросам рынка труда. Сложившаяся ситуация ставит под сомнение устойчивость существующей образовательной модели, при которой многолетнее обучение не гарантирует востребованности выпускника.

Таким образом можно сделать вывод, что рынок труда для начинающих IT-специалистов переживает глубокую трансформацию. Искусственный интеллект не только сокращает количество стартовых вакансий, но и меняет критерии отбора кандидатов. Традиционные показатели утратили значимость, а выпускники сталкиваются с необходимостью развивать навыки, отличные от навыков классического программирования.

И в этом, с нашей точки зрения, кроется большая опасность.

Последние годы ознаменовались утверждением нового типа разработчиков, которые используют так называемое «вайб-кодинг» – программирование на основе ощущений и подсказок ИИ, без глубокого понимания синтаксиса и процессов алгоритмизации. Если раньше инженер был разработчиком, понимающим все нюансы созданного им функционала, то теперь он по сути превращается в оператора «черного ящика».

В настоящее время работодатель открыто заявляет: «Нам не нужны профессионалы, досконально владеющие навыками программирования. Нам нужны те, кто генерирует код». Этот фундаментальный сдвиг в профессии характеризует переход от написания кода к рецензированию кода, написанного нейросетью. Но чтобы качественно рецензировать, нужно обладать большими знаниями, чем нейросеть. В противном случае мы попадаем в ловушку компетентности. Джуниор видит, что сгенерированный код запускается и отправляет его в работу. Он «чувствует вайб», что все замечательно и задание выполнено.

Бизнес приветствует внедрение ИИ и существенную экономию затрат – зачем нанимать «дорогого» профессионала, если нейросеть формирует тысячи строк кода за минуту. Ответ прост и очевиден – обеспечение техподдержки. ИИ позволяет генерировать функционал с большой скоростью, однако код, написанный ИИ, часто страдает от скрытых дефектов: использование несоответствующих библиотек, нарушение правил кибербезопасности, логические бомбы, которые «взрываются» при определенных граничных условиях. Когда такой код накапливается, функционал превращается в громадный неповоротливый механизм. Поддерживать его становится невозможно, потому что никто – ни человек, ни ИИ не понимает общей картины.

При этом опытные инженеры либо уходят, устав исправлять то, что сгенерировали «вайб-кодеры», либо их выдавливают как «балласт», мешающий прогрессу. В результате теряется школа инженеров, которая заменяется школой операторов промптов. И когда ИИ в очередной раз сгенерирует громоздкий и неповоротливый функционал, в команде может не остаться никого, кто способен понять, почему это решение абсурд. И современный бизнес должен это четко понимать.

В этих условиях ключевым фактором успешного трудоустройства выпускников является компромисс между пониманием работодателем долгосрочных перспектив развития бизнеса и способностью системы образования к оперативному пересмотру образовательных программ и подходов к формированию профессиональных навыков, способствующих быстрому самостоятельному освоению новых компетенций. Без этого проблема трудоустройства молодых инженеров будет только усугубляться.

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**ТЕОРИЯ И МЕТОДОЛОГИЯ ФОРМИРОВАНИЯ ЖИЗНЕННЫХ КОМПЕТЕНЦИЙ
УЧАЩИХСЯ ПОСРЕДСТВОМ ФИЗИЧЕСКИХ ЭКСПЕРИМЕНТОВ КАК
ИНСТРУМЕНТА ПОДГОТОВКИ К РЕАЛЬНОЙ ЖИЗНИ.****Сергей Михайлович Капталан**

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Abstract. The article discusses the problem of developing students' life competencies and functional literacy in the process of teaching physics. The reasons for the decline in the quality of science education in the post-Soviet period are analyzed, and the necessity of revising methodological approaches is substantiated. Special attention is paid to the role of simple physical experiments as a basic tool of cognition for pupils aged 10-15. The author proves that in conditions of a shortage of educational equipment and the digitalization of society, it is the independent experiment with simple instruments that is the key to developing critical thinking, observation skills, and the ability to apply knowledge in unfamiliar real-life situations.

Keywords: physics teaching methodology, life competencies, educational experiment, simple physical instruments, activity-based approach, science education.

Громадное значение естествознания как в образовании каждого отдельного человека, так и во всей культурной жизни человечества в настоящее время является фактом общепризнанным и неоспоримым. Физика, как наука о наиболее общих законах природы, составляет базис современного мировоззрения. Всякий рядовой работник школы, и в особенности учитель физики, должен ясно сознавать, что его важнейшая обязанность – не просто транслировать набор формул, но приобщить учащегося к великим достижениям естественных наук, сделав их частью его повседневного мышления.

Для этой цели в распоряжении учителя имеются предметы классного преподавания, которые знакомят учащегося с явлениями природы путем точных методов. К таким предметам относятся физика, широко пользующаяся математическим аппаратом, а также химия. Взаимосвязь этих дисциплин формирует единую картину мира, однако именно физика часто выступает тем каркасом, на котором держится понимание процессов в смежных науках.

Еще 30 лет назад профессор Ф. Н. Шведов писал: *«Можно быть первоклассным астрономом, не зная минералогии, минерологом – не зная ботаники, химиком – не зная зоологии, наконец, физиком – не зная ни одной из вышеназванных наук. Но нельзя быть специалистом хотя бы по одной из этих наук, не имея хотя бы элементарных, но точных сведений по физике»* [1]. Эти слова не потеряли своей актуальности и сегодня. Напротив, в эпоху междисциплинарных исследований роль физики как методологической основы только возрастает.

Однако, несмотря на декларируемую важность предмета, мы сталкиваемся с серьезным противоречием между требованиями современного общества к выпускнику и реальным состоянием школьного физического образования.

Кризис практического метода и его предпосылки

Значение физики в познании окружающего мира, в социально-экономической и культурной жизни общества весьма велико. В современной концепции физического образования отмечается, что физика рассматривается как важнейшая составляющая научно-технического прогресса, а ее преподавание в школе всегда было в центре внимания общественности и государственных органов образования.

Тем не менее, анализ образовательной динамики показывает тревожные тенденции. Начиная с 90-х годов XX века проявилась нарастающая тенденция к отставанию уровня знаний и, что более важно, практических умений школьников. Сравнительные международные исследования и результаты локальных мониторингов демонстрируют особенно низкие результаты освоения нашими учащимися элементов научных методов познания. Ученики могут воспроизвести закон Ома, но теряются при необходимости применить свои знания в незнакомых ситуациях – например, объяснить бытовое явление или диагностировать простую неисправность электроприбора.

Основными причинами снижения качества обучения, не считая общих социально-экономических факторов данного периода, являются следующие:

1. **Сокращение учебного времени** на изучение физики в базисных учебных планах.
2. **Разрушение материально-технической базы**, системы обеспечения школ учебным физическим оборудованием.
3. **Вымывание экспериментального метода обучения** из школьной практики.

Отсутствие в процессе изучения физики полноценных опытов значительно затрудняет формирование у школьников умений методологического характера. Физика превращается в «меловую» науку, где реальные явления подменяются их текстовыми описаниями или абстрактными схемами. В таких условиях формирование жизненных компетенций – способности решать реальные задачи – становится невозможным.

Целевые ориентиры в контексте интеграции образования

Интеграция Молдавской общеобразовательной школы в мировое образовательное пространство и ее богатые педагогические традиции предполагают переосмысление целей физического образования. Приоритетами становятся не только академические знания, но и личностное развитие ученика.

Ключевые цели современного физического образования можно сформулировать следующим образом:

- Усвоение учащимися основ фундаментальных физических теорий и ознакомление с методами научного познания.
- Формирование физической картины мира и умений применять научные знания для анализа наблюдаемых процессов.
- Развитие у школьников таких личностных качеств, как наблюдательность, любознательность, образное и аналитическое мышление.
- Формирование и поддержание устойчивого познавательного интереса к физике, раскрытие ее роли в современной цивилизации.
- Помощь выпускникам в профессиональном самоопределении.

Достижение указанных выше целей обучения физике абсолютно невозможно без систематического использования в учебном процессе физического эксперимента.

Психолого-педагогическое обоснование экспериментального метода

Исходя из особенностей детского внимания и психологии восприятия, необходимо при преподавании физики выдвинуть на первый план именно опыт, непосредственное взаимодействие с материей. Усвоение физики исключительно по книге или со слов учителя, без эксперимента, неизбежно влечет за собою механическое, часто бессознательное запоминание фактов, которые в сознании ребенка не связываются с действительностью. Это приводит к так называемому «фрагментарному мышлению».

Мерилом успешности преподавания должно явиться наличие у учащегося конкретных, чувственных представлений. Называя предмет, описывая явление (будь то инерция, кипение или электризация), учащийся должен вспоминать не страницу учебника и не интонацию учителя, а **собственные наблюдения**, при которых он лично ознакомился со свойствами и особенностями предмета или явления.

Здесь мы опираемся на известный из педагогики и психологии тезис о том, что восприятие ученика в возрасте 10-15 лет (основная школа, 5-9 классы) является **чувственно-конкретным**. Абстрактное мышление находится в стадии формирования, и для его развития необходим фундамент из осязаемых образов. Именно поэтому демонстрационный эксперимент, проводимый учителем за столом, дает гораздо меньше пищи для размышления и развития, чем эксперимент, поставленный самим учащимся.

Следует отметить, что применение физического эксперимента в процессе обучения физике всегда было предметом особого внимания ученых-методистов и учителей-практиков. С. Ф. Покровский справедливо отмечает: *«Без эксперимента нет и не может быть рационального обучения физике; однословесное обучение физике неизбежно приводит к формализму и механическому заучиванию. Учебный физический эксперимент позволяет формировать интерес к изучению физики, развивать экспериментальные умения школьников, что, безусловно, очень важно для эффективного усвоения теоретических обобщений»* [2].

Именно в процессе проведения эксперимента на основе предметной деятельности идет освоение школьниками образцов социокультурного опыта, который несет в себе наука.

Дилемма цифровизации и «простого эксперимента»

На современном этапе развития теории и методики обучения физике значимость учебного эксперимента неуклонно повышается, однако меняется его инструментарий. Использование в школьном кабинете физики цифровых средств измерения (датчиков, цифровых лабораторий) и компьютерных измерительных систем становится нормой. Оптимальное сочетание цифровых технологий с классическими методами в значительной степени соответствует миру техники, в котором живут современные учащиеся. Данная тенденция обусловлена тем, что современный человек окружен техническими устройствами на производстве, транспорте, в быту. Умение считывать показания цифрового прибора – это тоже важная компетенция.

Тем не менее, существует опасность подмены сути явления его цифровой моделью. Использование сложных приборов не должно затмевать сущности наблюдаемых физических явлений; приборы служат только средством их воспроизведения и измерения. Если ученик нажимает кнопку и видит график на экране, минуя стадию физического понимания процесса, эксперимент теряет свою обучающую ценность.

Поэтому прибегать к сложным экспериментальным установкам нужно дозированно, особенно в начале изучения предметов естественнонаучного цикла. Современная цель любого учителя физики заключается в том, чтобы с помощью **простых экспериментов** помочь сформировать у учащихся естественнонаучные умения (то есть умения, обладающие свойством широкого переноса), необходимые им для познания окружающего мира.

Методология использования простых приборов

Из всех видов учебного эксперимента инструментом для непосредственного познания природы важнейшим является **простой эксперимент** [3]. И это не случайно. Простые эксперименты обладают рядом особенностей, которые выгодно отличают их от других, более технически сложных лабораторных работ:

1. **Доступность.** Пособиями при прохождении начального курса физики могут служить коллекции предметов обихода и простейшие материалы.

2. **Прозрачность принципа действия.** В простом опыте (например, с рычажными весами или сообщающимися сосудами из трубок) нет «черных ящиков», скрытых алгоритмов обработки данных. Вся физика процесса открыта глазу наблюдателя.

3. **Эмоциональная вовлеченность.** Простые опыты и наблюдения позволяют школьнику довести изучение каждого явления до осязательного и действенного восприятия посредством всех органов чувств.

Учитывая бедность многих школ пособиями вообще, а современными физическими приборами в частности, приходится возлагать большие надежды в деле рационального преподавания физики на самостоятельность учителя. Однако эту ситуацию следует рассматривать не только как проблему, но и как методическую возможность.

Когда учитель конструирует прибор из подручных материалов или предлагает ученикам домашний эксперимент с использованием бытовых предметов, он разрушает стену между «наукой в кабинете» и «реальной жизнью». Ученик понимает: физика – это не то, что происходит в специальном шкафу за стеклом, физика – это то, что происходит на кухне, на улице, в мастерской [4].

Практическая реализация методики

В рамках моего исследования была разработана серия простых экспериментов, направленных на формирование конкретных жизненных компетенций. Рассмотрим примеры, демонстрирующие эффективность данного подхода.

Пример 1. Эксперимент «Сферическая природа давления» (на основе опыта «Почему шарик растет»)



Цель: Эмпирическое доказательство закона Паскаля и демонстрация отличия газов от твердых тел в передаче давления.

Оборудование: Эластичная оболочка (воздушный шар).

Ход эксперимента и наблюдения: Учащимся предлагается надуть воздушный шар, обращая внимание на направление потока воздуха (строго вперед, в отверстие) и форму, которую принимает оболочка. Ученики фиксируют, что несмотря на направленное воздействие, шар раздувается во всех направлениях (вверх, вниз, вбок), стремясь к форме сферы. При тактильном контакте (сжатии надутого шара) фиксируется одинаковая упругость во всех точках поверхности.

Формируемая компетенция: Данный опыт переводит абстрактную формулировку закона Паскаля («давление передается без изменений во все точки») в плоскость жизненного опыта.

Научное объяснение: Учащиеся связывают хаотичное движение молекул газа с равномерными ударами о стенки сосуда, в отличие от твердых тел, где давление обусловлено весом и вектором силы.

Жизненный навык: Понимание принципов работы пневматических шин, мячей, баллонов под давлением; осознание того, почему природные объекты (пузыри, капли) стремятся к сфере.

Пример 2. Эксперимент «Индукция в действии»
(на основе опыта «Магнитная гирлянда»)



Цель: Демонстрация явления магнитной индукции и временного намагничивания ферромагнетиков.

Оборудование: Постоянный магнит, набор легких стальных гвоздей или скрепок.

Ход эксперимента и наблюдения: Ученики выстраивают вертикальную цепочку («гирлянду»), поднося гвозди последовательно друг к другу через влияние основного магнита. Ключевым этапом является момент разрыва связи: удерживая верхний гвоздь, учащийся убирает основной магнит. Цепочка мгновенно рассыпается.

Формируемая компетенция: Эксперимент наглядно демонстрирует невидимые полевые взаимодействия.

Научное объяснение: Вводится понятие доменной структуры. Магнитное поле упорядочивает домены в гвозде, превращая его во временный магнит с полюсами N и S. Исчезновение внешнего поля возвращает хаос и уничтожает магнетизм.

Жизненный навык: Понимание работы электромагнитов на производстве (подъемные краны), принцип работы магнитных отверток и замков. Развитие мелкой моторики и терпения при сборке неустойчивых систем.

Результаты исследования и обсуждение: от знаний к компетенциям

Доказано, что «период полураспада знаний» в современном мире равен примерно пяти годам. Это означает, что фактологическая информация устаревает или забывается крайне быстро. Именно поэтому мы не ставим цель вооружить учащихся только конкретными знаниями (которые можно найти в справочнике), а делаем попытку научить их **добывать информацию** через эксперимент, наблюдение и самостоятельные размышления [5].

В ходе педагогической практики из всего многообразия экспериментальных заданий мной были выбраны и систематизированы именно простые эксперименты. Этот выбор обоснован необходимостью формирования жизненных компетенций, таких как:

- **Критическое мышление:** способность подвергать сомнению увиденное и искать причины (почему результат опыта отличается от идеального теоретического?).
- **Функциональная грамотность:** умение использовать инструментарий для решения бытовых задач.

• **Самоорганизация:** простой эксперимент часто требует от ученика самостоятельной сборки установки, что развивает инженерные навыки и мелкую моторику.

Изучение естественнонаучного материала в основной школе (5-9 кл.), опирающееся на доступный учебный эксперимент, обеспечивает усвоение школьниками методологических знаний на уровне, достаточном для дальнейшего самообразования.

Заклучение

Подводя итог, можно утверждать, что формирование жизненных компетенций учащихся невозможно в отрыве от практической деятельности. Физический эксперимент выступает здесь не просто как иллюстрация к параграфу учебника, а как основной метод познания реальности.

Переход от репродуктивного обучения к исследовательскому, основанному на простых и понятных опытах, позволяет решить проблему отчужденности знаний. Ученик, который своими руками собрал простейшую электрическую цепь или проверил закон Архимеда в стакане с водой, получает не просто информацию, а опыт, который интегрируется в его личность и становится инструментом взаимодействия с миром. В условиях, когда школа должна готовить к жизни в быстро меняющемся мире, возвращение к истокам – к непосредственному, живому наблюдению природы – становится наиболее прогрессивным шагом.

Таким образом, методология использования простых физических экспериментов является эффективным ответом на вызовы времени, позволяя преодолеть разрыв между теорией и практикой и сформировать у выпускников готовность к реальной жизни и профессиональной деятельности.

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COGNITIVE ORGANISMIC LOGIC IN BIOLOGICAL AND SOCIAL OBJECTS AND PHENOMENA

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Abstract. This article examines the pressing problem of constructing a theory of neural hypernetworks. The hypernetwork theory of the brain consists of an axiomatic theory of the cognitome (the fundamental model), a mathematical theory of neural hypernetworks (the formal model), and a biological hypernetwork theory of the brain (the substantial model). The task is to

materialize the system of equations of the information field in the process of endowing the mathematical quantities in informatsiala of the cognitome with physical meaning.

Keywords: informatsial of cognitome; cognitive progression, cognitive-intellectual transformations; cognitive organizmics logic; cognitome; cognitome-intellectual transformations; neural hypernetworks; information field theory.

Введение

В философии не решён вопрос о природе и статусе человеческого интеллекта. Нет и точного критерия достижения компьютерами «разумности», хотя на заре искусственного интеллекта был предложен ряд гипотез, например, тест Тьюринга или гипотеза Ньюэлла – Саймона. Поэтому, несмотря на наличие множества подходов как к пониманию задач искусственного интеллекта [1, 62 с.], так и созданию интеллектуальных информационных систем, можно выделить два основных подхода к разработке искусственного интеллекта.

Во-первых, это *нисходящий* подход (англ. *Top-Down AI*), семиотический – создание экспертных систем, баз знаний и систем логического вывода, имитирующих высокоуровневые психические процессы: мышление, рассуждение, речь, эмоции, творчество и тому подобные. Во-вторых, это *восходящий* подход (англ. *Bottom-Up AI*), *биологический* – изучение нейронных сетей и эволюционных вычислений, моделирующих интеллектуальное поведение на основе биологических элементов, а также создание соответствующих вычислительных систем с использованием *живой* элементной базы [2, С. 106-109.], таких как *нейрокомпьютер* или *биокомпьютер*.

Последний подход, строго говоря, не относится к науке об искусственном интеллекте в смысле, данном Джоном Маккарти, – их объединяет только общая конечная цель. Но именно восходящий подход к разработке искусственного интеллекта был принят автором настоящей статьи, потому что речь, в конечном итоге, идет о вопросах *организации Нового Мирового Порядка, о новом валютном мире и о новой экономической модели капитализации прибыли*. Переход в Новый Мировой Порядок осуществляется давлением обстоятельств непреодолимой силы – Третьей мировой войны (WWIII) нового гибридного типа. Где мировая торгово-экономическая война выступает главным фронтом борьбы за захват будущего. Очевидно, что новый валютный мир будет установлен не иначе как по результатам войны WWIII нового гибридного типа, которая ведется *проектами мирового уровня 6-го технологического уклада* (Стратегия *Industry 6.0*) за карточным столом истории за долю в переучтенном богатстве мира и за емкость контролируемой проектом валютной зоны.

С точки зрения кибернетики, мозг представляет собой гигантскую обучающуюся статистическую аналоговую машину из *живых* ионных элементов без жесткой структуры связей между элементами, с потребляемой мощностью около 25 ватт (Вт, W). Оценки объёма памяти мозга, совершёнными различными авторами, колеблются от 10^6 до 10^{16} бит. Высшая нервная деятельность заключается в работе с образами внешнего мира многоступенчатым иерархическим методом параллельной обработки информации. Память мозга (*brain*) устроена по особому принципу – запоминаемая информация одновременно является адресом запоминания в коре головного мозга (*brain*), причем запоминается не только информация, но и частота её повторения. При этом соединения нейронов мозга (*brain*) образуют многоуровневую сетевую структуру.

Предпринимаются первые попытки создания математических моделей мозга (*brain*) на основе теории автоматов, нейронных гиперсетей, математической логики, кибернетики.

Например, американские учёные попытались сравнить человеческий мозг (*brain*) с жестким диском компьютера и подсчитали, что человеческая память способна содержать в себе около 1 миллиона гигабайт – (ГБ) – (или 1 петабайт – (ПБ)), например, поисковая система *Google* обрабатывает ежедневно около 24 ПБ данных. Если учесть, что для обработки такого колоссального массива информации мозг (*brain*) человека тратит только 25 ватт (Вт, W) энергии, его можно назвать самым эффективным вычислительным устройством на Земле.

Для обозначения совокупности познавательных способностей мозга К. В. Анохин (внук П. К. Анохина) ввёл термин «*когнитом*», который образован по аналогии с термином «*коннектом*», но с использованием термина элемента «*cog*» от латинского *cognitio*, означающего «познание, изучение, осознание» [3, С. 39-71]. В концепции «*когнитома*» проблема мозга (*brain*) рассматривается как междисциплинарная: биомедицинская, технологическая и экзистенциальная.

Согласно теории нейронных гиперсетей, высшие элементы головного мозга (*brain*) это нейронные когнитивные группы, коги (игра слов: *cog* на английском «зубец шестеренки, винтик, мелкий элемент большой системы») и локи (линкеры), объединяющие коги.

Название устройства «нейронная гиперсеть» заложена в названии теории. Теория говорит, что вот те группы, которые образовывались в такой борьбе за результаты поведения у организма, и возникают за счет специализации клеток мозга (*brain*), образуют элементы нашего мозга (*brain*), которые являются элементами разума (*mind*). В теории они называются когнитивными группами или когами. Они связаны друг с другом. Поскольку они состоят из отдельных нервных клеток, какие образуют вершину, которая является уже элементом опыта знаний организма, то эта гиперсеть та самая сеть, которая состоит из *когнитивных элементов* более низкого уровня и приобретает новые более высокопорядковые свойства.

Когнитом возникает в результате появления устойчивой петли когнитивной аккреции как восходящей эмерджентности на этапе композиции когов α (опероны), нисходящей эмерджентности на этапе декомпозиции когов β (квалоны) и восходящей эмерджентности на этапе рекомпозиции когов γ (холоны). Нейроны головного мозга (*brain*) образуют уровень N (исходную нейронную сеть), которая надстраивается «вторым этажом» за счет эпигенетической памяти (наследственности). В ходе субъективного опыта в процессе жизненного цикла организма на «втором этаже» возникают квалоны (интеркоги), которые образуют уровень $K - 1$ (интергруппы). Появляются опероны (протокоги), которые строят уровень K (протогруппы) и, наконец, холоны (гиперкоги), которые создают уровень $K + 1$ (гипергруппы). Так возникает разум (*mind*) организма в смысле К. В. Анохина, как нейронная гиперсеть [4, 5].

Гиперсети представляют собой естественное расширение графов, гиперграфов и сетей. Гиперсети характеризуются тремя основными идеями: 1) «реляционного симплекса» или «гиперсимплекса», 2) того, что гиперсимплексы являются однозначным средством различения уровней в многоуровневых системах и 3) того, что они могут поддерживать устойчивую структуру (*backcloth*) и динамику активности (*traffic*) в многоуровневых системах.

Таким образом, гиперсетевая теория мозга (*brain*) состоит из аксиоматической теории когнитома (принципиальной модели), математической теории нейронных гиперсетей (формальной модели) и биологической гиперсетевой теории мозга (субстанциальной модели).

Постановка задачи

Если рассматривать *ког* как гиперсимплекс в гиперсети, то гиперсети представляют собой адекватный математический формализм для описания организации высших функций мозга (*brain*) как открытой системы.

Гиперсети состоят из геометрических структур, известных как гиперсимплексы. Основание гиперсимплекса содержит множество когнитивных элементов одного уровня, а его вершина образуется описанием их отношений и приобретает интегральные свойства, делающие ее элементом сети более высокого уровня, элементом гиперсети. Реляционным такое структурированное множество элементов называется потому, что их отношения эксплицитно заданы. Гиперсеть представляет собой совокупность связанных гиперсимплексов. Гиперсети являются инструментом формализации структуры и динамики в многоуровневых системах.

То, что разум (*mind*) может быть описан как физическая и математическая структура, а сознание и мышление – как специфические процессы в этой структуре, есть важнейшие следствия теории нейронных гиперсетей.

Тогда *понимание* можно рассматривать как процедуру *сжатия* информации, то есть объяснение многих фактов с помощью небольшого количества теоретических допущений, и что теорию можно рассматривать как компьютерную программу для вычисления наблюдений. Отсюда задается мотивация для определения сложности чего-либо как размера простейшей теории для этого, другими словами, размера наименьшей программы для его вычисления.

Рекуррентный алгоритм когнитивной прогрессии по К. В. Анохину на основе естественного отбора приводит к сложности мозга (*brain*) и разума (*mind*), а также к разнообразию разумов (*minds*) и мозга (*brain*). Теория утверждает, что у организма с необходимостью сформируется нейронная гиперсеть и разовьется когнитивность, то есть психика или разум (*mind*).

В основу когнитивной прогрессии положено всего три многократно повторяющихся шага, если хотите три аксиомы или три постулата. Это 1) если организмы обладают размножающимися функциональными системами, 2) если это размножение происходит в глубокой нервной сети, 3) если узлы этой сети обладают долговременной пластичностью, то есть задается простой *генетический алгоритм* программы вычисления всего лишь в три шага с запоминанием результатов вычислений, и который многократно итерируется до получения устойчивого результата как развитой психики или разума (*mind*) у организма.

В фундаментальном труде [6, С. 45-58] подробно и развернуто рассмотрена теория информационного поля А. А. Денисова, одновременно характеризуются также основные идеи этой теории и ее вклад, который за прошедшие 50 лет ученые, объединяемые Научно-педагогической школой «Системный анализ в проектировании и управлении», внесли на основе этой теории в развитие теории систем, системного анализа и других наук о системах.

Когнитивно-интеллектуальные преобразования в открытой системе [7, 289 р.; 8, С. 94-107] нейронной гиперсети организма формально были представлены в научной статье [9, С. 106-109] и развиты автором в настоящее время как когнитивно-интеллектуальные преобразования в нейронной гиперсети души организма.

Как и в теории информационного поля [6, С. 45-58], так и в когнитивно-интеллектуальных [9, С. 303-315] и когнитивно-интеллектуальных преобразованиях наряду с величинами информационала информационного поля как информационного напряжения сути вещей и явлений, в силу дуальности процессов мышления введены величины изменения информационала информационного поля как информационного тока (как было показано автором битовой скорости передачи информации между узлами (нервными клетками) нейронной гиперсети организма как частоты импульсов электрического тока). И если величины информационала хорошо осмыслены автором научных трудов [2, С. 106-109; 9, С. 303-315], то математические величины информационала информационного поля до конца не осознаны автором данных научных исследований и введены лишь только по формальным соображениям для полноты соответствующего математического аппарата для *защиты экономической безопасности, эго и сознания* абонентов инфокоммуникационных сетей от *сенсорной информации* типа «25 кадр» с эффектом Кулешова.

Заключение

Гиперсети состоят из геометрических структур, известных как гиперсимплексы. Основание гиперсимплекса содержит множество когнитивных элементов одного уровня, а его вершина образуется описанием их отношений и приобретает интегральные свойства, делающие ее элементом сети более высокого уровня, элементом гиперсети. Гиперсети являются инструментом формализации структуры и динамики в многоуровневых системах.

Возникает актуальная задача материализации системы уравнений информационного поля организма путем наделения физическим смыслом математических величин информационала когнитивного, введенных автором в статье [9, С. 303-315] только по формальным соображениям для защиты экономической безопасности, эго и сознания абонента сети электросвязи от сенсорной информации.

Поднимается актуальная проблема создания *биологического* квантового компьютера, способного к реинкарнации из *живых* элементов когнитивной организмической логики,

которая вручает нашей цивилизации уникальную возможность обгонять, не догоняя, и позволяет осуществить переход сразу в *Организмику* 7-го технологического уклада как пленительной мечты разработки *проекта мирового уровня* по Стратегии *Industry 7.0*.

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FORMAREA COMPETENȚEI INTERCULTURALE ÎN CONTEXTUL TRANSFORMĂRII DIGITALE A EDUCAȚIEI

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Abstract This article examines the role of digital communication and educational technologies in the development of students' intercultural competence. The digital environment is viewed not only as a technical tool but as a space for active intercultural interaction requiring an interdisciplinary approach. The paper outlines key groups of technologies used in computer science education and extracurricular activities, including interactive platforms, project-based methods, and automatic translation tools, with special attention to their pedagogical interpretation in a networked society.

Keywords: digital communication, intercultural competence, computer science education, networked society, automatic translation, pedagogical design

Sistemul educațional contemporan se dezvoltă în condițiile unei transformări digitale accelerate și ale extinderii contactelor interculturale, determinate de implementarea activă a tehnologiilor informaționale și de comunicații, precum și de creșterea formelor de interacțiune în rețea în procesul educațional. Aceste schimbări conduc la transformarea modelelor tradiționale de comunicare pedagogică și necesită reconsiderarea scopurilor și a conținutului procesului de instruire. [2]

Mediul educațional digital îndeplinește în prezent nu doar funcția de transmitere și asimilare a informațiilor educaționale, ci devine și un spațiu de interacțiune durabilă între elevi care aparțin unor comunități culturale și lingvistice diferite. Utilizarea platformelor online, a serviciilor digitale de colaborare și a formelor de învățământ la distanță contribuie la extinderea experienței comunicaționale a elevilor, actualizând totodată problema formării competenței interculturale ca o condiție necesară pentru realizarea unei interacțiuni educaționale eficiente. [9]

În contextul predării informaticii, această problemă capătă o importanță deosebită. Informatica și tehnologiile informaționale, ca discipline de studiu, sunt orientate spre însușirea tehnologiilor digitale, a gândirii algoritmice și a lucrului cu informația, iar o parte semnificativă a activității didactice se realizează sub forma muncii colective și a activităților în rețea. Acest fapt creează premise pentru includerea elementelor de interacțiune interculturală în procesul educațional și pentru formarea la elevi a abilităților de comunicare corectă și responsabilă în mediul digital. [8]

În acest context, activitatea profesională a profesorului de informatică și de tehnologii informaționale depășește limitele formării exclusive a cunoștințelor și abilităților tehnice. Cadrul didactic devine un subiect al proiectării mediului educațional digital, care contribuie atât la dezvoltarea competenței informaționale și digitale, cât și a competenței interculturale a elevilor. Realizarea acestei sarcini presupune selectarea intenționată a conținutului instruirii, utilizarea tehnologiilor pedagogice adecvate și crearea condițiilor pentru o interacțiune conștientizată a elevilor într-un mediu cultural divers. [4]

Astfel, formarea competenței interculturale prin intermediul predării informaticii și a tehnologiilor informaționale trebuie considerată o direcție actuală a cercetărilor pedagogice, care necesită

fundamentare teoretică și elaborarea unor abordări metodologice adecvate condițiilor actuale ale educației digitale. [1, 2, 3]

Comunicarea interculturală în mediul educațional reprezintă un proces complex, multistratificat, determinat de diferențele culturale ale participanților. Cercetători precum Edward Hall consideră cultura drept un sistem de „coduri ascunse” care determină modul de percepție a informației. În mediul digital, unde semnalele nonverbale sunt reduse la minimum, aceste coduri pot deveni o cauză a disfuncționalităților comunicaționale în cazul în care elevii nu dispun de un nivel suficient de conștientizare culturală. [4]

Obiectivul-cheie al educației în acest context îl constituie formarea competenței interculturale. Conform modelului lui Michael Byram, aceasta reprezintă un ansamblu de cunoștințe despre cultură, abilități de interpretare și interacțiune, precum și atitudini de deschidere și gândire critică. Este important de subliniat faptul că această competență este o formațiune personală integrativă, care nu apare spontan, ci necesită un proces de instruire orientat și sistematic. [1]

Comunicarea digitală creează condiții specifice pentru acest proces:

1. Mediarea și asincronia: posibilitatea de a reflecta asupra mesajului înainte de transmitere favorizează reflecția.
2. Multimodalitatea: utilizarea textului, a elementelor grafice și a materialelor video permite transmiterea mai completă a semnificațiilor culturale.
3. Utilizarea mediatorilor: aplicarea activă a instrumentelor software (de exemplu, a programelor de traducere) modifică însăși structura interacțiunii.

Fundamentul teoretic al înțelegerii practicilor comunicaționale contemporane a fost pus de Manuel Castells, care a descris conceptul societății în rețea. În cadrul acestei structuri, rețelele digitale nu doar accelerează schimbul de date, ci transformă și modalitățile de formare a sensurilor și a identităților. În activitatea profesorului de informatică, devine esențială înțelegerea faptului că interacțiunea în rețea extinde gama formelor de autoexprimare ale elevilor și contribuie la formarea identității acestora ca subiecți activi ai mediului digital global. [2]

Totuși, comunicarea digitală aduce și provocări noi. Mark Warschauer subliniază că, în ciuda accesibilității comunicării autentice, riscul neînțelegerilor crește din cauza diferențelor în practicile digitale ale diferitelor culturi. Aceasta necesită ca cadrul didactic să utilizeze tehnologiile într-un mod „pedagogic conștient”, astfel încât mediul digital să devină un factor eficient în dezvoltarea componentelor cognitive și socioculturale ale personalității. [8]

Pe baza unei analize funcționale a mijloacelor digitale de învățare, pot fi evidențiate patru grupuri principale de tehnologii pe care profesorul de informatică și tehnologii informaționale le poate integra în procesul educațional în scopul dezvoltării competențelor interculturale ale elevilor.

Tehnologiile de interacțiune interactivă și colaborativă.

În această categorie se încadrează platformele online și sălile de clasă virtuale, orientate spre activitatea educațională comună a elevilor (sisteme de gestionare a învățării, servicii pentru munca în grup, videoconferințe). În astfel de medii, diferențele interculturale se manifestă prin stilurile de comunicare, ritmul de lucru, modalitățile de exprimare a opiniilor și de luare a deciziilor, ceea ce impune armonizarea strategiilor de interacțiune. Eficiența utilizării acestor tehnologii depinde în mare măsură de nivelul de acompaniere pedagogică, în special de capacitatea profesorului de a modera în mod ținut dialogul educațional și intercultural, de a preveni barierele comunicaționale și de a crea condiții pentru o colaborare constructivă.

Tehnologii digitale orientate spre proiecte.

Activitatea de proiect utilizând mijloace de comunicare permite modelarea situațiilor reale de interacțiune interculturală în context educațional. Participarea elevilor la proiecte IT comune, inclusiv dezvoltarea produselor digitale, sarcini de cercetare și creative, presupune distribuirea rolurilor, armonizarea obiectivelor și luarea deciziilor în comun. În cadrul unei astfel de activități, elevii dobândesc competențe practice de comunicare interculturală, învață să țină cont de particularitățile culturale ale partenerilor și să își asume responsabilitatea colectivă pentru rezultatele muncii comune.

Tehnologii digitale de socializare.

Implicarea elevilor în comunități profesionale și educaționale online, forumuri, grupuri de învățare în rețea și platforme tematice creează condiții pentru comunicarea informală în mediul digital. Aceste tehnologii contribuie la extinderea experienței sociale și culturale a elevilor, precum și la integrarea elementelor comunicării interculturale în practicile digitale cotidiene. În cadrul unei organizări pedagogice corecte, ele permit dezvoltarea competențelor de comportament etic, comunicare respectuoasă și percepție critică a informației într-un mediu cultural divers.

Tehnologii de mediere lingvistică și culturală.

Programele de traducere automată joacă un rol cheie în reducerea barierei lingvistice. Totuși, utilizarea lor necesită dezvoltarea unei atitudini critice. Traducerea automată nu transmite pe deplin nuanțele pragmatice și normele discursive. În cadrul orelor de informatică și tehnologii informaționale, astfel de instrumente trebuie considerate un mijloc de dezvoltare a gândirii analitice și a sensibilității interculturale.

Dezvoltarea competenței interculturale are un caracter pronunțat interdisciplinar, situându-se la intersecția informaticii, pedagogiei și culturii. Digitalizarea determină conexiunea acestor științe, în care tehnologiile nu sunt privite izolat, ci ca elemente structurale ale comunicării educaționale.

Așa cum subliniază Constantin Kukosh, tehnologiile digitale sporesc potențialul educației interculturale, dar în același timp cresc responsabilitatea profesorului pentru calitatea mediului comunicațional creat. Cadrul didactic acționează ca un moderator, ajutând elevii să interpreteze sensurile culturale complexe în spațiul digital. [9]

Analiza efectuată permite concluzionarea că comunicarea interculturală în educația contemporană reprezintă un fenomen pedagogic cu multiple componente, a cărui formare necesită o abordare sistematică și orientată. În condițiile digitalizării educației, tehnologiile educaționale digitale constituie un important resurs în dezvoltarea competenței interculturale a elevilor, asigurând extinderea experienței lor comunicaționale și formarea competențelor socioculturale în cadrul interacțiunii educaționale. [10][7]

Potențialul educațional al mijloacelor digitale nu este dat automat și se realizează doar în condițiile utilizării lor pedagogic justificate. În acest context, activitatea profesorului de informatică și tehnologii informaționale depășește simpla transmitere a cunoștințelor de specialitate și include proiectarea unui mediu educațional digital orientat spre dezvoltarea culturii comunicării, a interacțiunii conștiente și a respectului față de diversitatea culturală.

Analiza teoretică confirmă că, în condițiile societății în rețea, comunicarea digitală devine un factor important al procesului educațional, influențând nu doar însușirea materialului didactic, ci și formarea calităților personale și social semnificative ale elevilor. Sistematizarea tehnologiilor digitale efectuată a permis identificarea posibilităților lor funcționale în dezvoltarea competenței interculturale, precum și evidențierea necesității unei abordări critice și reflexive în utilizarea instrumentelor digitale în practica educațională. [12]

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ЦИФРОВАЯ ТРАНСФОРМАЦИЯ РЕГИОНОВ РЕСПУБЛИКИ МОЛДОВА В КОНТЕКСТЕ ЦИФРОВОЙ ПОВЕСТКИ ЕС И ЕВРОПЕЙСКОГО ИССЛЕДОВАТЕЛЬСКОГО ПРОСТРАНСТВА

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Abstract. This article examines the digital transformation of the regions of the Republic of Moldova in the context of the European Union's digital agenda and the European Research Area (ERA). The study focuses on the role of the data economy, analytical platforms for territorial assessment, and institutional constraints related to the application of the international standard ISO 3166-2. Using an institutional and comparative analytical approach, the paper demonstrates that the regional level represents a critical interface between European strategies, national policies, and local socio-economic development, particularly for EU candidate countries. The findings highlight those inconsistencies between the national regional architecture and international classification standards limit the effective use of data-driven governance tools and participation in EU programs. The article substantiates the need for harmonizing regional classification frameworks as a prerequisite for sustainable digital transformation, transparent governance, and the integration of Moldova's regions into European digital and research initiatives.

Keywords: Regional digital transformation; EU digital agenda; data economy; Territorial Economic Data Viewer (TEDv); ISO 3166-2; European Research Area (ERA).

Введение

Статус Республики Молдова как страны-кандидата в Европейский союз требует актуализации цифровую трансформацию не только как технологический процесс, но и как инструмент институциональной конвергенции, территориальной сплочённости и устойчивого регионального развития. В условиях углубления интеграции с ЕС региональный уровень приобретает стратегическое значение, выступая связующим звеном между общеевропейскими приоритетами, национальной политикой и локальными социально-экономическими потребностями. Цифровая повестка Европейского союза ориентирована на развитие экономики данных, электронных публичных услуг,

цифровых навыков и платформенных решений, обеспечивающих принятие управленческих решений на основе доказательных данных (evidence-based policymaking) [1]. Для стран-кандидатов региональное измерение цифровизации становится критически важным условием участия в программах *Digital Europe*, *Horizon Europe* и инициативах ESPON [2], а также интеграции в Европейское исследовательское пространство (ERA) [3]. Несмотря на достигнутый прогресс в цифровизации публичных услуг, Республика Молдова сталкивается с институциональными и структурными ограничениями, связанными с административно-территориальной реформой и использованием международных классификационных стандартов. В частности, стандарт ISO 3166-2:MD [4] продолжает отражать региональную модель управления, не соответствующую де-факто функционирующей региональной архитектуре. Это создаёт институциональный разрыв между национальным управлением, цифровыми инструментами и европейскими механизмами региональной политики.

Целью настоящего исследования является анализ потенциала цифровой трансформации регионов Республики Молдова в контексте цифровой повестки ЕС и ERA с акцентом на экономику данных, использование аналитических платформ территориального анализа и институциональные ограничения, обусловленные стандартом ISO 3166-2.

Европейская цифровая повестка, экономика данных и инструменты регионального менеджмента

Исследование основано на комбинированном качественно-аналитическом подходе, включающем институциональный анализ, элементы сравнительной региональной оценки и моделирование цифровой зрелости территорий. Методология ориентирована на выявление региональных диспропорций и оценку потенциала участия территорий в цифровых и исследовательских инициативах Европейского союза. В рамках исследования использованы следующие методологические компоненты:

- анализ стратегических документов ЕС в области цифровой повестки и регионального развития;
- институциональный анализ административно-территориальной структуры Республики Молдова;
- моделирование цифровой зрелости регионов на основе логики платформы Territorial Economic Data Viewer (TEDv) [5];
- сравнительный анализ регионального и местного уровней цифрового управления.

Цифровая повестка ЕС охватывает инфраструктуру, электронные публичные услуги, искусственный интеллект, открытые данные и цифровые навыки. Региональное измерение цифровизации важно для выравнивания возможностей территорий и эффективности политики сплочённости. Экономика данных становится ключевым ресурсом регионального развития, обеспечивая основу для принятия решений на основе доказательств. Данные рассматриваются как стратегический актив, способствующий инновациям, инвестиционной привлекательности и устойчивому управлению территориями. *Territorial Economic Data Viewer (TEDv)* - аналитическая платформа ЕС, позволяющая визуализировать социально-экономические и цифровые показатели регионов, выявлять диспропорции и повышать адресность программ ЕС. Для Молдовы TEDv может использоваться для мониторинга цифровой зрелости территорий и планирования региональных проектов.

Для наглядного сравнения социально-экономической и цифровой зрелости регионов Республики Молдова целесообразно представить ключевые показатели, которые отражают уровень цифровой инфраструктуры, доступ к электронным услугам и потенциал для инновационного развития. Следует подчеркнуть, что приведённые данные условные и демонстрационные; их цель - методологическая иллюстрация (illustrative example), а не статистическая отчётность. Такой подход полностью допустим в научной статье и позволяет демонстрировать методику анализа региональных диспропорций и обоснования распределения ресурсов на основе данных. В таблице 1 представлены сопоставимые показатели шести статистических регионов страны.

Таблица 1. Модель оценки цифровой зрелости регионов (TEDv-based)

Измерение	Индикатор	Описание	Уровень зрелости
Цифровая инфраструктура	ШПД	Доступ домохозяйств к широкополосному интернету	Низкий – Высокий
Цифровые услуги	e-services	Использование G2C (Gov to Consumers) и G2B (Gov to Business)	Высокий
Человеческий капитал	Digital skills	Уровень цифровых компетенций населения	Низкий – Высокий
Институциональная готовность	ISO / NUTS	Совместимость со стандартами ЕС	Ограниченная – Полная

Источник: Разработано авторами на основе аналитической платформы TEDv.

Эти данные позволяют адресно планировать цифровую и инвестиционную политику регионов, ориентируясь на реальные потребности. Анализ представленных данных позволяет сделать несколько ключевых выводов. Наиболее высокий уровень цифровой инфраструктуры и интеграции в электронные сервисы наблюдается в столичном регионе, в то время как периферийные регионы [6], особенно на левом берегу Днестра, остаются слабо обеспеченными цифровыми ресурсами. Эти различия подчёркивают необходимость координации государственной поддержки на основе данных, что делает внедрение систем вроде TEDv и использование стандартов ISO 3166-2 критически важным для обеспечения прозрачности распределения ресурсов, межрегионального финансового выравнивания и стимулирования инновационного развития по всей территории страны.

Для обеспечения сбалансированного развития всех регионов Республики Молдова критически важно использовать цифровые инструменты и методологии, которые позволяют одновременно координировать межрегиональное финансовое уравнивание и управление инновационным развитием. Применение платформ для анализа данных, таких как TEDv, а также стандартизированных систем учета на основе ISO 3166-2 и NUTS [7], предоставляет шесть статистических регионов страны равные возможности для получения государственной поддержки. Такие подходы позволяют органам власти принимать решения на основе объективных данных, распределять ресурсы справедливо, стимулировать инновационную активность и сокращать социально-экономические дисбалансы, создавая условия для эффективной интеграции регионов в Европейское исследовательское пространство

Институциональные основы регионального измерения цифровой повестки ЕС и ERA

Международный стандарт ISO 3166-2 является не только статистическим инструментом, но и элементом цифрового суверенитета [8] государства. Он влияет на функционирование электронных регистров, платформ e-government, геоинформационных систем и финансовых механизмов. Несоответствие ISO 3166-2:MD де-факто функционирующей региональной модели управления в Республике Молдова ограничивает внедрение экономики данных и автоматизированных механизмов межрегионального финансового выравнивания. В условиях цифровой трансформации гармонизация национальной региональной архитектуры с международными классификационными стандартами становится необходимым условием прозрачности управления, интеграции в европейские цифровые платформы и участия регионов в программах ЕС. Корректировка ISO 3166-2 должна рассматриваться как институциональная реформа, поддерживающая цифровое управление и устойчивое территориальное развитие.

Региональный и местный уровни формируют основу цифровых экосистем государства. Региональные структуры обеспечивают стратегическое и аналитическое планирование, координацию проектов и участие в программах ЕС, тогда как муниципалитеты выступают первичными поставщиками данных и электронных публичных услуг для граждан и бизнеса. Развитие цифровых сервисов на местном уровне является критически важным для формирования экономики данных [9], поскольку именно муниципалитеты обеспечивают наполнение аналитических платформ достоверной и актуальной информацией. Эффективная координация регионального и местного уровней создаёт условия для устойчивого сокращения территориальных дисбалансов. В рамках цифровой повестки Европейского союза [10] регионы рассматриваются как ключевые платформы внедрения инноваций [11], тестирования цифровых решений для бизнеса, местных администраций и формирования экономики знаний. В предыдущих исследованиях, мы приводили пример внедрения инноваций в Испании «Центра цифровой трансформации предприятий» Университета Деусто (Рис. 1), который для

достижения своих целей организовал прямое сотрудничество с ведущими компаниями региона и муниципалитетами Сан-Себастьяна и Бильбао, крупнейшего промышленного города Страны Басков [12], охватывающее такие мероприятия, как: адаптация предприятий к новым цифровым технологиям и Цифровая трансформация компаний в их взаимодействии с клиентами, поставщиками и партнерами по «цепочке создания ценности».

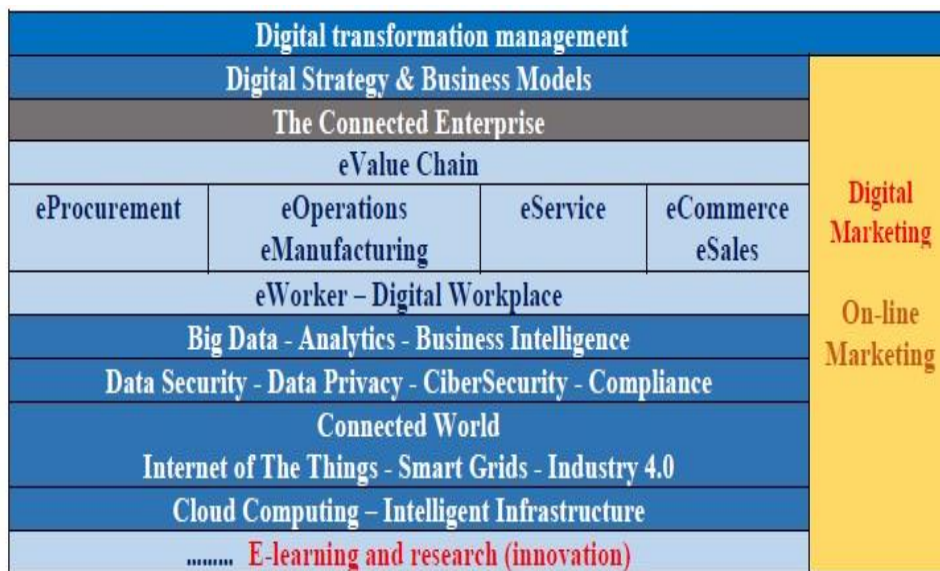


Рис. 1. Центр цифровой трансформации предприятий
Источник: Университет Деусто [12]

Для стран-кандидатов региональный уровень играет стратегическую роль в адаптации общеевропейских приоритетов и формировании институциональных условий для участия в Европейском исследовательском пространстве. Интеграция регионов [13] в ERA требует не только участия в научных программах, но и наличия цифровой инфраструктуры, управленческих компетенций и аналитических инструментов, обеспечивающих эффективное использование данных и ресурсов. Экономика данных рассматривается в ЕС как стратегический ресурс регионального развития, обеспечивающий доказательную основу для планирования инвестиций, мониторинга программ и оценки эффективности политики. Развитие региональных data hubs [14] и использование аналитических платформ, таких как TEDv, позволяют органам власти переходить от реактивного управления к проактивным моделям принятия решений, которые указаны в таблице 2.

Таблица 2. Функциональное распределение цифрового управления

Уровень	Основные функции	Цифровые инструменты	Роль в ERA
Национальный	Стратегия и стандарты	ISO, национальные регистры	Политическая координация
Региональный	Планирование и аналитика	TEDv, региональные data hubs	Участие в программах ЕС
Местный	Предоставление услуг	G2C, G2B, GIS	Источник данных

Источник: Разработано авторами на основе аналитической платформы TEDv

Эта структура демонстрирует, как цифровизация и стандартизация регионов создают основу для прозрачного управления и устойчивого развития. При этом важность правильного кодирования регионов через ISO 3166-2 становится очевидной: без согласованной структуры невозможно обеспечить единое управление ресурсами, прозрачность бюджетных процессов и эффективное участие регионов в европейских инициативах. Так, крупные муниципалитеты, такие как Кишинёв, используют цифровые инструменты для взаимодействия с гражданами и бизнесом, тогда как сельские районы пока остаются менее подключёнными. Местные органы - первичная база цифровых сервисов и источников данных. Их вовлечение необходимо для успешной реализации TEDv и экономики данных. Гармонизация ISO 3166-2 с национальной региональной моделью, интеграция региональных data hubs,

rural observatories [15] в европейское цифровое пространство и вовлечение муниципалитетов создают институциональную основу для:

- устойчивой цифровой трансформации [16];
- межрегионального финансового уравнивания [17];
- интеграции в ERA и программы ЕС.

Таким образом, гармонизация национальной региональной модели с международными стандартами ISO 3166-2 и интеграция цифровых инструментов управления создают прочную основу для устойчивого развития регионов Республики Молдова. Цифровизация публичных сервисов, внедрение экономики данных и использование платформ, таких как TEDv, позволяют органам власти принимать обоснованные решения, обеспечивать прозрачность бюджетных потоков и стимулировать инвестиции. В совокупности эти меры способствуют сокращению территориальных дисбалансов, укрепляют финансовую солидарность и создают условия для эффективной интеграции регионов в Европейское исследовательское пространство, обеспечивая долгосрочную устойчивость и конкурентоспособность государства.

Выводы

Региональный уровень является ключевым элементом цифровой трансформации и интеграции Республики Молдова в Европейское исследовательское пространство. Использование экономики данных и аналитических платформ территориального анализа повышает адресность региональной политики и инвестиционную эффективность. Гармонизация международных классификационных стандартов с национальной региональной архитектурой укрепляет институциональную устойчивость, цифровой суверенитет и конкурентоспособность государства в долгосрочной перспективе.

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DIGITAL TRANSFORMATION OF HEALTHCARE SERVICES IN THE EUROPEAN UNION: TRENDS, CHALLENGES AND THE CASE OF BOTOSANI

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Summary: This article examines current trends in the development of the digital economy in the European Union, with a particular focus on the transformation of services through digital technologies. The objective of the study is to analyze how digital innovations contribute to improving the accessibility, efficiency and quality of public services, with a particular focus on the health sector as a key area of transformation. The study is comparative in nature, analyzing European strategies and best practices and then applying them to a local case study in Botoșani, Romania. The paper uses a qualitative analysis of regulatory frameworks, digital platforms and service delivery models, as well as an assessment of local initiatives for implementing digital solutions in the healthcare system. The results demonstrate that digital solutions contribute to expanding citizens' access to healthcare services, streamlining administrative processes and increasing the sustainability of service delivery. At the same time, significant challenges are identified, including the need to strengthen digital infrastructure, develop professional skills and align local policies with European digital strategies. The conclusions highlight that the digital transformation of healthcare services requires a balanced integration of technological innovation, institutional support and active citizen engagement. This study contributes to the academic debate on the digital economy and governance, providing both a European perspective and local empirical evidence, as well as practical recommendations for the sustainable modernization of healthcare services.

Keywords: digital economy, digital services, healthcare, European Union, digital transformation, case study.

Introduction

The digital transformation of the healthcare sector is a priority area for the development of the digital economy within the European Union. In the context of an ageing population, the increasing prevalence of chronic diseases and widening territorial disparities, digital technologies are becoming not only a tool for technological modernisation, but also a strategic factor in ensuring the sustainability of regional healthcare systems. At European level, a unified architecture for the digital healthcare space is being developed, including the European Health Data Space (EHDS) initiative [1], which aims to create a secure environment for the exchange of healthcare data, and the MyHealth@EU infrastructure [2], which facilitates the cross-border use of electronic prescriptions and medical records. These mechanisms operate in accordance with the requirements of the General Data Protection Regulation (GDPR) [3] and the Medical Devices Regulation (MDR) [4], forming the regulatory framework for interoperability, cybersecurity and personal data protection.

In Romania, the digitalization of healthcare is mainly developed within a centralized architecture managed by CNAS [5]. The key components of the national system are PIAS, SIUI, SIPE and DES. Despite significant investments in the period 2002-2023, the level of real integration and operational resilience of these systems remains limited, reflected in occasional technical failures, low use of electronic medical records and uneven digital adaptation of healthcare facilities. This issue is particularly pressing for peripheral and predominantly rural regions, where structural constraints - staff shortages, transport isolation and weak digital infrastructure - increase inequalities in access to healthcare. In this context, Botoșani county is an illustrative example of a region with a dispersed settlement pattern and a high proportion of rural population. For this territory, the digitalization of healthcare acts not only as a technological reform, but also as a tool for spatial equalization and improvement of the quality of life in accordance with the concept of the "Smart Village" [6].

The integration of national eHealth platforms with a geospatial data infrastructure based on the principles of the INSPIRE Directive 2007/2/EC [7] is becoming crucial for regional planning. Spatial data on administrative boundaries, addresses, healthcare facilities, transport networks and population distribution allow for an objective assessment of healthcare accessibility, identification of areas of medical vulnerability and formation of an evidence base for strategic decisions.

The purpose of this paper is to analyze the current state of the health system in Botoșani county and municipality in the context of the national digital architecture and European initiatives, to identify institutional and spatial constraints, to assess the degree of adaptation of regulations to EU standards and to develop a conceptual model of a regional digital health ecosystem focused on rural areas and on the principles of interoperability, sustainability and spatial integration.

Current state of healthcare in Botoșani county and municipality: institutional, statistical and spatial-digital aspects of development

Botoșani County, located in the north-east of Romania, is a predominantly rural and peripheral region of the country, characterized by a pronounced demographic asymmetry, a high proportion of the rural population and limited economic diversification. The municipality of Botoșani serves as the administrative and medical center, concentrating the main hospitals, diagnostic units and administrative structures. However, the spatial distribution of the population - dispersed, with a predominance of rural communities - creates significant disparities in access to healthcare and increases the dependence of the quality of services on transport and digital infrastructure.

The demographic dynamics of the region are determined by a persistent trend of population aging and the migration of working-age citizens to more developed regions of the country and European Union countries. The growing proportion of older adults objectively increases the need for treatment of chronic diseases, cardiac and endocrinological care and long-term care services. With a population of approximately 380,000-390,000 inhabitants, the proportion of rural residents exceeds half of the total, significantly higher than the national average. This demographic structure increases the burden on primary healthcare and requires territorially differentiated solutions. The county's institutional healthcare system includes a county emergency hospital, city hospitals, outpatient centers, a network

of family doctors and private practices. Most specialized healthcare is concentrated in the municipality, while rural settlements, despite the presence of medical centers and family doctors, face shortages of equipment and limited capacity for comprehensive diagnostics. The spatial concentration of resources creates a structural imbalance: residents of isolated communities are forced to travel significant distances to receive specialized care, which increases the importance of transportation accessibility and seasonal factors.

Statistical indicators [8] confirm the existing limitations. The density of doctors is about 1.8 per thousand inhabitants (in the municipality, about 2.4), which is below the national average (about 3.4). A similar situation is observed with regard to mid-level medical staff. The staff shortage is exacerbated by the emigration of specialists to other EU countries, including Germany and Italy, which reduces the resilience of the system and limits its innovative potential. The increased workload of the existing staff reduces the opportunity to implement digital tools and improve the quality of services. For a more systematic analysis of the current state of the medical sector, it seems appropriate to resort to generalized statistical indicators that reflect the demographic, staffing and infrastructure parameters of the region in comparison with national averages.

Table 1. Key indicators of the health sector in Botoșani county and municipality (2024–2025)

Indicator	Botosani County	Botosani Municipality	Media for Romania
Population size	~385,000	~95,000	—
Share of rural population	~58%	—	~46%
Number of hospitals	5–6	2	—
Doctors (per 1000 inhabitants)	~1.8	~2.4	~3.4
Nurses (per 1000 inhabitants)	~4.5	~5.2	~7.0
The level of digitalization of medical documentation	Partial	Partial	Development
Broadband internet access (rural)	~65%	—	~85%

Source: prepared by the authors based on data from the National Institute of Statistics, Botoșani Public Health Directorate [8], the Ministry of Health and regional reports on the state of health (2023–2025).

The digitalization of healthcare in the region is developing in the context of a national architecture managed by CNAS and is based on the functioning of the Health Insurance Information Platform [9], the Electronic Prescription Information System [10] and the Electronic Health Record (DES) [11]. Despite the availability of electronic prescriptions and digital patient identification mechanisms, the level of digital maturity of healthcare institutions in the county remains partial. Electronic health records are used sparingly, the interoperability of software solutions between institutions is uneven, and the integration of local institutions into pan-European services is fragmented. A significant barrier to digital transformation is the uneven telecommunications infrastructure. In a number of rural communities, broadband internet access remains below the national average, limiting the use of telemedicine, remote monitoring of chronic patients and cloud data storage solutions. Spatial digital inequality is exacerbated by a social factor: a high proportion of elderly residents with low levels of digital literacy hinders the use of electronic services. Thus, the digital divide takes on both an infrastructural and demographic dimension.

The digital regulatory framework for health is shaped by European Union legislation, including the General Data Protection Regulation and the Medical Devices Regulation. Further impetus for development is provided by the European Health Data Space initiative, which aims to create a unified space for the exchange of health data, and by the MyHealth@EU infrastructure, which facilitates the cross-border exchange of electronic prescriptions and medical records. For the peripheral region, connecting to these mechanisms means extensive interoperability and access to European funding programmes; however, practical implementation faces financial and organisational constraints.

Regional strategic documents [12], including municipal and county development programs, declare a transition to a “Smart City – Smart Village – Digitalization” model, which involves the creation of integrated healthcare management platforms and expanded online access to information about healthcare services. However, the measures proposed so far focus mainly on information accessibility, without developing a comprehensive, spatially integrated data architecture. Incorporating geoinformation analysis – assessing the temporal availability of healthcare services, mapping the distribution of doctors and analyzing the population density of older age groups – would allow a transition from a descriptive healthcare management model to an analytical one. The social cohesion of local communities remains a strength of rural areas, creating favorable conditions for the implementation of pilot projects in telemedicine and mobile diagnostic systems. However, limited municipal budgets, fragmented managerial decisions and insufficient staff training slow down digital modernization.

Table 2. Comparative analysis of strategies

Criterion	Municipal strategy	County strategy	Actual condition
Smart approach	Yes	Yes	Partial
Online healthcare platform	It is proposed	It is proposed	There is no unified integrated system
Geospatial analysis	Undisclosed	Undisclosed	Not used systemically
Integration with CNAS	Not specified	Not specified	Limited
Focus on rural areas	Partial	Yes	High demand
Mental health	Mentioned	Limited	There are no systemic digital solutions

Source: prepared by the authors based on an analysis of urban planning documents of Botoșani County. Thus, there is a discrepancy between the strategic rhetoric and the operational digital architecture of healthcare. The current state of healthcare in the county and municipality of Botoșani is characterized by a combination of structural demographic challenges, human resource deficit and spatial and digital inequality. At the same time, the region has the potential for modernization through integration into the pan-European digital architecture, the development of telemedicine solutions and the implementation of spatial and analytical planning tools. In this context, digitalization is not only a technological process, but also a strategic mechanism for reducing territorial disparities and strengthening the resilience of the regional healthcare system.

European digital health policy and its implications for peripheral regions: the case of Botoșani county

In the context of the European Union, the European Digital Health Policy aims to transform traditional health systems into integrated digital ecosystems that ensure access to services regardless of the geographical location of the patient or the level of development of the territory. This policy includes the development of high-level regulatory frameworks, practical tools and support mechanisms aimed at increasing the digital maturity of rural areas, such as Botoșani County, as well as supporting municipalities and town halls in the implementation of innovative projects. The EU's digital health is based on three interconnected components:

1. **Regulatory standards**, including the General Data Protection Regulation (GDPR) and the Medical Devices Regulation, which ensure trust in digital services and the security of medical data. For rural regions, these standards create universal rules that ensure the compatibility of local systems with pan-European platforms.
2. **Interoperability tools**, such as the European Health Data Space (EHDS), MyHealth@EU and HealthData@EU, which create infrastructure for cross-border exchange of health data and enable the use of telemedicine and analytical services at international level.
3. **Funded support mechanisms**, including the European Structural and Investment Funds, the European Digital Innovation Hubs (EDIH) [13] and the Interreg cooperation programmes,

which allow municipalities to modernise infrastructure, train staff and participate in joint digital projects.

Strategic objectives and the role of digital health for rural regions

According to EU strategic documents (European Commission, 2020; 2021), the digitalisation of healthcare is a tool for reducing territorial gaps in access to healthcare services, particularly relevant for rural areas with low population density, shortage of specialists and limited infrastructure. Within the Smart Territories [14] / Smart Village concept, digital healthcare is seen as a means of eliminating spatial inequalities. Rural communities are involved in digital infrastructure not only as users, but also as active participants through telemedicine, digital literacy educational programmes and the integration of local services into pan-European platforms. EHDS offers three key functions:

1. Giving citizens control over their health data and facilitating its exchange for the provision of healthcare within the EU (first use of data).
2. Establish a coherent system for the reuse of medical data for research, innovation, policymaking and regulation purposes (data reuse).
3. Formation of a single market for electronic health records (EHR systems).

For regions like Botoșani, participation in the EHDS opens opportunities to integrate local medical registries into the pan-European standard, participate in research projects, and use predictive analytics tools for healthcare management.

Practical implementation of the digitalization of the medical system in Romania

In Romania, the digitalization of the healthcare system has only been partially achieved. Although there are several electronic platforms, they are poorly integrated and frequently prone to failures. For example, the Information Platform for Health Insurance (PIAS) was unavailable for about a week in February 2025. The cost of digitalization: from 2002 to 2023, the National Health Insurance Authority (CNAS) spent approximately 1.1 billion lei (~215 million euros) to implement a single integrated information system, an electronic medical record (CEAS), an electronic patient record and an electronic medical prescription system (SIPE) (interview with Larisa Mezinu-Bălan, 2025, Medika TV). Romania's main digital systems include:

1. **PIAS**– manages data on insured persons, medical services provided and medicines, ensures communication between CNAS, medical service providers and patients.
2. **Unified Integrated Information System (UIIS)**– assigns a unique insured person identification code (CID), tracks the use of healthcare funds, and manages billing processes and contracts with providers.
3. **Electronic health insurance card (CEAS)**– confirms the existence of an insurance policy and provides access to free services, but does not store medical history.
4. **Prescription Information System (SIPE)**– allows doctors to write electronic prescriptions that pharmacists can fill without the need for paperwork. The practical use of the system remains limited.
5. **The patient's electronic medical record (EMR)**– is intended for storing complete medical information, but in practice it is rarely used, as most documents are still provided on paper.

Architecture of the digital health ecosystem of Botoșani County in the context of European digital transformation with the help of artificial intelligence

The digitalization of the Romanian healthcare system is characterized by partial fragmentation and limited interoperability of existing platforms, despite significant investments (approximately 1.1 billion lei between 2002 and 2023). Key digital components - CNAS, PIAS, SIUI, CEAS, SIPE and DES - are operational at national level, but their operational sustainability and use remain limited. This conceptual model proposes an architecture of the digital health ecosystem for Botoșani County and adjacent rural areas, aligned with the objectives of the European Health Data Space (EHDS) and the spatial standards of the INSPIRE Directive 2007/2/EC.

Theoretical and normative framework

National level

The architecture is based on the existing CNAS infrastructure and its digital subsystems (PIAS, SIUI, CEAS, SIPE, DES), which provide:

- identification of insured persons;
- medical services accounting;
- processing of electronic prescriptions;
- electronic medical data storage.

European level

Institutional guidelines are formulated within:

- European Health Data Space (EHDS) initiatives;
- Regulations regarding the compatibility of digital government services;
- INSPIRE Directive 2007/2/EC (Infrastructure for Spatial Data in Europe).

Conclusions

The European Digital Health Policy creates the legal and technical framework for integrating local health systems into pan-European digital networks. In Romania, the implementation of these principles faces challenges related to technical integration, system stability and low use of existing digital tools. For rural regions such as Botoșani County, participation in the European initiatives EHDS, MyHealth@EU and EDIH creates the conditions for:

- integration of local medical institutions into pan-European digital networks;
- increasing the availability of quality medical services through telemedicine and remote monitoring;
- optimization of management processes;
- participation in cross-border and interregional projects, strengthening the capacity of municipalities in digital transformation.

Thus, digitalization becomes not an abstract goal, but a practical resource for improving the accessibility and quality of healthcare in peripheral regions, creating a sustainable platform for long-term development.

Recommendation

- Development of a regional roadmap for the digitalization of healthcare in the county, taking into account EU standards. - Strengthening the digital infrastructure of rural communities (broadband internet, secure IT systems). - Strengthening the institutional preparation of city halls for participation in cross-border and interregional projects. - Integration of diagnostics and mobile solutions based on artificial intelligence into national medical platforms. - Organization of training for medical staff and information campaigns for the population.

Overall, the digitalization of the health system could become a strategic tool for reducing territorial inequalities and increasing access to medical services in rural areas of Botoșani County.

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РЕТРОСПЕКТИВНЫЙ АНАЛИЗ ВНЕДРЕНИЯ И РАЗВИТИЯ ПЛАТФОРМЫ MOODLE В ОБРАЗОВАТЕЛЬНЫЙ ПРОЦЕСС КОМРАТСКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА

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Abstract. In the article, the author has conducted a retrospective analysis of the use of the Moodle platform in the educational process at Comrat State University from 2012 to the present. Key stages are described: from participation in the Tempus CRUNT project and initial teacher training to server acquisitions, platform upgrades, integration of videoconferencing tools, and the development of regulatory framework. The evolution of Moodle usage is analyzed. Main achievements are identified, including the preparation of methodological materials, conducting trainings and conferences, as well as contribution to program accreditation. Persistent challenges are outlined, and directions for further improvement of the university's digital learning environment are proposed.

Keywords: Moodle, university, courses, students, course creators, implementation, update, development.

Комратский государственный университет (КГУ) был партнёром проекта Tempus CRUNT (516597-TEMPUS 1-2011-1-FR «Création Réseau Universités Numériques Thématiques en sciences appliquées et sciences économiques en Moldavie/«Crearea unei rețele universitare tematică în științe aplicate și economice în Moldova» - национальным координатором которого был Технический Университет Молдовы), что открыло новые возможности для участников проекта от университета (тренинги в зарубежных вузах – партнёрах Франции и Румынии, в

Молдове – Технический университет Молдовы (UTM), а также создание и размещение первых курсов на платформе Академии экономического образования Молдовы (ASEM) и UTM) с 2012 по 2013 год. Обучение по платформе Moodle осуществлялось с 12.01.2012 г. по 02.07.2013 г. в объеме 90 часов (Рис.1).



Nr. crt.	Denumirea modulului	Nr. de ore
A	Crearea cursului on-line	32
B	Platforma E-Learning - MOODLE	30
C	Organizarea instruirii on-line cu studenții	28
D		
E		

Numărul total de ore: 90

Nr. crt.	Probele
1.	Lucrare de absolvire
2.	
3.	
4.	
5.	

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Рис.1. Сертификат обучения платформе Moodle

Опыт, полученный в рамках обучения, необходимо было распространить среди коллег университета, что и было сделано. Была подготовлена программа, обучены педагоги, которые с большим энтузиазмом изучали и внедряли в учебный процесс электронные курсы.

В 2013 году была запущена впервые платформа КГУ (в рамках проекта Tempus CRUNT) [5], были сделаны значительные усилия для того, чтобы платформа развивалась. Поскольку первоначально не было предусмотрено покупки отдельного сервера для нашего университета, платформа работала круглосуточно на обычном ПК. В какой-то момент времени стал вопрос о том, что нужен сервер. В рамках проекта ERASMUS + TEACH ME в 2017 году был закуплен сервер DELL Poweredge T330, обновлена и запущена платформа на новом сервере при помощи привлечённого технического специалиста с Аграрного университета Республики Молдова. Прошли годы, платформа требовала обновления и уже в августе 2024 года платформа прошла новый этап обновления до новой версии (с Moodle 3.4+ до версии Moodle 4.1) и перенесена на новый сервер FUJITSU Server PRIMERGY RX2530 M5, который был получен по проекту ERASMUS+COMPASS. Кроме того, была осуществлена настройка архивов - бэкап курсов, настройка аутентификации по gmail аккаунту (т.к. ранее не было такой возможности). Создание двух пользователей с правами VIEW (может видеть все курсы, но редактировать ничего не может). Было осуществлено переключение платформы Moodle на новый IP, который предоставил провайдер RENAM (ранее работал через провайдер Moldtelecom), а также выполнена установка BigBlueButton на сервер для проведения видеоконференций через платформу Moodle.

Таким образом, после завершения проекта TEMPUS CRUNT в 2014 году, университет старался найти решения для поддержания платформы, чтобы у преподавателей была возможность создавать электронные курсы, справиться с этапом COVID и другими вызовами. Все эти годы преподаватели кафедры "Информационных технологий, математики и физики" проводили тренинги, мастер-классы, был привлечён в 2018 году эксперт SES Werner Hassenpflug с Германии, который проводил тренинги для преподавателей университета и консультировал администратора платформы Moodle – доктора, конф. унив. Великову Т.Г. Были подготовлены преподаватели, которые с успехом создают и сегодня новые курсы, развивают существующие курсы. Консультирование преподавателей и студентов, в котором особо нуждались преподаватели на первых этапах внедрения платформы, было очень важным,

что способствовало тому, что платформа стала надёжным инструментом и помощником для доставки образовательного контента студентам.

Немаловажное значение оказало участие преподавателей КГУ в конференциях Moodle Moot Moldova (Технический университет Молдовы, г. Кишинев – 2016 год, Педагогический университет Иона Крянгэ, г. Кишинев – 2017 год, Европейский университет политических и экономических исследований Константин Стере, г. Кишинёв – 2018 год). Конференция MoodleMoot Moldova 2019 (выпуск VII-ой) была организована eLearning SOFTWARE S.R.L. и проведена 25 октября 2019 г. в Комратском государственном университете [10].

MoodleMoot Moldova - это ежегодное мероприятие, которое собирает пользователей платформы eLearning Moodle в пространство, ориентированное на опыт, сотрудничество и общение. Данное мероприятие позволило открыть новые возможности по использованию платформы в плане настройки журнала оценок на платформе Moodle, что использует с успехом и выступает на тренингах для преподавателей зав. кафедрой Информационных технологий, математики и физики, Попиль Г.П.

Автором настоящей статьи, Великовой Т.Г. были написаны работы [1-7], которые отражают то, как развивалась платформа, какие акценты ставились с 2012 года (от инструмента оценки и контроля) к площадке для организации интерактивных лекций и внедрения «активных элементов» (2014-2016 год), т.е. переход от «тестирования» к «обучению через действие».

В 2017 году учебно-методическим центром Дистанционного обучения E-learning CENTER (открытого в рамках проекта Tempus CRUNT) было разработано Положение об использовании системы Moodle в Комратском государственном университете (утверждено Решением Сената, протокол №4 от 31.03.2017 г.) [11].

С 2018 по 2021 уже ставился упор на проведение курсов по программе - "E-teaching (tehnologii avansate de instruire prin utilizarea TIC/ Современные технологии обучения посредством ИКТ)", 10 кредитов (300 часов), из которых 76 часов – контактных, 224 часов – индивидуальных. Один из модулей был посвящен изучению платформы Moodle и назывался Модуль В. Создание и администрирование курса на платформе Moodle, который включал вопросы знакомства с платформой Moodle, подготовки электронных материалов для размещения на платформе Moodle, регистрации пользователей, записи студентов на курс. Материалы, подготовленные в период проведения курсов, стали основой для разработки методического руководства для создателей курсов на платформе Moodle Комратского государственного университета. Так, в 2021 году был издан Гид для преподавателей по использованию Moodle, которым преподаватели пользуются и до сих пор [8].

В 2021 году была разработана Стратегия Внедрения E-teaching (современных технологий обучения посредством ИТ) в Комратском государственном университете на 2021-2025 годы, утверждённая Сенатом КГУ - Протокол № 4 от 04 марта 2021 г. Данная стратегия была разработана в рамках программы «Tekwill Ambassadors 2020: UTeach edition» по проекту "Развитие и распространение E-teaching (современные технологии обучения посредством ИКТ) в образовательных учреждениях РМ"/ "Dezvoltarea și răspîndirea E-teaching (tehnologii avansate de instruire prin utilizarea TIC) în instituțiile de învățămînt din RM", реализуемого при финансовой поддержке Агентства США по международному развитию (USAID) и Швецией в рамках проекта "Tekwill".

В гиде по внешней оценке ANACES [9] программ высшего образования 1 цикла (лиценциат) имеется 3 стандарт. При формировании отчётов согласно данного гида, наличие платформы Moodle позволяет покрыть данный пункт, поскольку у всех преподавателей КГУ есть курсы на платформе Moodle.

Информация по курсам на платформе Moodle запрашивается Учебным отделом Комратского государственного университета в начале каждого семестра в виде Таблицы 1.



Таблица 1. Информация о курсах, размещенных на платформе Moodle
Великовой Т.Г. в 1 семестре 2025-2026 уч. года

Предмет	лекции	практ.	куррик.	Ссылка на курс
Tehnologii de comunicare informațională, IIM-23	(+)	(+)	(+)	https://elearning.kdu.md/moodle/course/view.php?id=1188
Bazele de date, MII-24	(+)	(+)	(+)	https://elearning.kdu.md/moodle/course/view.php?id=598
HTML și Web-design, IIM-23	(+)	(+)	(+)	https://elearning.kdu.md/moodle/course/view.php?id=782
Programarea aplicațiilor mobile (Java), MII-24	(+)	(+)	(+)	https://elearning.kdu.md/moodle/user/index.php?id=1688
Rețele de calculatoare și siguranța, IIM-23	(+)	(+)	(+)	https://elearning.kdu.md/moodle/course/view.php?id=270
Tehnologii de comunicare informațională, ZNDP-25, NDP-25, PM-25, GR-25	(+)	(+)	(+)	https://elearning.kdu.md/moodle/course/view.php?id=1343
Tehnologii de comunicare informațională, AN-25	(+)	(+)	(+)	https://elearning.kdu.md/moodle/course/view.php?id=1345
Practica de inițiere MII-24	Не требуется	Не требуется	(+)	https://elearning.kdu.md/moodle/course/view.php?id=1698
Tehnologii moderne de instruire, MII-24	(+)	(+)	(+)	https://elearning.kdu.md/moodle/course/view.php?id=1693
Tehnologii pedagogice moderne în educație muzicală, MMB-25	(+)	(+)	(+)	https://elearning.kdu.md/moodle/course/view.php?id=364

Moodle превращается в основной образовательный стандарт. Акцент смещается на инновационные технологии и системную поддержку преподавателей.

Обязательная аккредитация специальностей со стороны ANACEC в Республике Молдова включила в обязательную подготовку документов (таблицы 3), где необходимо указывать название дисциплины (курса на платформе Moodle), ссылку на курс, что способствовало тому, что платформа Moodle стала обязательным инструментом, что позитивно отразилось на статистике зарегистрированных пользователей на платформе Moodle, а также студентов.

В рамках проекта Tempus CRUNT также была разработана Анкета оценивания электронного учебного материала на платформе Moodle КГУ в формате Word (для создателей курса) и Анкета оценки курсов Студентов в формате MS Excel (студенту была доступна анкета на курсе, он скачивал её, заполнял, а затем отправлял на платформу для дальнейшего анализа). В 2021 году была разработана электронная версия для оценки курса студентом, которую преподаватель внедряет себе в курс, а студент может её заполнить непосредственно в курсе.

В 2023 году была разработана Декларация об ответственности для сотрудников Комратского государственного университета по доступу к платформе Moodle <https://elearning.kdu.md>. Доступ для мониторинга курсов (в режиме просмотра) имеется у старшего инспектора по учебной работе (Учебный отдел) и у начальника Центра Непрерывного Образования и карьерного роста.

Moodle в КГУ прошел путь от экспериментального инструмента до фундамента образовательного процесса. Ежедневно и преподаватели, и студенты используют платформу в учебном процессе. Moodle используется в Комратском государственном университете с 2012 года и остаётся ключевым инструментом трансформации образовательных практик университета.

Какие сложности ещё существуют:

- Студенты регистрируются на платформе Moodle с разных электронных почт, что создает путаницу. Так, в одном кабинете у студента отображается часть курсов, а в другом кабинете другие или те же курсы. Это создаёт сложности и для преподавателей, поскольку студент на один и тот же курс записывается дважды, но с разной электронной почтой. Это можно предотвратить, если выдавать каждому студенту логин и пароль, но для этого у администратора платформы должна быть рабочая электронная почта каждого студента (с университетским доменом).

- Актуальным вызовом остаётся защита авторских прав на контент электронных курсов. Требуется разработка нормативной базы, регламентирующей: право собственности на курс (в том числе после увольнения преподавателя); возможность передачи курса другому коллеге; правила распространения и использования скачанных материалов. Рекомендуется обязательное указание атрибутов лицензии Creative Commons во всех материалах (лекциях, презентациях, видео и т.д.), размещённых создателями курсов на платформе Moodle.

- Сложности по созданию курсов на платформе Moodle новыми трудоустраиваемыми сотрудниками, поскольку если даже сотрудник был ранее студентом, он работал на платформе в роли студента, ему не был доступен функционал, доступный только учителю (создателю курсов). В этом случае рекомендуется, чтобы сотрудник получил поддержку коллег кафедры, которые прошли курсы и имеют опыт работы на платформе Moodle.

- Ввиду того, что одну дисциплину могут читать два человека (лектор и ассистент), курс создается тем, кто имеет опыт работы на платформе Moodle, но всё ещё есть вопросы, связанные с записью второго человека на платформу Moodle в качестве создателя курса (учителя или ассистента).

- Загрузка больших файлов – для студентов 1 курсов, которые пока только знакомятся с работой Moodle, проблематично осуществить отправку домашнего задания (рефератов, презентаций, отчётов, проектов, программ и др.), им необходимо отправить задания более 1 МБ в личное облачное хранилище и затем осуществить доступ к файлу, скопировав ссылку в текстовый документ. Альтернативным решением для создателей курса может быть настройка Элемента курса Семинар (максимальный размер загружаемого файла 128 МБ) вместо Ресурса Файл (максимальный размер загружаемого файла 1 МБ). Но Элемент курса Семинар ещё не все создатели курса освоили.

- На данный момент на платформе Moodle КГУ не настроен плагин, который бы автоматически проверял документы студентов, загруженные на платформу (на антиплагиат) и в перспективе станет актуальным вопрос необходимости внедрения плагинов на базе искусственного интеллекта, которые помогут облегчить труд создателя курса (сгенерировать картинку непосредственно на платформе, сгенерировать интеллект-карту на базе имеющегося материала, составить тест из банка вопросов, создать банк вопросов и др.). Ретроспективный анализ показывает, что внедрение Moodle в Комратском государственном университете с 2012 года прошло несколько этапов: от фокуса на формах контроля и интерактивных уроков (2012–2015) через институциональное закрепление и методическую поддержку (2016–2019) к ускоренной цифровой трансформации в период пандемии и последующему устойчивому развитию (2020–2025). Благодаря проектам Tempus, ERASMUS+ и внутренним усилиям платформа превратилась из вспомогательного инструмента обучения, в основной (особенно в период COVID), существенно изменив подходы к активизации студентов и оцениванию результатов студентов.

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УДК 37.016:004:004.8

ИСПОЛЬЗОВАНИЕ ИИ ДЛЯ ПОДГОТОВКИ УЧЕНИКОВ К ОЛИМПИАДЕ ПО ИНФОРМАТИКЕ В МОЛДОВЕ

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Abstract

The paper analyzes the role of AI as a supportive instrument in preparing school students for informatics competitions, focusing on its alignment with the national syllabus defined by the National Agency for Curriculum and Evaluation (ANCE). Particular attention is given to the progressive development of algorithmic thinking, adaptation of training strategies to different olympiad stages, and alignment with international standards. The study highlights how AI-based tools can assist in diagnostics, practice, and personalized learning while preserving the principles of academic integrity and independent problem-solving. Ethical considerations related to the use of AI in olympiad preparation are also discussed.

Keywords artificial intelligence in education; informatics olympiads; competitive programming; algorithmic thinking; olympiad training; ONIA; AI-assisted learning; secondary education; Moldova

Введение

В последние годы искусственный интеллект (ИИ) перестал быть только темой для исследований и стал мощным инструментом подготовки школьников к соревнованиям по информатике. В Молдове, где традиционно сильная школа олимпиадного программирования

(IOI, EJOI, BOI и национальные этапы), в 2025–2026 учебном году ИИ активно интегрируется в тренировочный процесс. Это связано как с общемировым трендом, так и с запуском в Молдове **первой Национальной олимпиады по искусственному интеллекту (ONIA)** в 2026 году.

Почему ИИ стал важен для олимпиадников по информатике в Молдове

1. **Пересечение тем** Многие задачи республиканского этапа и выше в последние годы включают элементы, близкие к машинному обучению:
 - оптимизация гиперпараметров
 - обработка больших данных
 - графовые нейронные сети
 - задачи на прогнозирование / классификацию с ограниченными ресурсами
2. **ONIA-2026 как новый вызов** В январе–феврале 2026 года Молдова впервые проводит Национальную олимпиаду по ИИ (возраст 16–19 лет, командный формат 2 ученика + наставник). Участники должны разработать полноценный AI-проект, решающий реальную социальную или экологическую задачу. Это заставляет тренеров и учеников осваивать ИИ-инструменты уже сейчас.

Агентство Национальное по Куррикулуму и Оценке (ANCE), совместно с Республиканским Олимпийским Советом, в своем "Cadru de referință" (Рамочном документе) для Олимпиады по Информатике подчеркивает, что подготовка должна быть ориентирована на развитие алгоритмического мышления, анализ, абстракцию и моделирование. Документ не содержит отдельных "рекомендаций по подготовке", но syllabus (программа) служит прямым руководством: он определяет темы по классам (7–9, 10, 11, 12) с уровнями освоения ("+" — базовый, "*" — продвинутый, "-" — не предусмотрен).

Вот ключевые рекомендации, вытекающие из документа ANCE:

1. **Фокус на прогрессивном развитии:** Подготовка должна следовать эволюции сложности. Для младших классов (7–9) акцент на базовых темах (арифметика, простые структуры данных, линейный поиск). Для старших (11–12) — на продвинутых (графы с потоками, DP с оптимизациями, геометрия).
2. **Адаптация под этапы олимпиады:** Учитывать структуру: 3 задачи за 4 часа на районном/муниципальном этапе, 6 задач за 2 дня на республиканском. Подготовка включает практику на платформе с автоматической оценкой (время, память).
3. **Интеграция с международными стандартами:** ANCE рекомендует aligning (согласование) с IOI/EJOI: развивать навыки без вспомогательных материалов, фокус на чистом коде (C++, Pascal, C) без сетевого доступа или внешних библиотек.
4. **Анализ сильных/слабых сторон:** Использовать syllabus для самодиагностики. Например, если слабые строки — практиковать DP на edit distance (* для 11–12 классов).
5. **Этические аспекты:** Подготовка должна развивать самостоятельность; ИИ (как в статье) — только инструмент, не замена мышлению.

Таблица ключевых тем из syllabus ANCE (с уровнями по классам)

Раздел	Подтема	7–9	10	11	12
А. Арифметика и дискретная математика	Целые числа, делимость, GCD/LCM	+	+	+	+
	Простые числа и факторизация	+	+	+	+
	Модульная арифметика (без инверсий)	+	+	+	+
	Модульная арифметика с инверсиями	-	-	+	+
	Малая теорема Ферма	-	-	*	*
	Основы криптографии	*	+	+	+
В. Структуры данных	Массивы	+	+	+	+
	Списки, стек, очередь	+	+	+	+
	Множества и ассоциативные массивы	+	+	+	+
	Куча (очередь с приоритетами)	*	+	+	+
	Union-Find (дизъюнктные множества)	*	+	+	+
	Бинарные деревья (понятия, обходы)	*	+	+	+
	Segment Tree (базовые операции)	-	*	+	+
	Fenwick Tree	-	*	*	+
	Lazy propagation	-	-	*	*
С. Строки	Простые обработки строк	+	+	+	+
	Наивный поиск	+	+	+	+
	Общая подстрока	-	+	+	+
	Расстояние редактирования	-	-	*	*
	Эффективный поиск в строках	-	-	*	*
Д. Алгоритмы и техники программирования	Линейный и бинарный поиск	+	+	+	+
	Элементарные сортировки	+	+	+	+
	Эффективные сортировки	*	+	+	+
	Greedy	*	+	+	+
	Divide et Impera	*	+	+	+
	Backtracking	*	+	+	+
	DP (общие концепции)	*	+	+	+
	DP на графах и деревьях	-	-	+	+
	DP с bitmask	-	-	*	+
	Оптимизации DP	-	-	-	*
Е. Графы	Основы, BFS/DFS	*	+	+	+
	Ориентированные графы, DAG	-	+	+	+
	Топологическая сортировка	-	+	+	+
	Кратчайшие пути	-	+	+	+
	Сильно связанные компоненты, бисвязность	-	+	+	+
	MST (минимальное остовное дерево)	-	*	+	+
	Специальные проблемы на графах	-	-	*	+



Раздел	Подтема	7–9	10	11	12
Г. Теория множеств и комбинаторика	Булева алгебра	+	+	+	+
	Перестановки, комбинации, размещения	+	+	+	+
	Принцип включения-исключения	-	+	+	+
	Рекуррентные специальные числа	*	*	+	+
Г. Вычислительная геометрия	Основы, координаты	+	+	+	+
	Дистанции и площади элементарные	+	+	+	+
	Векторное представление	-	+	+	+
	Простые пересечения и ориентация	-	+	+	+
	Площадь простого многоугольника	-	-	+	+
	Convex Hull	-	-	-	*
	Геометрические оптимизации	-	-	-	*
Н. Теоретические аспекты	Ограничения представления чисел/символов	+	+	+	+
	Элементарные операции	-	+	+	+
	Асимптотическая сложность	-	-	*	+
	Метаоперации	-	-	*	+
	Классы проблем	-	-	-	*

Эти рекомендации ANCE интегрируются в использование ИИ: генерируйте задачи по темам с "+" для базы, "*" для продвинутых. Например, для 10 класса фокусируйтесь на greedy и divide et impera через промпты ИИ для идей решений.

Как именно используют ИИ для подготовки к классической олимпиаде по информатике

Направление использования ИИ	Примеры инструментов (2026 год)	Как помогает на олимпиаде по информатике	Уровень использования в Молдове (оценка 2026)
Генерация идей / разбор решений	Grok, Claude 3.5/4, Gemini 2.0, DeepSeek-R1	Быстрое нахождение нетривиальных идей, проверка гипотез	★★★★★ (очень широко)
Написание и отладка кода	Cursor, GitHub Copilot, Windsurf, Aider	Автодополнение сложных структур (сег. деревья, FFT, flows)	★★★★☆
Генерация тренировочных задач	o1 / o3-mini, QwQ-32B, Llama-3.1-405B	Создание оригинальных задач нужной сложности и тематики	★★★★☆
Объяснение чужих решений	ChatGPT + o1-preview, Perplexity + Sonar	Разбор решений из архивов IOI/EJOI/BOI за 2–5 минут	★★★★★

Направление использования ИИ	Примеры инструментов (2026 год)	Как помогает на олимпиаде по информатике	Уровень использования в Молдове (оценка 2026)
Симуляция интервью / спарринг	Grok voice / Claude voice mode	Тренировка устного объяснения алгоритма (важно для финалов)	★★★★☆
Помощь в ML-задачах олимпиадного типа	Kaggle notebooks + Colab + Grok-3	Быстрое прототипирование решений задач с ML-элементом	★★★★☆ (растущий тренд)
Анализ слабых мест ученика	Custom fine-tune на истории посылок	Персонализированные рекомендации по темам	★★★☆☆ (только сильные группы)

Конкретные сценарии использования ИИ в подготовке к олимпиаде (2025–2026)

- Ученик застрял на задаче с деревьями отрезков + двоичным подъёмом → просит ИИ сгенерировать 5 разных идей решения за 60 секунд → выбирает самую перспективную и дописывает сам
- Подготовка к этапу с большими входными данными → ИИ помогает написать генератор тестов на 10^7 – 10^8 элементов
- Разбор архивных задач EJOI 2023–2025 → загружают условие + правильный код в Claude / Grok → получают объяснение на уровне 9–10 класса за 2 минуты
- Командная работа перед ONIA → ИИ используется для мозгового штурма идей проектов (экология + компьютерное зрение, медицина + NLP и т.д.)

Риски и ограничения

- Сильная зависимость → некоторые ученики перестают думать самостоятельно
- ИИ часто ошибается в очень сложных комбинаторных задачах уровня IOI gold (2025–2026)
- Запрет использования ИИ во время самой олимпиады → нужно уметь решать без подсказок
- Этический аспект → некоторые школы вводят правила «ИИ только на этапе обучения, никогда на контесте»

Заключение

В 2026 году в Молдове использование ИИ при подготовке к олимпиаде по информатике перешло из экспериментальной фазы в повседневную практику большинства сильных учеников и тренеров. При этом ИИ рассматривается не как замена мышлению, а как **супер-ассистент**, который ускоряет обучение в 2–4 раза при правильном использовании.

Самые успешные молдавские олимпиадники сейчас сочетают три навыка:

1. Глубокое понимание алгоритмов и структур данных
2. Умение грамотно формулировать запросы к ИИ
3. Способность критически оценивать и исправлять ответы ИИ

Именно это сочетание сейчас даёт наибольшее преимущество как на классических олимпиадах по информатике, так и на новой олимпиаде ONIA-2026.

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ИНТЕГРАЦИЯ STEAM-ТЕХНОЛОГИЙ В ОБУЧЕНИЕ БУДУЩИХ УЧИТЕЛЕЙ МАТЕМАТИКИ

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Abstract. The article examines the possibilities of integrating STEAM technologies into the training of future mathematics teachers through project-based learning within the course Mathematical Modeling in Economics and Statistics. The relevance of using interdisciplinary projects aligned with the requirements of the National Curriculum of the Republic of Moldova for the gymnasium and lyceum levels of mathematics education is substantiated. A project-oriented learning model is proposed, aimed at developing students' competencies in mathematical modeling, analysis of real socio-economic processes, and the design of educational activities in a STEAM learning environment.

Keywords: STEAM education, mathematics teacher education, project-based learning, mathematical modeling, curriculum, economic and mathematical models.

«Математик — это тот, кто умеет находить аналогии между утверждениями; лучший математик — тот, кто устанавливает аналогии между доказательствами; великий математик — тот, кто видит аналогии между теориями; но самый великий — тот, кто видит аналогии между науками». — Стефан Банах [11]

Этот эпиграф от Стефана Банаха задает идеальную планку: мы готовим не просто трансляторов знаний, а архитекторов междисциплинарных связей. В эпоху четвертой промышленной революции математика перестает быть изолированной дисциплиной, превращаясь в универсальный язык междисциплинарного общения. Современный учитель должен выступать не только как теоретик, но и как фасилитатор, способный показать студентам живую связь между абстрактным уравнением и устойчивостью архитектурной формы.

Интеграция STEAM-технологий позволяет трансформировать скучное заучивание алгоритмов в увлекательный процесс инженерного творчества и научного поиска. Когда будущий педагог

осознает, что тригонометрия является фундаментом цифровой обработки звука, а геометрия — основой параметрического дизайна, его преподавание обретает новую глубину. Использование компонента «Arts» в обучении математике снимает психологические барьеры перед «сухой» наукой, развивая у студентов эстетическое восприятие логических структур.

Седьмой год, с 2019 года, в Республике Молдова внедряется новая концепция образования — STEM и STEAM. STEAM-образование развивается как часть современной образовательной политики и международных инициатив. Министерство образования и исследований Республики Молдова совместно с международными партнёрами реализует проекты по подготовке педагогов к использованию STEAM-подхода в обучении, включая тренинги по применению цифровых технологий, инженерных и творческих задач [1,2,3,10].

Проекты, поддерживаемые UNICEF и ЕС, привлекают учителей и школьников к созданию STEAM-проектов, которые объединяют междисциплинарные знания и цифровые навыки, а также способствуют развитию критического мышления и навыков коллективной работы. Так, в 2024 году в рамках программы «Укрепление инновационных практик преподавания» около 100 педагогов и 400 учащихся создали STEAM-проекты, применяя генеративный искусственный интеллект и цифровые инструменты [4].

Кроме того, национальные и международные конференции и круглые столы, такие как «STEAM Skills for Social Growth», способствуют обмену опытом в области STEAM между академическими и образовательными сообществами, расширяя возможности внедрения инновационных подходов в обучение будущих учителей [1].

STEAM-образование представляет собой междисциплинарный подход, объединяющий естественные науки, технологии, инженерию, искусство и математику с целью развития навыков XXI века — критического мышления, творческого решения проблем, коллаборативной работы и цифровой грамотности. Такой подход способствует углублённому пониманию предметного материала через проектную деятельность и практическое применение знаний, делая образовательный процесс более актуальным и жизненно ориентированным.

Школьные куррикулы по математике для гимназий и для лицейского цикла Республики Молдова определяют математическую дисциплину как основу формирования компетенций, направленных на целостное развитие личности учащегося и построение системного понимания учебного содержания. Документы предполагают, что содержание и педагогические стратегии должны ориентироваться на развитие ключевых и предметных компетенций, стимулировать творческий подход к решению задач и применение междисциплинарных связей [5, 6, 7, 8].

Методические ориентиры, сопровождающие куррикулы, прямо упоминают возможность реализации проектов типа STEM/STEAM как части образовательной деятельности, включая межпредметные проекты. Учитель, совместно с коллегами, может использовать предложенные темы или разрабатывать собственные STEAM-проекты и обеспечивать их презентацию учащимися. Проекты становятся не только формой оценки знаний, но и инструментом развития исследовательских и проектных компетенций, необходимых будущему учителю [9]. Важным моментом в STEAM-движении является подготовка учителей к этой деятельности, в частности учителей математики, ведь именно им предстоит стать проводниками в современный мир знаний. Они должны не просто дать материал, объяснить примеры, показать задачи, а так смоделировать весь процесс, чтобы ученики видели: вот она, связь с жизнью, связь между всеми предметами, вот зачем нам это нужно.

Современная подготовка будущих учителей математики требует не только усвоения теоретических знаний и методов математического моделирования, но и формирования умений проектировать образовательный процесс в соответствии с требованиями национального куррикула и концепции STEAM-образования.

Для будущих учителей математики интеграция STEAM-технологий открывает возможности не только для усвоения математического содержания, но и для развития педагогических

компетенций, способности создавать междисциплинарные уроки и адаптировать инновационные методы обучения.

В профессиональной подготовке будущих учителей STEAM-технологии могут быть интегрированы через:

- курсы по инновационным педагогическим технологиям и цифровой грамотности;
- участие в международных проектах и тренингах;
- разработку и реализацию междисциплинарных проектов с использованием реальных данных и цифровых инструментов;
- анализ и адаптацию STEAM-практик селективно из куррикулумов, методических пособий и образовательных проектов.

Все эти аспекты реализуются посредством совершенствования учебных программ, дисциплин, включенных в учебные программы по подготовке учителей математики. Для реализации третьего пункта одной из мер было включение в учебный план 2022 года специальности 0114.2/0114.1 Информатика и математика учебной дисциплины «Математическое моделирование в экономике и статистике», изучение которого сопровождается требованием каждому студенту разработать проект типа STEM/STEAM, согласно требованиям.

Проекты, разрабатываемые студентами, ориентированы на двойную цель:

- освоение методов математического моделирования;
- формирование готовности к проектированию и реализации STEAM-проектов в гимназическом и лицейском циклах обучения.

В рамках курса студентам предлагается серия проектов, соотнесённых с практическими занятиями и ключевыми содержательными линиями школьного куррикулума по математике Республики Молдова. Каждый проект предполагает прохождение этапов математического моделирования: анализ реальной ситуации, формализация, построение модели, решение и интерпретация результатов, а также педагогическую адаптацию для школьного уровня.

Таблица 1. Соответствие практических тем курса, школьного куррикулума и проектной деятельности

Тема практического занятия	Содержание школьного куррикулума (гимназия/лицей)	Тема проекта
Решение текстовых задач с использованием моделирования	Текстовые задачи, пропорции, проценты	Математическая модель реальной жизненной ситуации
Линейные и квадратные уравнения	Уравнения и системы уравнений, квадратичная функция	Экономические задачи с линейной и квадратичной моделью
Функции и их приложения	Функции, графики, анализ зависимостей	Функции как модели социально-экономических процессов
Приложения производной	Исследование функций, экстремумы	Оптимизационные задачи в экономике
Приложения интеграла	Геометрическая интерпретация интеграла	Интеграл как модель накопленных величин
Линейная алгебра и балансовый анализ	Системы уравнений	Балансовые модели в экономике
Финансовая математика	Проценты, финансовая грамотность	Моделирование финансовых процессов
Статистический анализ данных	Статистика, диаграммы, средние значения	Анализ реальных данных
Эконометрические исследования	Функциональные зависимости	Регрессионные модели и школьные функции

Реализация проектов осуществляется по стандартной схеме.

Приведем примеры конкретных заданий для студентов в рамках проектной деятельности по данной дисциплине. STEAM-проекты включают систему практико-ориентированных заданий, выполняемых индивидуально или в малых группах.

Задание 1. Анализ и моделирование реальной ситуации

Цель: формирование навыков математической формализации.

Содержание задания:

Выберите реальную экономическую или социальную ситуацию (семейный бюджет, расходы школы, динамика цен, демографические данные).

1. Опишите ситуацию и сформулируйте проблему.
2. Определите переменные и допущения.
3. Постройте математическую модель (уравнение, функцию, систему).
4. Проанализируйте полученную модель.

Задание 2. Проектирование школьной задачи на основе модели

Цель: развитие методической компетентности.

Содержание задания:

На основе построенной модели разработайте:

- вариант задачи для гимназического уровня;
- вариант задачи для лицейского уровня;
- методические рекомендации по решению.

Задание 3. Функциональное моделирование и визуализация

Цель: формирование умений анализа функций.

Содержание задания:

1. Подберите данные, описывающие реальный процесс.
2. Выберите тип функции, наиболее адекватно описывающий зависимость.
3. Постройте график и проанализируйте его.
4. Опишите, как данный материал может быть использован на уроке математики.

Задание 4. Оптимизационная задача

Цель: освоение приложений производной.

Содержание задания:

Сформулируйте задачу оптимизации (максимизация прибыли, минимизация затрат).

1. Постройте математическую модель.
2. Найдите экстремум функции.
3. Дайте экономическую интерпретацию результата.
4. Разработайте школьный STEAM-кейс по данной теме.

Задание 5. Балансовая модель

Цель: применение линейной алгебры в практических задачах.

Содержание задания:

1. Опишите систему с балансовыми связями.
2. Составьте систему линейных уравнений.
3. Решите её и проанализируйте результат.
4. Предложите упрощённую версию задачи для лицейского курса.

Задание 6. Статистическое исследование

Цель: развитие навыков анализа данных.

Содержание задания:

1. Соберите или используйте готовые статистические данные.
2. Вычислите основные статистические характеристики.
3. Постройте диаграммы и графики.
4. Подготовьте мини-проект для школьников.

Задание 7. Финансовая модель

Цель: формирование финансово-математической грамотности.

Содержание задания:

Разработайте модель расчёта кредита или вклада.

1. Определите параметры модели.
2. Выполните расчёты.
3. Проанализируйте результаты.
4. Адаптируйте материал для школьного проекта.

Для оценки проектов предлагается использовать комплекс критериев, отражающих как математическую, так и педагогическую составляющую.

Таблица 2. Критерии оценивания проектов

Критерии	Содержание
Корректность математической модели	Обоснованность допущений, корректность вычислений
Глубина анализа	Интерпретация результатов, выводы
Соответствие куррикулуму	Связь с содержанием гимназического/лицейского курса
STEAM-интеграция	Междисциплинарность, практическая направленность
Методическая проработка	Возможность внедрения проекта в школьную практику
Презентация и визуализация	Графики, таблицы, логичность представления

Разрабатываемые проекты в полной мере соответствуют концепции STEAM-образования:

Проведённое исследование показывает, что интеграция STEAM-технологий в подготовку будущих учителей математики на основе проектной деятельности в курсе «Математическое моделирование в экономике и статистике» является эффективным средством формирования профессиональных, методических и междисциплинарных компетенций. Разработанная система проектов обеспечивает связь университетского математического образования с требованиями Национального куррикулума Республики Молдова и способствует формированию у студентов готовности к практической реализации STEAM-подхода в гимназическом и лицейском циклах обучения.

Использование математического моделирования как основы проектной деятельности позволяет будущим учителям математики осознать прикладной характер изучаемых тем, научиться трансформировать сложные экономико-математические модели в доступные школьные задания и организовывать учебную деятельность учащихся на основе междисциплинарного подхода. Полученные результаты могут быть использованы в системе профессиональной подготовки учителей математики, а также при разработке методических рекомендаций по внедрению STEAM-образования в школьную практику.

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ИСПОЛЬЗОВАНИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ОБУЧЕНИИ

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Annotation

Digital technologies and artificial intelligence are being actively integrated into the education system, transforming traditional approaches to teaching and learning. The article examines the main areas of AI application, including adaptive learning platforms, chatbots, the generation of educational and methodological materials, automated assignment assessment, and virtual tutors. Special attention is paid to the role of AI as an assistant to the teacher rather than a replacement. The advantages of AI implementation, such as time savings and the development of creative forms of learning, are discussed. The views of researchers on the prospects and risks of using AI in education are analyzed. The article concludes that the conscious and responsible use of artificial intelligence in educational practice is necessary.

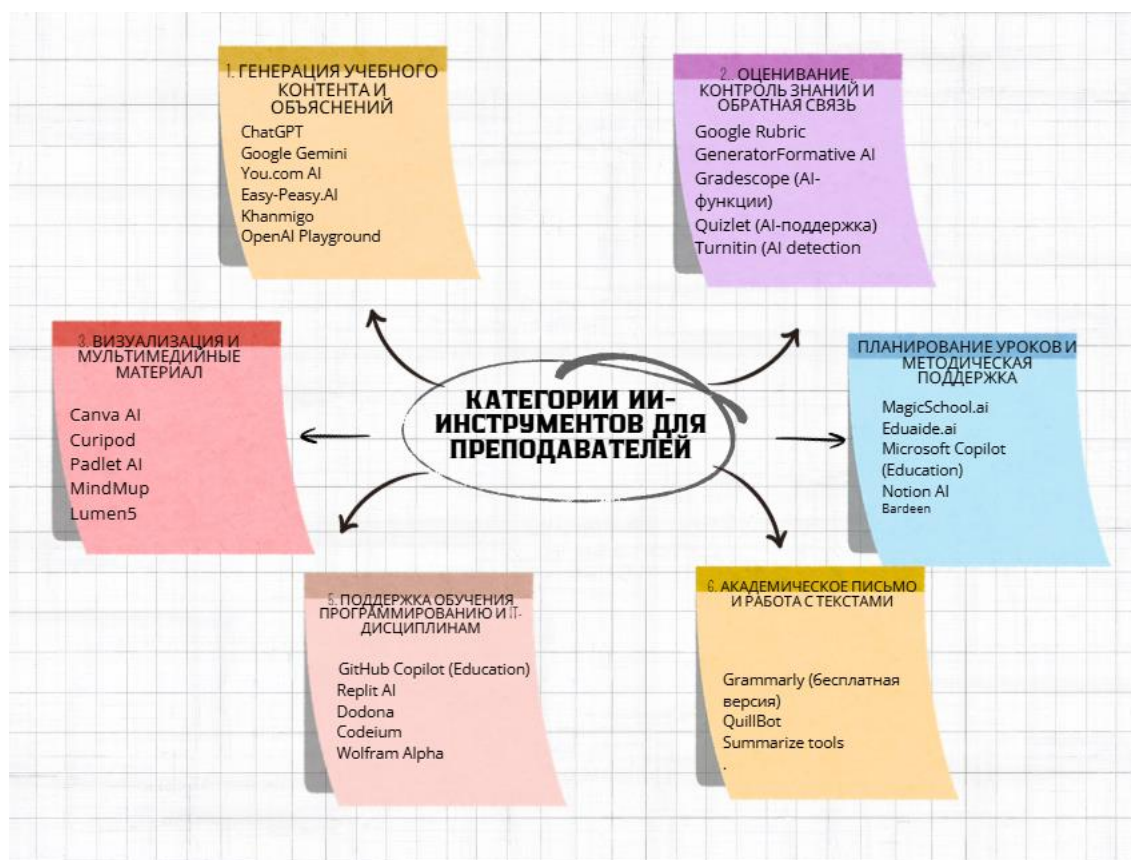
Keywords: artificial intelligence, digital technologies, adaptive platforms, chatbots, digitalization of education

XXI век, век цифровых технологий и искусственный интеллект (ИИ) внедряется во все значимые сферы. Применение ИИ в образование способствуют снизить рутинную нагрузку преподавателей, сделать процесс обучения и оценивания более персонализированной и интересной для студентов. Основные направления использования ИИ включают адаптивные платформы, чат-боты, генерацию учебных материалов, создание учебно-методического материала, контролирующих материалов, автоматическую проверку заданий и репетиторов. Использование данных инструменты помогают педагогу работать эффективнее, получать идеи для разработки инструкций и для структурирования информации, ускоряет темп обучения

Искусственный интеллект для обучения — это не замена преподавателя, а умный помощник, который берет на себя рутинные задачи и помогает делать уроки интереснее. Использование ИИ в образовании рассматривается не как замена педагога, а как интеллектуальный помощник, дополняющий его функции и расширяющий педагогические возможности, объяснять сложные темы, быстро готовить материалы и создавать увлекательные уроки.

Преподаватели сегодня используют ряд ИИ-инструментов, адаптированных под учебные задачи. структурированное распределение ИИ-инструментов по категориям, удобное для включения в статью или методические рекомендации. Я использую те же инструменты, что были ранее, и группирую их **по педагогическим задачам**, а не по предметам — это универсально для всех направлений.

Современные преподаватели активно применяют разнообразные ИИ-инструменты, специально адаптированные под образовательные задачи и процессы. Для упрощения их внедрения в практику целесообразно использовать структурированную классификацию инструментов по функциональным категориям, что делает материал наглядным и удобным для методических рекомендаций. В данной статье предлагается группировка ИИ-инструментов не по конкретным предметам, а по педагогическим функциям — генерация контента, планирование уроков, оценивание и обратная связь, визуализация, поддержка IT-дисциплин и работа с текстами. Такой подход обеспечивает универсальность классификации и позволяет преподавателям разных направлений эффективно выбирать инструменты в зависимости от конкретных образовательных целей, облегчает интеграцию ИИ в учебный процесс и стимулирует творческое использование технологий при подготовке и проведении занятий (Рис 1)



Источник: разработан автором

Рисунок 1. Группировка ИИ-инструментов по педагогическим функциям

В таблиц1 представлены современные ИИ-инструменты для организации учебного процесса. Инструменты охватывают ключевые педагогические функции: планирование уроков,

оценивание, визуализацию, генерацию контента, работу с текстами. Наибольшее распространение получили инструменты для генерации учебных материалов, что отражает актуальность персонализированного обучения и ускорения подготовки уроков. Визуальные и интерактивные сервисы, способствуют вовлечению студентов и развитию креативных навыков. Инструменты для оценивания и обратной связи упрощают контроль знаний и адаптацию заданий под уровень учащихся. Универсальность большинства платформ позволяет использовать их в различных дисциплинах, не ограничиваясь одной областью. В целом, внедрение этих ИИ-инструментов помогает преподавателям снизить рутинную нагрузку и повысить эффективность образовательного процесса.

Таблица 1.

Современные ИИ-инструменты для организации учебного процесса.

№	ИИ-инструмент	Основное назначение (для преподавателей)	Платный/ Бесплатный
1	ChatGPT	Генерация материалов, объяснений, обратная связь студентам, планирование уроков	Бесплатный
2	Google Workspace (Docs/Slides) с Gemini	Автоматизация уроков, создание материалов, аналитика успеваемости	Бесплатный
3	Curipod	Интерактивные уроки, опросы, визуальные слайды	Бесплатный
4	MagicSchool.ai	Автоматизация планов уроков, дифференцированное обучение	Бесплатный
5	Eduaide.ai	Планирование уроков и тестов, цели обучения	Частично бесплатно
6	Google Rubric Generator	Генерация рубрик и критериев оценивания	Бесплатный
7	Formative (AI Feedback)	Помощь в обратной связи по работам	Ограниченный бесплатный доступ
8	Dodona	Интеллектуальная система для обучения программированию	Бесплатный
9	Grammarly (базовая версия)	Проверка и улучшение текста	Бесплатный
10	Canva AI	Создание визуальных материалов	Бесплатный
11	You.com AI	Поиск, генерация идей, учебные материалы	Бесплатный
12	Padlet	Коллаборативные доски для проектов	(AI + бесплатный план)
13	Bardeen	Автоматизация рутинных задач	Бесплатный
14	Summarize tools	Сжатие и анализ текста	Бесплатный
15	MindMup	Создание интеллект-карт	Бесплатный
16	Quizlet	Создание карточек, тестов	Бесплатный
17	Khanmigo	Генерация материалов, инструкции	Ограниченный бесплатный доступ
18	Easy-Peasy.AI	Мощный набор шаблонов и бот-ассистентов	Бесплатный

19	MagicSchool AI	Генерация заданий и уроков	Бесплатный
20	OpenAI Playground / GPT free tier	Эксперименты с ИИ-подсказками и идеями	Бесплатный

Источник: разработан автором

Большинство перечисленных инструментов имеют бесплатные версии, базовые планы или образовательный доступ, который часто бесплатен для учителей (например, ChatGPT, Google Workspace, Curipod, Google Rubric Generator) — этот тренд отмечается в ряде обзоров по ИИ для обучения. Некоторые инструменты имеют условно-бесплатный доступ с лимитами или требуют регистрации через образовательные аккаунты

В Р. Молдове большое внимание уделяется обучению преподавателей использованию ИИ-инструментов в рамках курсов повышения квалификации, пилотные программы повышения цифровой грамотности, которые внедряет Министерство образования и науки Р. Молдова, а также педагоги повышают навыки применения генеративного ИИ в STEAM-образовании через онлайн-курсы образовательные проекты UNICEF, SuperCoders, EducatieOnline, TekwillAcademy.md которые включают обучение педагогов ИИ-инструментов и их практическому применению

Искусственный интеллект облегчает работу педагогов, помогает персонализировать обучение и ускоряет выполнение рутинных задач. Однако у него есть ряд отрицательных моментов и ограничения, которые важно учитывать.

Один из ведущих авторов, пишущих о преимуществах искусственного интеллекта в образовании, Мэтью Линч («Мое видение будущего искусственного интеллекта в образовании»), тщательно исследует потенциальные подводные камни с преимуществами, отмечая, что «использование ИИ в образовании в некотором смысле ценно, но мы должны быть исключительными, следуя за его ролью и его общей ролью в нашем мире»

Таблица 2.

Плюсы и минусы использования искусственного интеллекта в образовании

Плюсы	Минусы
Экономит время ИИ берет на себя рутинную работу. Он помогает составлять тесты, формировать планы уроков, анализировать успеваемость учеников и даже заполнять отчеты. Учитель может задать тему, а нейросеть предложит готовую структуру занятия с вопросами для обсуждения и примерами	Оценивать знания становится сложнее Учителя сталкиваются с проблемой объективной оценки. Если ученик написал эссе с помощью ИИ, сложно понять, насколько он освоил материал. Это требует новых подходов к проверке знаний, например, больше устных заданий или творческих проектов
Помогает готовить творческие уроки Благодаря ИИ педагоги могут быстрее воплощать креативные идеи. Например, если учитель хочет провести урок в формате ролевой игры, ИИ предложит сценарии, задания для групп и вопросы для обсуждения	Развивает зависимость от технологий Ученики могут использовать ИИ не для обучения, а для списывания. Они привыкают получать готовые ответы и не развивают критическое мышление. Когда ребенок всегда просит нейросеть решить задачу, он не учится думать самостоятельно
Необходимость обучения преподавателей ИИ-компетенциям Педагоги должны овладеть навыками эффективного и этичного использования ИИ, что требует дополнительных профессиональных тренингов и времени.	Допускает ошибки и искажает факты ИИ не всегда дает правильные ответы. Если нейросеть не находит нужную информацию, она может «придумать» данные, которые не соответствуют реальности
Адаптирует учебные материалы под ученика Если школьник лучше понимает информацию через визуальные образы, алгоритм подберет инфографику. Если ребенок увлекается музыкой, ИИ может объяснить сложные темы через примеры	Вопросы конфиденциальности и безопасности данных При использовании ИИ платформа может обрабатывать персональные данные

из этой сферы. Это особенно полезно в репетиторстве и индивидуальных занятиях	учащихся, что вызывает опасения по поводу защиты конфиденциальной информации
ИИ-инструменты помогают автоматизировать проверку тестов , анализ кода, генерацию вопросов и шаблонов материалов, что уменьшает нагрузку преподавателя и позволяет больше времени уделять творческим аспектам обучения	Риск ошибок и недостоверных ответов ИИ Генеративный ИИ иногда может выдавать <i>галлюцинации</i> — неправдивую или некорректную информацию, поэтому преподавателю важно проверять такие ответы перед использованием
Персонализированное сопровождение учащихся На основе анализа данных ИИ может предлагать адаптированные задания, объяснения или дополнительные материалы, учитывая индивидуальный уровень знаний каждого студента	Зависимость учащихся от ИИ-подсказок Ученики могут начать полагаться на ИИ при выполнении задач, не развивая собственные навыки мышления и критического анализа
ИИ-системы могут собирать и анализировать данные об успеваемости и взаимодействии студентов с материалом, что помогает выявить слабые темы или зоны, требующие дополнительного внимания	Проблемы объективной оценки знаний Поскольку студенты могут использовать ИИ для составления текстов или решения задач, традиционные способы оценивания (эссе, тесты) становятся менее информативными о реальных знаниях.
Повышение качества обратной связи ИИ может быстро анализировать работу учащегося и давать развернутые комментарии или подсказки, которые помогают лучше понять ошибку или пробел в знаниях	Недостаток педагогического контроля При автоматизации части образовательного процесса может снизиться личный контакт преподавателя со студентом, что влияет на развитие навыков коммуникации и социального взаимодействия.
Вопросы конфиденциальности и безопасности данных При использовании ИИ платформа может обрабатывать персональные данные учащихся, что вызывает опасения по поводу защиты конфиденциальной информации	Необходимость обучения преподавателей ИИ-компетенциям Педагоги должны овладеть навыками эффективного и этичного использования ИИ, что требует дополнительных профессиональных тренингов и времени.
Составление расписаний, отчётов , генерация шаблонов для коммуникации с родителями и студента может осуществляться с помощью ИИ, освобождая время для педагогической деятельности.	Вопросы конфиденциальности и безопасности данных При использовании ИИ платформа может обрабатывать персональные данные учащихся, что вызывает опасения по поводу защиты конфиденциальной информации.

Источник: разработан автором

ИИ в образовании позволяет преподавателям экономить время, автоматизируя рутинные задачи, такие как составление тестов, планирование уроков и анализ успеваемости. Он способствует подготовке творческих и интерактивных уроков, адаптируя материалы под уровень и интересы каждого ученика. Системы ИИ обеспечивают персонализированную обратную связь и помогают выявлять проблемные зоны в освоении материала. Вместе с тем, использование ИИ создаёт сложности объективного оценивания знаний и может приводить к зависимости учащихся от подсказок. Кроме того, инструменты иногда генерируют недостоверную информацию, что требует проверки преподавателем, а обработка персональных данных поднимает вопросы конфиденциальности. Таким образом, ИИ обладает большим потенциалом для улучшения образовательного процесса, но требует осознанного и этичного применения.

Следует учитывать, что ИИ не всегда учитывает законодательство конкретной страны, что особенно важно при преподавании экономических и юридических дисциплин. Автоматически сгенерированные материалы могут содержать рекомендации или примеры, которые противоречат местным законам, налоговым нормам или правилам делового оборота. Поэтому

при использовании ИИ в этих областях преподавателям необходимо самостоятельно проверять соответствие контента национальным правовым и экономическим требованиям, чтобы избежать ошибок и распространения недостоверной информации.

ИИ-инструменты открывают возможности для анализа больших объемов учебных данных и выявления индивидуальных образовательных потребностей студентов. Инструменты искусственного интеллекта помогают внедрять инновационные методы обучения, включая интерактивные и мультимедийные форматы. Особое внимание требует соответствие с национальными законами и экономическими нормами, чтобы избежать ошибок в специализированных дисциплинах. Педагогам необходимо развивать навыки критической оценки генерируемого ИИ контента и безопасного использования данных учащихся. При этом важно учитывать ограничения ИИ, такие как возможные ошибки, недостоверная информация, зависимость учащихся от подсказок и сложности объективного оценивания. Таким образом, ИИ становится инструментом стратегического планирования и оптимизации учебного процесса, поддерживая образовательные процессы

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SECTION III. AGRICULTURE AND FOOD PROCESSING INDUSTRY
SEKŦİYA III. ÇİFTÇİLİK HEM İŞLETMÄK İNDUSTRİYASI
SECȚIUNEA III. AGRICULTURĂ ȘI INDUSTRIA ALIMENTARĂ
СЕКЦИЯ III. СЕЛЬСКОЕ ХОЗЯЙСТВО И ПЕРЕРАБАТЫВАЮЩАЯ ПРОМЫШЛЕННОСТЬ

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ПРОМЫШЛЕННОСТЬ

UDC 631.861:633.15:338.314

**ENVIRONMENTALLY SAFE DOSAGE OF POULTRY MANURE: EARTHWORM
TEST AND CORN PROFITABILITY**

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Abstract. The use of various organic fertilizers is recommended to improve soil quality and meet plant nutrient requirements. However, in some cases, the constituent of organic fertilizers may negatively impact plant growth and/or the environment instead of providing benefits. To investigate the ecological impact of chicken manure, which raises various concerns, and to determine the ecotoxicologically safe dose, a laboratory experiment was conducted. In the experiment, an earthworm avoidance test was applied at doses of 0.625%, 1.25%, 2.5%, 5%, 10%, and 20% chicken manure. The research results showed that even the highest dose did not cause significant earthworm avoidance. Economically, it was determined that the use of chicken manure contributes to the production economy. Although not determined in the experiment, in light of concerns in the literature regarding chicken manure, it was concluded that chicken manure can be used as an organic fertilizer in agriculture, but low doses should be recommended.

Keywords: Chicken manure, organic fertilization, worm avoidance test, ecotoxicology, corn.

Introduction

The productivity of agricultural crops depends on the plant-available nutrients in the soil. Besides mineral fertilizer incorporation of manures not only enhances plant nutrition but also

improves the soil biota [2]. One of the materials that can be added to soils as a source of organic fertilizer is chicken manure. However, chicken manure is a questionable source due to its high salt content and the presence of various antibiotics used in hens' production. Poultry manure, by its nature, is a product of metabolic processes with a colloidal consistency and a clumpy-porous structure, excreted as a mixture of urine and feces [3]. The daily output of manure from a medium-sized poultry farm (400,000 laying hens or 10 million broiler chicks) exceeds 100 tons [4]. L.S. Fastukov [5] notes that with cage housing, the daily manure output per adult hen ranges from 176–300 g. For hens from egg-laying parent stock, the output is 189 g per bird daily, for meat parent stock 276–300 g, for turkeys 450 g, for ducks 423 g, and for geese 594 g [6]. Poultry manure is a valuable organic fertilizer with a high content of nutrients (nitrogen, phosphorus, potassium, and micronutrients) [7, 8, 9]. Due to its high concentration of organic components and their gradual release, poultry manure impacts crop yields for 2–3 years after application [3]. The output and fertilizing value of poultry manure vary significantly depending on the composition, quantity, and quality of feed, the species and age of the poultry, and the housing system [10, 11]. Chicken manure contains all essential plant nutrients in sufficient quantities and combinations. Its effect on crop yields is closer to that of mineral fertilizers than to manure. However, its action is more favorable than mineral fertilizers, as some nitrogen is in organic form, gradually becoming available to plants [12]. Researchers differ in their assessments of nutrient content in chicken manure. A.A. Mastik [13] suggests that nutrient content in air-dried chicken manure can vary widely: nitrogen 1.20–5.82%, phosphorus 0.60–3.65%, and potassium 0.50–2.94%. According to V.I. Chukanov [14, 15], fresh chicken manure with a natural moisture content of 56–76% contains 1.20–2.74% nitrogen, 1.18–2.00% phosphorus, and 0.61–1.10% potassium. N.A. Punda [16] compared the fertilizing value of different types of chicken manure. He suggests that fresh manure with 67% moisture contains 2.09% total nitrogen, 3.89% total phosphorus, and 1.60% total potassium on a dry matter basis. Litter-based manure with 68% moisture contains 3.09% nitrogen, 4.21% phosphorus, and 1.06% potassium. When using poultry manure, uniform distribution across the soil surface and proper incorporation are critical. Uniform spreading prevents areas of high nutrient concentration, while immediate incorporation is necessary because manure contains significant amounts of ammonia nitrogen, which volatilizes if left on the surface [17]. S.S. Sdobnikov [18] report that applying 40 t/ha of peat-manure compost enhances microbial activity throughout the arable layer. The decomposition intensity of flax fabric in the 0–40 cm soil layer averaged 16%, and soil microflora produced 62.8 mg/kg of carbon dioxide. The authors attribute this to the presence and proliferation of numerous microorganism groups in the compost during maturation, which begin decomposing nitrogen-containing, cellulose-containing, and other complex organic compounds immediately after application. Poultry manure also promotes the development of nitrogen-fixing microorganisms, particularly *Azotobacter*, which is 4–8% more abundant than in control plots. One of the most critical aspects of poultry manure utilization in agroecosystems is determining the correct application rate. Research in this area primarily focuses on establishing the optimal fertilizer dose that provides maximum agronomic and economic efficiency [19]. Manure application rates are typically determined based on the nitrogen requirements of the fertilized crops and the nitrogen content in the fertilizer. The rates of manure and manure-based composts vary across different soil and climatic zones [20].

Material and methods

In the study, plastic containers with a capacity of 1 kg of soil were used. 500 g of reference soil, without any treatment, was placed on one side of these containers, while another 500 g of soil mixed with chicken manure at 0.625%, 1.25%, 2.5%, 5%, 10%, and 20% doses (weight/weight) on a dry weight basis were placed on the other side [1]. The prepared setup was brought to field capacity moisture content. In the final stage, the 10 juvenile (0.3 to 0.6 g each) *Eisenia fetida* earthworms were placed at the intersection point of the reference soil and the test soil. The setup, with its lid closed, was left to incubate for 48 hours. After incubation, a plastic divider was placed at the intersection point of the reference and test soils in the plastic container, and the worms on both sides were counted. The avoidance percentage was determined according to the following formula [1].

$$x = \left(\frac{nc - nt}{N} \right) * 100$$

where,

x is avoidance, expressed as a percentage;

nc is the number of worms in the control soil;

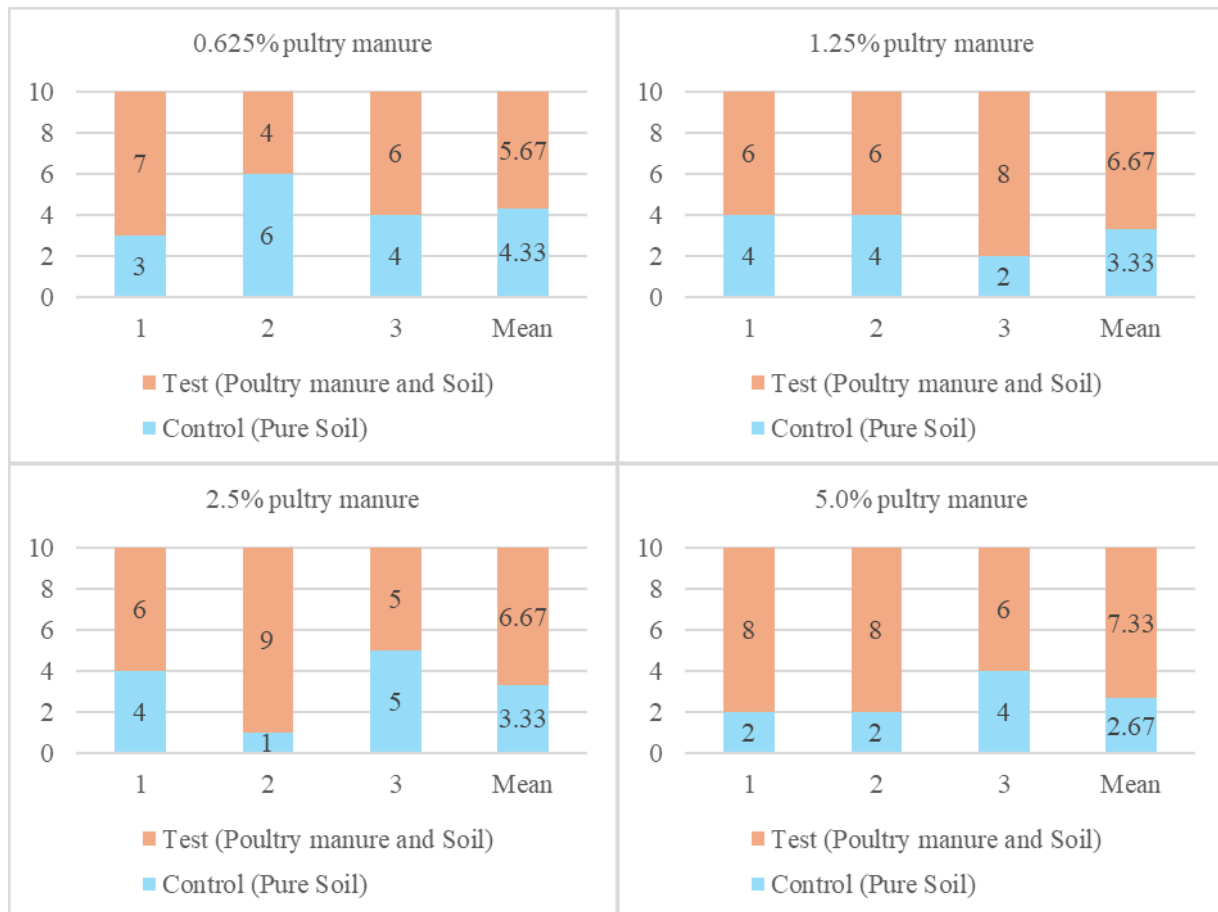
nt is the number of worms in the test soil;

N is the total number of worms

The experiment was carried out with 3 replicates using chernozem soil, characterized by its inherently high fertility, good structure, and agricultural importance. Before utilization, the soil was air-dried to constant weight, homogenized, and passed through a 2 mm sieve to ensure uniformity. Poultry manure obtained from an uncommercial household chicken barn. Standard deviation and trend lines were determined using MS Excel software.

Results and discussion

The results obtained from this study, which was conducted to determine whether the manure generated from poultry production would have adverse effects on soil organisms, are presented separately for each application dose at Figure 1.



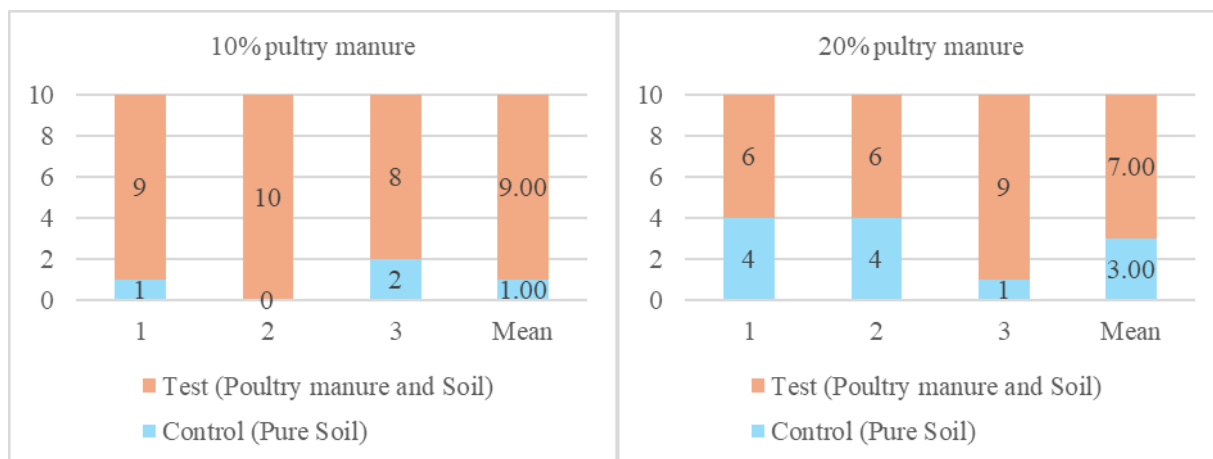


Figure 1. Earthworm avoidance at all doses tested

When all chicken manure doses were evaluated together, it was observed that earthworms preferred the treated areas depending on the increasing dose. This showed a steady increase up to a 10% dose, after which it tended to decrease. However, it should be kept in mind that a 20% dose is practically infeasible. A 1-hectare area contains approximately 2500 tons of soil in the first 20 cm, and applying a 20% dose would require 500 tons of chicken manure. This amount of chicken manure could lead to necrosis in plants, nitrogen accumulation in groundwater, and significant environmental problems. On the other hand, it has been stated many times in literature that chicken manure is quite likely to cause potential agronomic problems. Therefore, even though this study determined that even the highest dose was not ecotoxic, caution should always be exercised when using chicken manure.

Earthworm preferences and avoidance tendencies were presented in Figure 2. As clearly seen in Figure 2, the earthworms' preference for chicken manure increases with increasing doses. In other words, their avoidance decreases as the doses increase. However, as clearly seen in the graph, the points corresponding to the 20% dose are well outside the trend line. Therefore, it is observed that the earthworms gradually begin to avoid chicken manure at a dose between 10% and 20%.

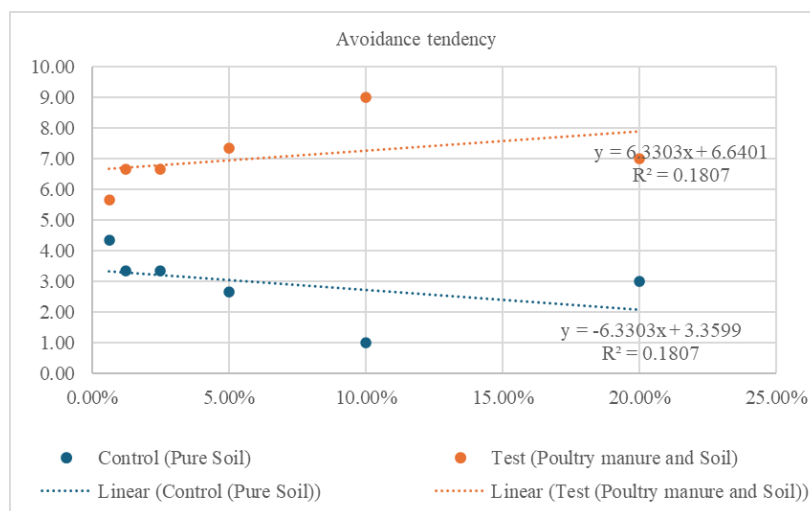


Figure 2. Earthworm behavior tendency depending on increasing poultry manure doses

Earthworm avoidance percentage, standard deviation and second-order correlation curve are presented in Figure 3. The number of earthworms in the control (pure soil) varies widely, ranging from 0 in the 0.625% chicken manure per 500 g dry soil, third repetition to 6 in the 0.625% chicken manure per 500 g dry soil, first repetition, with an average of 2.94 across the 18 containers.

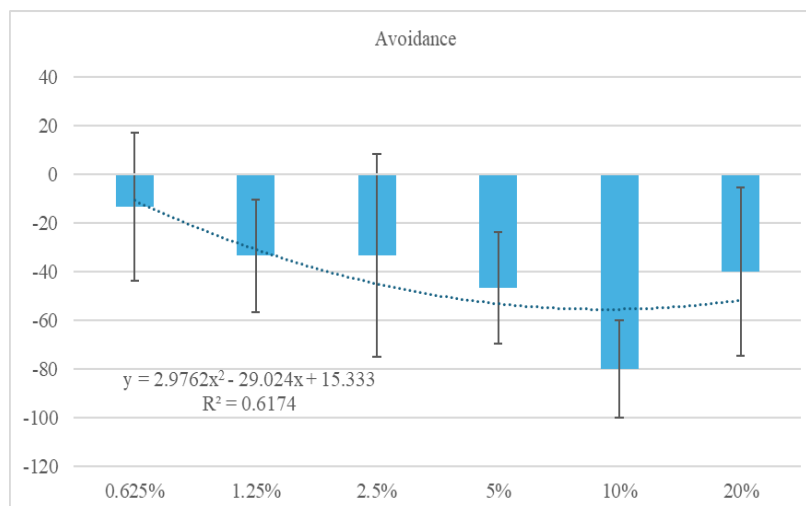


Figure 3. Dose comparison of earthworm avoidance

This variability suggests that even in the absence of manure, earthworms exhibit differing preferences for pure soil, possibly due to micro-scale differences in soil texture, moisture, or other factors not specified in the experiment. In contrast, the test condition (poultry manure mixed with soil) shows a higher average of 7.06 earthworms, with values ranging from 4 (in 0.625%) chicken manure per 500 g dry soil, first repetition) to 10 (in 0.625%) chicken manure per 500 g dry soil, third repetition. This indicates a general preference for the manure-soil mixture, likely due to the organic content providing a more favorable environment or food source for the earthworms. The total number of worms per container is consistently 10, which ensures a controlled experimental setup where the distribution reflects true behavioral choices rather than differences in population size. As previously explained, there is high variation between the replicates. This prevents a definitive conclusion from being drawn. One reason for this variation may be the non-homogeneous mixing of chicken manure with the soil. Variations caused by earthworms are also a factor. It would be beneficial to verify the values shown here with more replications.

Economic perspective

From both an economic and agronomic perspective, the use of chicken manure is a viable alternative to mineral fertilizers, especially in agricultural regions with developed poultry farming. However, proper handling, dosage, and sanitary measures must be observed during application. The analysis showed that (1) The cost of applying mineral fertilizers ranges from 1,684.42 to 2,000 lei/ha, depending on composition and supplier. (2) The cost of applying chicken manure to meet similar nutrient needs is approximately 626.00 lei/ha, which is 2.5–3 times cheaper. Thus, chicken manure is a more economically advantageous nutrient source for maize, provided it is available in sufficient quantities. Moreover, it improves soil structure, increases organic matter content, and activates soil microbiota, which positively affects the agroecological condition of the soil. On the other hand, it is not possible to meet all the plant's nutrient requirements with chicken manure, and it is also not suitable in terms of soil health and the environment.

Conclusions

In conclusion, this affirmative analysis confirms that poultry manure generally attracts earthworms, as evidenced by the average avoidance percentage of -41.11%, with most containers showing a clear preference for the manure-soil mixture over pure soil. The results of the study generally indicate that the use of chicken manure in agricultural areas does not pose an ecotoxicological problem. However, the chicken manure used in the experiment was obtained from the bedding of chickens raised at home, not from a commercial farm. This means that various chemicals, including antibiotics, commonly used in farm production were not used. Repeating these experiments with manure obtained from commercial farms would be highly beneficial. Longer-term field trials are needed to determine whether salinity, a major concern for chicken manure, occurs. Based solely on these research results and without conducting these trials, applying chicken manure

as an organic fertilizer to agricultural areas remains questionable. Due to the aforementioned concerns, it was assessed that recommending lower doses of chicken manure would be a more appropriate approach, even though no ecotoxicological problems were identified even at the highest doses in this study. Low manure doses contribute to the production economy without negatively impacting soil biota.

Acknowledgement

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VITICULTURE IN THE ATU GAGAUZIA: CURRENT CHALLENGES AND STRATEGIES FOR SUSTAINABLE DEVELOPMENT

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Abstract. This article analyzes the current state of the viticulture sector in the ATU Gagauzia, identifies key challenges, and proposes strategies for sustainable development. The study covers the period 2014-2024 and reveals a steady decline in vineyard area (-14.7%) accompanied by high yield variability. Grape productivity ranged from 34.3 t/ha in 2020 to 82.3 t/ha in 2018, indicating strong dependence on climatic factors and low resilience of production systems. Critical declines observed in 2020 and 2024 highlight structural problems, including vineyard aging, insufficient renewal, phytosanitary risks, and market limitations. Despite these difficulties, the sector maintains significant potential due to favorable agroclimatic conditions and unique autochthonous grape varieties. Sustainable development requires an integrated approach focused on vineyard modernization, irrigation development, diversification of sales markets, strengthening producer cooperation, and enhanced scientific support aimed at climate adaptation and productivity stabilization.

Key words: ATU Gagauzia, Climate change, Sustainable development. Viticulture.

Global climate transformations pose a serious threat to viticulture and winemaking worldwide. Vineyards in the Eastern European region are increasingly facing water deficits as a result of rising temperatures, unstable precipitation patterns, and prolonged drought periods. These climatic changes have a negative impact on grapevine development throughout the growing season, the qualitative characteristics of the harvest, and the overall efficiency of production [3].

The economic system of the Republic of Moldova is largely based on traditional sectors, among which agriculture and food production occupy leading positions. Of particular importance within the national agricultural structure are viticulture and winemaking, which provide employment for approximately one quarter of the economically active population of the country [4].

Viticulture in the Republic of Moldova, as a strategically significant branch of the agrarian economy, is especially vulnerable to unstable meteorological conditions under global climate change and, consequently, to increased phytosanitary pressure. Under these circumstances, the adoption of precision viticulture technologies becomes a priority, aimed at strengthening the adaptive capacity and sustainability of the viticulture and winemaking sector as a whole [6].

The Autonomous Territorial Unit of Gagauzia (ATU Gagauzia) is geographically located in the southern part of the Republic of Moldova and constitutes an independent economic region of the

country. The agro-industrial complex, which generates up to 70% of the gross regional product, has historically occupied a dominant position in the economic structure of ATU Gagauzia. Grape cultivation represents the most intensive branch of agricultural production in the autonomy. The progressive development of the viticulture sector is therefore regarded as a strategic priority for the agricultural economy of ATU Gagauzia [2].

Viticulture in ATU Gagauzia is the most intensive segment of agricultural production and plays a critical role in the regional economy. This sector provides a substantial share of rural incomes, forms the foundation for the operation of processing enterprises, and largely determines the socio-economic stability of the autonomy. The regional viticulture and winemaking complex traditionally serves as a major source of employment for a significant proportion of the working-age population, while simultaneously preserving the cultural and historical identity of the territory and maintaining centuries-old traditions of grape cultivation passed down from generation to generation [5].

In recent years, climate transformations have increasingly affected the growth and development of grapevines under the agro-ecological conditions of ATU Gagauzia, directly influencing the economic performance of the sector. Rising temperatures during the growing season, shifts in the timing of phenological phases, and the increased frequency of extreme weather events such as droughts, late spring frosts, and hailstorms create additional risks for stable grape production. Irregular and uneven precipitation during critical stages of vine development leads to plant water stress, which negatively affects yield formation and quality parameters. These climatic changes directly impact the economic indicators of viticultural enterprises through reduced yield stability, higher expenditures on protective measures, and increased production costs [1].

In view of the above, the present study was aimed at a comprehensive assessment of the current state of the viticulture sector in ATU Gagauzia under contemporary natural-climatic and socio-economic challenges, with the objective of developing scientifically grounded strategies for the sustainable development of this industry.

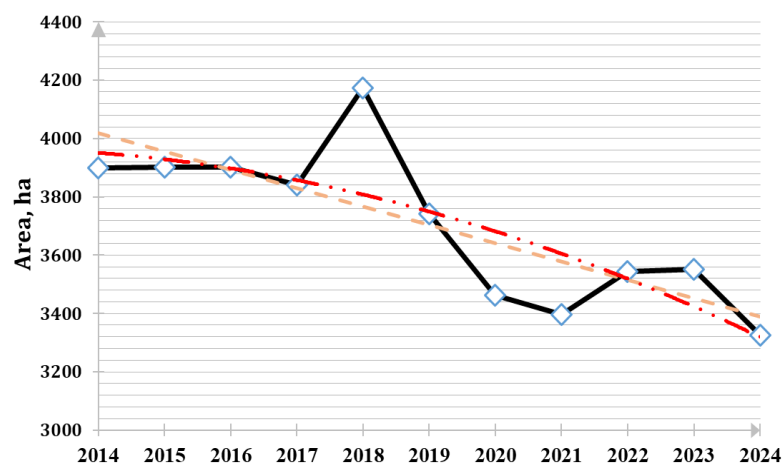


Figure 1. Total Area of Vineyards on Agricultural Enterprises and Peasant (Farmer) Holdings in ATU Gagauzia (with agricultural land of 10 ha or more).

Source: <https://statbank.statistica.md> [7].

An analysis of the general indicators of viticulture in ATU Gagauzia over the period 2014-2024 reveals structural problems characterized by a persistent decline in production capacity and critical instability of performance outcomes. During the analyzed period, the total area of vineyards decreased by 14.7%, from 3,900 ha in 2014 to 3,325 ha in 2024. This reduction of 575 hectares represents a significant loss of production potential for a region traditionally specialized in viticulture (Figure 1).

The dynamics of vineyard area demonstrate two distinct phases of sectoral development. The period from 2014 to 2018 was marked by relative stability and a moderate expansion of production, reaching a maximum of 4,174 ha in 2018, which was 7.0% higher than in 2014. This stage can be characterized as a phase of investment in the sector, when producers expanded vineyard plantations

in anticipation of favorable market conditions. However, since 2019 a systematic and almost continuous decline in vineyard area has begun, acquiring the features of a structural crisis. Over the six-year period from 2019 to 2024, vineyard area decreased by 20.3% compared with the 2018 peak level, indicating deep and persistent systemic problems within the sector.

The gross grape yield demonstrates extremely high volatility, exceeding that observed for individual varietal categories (Figure 2). Fluctuations range from a minimum of 118,652 tons in the catastrophic year 2020 to a record high of 343,589 tons in the favorable year 2018, representing nearly a threefold difference. Such variability creates highly unfavorable conditions for operational planning by both grape producers and processing enterprises. This instability indicates a critical dependence of the sector on weather conditions and insufficient resilience of production systems to external stresses.

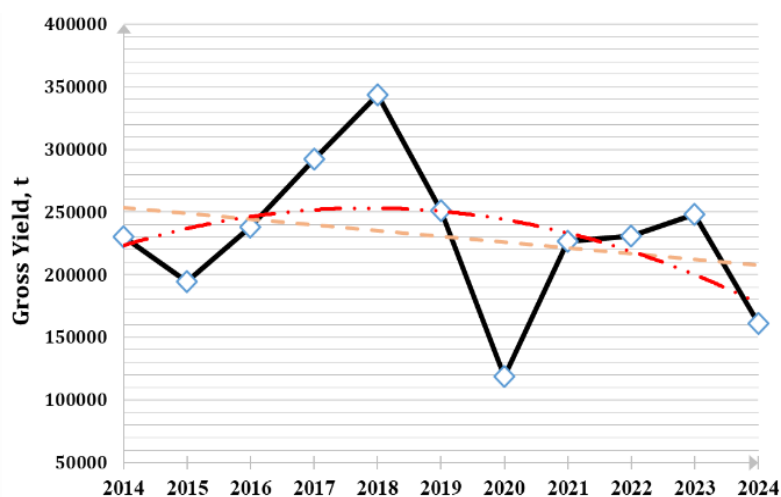


Figure 2. Gross Yield of Vineyards on Agricultural Enterprises and Peasant (Farmer) Holdings in ATU Gagauzia (with agricultural land of 10 ha or more).

Source: <https://statbank.statistica.md> [7].

The most productive years were 2017-2018, when gross yield volumes exceeded 290-343 thousand tons under relatively stable vineyard areas. This period can be regarded as a benchmark in terms of the sector's potential under a favorable combination of climatic conditions, vineyard status, and agronomic practices. The average production level during 2014-2016 and 2021-2023 amounted to 194-248 thousand tons, which can be considered typical for the region given the current level of viticultural development. Critical production declines were observed in 2015, 2020, and 2024, when the gross harvest did not exceed 118-194 thousand tons.

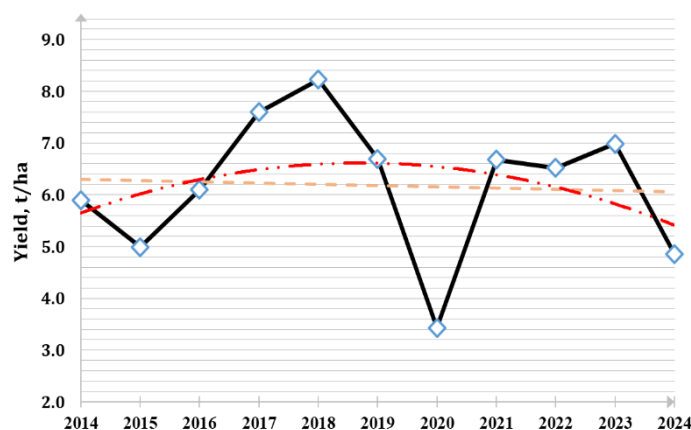


Figure 3. Vineyard Yields on Agricultural Enterprises and Peasant (Farmer) Holdings in ATU Gagauzia (with agricultural land of 10 ha or more)

Source: <https://statbank.statistica.md> [7].

Vineyard yield, as an integrated indicator of production efficiency, also exhibits sharp fluctuations, ranging from 34.3 t/ha in 2020 to 82.3 t/ha in 2018, i.e., a 2.4-fold difference (Figure 3). The coefficient of variation of yield exceeds 30%, which represents an extremely high level of instability for perennial crops. The initial yield level in 2014 was 59.0 t/ha, followed by a decline to 49.9 t/ha in 2015. The period from 2016 to 2018 was characterized by a steady increase in productivity, reaching a historical maximum of 82.3 t/ha in 2018, which indicates a high agrotechnical potential of viticulture in the region. The catastrophic year 2020 became a turning point for the sector. The decline in yield to 34.3 t/ha represents a reduction of 48.8% compared with the previous year and 58.3% relative to the peak value recorded in 2018. Such a sharp decrease in productivity, accompanied by only a moderate contraction of vineyard area (7.4% compared with 2019), indicates the impact of extreme external factors.

The recovery of the sector after the 2020 crisis was gradual and did not reach pre-crisis levels. During 2021-2023, yields stabilized at 65.2-69.9 t/ha, which is significantly lower than the values observed in the successful years 2017-2018, but substantially higher than in the failure years. This suggests that, despite the reduction in cultivated area, the vineyards remaining in production largely retained their productive capacity. However, a new decline in 2024, when yield dropped to 48.5 t/ha – 30.6% lower than in 2023 and the second worst result over the entire study period – raises serious concerns regarding the long-term sustainability of the sector.

The downturn observed in 2024 is particularly alarming as it occurred against the background of a continued contraction of vineyard area to a historical minimum of 3,325 ha. Gross grape production amounted to only 161,186 tons, which is merely 36% higher than the catastrophic level recorded in 2020 and more than twice lower than the record harvest of 2018. This trend indicates the accumulation of systemic problems, including possible aging of vineyards, insufficient replanting and renewal of plantations, deterioration of phytosanitary conditions, unfavorable weather events, or a combination of these factors.

A comparison between the dynamics of technical and table grape varieties and the overall sector indicators reveals important patterns. Technical varieties, which accounted for approximately 86% of the total vineyard area in 2024, largely determine the general development trends of the sector. In contrast, table grape varieties, despite representing a smaller share (about 14%), exhibit a more pronounced reduction in cultivated area (22.4% compared with 13.4% for technical varieties), indicating a deeper crisis in this production segment. At the same time, in certain years, particularly after 2020, table grape varieties demonstrated higher yield levels; however, this was insufficient to offset the overall decline due to their limited proportion within the vineyard structure.

The economic analysis indicates that viticulture in the ATU Gagauzia is currently in a state of crisis. The systematic reduction of vineyard areas reflects low production profitability, insufficient market competitiveness, and an unfavorable investment climate. High yield volatility creates substantial financial risks for producers, complicating production planning and limiting access to credit for development. Two critical yield collapses within five years (2020 and 2024) demonstrate the sector's inability to effectively withstand external shocks, whether caused by weather anomalies or other adverse factors.

The aging of the sector's material and technical base represents a serious threat. The decline in vineyard area is mainly the result of uprooting old and unproductive plantations, while the establishment of new vineyards remains clearly insufficient to compensate for the withdrawn areas. This leads to an increase in the average age of vineyards and a gradual erosion of production potential.

A shortage of qualified personnel further aggravates the situation. The contraction of production makes viticulture less attractive to young specialists, resulting in workforce aging and the loss of traditional knowledge and skills. The labor-intensive nature of viticulture, especially in table grape production, requires considerable manual labor, the availability and cost of which have become critical constraints. Insufficient mechanization and automation increase production costs and reduce overall competitiveness.

Marketing and sales problems constitute one of the key drivers of the crisis. Limited diversification of export destinations restricts growth opportunities. In the table grape segment, difficulties arise from competition with imported products on the domestic market and from barriers to entry into demanding European markets due to strict phytosanitary standards. Weak cooperation among producers reduces their bargaining power and hampers the organization of efficient marketing channels.

Despite these serious challenges, the sector retains significant development potential. The experience of the successful years 2017–2018 demonstrates that under favorable conditions the region's viticulture can achieve yields exceeding 80 t/ha and produce more than 340 thousand tons of grapes, confirming the availability of agroclimatic resources and technological capacity. The partial recovery after the 2020 crisis reflects the resilience of remaining producers and their willingness to continue operating under difficult circumstances. In the long term, the concentration of production in more efficient enterprises may contribute to higher labor productivity and improved product quality.

Unique autochthonous grape varieties represent a major competitive advantage of the region that remains underutilized. Global demand for authentic, terroir-driven wines creates favorable opportunities for promoting wines made from local varieties on international markets. The development of wine tourism can serve as an additional income source and an effective tool for promoting regional wines. Geographic proximity to the European Union and Black Sea markets provides logistical advantages for export.

To overcome the crisis and ensure sustainable development of viticulture in ATU Gagauzia, a comprehensive multi-level action program is required. Immediate measures should include a detailed investigation of the causes of the catastrophic yield decline in 2024, involving scientific institutions and practitioners to develop recommendations for preventing similar situations in the future. Support for affected producers is essential to prevent mass vineyard uprooting and further contraction of cultivated areas.

The medium-term strategy should focus on structural modernization of the sector. A state-supported vineyard renewal program should be developed and implemented, providing subsidies for the establishment of new plantations with modern varieties and clones that meet market demands and exhibit increased resistance to adverse factors. The creation of a regional system for producing certified, virus-free planting material must become a priority to ensure a high-quality foundation for future vineyards. The development of modern irrigation infrastructure, particularly drip irrigation systems, will reduce dependence on weather conditions and stabilize yields, especially for table grape production.

Improving vineyard protection systems should involve the introduction of integrated pest management based on pest monitoring and environmentally safe control methods. The installation of anti-hail nets in table grape plantations can significantly reduce yield loss risks. Expanding meteorological monitoring and forecasting systems and providing real-time information to producers will facilitate timely decision-making regarding protective measures.

Market diversification is critically important for risk reduction. Efforts should be intensified to promote wines from autochthonous varieties in the European Union, Asian, and North American markets, using product uniqueness as a competitive advantage. The development of direct export channels for table grapes to countries with strong demand for high-quality produce can create new opportunities for growers.

Institutional development should include the establishment and strengthening of producer cooperatives for joint marketing, input procurement, and knowledge exchange. Expanding contract farming systems between grape growers and wineries through long-term agreements will ensure stable sales channels and predictable income. The creation of a specialized viticulture development fund to provide preferential loans for vineyard renewal and equipment acquisition can stimulate investment in the sector.

Human capital development requires a continuous training system for growers in modern technologies through demonstration plots, seminars, and internships in leading farms. Attracting young specialists through support programs for beginning winegrowers can ensure workforce renewal. Cooperation with research institutions for the adaptation and implementation of innovative viticultural technologies will enhance sector competitiveness.

Wine tourism development represents an important complementary direction. The creation of wine routes with visits to vineyards, wineries, and tasting rooms will attract tourists and promote local wines. Organizing grape and wine festivals to popularize regional viticultural culture will increase the region's attractiveness. The development of agrotourism facilities based on vineyards will generate additional income sources for producers.

Scientific support for sector development should include comprehensive research on climate change adaptation, including the selection of resilient varieties and the development of adaptive technologies. The study and conservation of the genetic diversity of autochthonous grape varieties as a unique regional resource require systematic efforts. The development of variety-specific cultivation technologies for the most promising autochthonous and introduced varieties will provide producers with scientifically grounded recommendations.

Increasing average yields to stable levels of 70-75 t/ha is achievable through improved agronomic practices, vineyard renewal, and irrigation system implementation. Expanding the share of autochthonous varieties among technical grape plantings to 20-25% will promote the production of unique high value-added wines. Diversification of export markets and reduced dependence on a single destination will enhance the sector's resilience to external shocks.

Decisive and coordinated actions by authorities, producers, processors, and the scientific community are required to overcome the crisis and ensure a transition toward sustainable development. The potential for recovery and growth exists, but its realization depends on strategic vision and adequate investment. Viticulture remains not only a key economic sector of the region but also an integral part of its cultural identity, which gives its preservation and development a significance that goes beyond purely economic considerations.

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EFFECT OF PGPR ON THE GROWTH OF THE ECONOMICALLY VALUABLE CROWN-OF-THORNS (*Euphorbia milii*) PLANT

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Abstract: The economically valuable crown-of-thorns (*Euphorbia milii*) plant is a slow growing and limited branching plant. Therefore, researchers continue to work on faster production techniques. As one of these techniques, the effects of PGPR inoculation on the development of this plant were tried to be determined. In the experiment, bacteria isolated from forest soils and previously determined to be effective on cultivated plants were inoculated into the plant's growing medium, the plant's root, or both. Mean values revealed that the bacterial applications increased the weight of the plant shoot compared to the negative control in which no application was made. However, the highest value was obtained from the positive control in which the medium used for the cultivation of the bacteria was inoculated. The results showed that any bacterial inoculation is not suitable for ornamental plant cultivation, particular bacteria determination is strongly required. Obtained weight increase on shoot by bacterial inoculation may be related to the medium properties of culture propagation rather than bacterial inoculations. Thus, positive control is the key to determine suitable PGPRs.

Keywords: Crown-of-thorns, *Euphorbia milii*, PGPR, ornamental plants, microbial fertilizers

Introduction

Flowers, which have been used for aesthetic purposes for centuries, are now used for purposes such as urbanization, satisfying the longing for nature of people who are moving away from natural life, turning cities into more pleasant and livable environments, and today they attract attention as a commercial branch that plays an important role in the economic development of many countries. Compared to general agricultural products, ornamental plants can have much higher economic returns per unit area. Accelerating the development of these plants can increase economic returns. For this purpose, the use of plant growth promoting rhizobacteria, abbreviated as PGPR, has become increasingly widespread recently. In a study, it was shown that the application of natural microbial fertilizer to the *Kalanchoe blossfeldiana* plant accelerated root formation in species produced by cuttings and better roots were obtained [1, p.76-77]. Microorganisms can also be used for biological

pest and disease control. It has been shown that the pathogen *Xanthomonas axonopodis* causes bacterial blight on Geranium (*Pelargonium spp.*) plants, and some of the bacteria isolated to struggle this disease are very effective [2, p.33]. In a similar study, it was determined that PGPR bacteria had a positive effect on the rooting of Sibirica plant cuttings [3, p.524]. In another study conducted with *Dahlia variabilis*, it was revealed that PGPR applications did not show the expected effect and PGPR application only increased the root dry weight among the measured parameters [4, p.2741]. In a study using PGPR and organic liquid fertilizers that promote plant growth in soilless basil cultivation, it was shown that inoculation with PGPR had no significant effect on basil plant growth but was effective in reducing the nitrate content of basil leaves [5, p.4]. The use of microorganisms in ornamental plants helps to re-establish the soil-plant-ecosystem relationship that has deteriorated over time. In this context, positive effects were determined in the study conducted with the bougainvillea plant [6, p.193]. The production rate of *Euphorbia milii* is slow because it has slow growing behavior and produces few branches [7, p.141]. Micro-propagation experiments are ongoing to enable faster production [8, p.234]. Therefore, in this study, the effect of PGPR inoculation on faster production of crown of thorns plant and thus more economic income was investigated. Although PGPR is generally effective on plants, as explained above, it sometimes does not provide benefit. In this study, it was tried to determine whether positive or neutral effect exists.

Material and methods

In the study, 4 bacteria selected from previously isolated from forest soil and the effectiveness demonstrated were used [9, p.117]. In addition, positive control, in which only the medium used in bacterial production was applied, and a negative control, in which no application was made, were added to the experiment. Bacteria applications were made only to the root, only to the growing medium (peat), and to both. Accordingly, the expressions root, peat, and root + peat were used in the result figures.

In the experiment, plants were taken from the crown of thorns plant (*Euphorbia milii*) by cutting, kept in the open air for 3-4 days, after the cut area was firmly crusted, it was planted in the soil and waited for rooting for 7-8 weeks. After this process, the plant roots were slowly removed from the soil they were attached to, and applications were started. In the first application, the plant roots were planted by dipping them into medium containing bacteria. In the second application, the plants were planted in peat, then 1 ml of bacteria suspension was applied to the surface of the peat and irrigation was done. In the last application, both root dipping was done, and application was made from the surface of the peat. A pot experiment was carried out for approximately 270 days to observe the vegetative development of the planted plants. For this purpose, 400 ppm N, 300 ppm P and 300 ppm K were applied as basic fertilizer to the pots used.

At the end of the experiment, the plants were harvested from the root collar and their fresh and dry weights were determined. In determining the dry weight, the samples were dried at 80 °C until they reached a constant weight.

Results and Discussion

Root dry weight values

The plants' roots were carefully removed from the growing medium their dry weights were determined. The dry root weight results are presented in Figure 1. Although the highest root weight value was obtained from the application of positive control to the root + growth medium inoculation, the increase obtained was not found to be significant. Bacteria inoculations were limiting root development, in general. In this case, it can be said that bacteria application should not be done considering root development. It has been reported in the literature that bacteria may have an effect on root elongation even if they do not affect plant development [4, p.2741]. In this experiment, the effect mentioned was not observed according to the results presented here. On the other hand, the bacteria used in this pot experiment may not be effective and that isolating other bacteria for this plant and this growing environment may be beneficial. In fact, some researchers have determined the positive effects of bacteria on the development of ornamental plants [2, p.33; 3, p.524].

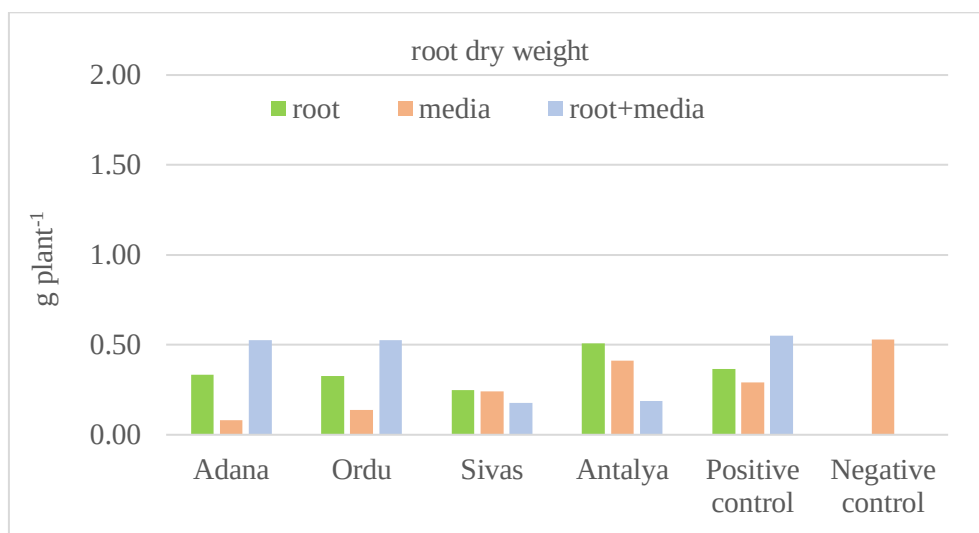


Figure 1. Root dry weights

The effects of bacteria and application methods in terms of average values are given in Figure 2 and 3, respectively. The results obtained showed that bacteria labeled with the names Adana and Ordu gave values close to the positive and negative controls, while bacteria labeled with the names as Sivas and Antalya had significant negative effects on root development. These results clearly show that not every microbial fertilizer can be used on every plant. Among the application methods (Table 3), it was concluded that the worse effective application was the application to the growing medium, whereas root inoculation gave better results, and the best result was obtained from combined inoculation to root and growing medium.

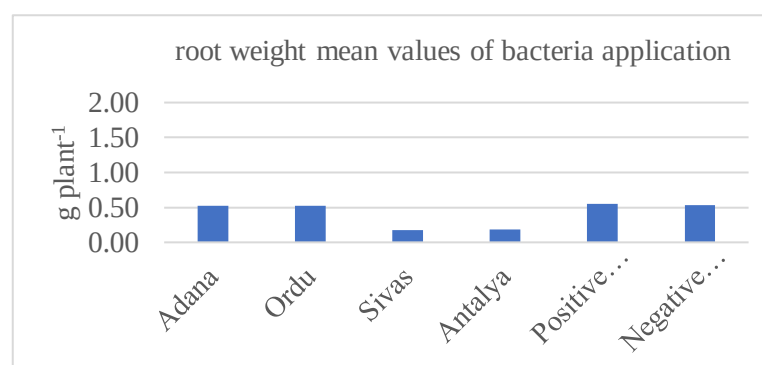


Figure 2. Mean values of bacteria in terms of root dry weights

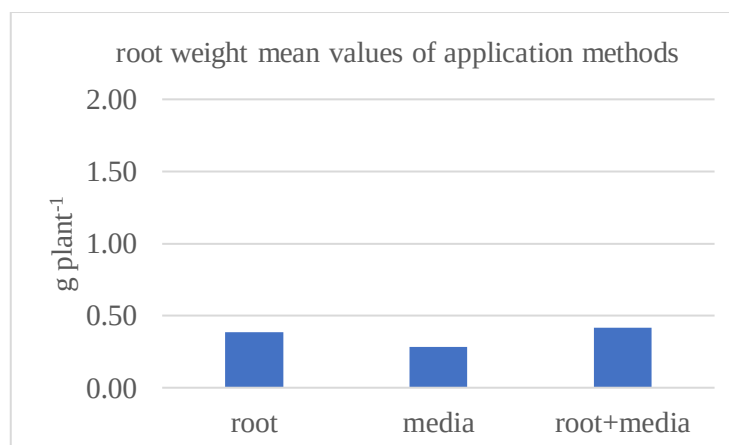


Figure 3. Mean values of application methods in terms of root dry weights

Shoot dry weight values

Shoot dry weights (Figure 4) revealed that the best result was in root inoculation of the bacteria labeled with Sivas. However, the effect of this bacteria on root development was quite low. This situation is an indication that the bacteria stimulate the shoot weights of the plant more than the root weights. If the experiment is continued longer, it can probably be expected that the plant, which will perform more photosynthesis, will provide more root development. Longer-term experiments are needed to reveal this situation. The lowest plant green parts weight determined was obtained from the negative control, where no application was applied. When the results were examined in terms of shoot weights, it was seen that the applications were effective on the shoot weights and that bacterial inoculation was an option in ornamental plants that are difficult to grow and have high economic returns.

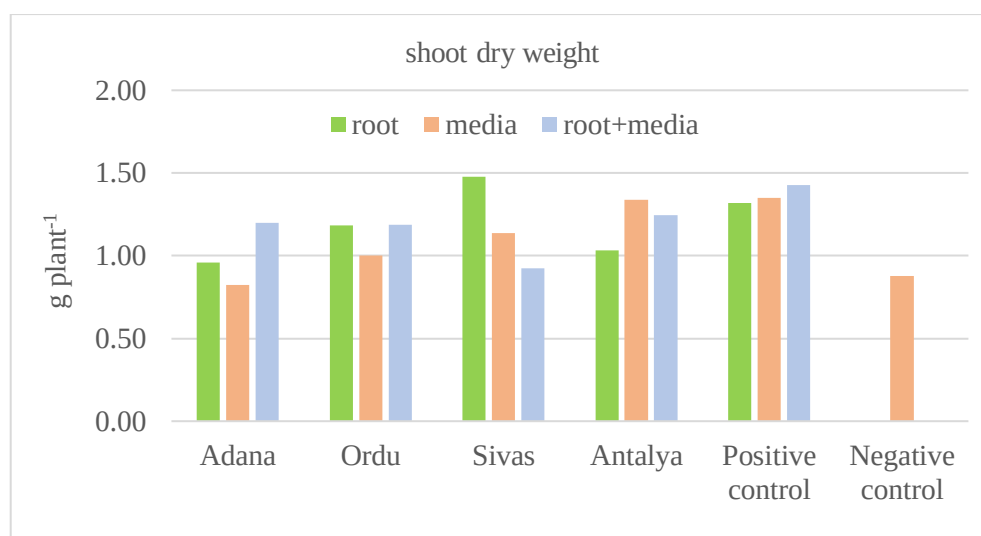


Figure 4. Shoot dry weights

When the bacterial applications were compared in terms of average values (Figure 5), it was clearly seen that the bacterial applications increased the weight of the plant shoot compared to the negative control in which no application was made. However, the highest value was obtained from the positive control in which the medium used for the cultivation of the bacteria was inoculated. This result may indicate that the positive effect obtained from the bacterial inoculation compared to the negative control is not due to the bacteria but to the medium used for the cultivation of the bacteria. Bacteria use nutrients from the medium while they are being grown. Since there were no bacteria in the positive control, nutrients from the medium could not be used. These results indicate that some elements or organic compounds may be deficient in the soil or the cultivation medium, and that the plant develops better when these deficiencies are eliminated. In order to understand that the bacteria are effective alone, the value of adding positive control in which the cultivation medium used is also included in the experiment has been demonstrated by this study.

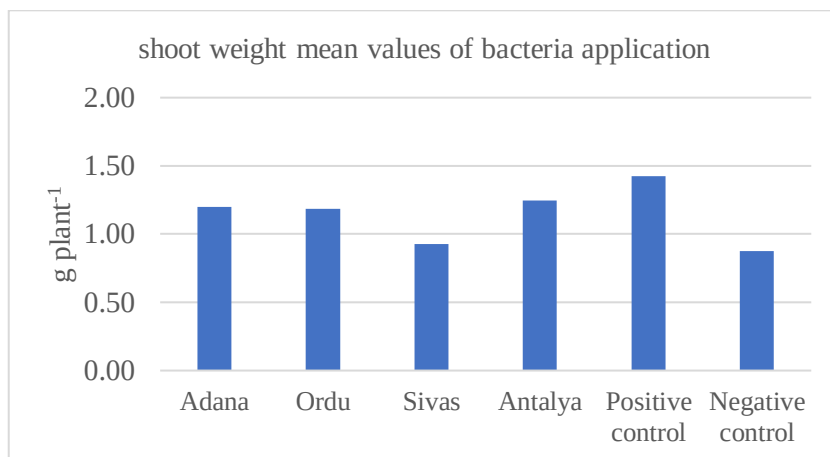


Figure 5. Mean values of bacteria in terms of shoot dry weights

The effect of inoculation methods on shoot weights is given in Figure 6. It was observed that the application method did not have significant effects in terms of inoculation methods and root and root + growth medium inoculation provided similar results. When root weights and green part weights were evaluated together, it was concluded that root + growth medium grafting should be recommended.

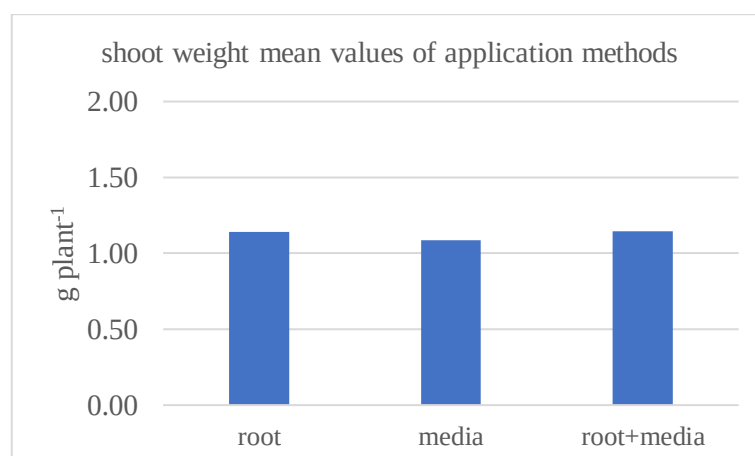


Figure 6. Mean values of application methods in terms of shoot dry weights

Conclusions

The results obtained from this study showed that not every bacterial inoculation is suitable for ornamental plant cultivation. On the other hand, bacterial inoculations increased the weight of green parts compared to the control without any application. However, it is difficult to say that the source of this positive effect is related by bacteria application. Because, in the positive control where the material used in bacterial production was applied, generally high values were obtained. This may be a sign that there are not enough nutrients in the growing medium. Although there are many studies on fertilization of cultivated plants, there are relatively fewer studies on fertilization of ornamental plants. In general, it was concluded from the results obtained from this study that it is important to use bacterial fertilizers after fertilizing ornamental plants in a balanced way.

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DINCOLO DE SACCHAROMYCES: LEVURILE NON-SACCHAROMYCES CA INSTRUMENTE DE PROIECTARE A AROMEI ȘI STRUCTURII VINULUI

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Abstract: Non-Saccharomyces yeasts have moved from being regarded as spoilage agents to becoming deliberate biotechnological tools in modern winemaking. Their taxonomic and functional diversity enables targeted modulation of aroma (including volatile thiols), mouthfeel (e.g., glycerol), acidity balance, and varietal expression through specific metabolic routes and extracellular enzymes. In mixed or sequential fermentations with *Saccharomyces cerevisiae*, they can act synergistically to increase sensory complexity, although competitive interactions for nitrogen, vitamins, and micronutrients may alter fermentation kinetics and stability. Practical implementation requires strain-

level selection, optimization of inoculum and inoculation timing (co-inoculation vs. sequential), and careful monitoring of potentially undesirable metabolites. The increasing availability of active dry non-Saccharomyces cultures supports controlled applications and reduces the risks associated with spontaneous indigenous microbiota.

Cuvinte-cheie: levuri non-Saccharomyces, fermentație alcoolică, inoculare secvențială, coinoculare, fermentație mixtă, Saccharomyces cerevisiae,

Introducere

În ultimul deceniu, utilizarea levurilor non-Saccharomyces în fermentația alcoolică a vinului a devenit o direcție aplicativă majoră, investigată atât în țări cu tradiție oenologică (Franța, Spania, Italia, Portugalia, Grecia), cât și în regiuni viticole emergente sau puternic industrializate (Australia, Chile, Argentina, Africa de Sud) [1]. Divergența de opinii din literatura de specialitate este explicabilă: unele levuri neconvenționale pot fi asociate cu deviații senzoriale sau fermentații incomplete, însă un număr tot mai mare de studii demonstrează capacități tehnologice favorabile—în special creșterea complexității aromatice, formarea de compuși volatili de interes, secreția de enzime extracelulare și influențarea parametrilor analitici ai vinului [2].

Diversitatea taxonomică și plasticitatea metabolică.

Grupul non-Saccharomyces include numeroase genuri și specii (de exemplu Hanseniaspora, Metschnikowia, Pichia, Candida, Zygosaccharomyces), cu variație genetică și fenotipică considerabilă la nivel de tulpină [3]. Această variație se reflectă direct în: (i) cinetica fermentației (viteza de consum a zaharurilor, capacitatea de a susține fermentație parțială), (ii) toleranța la stres (etanol, SO₂, temperatură, presiune osmotică), și (iii) rutele metabolice care generează compuși volatili și nevolatili cu rol senzorial și tehnologic. Consecința practică este că „specia” nu este un predictor suficient; selecția trebuie orientată tulpină-specific, cu validare în condiții oenologice.

Roluri tehnologice majore: aromă, enzime, structură.

Un argument central pentru includerea levurilor non-Saccharomyces este capacitatea lor de a amplifica expresia aromatică. Zott și colab. au arătat, prin analiza tiolilor volatili, că levurile neconvenționale pot transforma precursorii S-cisteinilici în compuși aromatici chiar și atunci când fermentația este doar parțială [2]. În aceeași logică, screening-uri extinse au identificat tulpini capabile să producă metaboliți secundari valoroși (alcooli superiori selectivi, esteri, compuși floralii), confirmând utilitatea lor ca „instrumente microbiologice” pentru industria oenologică [4].

În paralel, contribuția enzimatică este o componentă aplicativă subestimată în multe scheme tehnologice. S-a raportat activitate β-glucozidazică înaltă la tulpini din genul *Hansenula* [5], iar la un set larg de tulpini neconvenționale s-au evidențiat activități proteazice, esterazice și pectinazice, relevante pentru eliberarea precursorilor aromatici, stabilitatea coloidală și conturarea profilului senzorial specific soiului. În termeni tehnologici, aceste enzime pot crește „randamentul” aromatic al materiei prime fără intervenții excesive în must.

Interacțiunea cu *Saccharomyces cerevisiae*: sinergism, competiție, control.

În fermentația vinului, levurile non-Saccharomyces coexistă frecvent cu *S. cerevisiae*, influențând atât dinamica fermentativă, cât și compoziția finală. Fermentațiile mixte sau secvențiale pot îmbunătăți semnificativ caracteristicile organoleptice și analitice, însă necesită monitorizarea atentă a compușilor potențial indezirabili (inclusiv metaboliți toxici ai fermentației, în funcție de tulpini și condiții) [6].

Un punct critic, încă insuficient cuantificat experimental în multe lucrări, îl reprezintă competiția nutritivă: azot asimilabil, vitamine și oligoelemente pot deveni factori limitativi diferiți pentru cele două tipuri de levuri, cu efecte asupra dominanței populaționale și asupra finalizării fermentației alcoolice. De aici derivă necesitatea modelării strategiei de inoculare: coinoculare vs. inoculare secvențială, ajustarea inoculului și a momentului introducerii fiecărei tulpini, precum și adaptarea nutrițională a mustului (mai ales la soiuri cu YAN scăzut).

Exemplul *Torulaspora delbrueckii*: profil aromatic și parametri analitici.

Rezultatele obținute de grupuri de cercetare din Universitatea Politehnică din Ancona și Universitatea din Florența susțin ideea că selecția rațională din colecții largi de tulpini non-

Saccharomyces permite identificarea unor fenotipuri utile pentru vinificație [6]. În mod particular, studiile asupra tulpinii *Torulaspora delbrueckii* arată o fermentare mai lentă și necesitatea asocierii cu *Saccharomyces* pentru finalizarea procesului; în schimb, pot crește formarea de acizi organici, glicerol și 2-feniletanol, ceea ce se reflectă senzorial prin prospețime și complexitate floral-fructată [241]. Acest tip de profil este relevant mai ales pentru vinuri albe aromate sau pentru stiluri în care se urmărește diferențierea varietală fără supra-tehnologizare.

„Terroir” microbiologic și diferențierea tipologică a vinurilor.

Un set de rezultate din Universitatea din Stellenbosch și colaborări internaționale au sugerat că utilizarea maielelor combinate (non-*Saccharomyces* + *Saccharomyces*) poate ameliora calitatea vinurilor și poate accentua expresia specifică soiului și arealului, contribuind la conturarea factorului „terroir” în sens microbiologic. În Argentina s-a propus o schemă tehnologică de tip secvențial (inițial *Kloeckera apiculata*, apoi *Saccharomyces*), urmată de inocularea bacteriilor lactice *O. oeni* către finalul fermentației alcoolice, pentru reducerea acidității aspre și obținerea unui profil organoleptic caracteristic. Aceste exemple indică faptul că levurile non-*Saccharomyces* pot fi integrate nu ca „decor”, ci ca elemente de proiectare a procesului.

De la cercetare la industrie: culturi uscate active și reducerea riscului tehnologic.

O barieră istorică a fost imposibilitatea controlului reproductibil: vinificatorii nu se puteau baza pe dezvoltarea spontană a microbiotei indigene fără riscul de oprire a fermentației sau apariția deviațiilor senzoriale. În prezent, disponibilitatea culturilor active uscate non-*Saccharomyces* (în special *T. delbrueckii*) permite implementarea controlată, cu condiția folosirii în combinație cu *S. cerevisiae* pentru a asigura finalizarea fermentației într-un timp rezonabil. În consecință, fermentațiile mixte și secvențiale au trecut de la „experimente de crâmă” la opțiuni tehnologice standardizabile, care pot crește complexitatea aromatică și pot scoate în evidență note varietale specifice. În tabelul 1 este prezentată gruparea bacteriilor non-*Saccharomyces* utilizate în vinificație.

Tabelul 1. Utilizarea tulpinilor non-*Saccharomyces* în vinificație

Categoria (scop)	Speciile utilizate (exemple)	Modul de administrare (tipic)	Efect tehnologic urmărit
Controlul acidității volatile și al acidului acetic	<i>S. cerevisiae</i> / <i>T. delbrueckii</i> ; <i>S. cerevisiae</i> / <i>K. thermotolerans</i>	preponderent secvențial	reducerea acidului acetic, scăderea acidității volatile, creșterea „curățeniei” aromatice
Creșterea complexității aromatice și a profilului senzorial	<i>S. cerevisiae</i> / <i>T. delbrueckii</i> ; <i>S. cerevisiae</i> / <i>P. fermentans</i> ; <i>S. cerevisiae</i> / <i>C. stellata</i> ; <i>S. cerevisiae</i> / <i>C. pulcherrima</i> ; <i>S. cerevisiae</i> / <i>H. uvarum</i> (<i>K. apiculata</i>)	mixtă sau secvențială	intensificarea esterilor și a notelor floral-fructate, sporirea complexității aromatice, stimularea fermentației „naturale” controlate
Majorarea tiolilor varietali	<i>S. cerevisiae</i> / <i>P. kluyveri</i>	mixtă	creșterea tiolilor varietali și accentuarea caracterului varietal (mai ales la vinuri albe aromate)
Creșterea glicerolului și a „corpolenței”	<i>S. cerevisiae</i> / <i>C. stellata</i> ; <i>S. cerevisiae</i> / <i>C. cantarellii</i>	mixtă sau secvențială; uneori imobilizate	creșterea glicerolului, rotunjirea gustului, îmbunătățirea senzației de volum
Deacidificare prin degradarea acidului malic	<i>S. cerevisiae</i> / <i>S. pombe</i> și <i>Schizosaccharomyces spp.</i> ; <i>S. cerevisiae</i> / <i>I. orientalis</i>	imobilizate (lot/continuu) sau mixtă	reducerea acidului malic, diminuarea acidității aspre, ajustarea echilibrului acido-senzorial

Intensificarea compușilor terpenici (ex. geraniol)	<i>S. cerevisiae</i> / <i>D. vanriji</i>	mixtă	creșterea unor terpene/compuși floralii și consolidarea expresiei aromatice
Influențe în maturare (post-fermentativ)	<i>S. cerevisiae</i> / <i>Schizosaccharomyces spp.</i> și <i>Pichia spp.</i>	reproducere în timpul maturării	modificări fizico-chimice și organoleptice în perioada de maturare (complexitate, finețe, stabilitate)

Sinteză aplicativă a direcțiilor tehnologice

- Non-Saccharomyces pot reduce aciditatea volatilă (prin scăderea acidului acetic) și pot crește complexitatea aromatică atunci când sunt folosite secvențial cu *S. cerevisiae*.
- Unele asocieri vizează creșterea glicerolului (de exemplu cu *Candida stellata* sau *C. cantarellii*), fie prin tulpini mixte, fie secvențial.
- Alte scheme urmăresc degradarea acidului malic (de exemplu cu *Schizosaccharomyces spp* sau *I. orientalis*), inclusiv prin levuri imobilizate sau fermentație mixtă [69, 117, 237, 267].
- Pentru amplificarea tiolilor varietali și a profilului aromatic, sunt raportate combinații cu *P. kluyveri* sau *C. pulcherrima*.
- Anumite combinații pot influența compuși terpenici (de exemplu geraniol) și pot interveni în etape post-fermentative (maturare) prin dinamici microbiene controlate.

Concluzii.

Levurile non-*Saccharomyces* trebuie privite ca o platformă biotehnologică pentru reglarea fină a profilului senzorial și analitic al vinului, nu ca un „risc inevitabil” al fermentației spontane. Beneficiile lor sunt condiționate de selecția la nivel de tulpină, de alegerea strategiei de inoculare (coinoculare vs. secvențial), de managementul nutrițional al mustului și de controlul metaboliților indesezirabili. Direcțiile cele mai robuste din literatura consultată indică: (i) creșterea complexității aromatice (inclusiv tioli varietali), (ii) contribuții enzimatiche relevante pentru expresia soiului, și (iii) ajustări ale structurii (glicerol, acizi organici) atunci când non-Saccharomyces sunt integrate rațional cu *Saccharomyces*. Din punct de vedere aplicativ, extinderea culturilor uscate active non-Saccharomyces reduce variabilitatea și permite transferul din laborator în crama, cu obiective tehnologice explicit cuantificabile (fermentație completă, profil aromatic țintit, stabilitate).

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ASSESSMENT OF NUTRIENT ELEMENTS IN SLIPPERY ELM (*Ulmus rubra*)

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Abstract: Medicinal plants are widely used worldwide for the prevention, treatment, and management of numerous diseases. In this study, slippery elm (*Ulmus rubra*) bark was obtained from a herbal supplier and ground into powder form. Subsequently, the concentrations of macro- and micronutrients, including nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), iron (Fe), zinc (Zn), manganese (Mn), and copper (Cu), were determined. According to the findings, the concentrations were measured as 0.80% N, 0.43% P, 1.25% K, 0.35% Ca, 0.42% Mg, 359.5 mg Fe kg⁻¹, 18.9 mg Zn kg⁻¹, 75.1 mg Mn kg⁻¹, and 25.7 mg Cu kg⁻¹. The results indicate that slippery elm bark is generally sufficient in terms of nutrient elements; however, it contains relatively lower concentrations of nitrogen and calcium.

Keywords: Slippery elm, *Ulmus rubra*, macro- and microelements, medicinal plants.

Introduction

Slippery elm (*U. rubra*) is a diploid elm species native to eastern North America, with a natural distribution ranging from North Dakota in the west to southern Quebec in the east, and extending southward to northern Florida and eastern Texas [1]. This elm species is a broad-leaved, deciduous tree that is characteristically found in moist and nutrient-rich soils of bottomland forests; however, it may also occur in moist upland forests [2]. Elms (*Ulmus* spp.) are classified among large deciduous forest trees that shed their leaves during the winter months [3]. The genus, which is naturally distributed across the temperate regions of Europe and Asia, comprises approximately 18–20 species [4]. The genus *Ulmus* L. belongs to the family Ulmaceae and, in addition to its role as a forest tree, some species are widely used as ornamental trees in parks, gardens, and along roadsides [5]. Finely serrated leaf margins and an asymmetrical leaf base are among the distinctive morphological characteristics of the species. In elms with a hermaphroditic reproductive system, the flowers contain both male and female organs and bloom in clusters in early spring before leaf emergence. These long-lived trees can reach heights of up to 40 m and attain trunk diameters of 1–2 m [3].

Medicinal plants are widely used worldwide for the prevention, treatment, and management of a wide range of diseases. Elm species are among these plants, and they have traditionally been used for various medicinal purposes, particularly due to their soothing effects on the gastrointestinal system [6]. Slippery elm bark contains mucilage that forms a gel-like consistency when mixed with water; this gel coats the throat, esophagus, and stomach, creating a protective layer that helps reduce irritation [7]. This property makes slippery elm effective in the treatment of conditions such as

gastroesophageal reflux disease (GERD) and irritable bowel syndrome (IBS). The mucilage obtained from soaked bark has also been traditionally used as a demulcent, anti-inflammatory agent, skin emollient, laxative, and wound-healing remedy [8,9]. Studies have shown that indigenous populations living in eastern Kentucky have traditionally used tea prepared from the bark of this plant as a laxative [6]. In a study conducted by Ried et al. [10], slippery elm was included in a herbal formulation that significantly improved both upper and lower gastrointestinal (GI) symptoms in adults with digestive disorders, highlighting the plant's potential role in supporting intestinal health [11]. Beyond its applications related to the gastrointestinal system, *U. rubra* is also known to exhibit anti-inflammatory and antioxidant properties. Compounds such as catechins and flavonoid glycosides found in the genus *Ulmus* have been reported to show promising effects in the management of inflammatory diseases and even osteoporosis, with *Ulmus* extracts enhancing bone density and strength through the regulation of osteoclast activity [12]. In addition, recent studies suggest that slippery elm may play a potential role in strengthening intestinal barrier function. Aleman et al. [13] demonstrated that yogurt prepared with starter culture bacteria and enriched with ingredients such as slippery elm bark was effective in the treatment of leaky gut syndrome. In particular, *U. rubra* has been reported to contribute to the maintenance of intestinal integrity by reinforcing tight junctions.

In light of the aforementioned findings and the growing interest in the medicinal properties of *U. rubra*, the present study aimed to determine the concentrations of macro- and micronutrient elements in the slippery elm bark obtained from a herbal supplier.

Material and methods

Plan Material and Preparation

The slippery elm (*U. rubra*) bark used in this study was obtained from a herbal supplier in Sivas Province, located in the Central Anatolia Region of Turkey. In the laboratory, the bark was carefully ground into a fine powder using an agate mortar to ensure uniform particle size.

Sample Digestion and Wet Ashing

Approximately 0.2 g of the powdered bark was subjected to wet ashing using a mixture of hydrogen peroxide (H_2O_2) and nitric acid (HNO_3). The resulting solution was filtered to obtain clear filtrates for subsequent elemental analyses.

Elemental Analysis

Phosphorus (P) concentrations were determined colorimetrically at 882 nm using a spectrophotometer [14]. The concentrations of calcium (Ca), magnesium (Mg), potassium (K), iron (Fe), manganese (Mn), zinc (Zn), and copper (Cu) were measured using an Atomic Absorption Spectrophotometer (Shimadzu AA-7000) [15]. Nitrogen (N) content was quantified according to the Kjeldahl distillation method [16].

Quality Control and Replication

All measurements were performed in triplicate to ensure accuracy and reproducibility. Standard solutions and blanks were analyzed alongside samples to validate the analytical procedures.

Results and Discussion

The concentrations of macro- and micronutrients in slippery elm bark are summarized in Table 1 and Table 2, respectively. Analysis of the macroelement content revealed that the bark contained 0.80% N, 0.43% P, 1.25% K, 0.35% Ca, and 0.42% Mg (Table 1). For comparative context, a study evaluating the feed value potential of linden tree (*Tilia rubra* subsp.) leaves reported ranges of 0.23–0.80% for P, 0.04–1.75% for K, 1.80–2.97% for Ca, and 0.21–0.71% for Mg [17]. These findings suggest that, while the P and K contents of slippery elm bark fall within the range reported for linden leaves, its Ca content is lower, highlighting species-specific nutrient profiles. Similarly, in a study assessing the leaf N, P, and chlorophyll contents as well as photosynthetic gas exchange and chlorophyll fluorescence parameters in pure *Ulmus pumila* forests, pure *Robinia pseudoacacia* forests, and mixed *U. pumila*–*R. pseudoacacia* stands, the N content of *U. pumila* leaves ranged from 2.98 to 4.26%, and P content varied between 0.16 and 0.29% across three sampling periods [18]. These values are considerably higher than those observed in slippery elm bark,

reflecting differences between leaf and bark nutrient accumulation, as well as between species and environmental conditions.

Table 1. Some macronutrient concentrations of slippery elm (*U. rubra*) bark (%)

N	P	K	Ca	Mg
(%)				
0.80	0.43	1.25	0.35	0.42

The concentrations of micronutrients in slippery elm bark are presented in Table 2. The results indicated that the bark contained 359.5 mg Fe kg⁻¹, 18.9 mg Zn kg⁻¹, 75.1 mg Mn kg⁻¹, and 25.7 mg Cu kg⁻¹. These findings suggest that slippery elm bark is a relatively rich source of essential trace elements. For comparison, a study conducted to determine total and bioavailable levels of As, Cd, Cr, Cu, Ni, Pb, and Zn in soils, as well as the concentrations of these elements in roots and leaves of elm (*Ulmus glabra* Huds.) along the Sava River, reported Cu concentrations of 5.27–11.78 mg kg⁻¹ in roots and 5.47–8.50 mg kg⁻¹ in leaves, and Zn concentrations of 2.65–26.34 mg kg⁻¹ in roots and 3.89–30.45 mg kg⁻¹ in leaves [19]. These values are considerably lower than those observed in the bark of *U. rubra*, indicating species-specific accumulation patterns and differences between bark, root, and leaf tissues.

Table 2. Some micronutrient concentrations of slippery elm (*U. rubra*) bark (mg kg⁻¹)

Fe	Zn	Mn	Cu
(mg kg ⁻¹)			
359.5	18.9	75.1	25.7

A study investigating the ecological characteristics and behavior of *Ulmus glabra* Hudson (wych elm) reported that among the examined species, wych elm sequestered the highest amount of soil carbon, and the nutrient availability under its canopy was even higher than that under ash (*Fraxinus*) trees, supporting a rapid nutrient cycling process [20]. Considering the findings of the present study as a whole, it was determined that slippery elm (*U. rubra*) bark possesses generally sufficient levels of macro- and micronutrients, although nitrogen and calcium concentrations were relatively low [21]. These results indicate that slippery elm bark can be regarded as a nutritionally valuable medicinal plant material, providing both essential macro- and micronutrients.

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EFICIENȚA UTILIZĂRII FITOBIOTICELOR ÎN AVICULTURA ECOLOGICĂ

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Abstract. Avicultura ecologică reprezintă un sector în continuă dezvoltare, orientat spre obținerea unor produse sigure, de înaltă calitate și cu impact minim asupra mediului. În acest context, fitobioticele, compuși bioactivi de origine vegetală, constituie o alternativă viabilă la antibioticele de sinteză, fiind utilizate pentru stimularea performanțelor productive și menținerea stării de sănătate a păsărilor. Prezentul studiu analizează eficiența utilizării fitobioticelelor în avicultura ecologică și impactul acestora asupra calității produselor avicole. Rezultatele evidențiază faptul că administrarea fitobioticelelor contribuie la îmbunătățirea digestibilității nutrienților, la întărirea sistemului imunitar și la reducerea incidenței bolilor, fără a afecta negativ bunăstarea animalelor. De asemenea, utilizarea fitobioticelelor are un efect pozitiv asupra calității cărnii și ouălor, reflectat prin îmbunătățirea proprietăților organoleptice, a valorii nutritive și a siguranței alimentare. În concluzie, fitobioticele reprezintă o soluție sustenabilă și eficientă pentru creșterea păsărilor în sistem ecologic, contribuind la obținerea unor produse avicole de calitate superioară și la respectarea principiilor agriculturii durabile.

Keywords: Fitobiotice, Avicultura, System ecologic.

Abstract. Organic poultry production is a continuously developing sector aimed at obtaining safe, high-quality products with minimal environmental impact. In this context, phytobiotics – bioactive compounds of plant origin – represent a viable alternative to synthetic antibiotics, being used to enhance productive performance and maintain poultry health. The present study examines the efficiency of phytobiotic use in organic poultry production and their impact on the quality of poultry products. The results indicate that phytobiotic supplementation contributes to improved nutrient digestibility, strengthens the immune system, and reduces disease incidence without adversely affecting animal welfare. Furthermore, the use of phytobiotics has a positive effect on meat and egg quality, as reflected in improved organoleptic properties, nutritional value, and food safety. In conclusion, phytobiotics represent a sustainable and effective solution for poultry rearing in organic systems, contributing to the production of high-quality poultry products and compliance with the principles of sustainable agriculture.

Keywords: Phytobiotics, Poultry Production, Organic System

Introducere

Creșterea animalelor reprezintă un sector esențial pentru asigurarea securității alimentare a statului. În vederea sporirii calității și volumului produselor obținute, în practicile agricole moderne sunt implementate soluții inovatoare fundamentate pe dovezi științifice. Acestea includ utilizarea raselor, liniilor și încrucișărilor de animale de fermă cu potențial productiv ridicat, obținute în urma unor programe de ameliorare genetică riguros organizate [1], optimizarea condițiilor de adăpostire, precum și asigurarea unei alimentații complete și echilibrate [2]. În condițiile actuale, organizarea rațională a hrănirii animalelor nu este posibilă fără utilizarea aditivilor furajeri, care contribuie la compensarea deficiențelor de nutrienți și substanțe biologice active, la stimularea creșterii, la creșterea productivității și a performanțelor reproductive, precum și la prelungirea duratei de conservare și utilizare a furajelor. Un rol deosebit de important în nutriția animalelor monogastrice îl au aditivii furajeri cu efect de stabilizare și reglare a microbiotei intestinale [3].

În domeniul creșterii animalelor de fermă, identificarea și dezvoltarea de alternative eficiente, naturale și ecologice pe bază de plante (fitobiotice), menite să înlocuiască antibioticele, reprezintă în continuare o provocare majoră pentru științele biologice moderne.

Fitobioticele, denumite și fitochimicale sau fitogenice, reprezintă un subset larg de compuși bioactivi derivați din plante. Până în prezent, au fost identificate peste 5.000 de fitobiotice alimentare individuale în fructe, legume, cereale integrale, leguminoase, nuci, plante aromatice și uleiuri esențiale [4]. Fitobioticele pot fi împărțite în următoarele șase categorii: compuși fenolici, alcaloizi, compuși care conțin azot, compuși organosulfurici, fitosteroli și carotenoizi, fiind în continuare împărțite în mai multe subcategorii [5].

Datorită efectelor lor pozitive semnificative asupra productivității, rezistenței nespecifice și stării fiziologice a animalelor și păsărilor de curte, utilizarea fitobioticelor este justificată și pentru obținerea de produse ecologice, precum și pentru sporirea eficienței economice în producția zootehnică. Este recomandată administrarea fitobioticelor în combinație cu probiotice, precum și dezvoltarea de produse multifuncționale. Acestea ar trebui aplicate nu doar în fermele industriale, ci și în exploatațiile care produc produse zootehnice ecologice [6-9].

Pe viitor, se impune extinderea cercetărilor privind mecanismele de acțiune ale fitobioticelor asupra microflorei gastrointestinale, activității secretorii pancreatice, proceselor de absorbție a nutrienților, imunității, capacității de reproducere și calității produselor. Astfel de studii trebuie să țină cont de particularitățile fiziologice ale organismelor, de practicile specifice de hrănire și de tehnologiile de gestionare aplicate pentru diferitele grupe de vârstă și sexe ale animalelor și păsărilor de curte.

Materiale si metode

Pentru realizarea acestei lucrări de sinteză, s-a efectuat o analiză detaliată a literaturii științifice privind utilizarea fitobioticelor în avicultura ecologică. Sursele consultate au inclus articole publicate în reviste indexate în baze de date internaționale, precum Scopus, Web of Science și PubMed, în perioada 2000–2025. Căutarea a fost realizată utilizând cuvinte-cheie precum *phytobiotics*, *organic poultry*, *gut microbiota*, *growth performance*, *natural feed additives* și *eco-friendly production*. În analiza noastră au fost incluse studii care investighează efectele fitobioticelor asupra performanței productive, sănătății gastrointestinale și echilibrului microbiotei, imunității, calității produselor obținute, precum și eficienței economice în producția ecologică. Au fost excluse lucrările cu date incomplete sau neconcordante. Informațiile extrase din sursele selectate au fost sintetizate și prezentate pe teme principale, evidențiind tendințele actuale, mecanismele de acțiune și perspectivele de aplicare a fitobioticelor în avicultura ecologică.

Rezultatele și discuția

Studiile privind creșterea puilor de carne au evidențiat eficiența utilizării fitobioticelor comerciale și a extractelor naturale în furaje. Administrarea extractului de urzică (*Urtica dioica* L.) a condus la creșterea greutatei în viu la sfârșitul perioadei de creștere cu 0,4–3,3%, reducerea costurilor cu hrana cu 0,6–2,3% și îmbunătățirea supraviețuirii păsărilor, precum și la creșterea randamentului la sacrificare cu 0,30–0,75% și a valorii energetice a cărnii cu 0,8–6,6%, stabilindu-se ca doză optimă

10 mg/kg greutate vie [10]. Administrarea extractului de cimbru târâtor (*Thymus serpyllum* L.) a determinat creșteri semnificative ale greutății în viu cu până la 4,66%, ale greutății carcasei eviscerate cu 6,11–13,28% și ale randamentului la sacrificare cu 2,08–5,49%, precum și o creștere a concentrației unor aminoacizi esențiali, precum treonina, valina, metionina și izoleucina [11,12]. De asemenea, suplimentarea furajelor cu turmeric (*Curcuma longa* L.) a demonstrat efecte antioxidante puternice datorită curcuminei, contribuind la sporirea productivității puilor, acumularea de retinol și tocoferol în ficat și reducerea peroxidării lipidice în ficat și carne [13]. Utilizarea unui extract de lemn de castan indian (*Castanea sativa* Mill.) în combinație cu butirat de calciu a evidențiat proprietăți antibacteriene importante, inhibând funcțiile adezive și enzimatică ale agenților patogeni, precum *Salmonella*, *Clostridia* și *E. coli*, fără a prezenta efecte antinutriționale [14]. Aceste rezultate subliniază potențialul fitobioticeilor de a îmbunătăți performanța productivă, calitatea cărnii și sănătatea puilor de carne, oferind alternative naturale și sigure la aditivii convenționali.

Conform unui studiu microbiologic al conținutului cecal al puilor de carne, administrarea unui fitobiotic pe bază de taninuri de castan a condus la scăderea semnificativă a populațiilor de *Clostridia*, *Salmonella* și *Campylobacter* [15]. Alte cercetări au analizat efectele fitobioticeilor asupra parametrilor morfobiochimici ai sângelui. Astfel, utilizarea extractului de scoarță de stejar (*Quercus cortex*) în hrănirea puilor de carne a stimulat metabolismul proteinelor, carbohidraților și mineralelor fără efecte negative, înregistrându-se o scădere semnificativă a trigliceridelor serice și o creștere a activității enzimelor ALT, LDH și creatinkinazei [16]. Rezultate similare au fost obținute la administrarea unui fitobiotic pe bază de extract de brad siberian (*Abies sibirica*), care a determinat creșteri ale numărului de globule roșii, ale conținutului de hemoglobină, proteinelor totale, albuminei, trigliceridelor, glucozei, calciului, fosforului și fierului, precum și ale indicelui proteic și activității aminotransferazelor [17].

Utilizarea fitobioticeilor s-a extins și în creșterea păsărilor ouătoare. Hrănirea găinilor cu extract de fructe de sorbus (*Sorbus aucuparia* L.), bogat în vitaminele A, C și P, acizi organici, antocianine, taninuri, pectină, minerale, catechine, flavonoide și glicozide, a crescut producția de ouă (numărul mediu și inițial de ouă per găină, intensitatea producției, greutatea medie a ouălor și masa totală de ouă obținută), a redus costurile cu hrana și a îmbunătățit rata de supraviețuire a efectivului, precum și compoziția chimică a ouălor, prin creșterea conținutului de proteine și minerale [18].

De asemenea, suplimentele fitobiotice pe bază de uleiuri esențiale din extracte de cimbru, rozmarin și ardei iute au favorizat dezvoltarea tractului gastrointestinal, inclusiv a esofagului, pipotei, intestinului și cecelor. Morfohistologia bursei lui Fabricius a indicat o stare de imunitate umorală bine dezvoltată, reflectată prin reducerea mortalității cu 1,27% la păsările experimentale. Analiza histologică a splinei a evidențiat modificări patologice și involutive mai puțin pronunțate comparativ cu lotul martor, sugerând menținerea unei activități funcționale normale a organului [19,20].

Fitobioticele sunt compuși sintetizați de plante pentru a proteja împotriva agenților patogeni invazivi, inclusiv bacterii, virusuri și fungi, precum și pentru a proteja ADN-ul și aparatul fotosintetic de daunele oxidative cauzate de radiațiile ultraviolete. Stresul oxidativ apare atunci când formarea speciilor reactive de oxigen (ROS) depășește capacitatea antioxidantă celulară, reglată de enzime antioxidante precum superoxid dismutaza (SOD), catalaza (CAT) și glutatión peroxidaza; de constituenți cu greutate moleculară mică, cum sunt tocoferolii, acidul ascorbic, acidul uric, dipeptidele imidazolice și bilirubina; proteine care chelează metalele de tranziție libere, precum ovotransferina și ceruloplasmina. Activitatea antioxidantă a fitobioticeilor, în special a acizilor fenolici și a flavonoidelor, este determinată în principal de structura lor și de delocalizarea electronilor pe nucleul aromatic [21]. S-a propus că polifenolii acționează printr-o varietate de mecanisme antioxidante, diferite de modul unic de acțiune al antioxidantilor sintetici [22,23].

Deși efectele benefice ale fitobioticeilor sunt adesea atribuite proprietăților lor antioxidante, numeroase studii au arătat că aceste proprietăți singure nu pot explica pe deplin rezultatele pozitive [24,25]. Astfel, concentrația de fitobiotice și a metaboliților acestora detectată în plasmă și țesuturi după administrare este de peste 50 de ori mai mică decât cea a antioxidantilor endogeni, cum sunt

acidul uric și bilirubina [26]. Cu toate acestea, fitobioticele sunt utilizate cu succes pentru promovarea creșterii și îmbunătățirea calității cărnii și ouălor în producția de păsări de curte [27–30].

Cercetările recente au propus diverse mecanisme prin care fitobioticele pot contribui la sănătatea și creșterea animalelor [31,32]. S-a demonstrat impactul pozitiv al aditivilor fitogenici asupra performanței productive, proceselor fiziologice de digestie, absorbție și utilizare a substanțelor nutritive, echilibrului microbiotei intestinale, imunității, parametrilor morfobiochimici și capacității antioxidante a organismului păsării. Această observație ridică o întrebare importantă: cum pot fitobioticele să producă efecte benefice, având o biodisponibilitate atât de scăzută? Dovezile sugerează că efectele lor nu necesită absorbție sistemică [33].

S-a propus că fracțiunea neabsorbită a fitobioticelor poate acționa direct asupra intestinului, îmbunătățind funcția acestuia sau comportându-se ca prebiotice [34]. Bariera intestinală include mai multe componente, precum stratul de mucus, imunoglobulina A, peptidele antibacteriene și joncțiunile strânse intercelulare (TJ) [35]. Stratul mucosal reprezintă prima linie de apărare împotriva invaziei agenților patogeni și toxinelor în tractul gastrointestinal [36,37]. Pe baza acestor mecanisme, împreună cu dovezile privind efectele pozitive asupra sănătății intestinale și reducerii inflamației, se poate concluziona că multe dintre beneficiile fitobioticelor la animale derivă din îmbunătățirea funcției intestinale.

Concluzii

1. Fitobioticele îmbunătățesc performanța păsărilor de fermă – administrarea extractelor de plante, precum urzică, cimbru, turmeric sau lemn de castan, a condus la creșterea greutatei în viu, a randamentului la sacrificare și a calității cărnii, precum și la reducerea costurilor cu furajele și îmbunătățirea supraviețuirii păsărilor.
2. Efecte asupra sănătății și metabolismului – fitobioticele influențează pozitiv parametrii morfobiochimici ai sângelui, stimulând metabolismul proteinelor, carbohidraților și mineralelor și menținând activitatea enzimatică normală, ceea ce reflectă o stare generală de sănătate îmbunătățită.
3. Acțiune asupra microbiotei intestinale și imunității – fitobioticele reduc populațiile de agenți patogeni intestinali (*Clostridia*, *Salmonella*, *Campylobacter*) și sprijină echilibrul microbiotei, contribuind la dezvoltarea tractului gastrointestinal, îmbunătățirea barierei intestinale și stimularea imunității umorale.
4. Mecanisme multifactoriale de acțiune – deși fitobioticele prezintă proprietăți antioxidante, biodisponibilitatea lor sistemică este scăzută, sugerând că efectele benefice pot fi mediate prin acțiuni locale asupra intestinului, efecte prebiotice și modularea funcției digestive și imune.
5. Aplicabilitate în producția ecologică – fitobioticele constituie alternative naturale și sigure la aditivii convenționali, putând fi utilizate atât pentru puii de carne, cât și pentru găinile ouătoare, contribuind la creșterea productivității, calității produselor și sănătății generale a păsărilor.

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ASPECTE NUTRIȚIONALE ȘI BIOLOGICE ALE HRĂNIRII ALBINELOR DOICI ÎN TEHNOLOGIA CREȘTERII MĂTCILOR

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Rezumat: Efectuarea cercetărilor privind lărgirea diversității de substanțe biologice active, cu efect stimulator la creșterea mătcilor prezintă interes științific și practic. Scopul cercetărilor constă în stimularea familiei cu albine-doici pentru adoptarea larvelor la creștere, sporirea lungimii, diametrului, masei corporale și calitatea mătcilor. Hrănirea albinelor doici din familiile crescătoare s-a efectuat din prima zi la introducerea ramei cu 36 larve transvazate cu vârsta de 10-12 ore, câte 0,5 litri de sirop de zahăr cu biostimulator, apoi zilnic până la a 5-a zi la căpăcirea botcelor. S-a relevat că hrănirea albinelor doici în procesul tehnologic la creșterea mătcilor din momentul introducerii ramei cu larve transvazate până la căpăcirea botcelor pe parcursul a 5 zile câte 0,5 l de amestec de sirop de zahăr și biostimulator asigură sporirea acceptării larvelor la creștere, diametrului botcelor, lungimii și a masei mătcilor neîmperecheate și fecundate.

Cuvinte-cheie: familii crescătoare de albine, biostimulatori, sirop de zahăr, botce, măci.

Abstract: Research aimed at broadening the diversity of biologically active substances with a stimulatory effect in queen rearing is of both scientific and practical interest. The objective of this study is to stimulate nurse bee colonies to enhance larval acceptance for queen rearing and to increase the body length, thorax diameter, body mass, and overall quality of queens. Feeding of nurse bees in cell-builder colonies commenced on the first day of introducing a grafting frame containing 36 grafted larvae aged 10–12 hours, by administering 0.5 L of sugar syrup supplemented with a biostimulant, and continued daily until day 5, corresponding to the capping of queen cells. The results demonstrated that feeding nurse bees throughout the technological queen-rearing period—from the introduction of the grafted larvae frame to queen-cell capping—by providing 0.5 L/day of a sugar-syrup–biostimulant mixture for five consecutive days increases larval acceptance for queen rearing, enlarges queen-cell diameter, and improves the length and body mass of both unmated and mated queens.

Keywords: queen-rearing colonies, biostimulants, sugar syrup, queen cells, queens.

Introducere

Materialul de prăsilă valoros poate fi repede multiplicat prin lucrul de creștere a mătcilor. Totodată, calitatea mătcilor este influențată în perioada de creștere de o mulțime de factori, inclusiv de calitatea și cantitatea rezervelor de hrană [1, 8].

Înlocuirea mătcilor, ameliorarea materialului biologic și producerea mătcilor pentru extinderea stupinei sunt activități care depășesc nivelul unei simple proceduri tehnice. Ele presupun înțelegerea modului în care condițiile de mediu, managementul coloniei și intervențiile apicultorului influențează calitatea mătcilor obținute [3, 11, 4].

Albinele melifere depind de resursele florale prezente în mediu pentru a-și produce hrana, care constă în miere, polen, păstură și apă. Aceste elemente furnizează albinelor carbohidrații, proteinele, grăsimile, vitaminele și mineralele necesare pentru creșterea, dezvoltarea și elaborarea produselor lor.

Cu toate acestea, din cauza numeroșilor factori, cum ar fi condițiile meteorologice nefavorabile sezoniere sau distrugerea habitatului, nectarul și polenul de care au nevoie nu sunt întotdeauna disponibile. O nutriție deficitară va provoca stres nutrițional, care, în timp, va duce la slăbirea și pierderea coloniei [10, 18].

Din punct de vedere biologic, albinele doici (albinele lucrătoare în primele săptămâni de viață) își dezvoltă glandele hipofaringiene pe baza consumului de polen și păstură (sursa principală de proteine, lipide și steroli), iar dezvoltarea acestor glande este strâns legată de succesul creșterii puietului și, implicit, de calitatea hranei larvare oferite. În consecință, când aportul proteic/lipidic este dezechilibrat sau insuficient, fiziologia doicilor poate limita cantitatea și consistența secrețiilor cu care sunt hrănite larvele din botce. Această relație explică de ce, în tehnologia creșterii mătcilor, intervențiile nutriționale asupra doicilor sunt considerate un instrument practic pentru stabilizarea procesului [12, 13, 17].

În cazurile în care rezerva de hrană în familie este insuficientă, albinele trebuie alimentate suplimentar. Pentru a stimula adoptarea larvelor transvazate la creșterea mătcilor familiilor de albine doici se administrează sirop de zahăr [14], se utilizează hrănirea stimulatorie cu utilizarea aditivilor nutriționali [9].

Larva destinată să devină matcă depinde complet de îngrijirea doicilor. Doicile decid cantitatea și ritmul de hrănire, compoziția secreției și constanța microclimatului. Din acest motiv, tehnologia mătcilor este, în esență, tehnologia gestionării doicilor: câte sunt, ce vârstă au, în ce stare fiziologică se află și ce resurse au la dispoziție. Acolo unde doicile sunt subnutrite, botcele devin „economice”, iar mătcile rezultate pot avea potențial reproductiv redus [1, 15, 11].

Acizii organici și alte suplimente pot susține starea generală a albinelor, iar unele studii investighează efecte asupra parametrilor fiziologici ai lucrătoarelor. Într-o colonie crescătoare, orice intervenție care stabilizează metabolismul doicilor poate contribui indirect la calitatea botcelor [2, 1].

Un indicator practic al unei familii doici bine pregătite este procentul de acceptare a larvelor transvazate și uniformitatea botcelor căpăcite. Rezultate experimentale arată că hrănirea suplimentară a coloniilor starter cu sirop de zahăr îmbogățit cu adaos nutritiv (proteine, vitamine și minerale) poate spori acceptarea și poate îmbunătăți unii indicatori ai calității mătci, precum masa la eclozare și parametri ai aparatului reproducător. Prin urmare, alimentarea dirijată în perioada inițierii și dezvoltării botcelor poate influența simultan atât numărul botcelor obținute, cât și calitatea mătcilor rezultate [5].

Sunt cunoscute metode de creștere a mătcilor și procedee de hrănire a albinelor doici cu sirop de zahăr și aditivi furajeri [6, 14, 7, 8, 9]. Efectuarea cercetărilor privind lărgirea diversității de substanțe biologice active, cu efect stimulator la creșterea mătcilor prezintă interes științific și practic.

Scopul cercetărilor constă în stimularea familiei cu albine-doici pentru adoptarea larvelor la creștere, sporirea lungimii, diametrului, masei corporale și calitatea mătcilor.

Material și metoda

Cercetările au fost efectuate la stupina din s. Scoreni, unde au fost formate 4 loturi de familii crescătoare (doici). Familiile crescătoare sau format prin metoda orfanizării complete de la care s-a înlăturat fagurele pe care s-a găsit matca și 2 fagurii cu oușoare și puiet necăpăcit, care sau introdus într-un stup separat. Prin urmare în cuib au rămas fagurii cu miere, păstură și puiet căpăcit. Puietul necăpăcit s-a înlăturat ca albinele să nu crească botce din larvele din acei faguri.

În lipsa culesului melifer de întreținere familiilor de albine crescătoare li s-a administrat câte 0,5 litri de amestec de sirop de zahăr în concentrație de 50% și cu biostimulator lotul I – cu 1,2 ml/L, lotul II – cu 2,4 ml/L, lotul III – cu 3,6 ml/L, lotul IV (martor) – sirop de zahăr pur. Totodată biostimulatorul reprezintă o soluție apoasă a acidului glucuronic și clorurii de colină.

Albinele doici au fost hrănite din prima zi la introducerea ramei cu 36 larve transvazate cu vârsta de 10-12 ore câte 0,5 litri de sirop de zahăr cu biostimulator, apoi zilnic până la a 5 zi la căpăcirea botcelor.

La familiile crescătoare s-a studiat numărul larvelor acceptate la creștere, diametrul și lungimea botcelor, masa mătcilor neîmperecheate și împerecheate.

Datele obținute au fost prelucrate prin metoda variațiilor statistice cu utilizarea programelor de calculator.

Rezultate și discuții

Familiile de albine doici la începutul experienței aveau în cuib câte 15-16 faguri dintre care 9-10 cu puiet căpăcit, puterea – 13-14 ulicioare (spații dintre fagurii populați cu albine), rezerva de miere – 10,5-11,3 kg, cărora li s-au dat la creștere câte 36 larve transvazate. Din numărul total de larve (36 buc.) la lotul I au fost acceptate – 20 buc. sau 55,6%, lotul II – 19 buc. (52,8%), lotul III – 15 buc. (41,7%), lotul IV – 7 buc. (19,4%) (tabelul 1).

Așadar familiile doici din lotul I au acceptat cu 36,16%, lotul II – cu 33,36% și lotul III – cu 22,26% mai multe larve la creștere față de lotul martor IV.

Hrănirea albinelor doici în perioada creșterii larvelor până la căpăcirea botcelor a dus la creșterea lungimii și diametrul botcelor căpăcite, masa mătcilor neîmperecheate și fecundate.

S-a constatat că diametrul botcelor obținute de la familiile doici al lotului I a constituit 10,90 mm sau cu 0,19 mm (1,8%) mai mare față de lotul IV, lotul II respectiv – 11,37 mm sau cu 0,66 mm (6,2%) și lotul III – 12,07 mm sau cu 1,36 mm (12,7%) mai mare (* $B_1 \geq 0,95$).

Tabelul 1. Indicii productivi a familiilor crescătoare și numărul de larve transvazate și acceptate la creșterea mătcilor, 20.06.2024

Lotul	Nr. fag., buc.	Puterea familiilor de albine, ulicioare	Rezerva de miere, kg	Nr. fag. cu puiet, buc.	Nr. larvelor transvazate, buc.	Nr. larvelor acceptate	
						buc.	%
I – Sirop + biostimulator, 1,2 ml/L	15	13	10,5	9	36	20	55,6
II – Sirop + biostimulator, 2,4 ml/L	16	14	11,3	10	36	19	52,8
III – Sirop +biostimulator, 3,6 ml/L	16	14	11,0	10	36	15	41,7
IV – Sirop pur (martor)	15	13	10,5	9	36	7	19,44

Lungime botcelor a oscilat de la 25,71 mm (lotul martor) până la 27,0 mm (lotul II) sau cu 5,05 – 1,44 mm mai mare față de lungimea botcelor pe sezon indicate de unii autori (20,67-25,51 mm) [16].

Cele mai mari botce au fost crescute în lotul II, care aveau lungimea de 27,00 mm sau cu 1,29 mm (5,01%) mai mare ca lotul IV (martor) (tabelul 2).

Masa mătcilor tinere neîmperecheate din loturile experimentale a variat între 180,0 mg și 189,6 mg sau cu 0,29-0,89 mg (0,16-5,50%) mai mare față de lotul martor (tabelul 3).

S-a relevat că cele mai voluminoase mătci la care ovarele erau bine dezvoltate au fost obținute din lotul II cu masa corporală 269,6 mg sau cu 22,46 mg (9,08%), diferența fiind autentică (** $B_3 \geq 0,999$). Cu majorarea dozei biostimulatorului sau obținute mătci cu masa corporală mai redusă 248,0 mg.

Așadar, putem menționa că hrănirea albinelor doici din momentul introducerii ramei cu larve transvazate până la căpăcirea botcelor pe parcursul a 5 zile câte 0,5 L de amestec de sirop de zahăr și biostimulator asigură obținerea mătcilor cu o masă sporită, care este mai mare cu 8% față de rezultatele obținute precedent [6, 7].

Tabelul 2. Diametrul și lungimea botcelor căpăcite, 30.06.2024

Lotul	Indicii	Diametrul botcelor, mm	Lungimea botcelor, mm
I – Sirop + biostimulator, 1,2 ml/L	$\bar{x} \pm s_{\bar{x}}$	10,90±0,193	26,02±0,254
	V, %	7,93	4,37
II – Sirop + biostimulator, 2,4 ml/L	$\bar{x} \pm s_{\bar{x}}$	11,37±0,210	27,00±0,310
	V, %	8,06	4,99
III – Sirop + biostimulator, 3,6 ml/L	$\bar{x} \pm s_{\bar{x}}$	12,07±0,195*	26,87±0,284
	V, %	6,26	4,09
IV – Sirop pur (martor)	$\bar{x} \pm s_{\bar{x}}$	10,71±0,421	25,71±0,606
	V, %	10,38	6,24

*Diametrul botcelor: lotul II / lotul IV – $*B_1 \geq 0,95$

Tabelul 3. Masa mătcilor neîmperecheate și fecundate

Lotul	Indicii	Masa mătci neîmperecheată, mg	Masa mătci fecundate, mg
I – Sirop + biostimulator, 1,2 ml/L	$\bar{x} \pm s_{\bar{x}}$	181,33±9,419	258,17±4,976
	V, %	12,72	4,72
II – Sirop + biostimulator, 2,4 ml/L	$\bar{x} \pm s_{\bar{x}}$	189,6±6,787	269,6±3,829***
	V, %	8,00	3,18
III – Sirop + biostimulator, 3,6 ml/L	$\bar{x} \pm s_{\bar{x}}$	180,0±1,770	248,0±5,910
	V, %	2,41	5,84
IV – Sirop pur (martor)	$\bar{x} \pm s_{\bar{x}}$	179,71±3,523	247,14±2,659
	V, %	5,19	2,85

***Masa mătci împerecheate: lotul II / lotul IV – $***B_3 \geq 0,999$.

Prin urmare, hrănirea albinelor doici în procesul tehnologic la creșterea mătcilor asigură sporirea acceptării larvelor la creștere cu 22,3-36,2%, diametrului botcelor – cu 1,8-12,7%, lungimii – cu 1,2-5,0% și a masei mătcilor neîmperecheate – cu 0,2-5,5% și fecundate – cu 0,3 9,1%.

Concluzii

S-a relevat că hrănirea albinelor doici în procesul tehnologic la creșterea mătcilor din momentul introducerii ramei cu larve transvazate până la căpăcirea botcelor pe parcursul a 5 zile câte 0,5 L de amestec de sirop de zahăr și biostimulator asigură sporirea acceptării larvelor la creștere, diametrului botcelor, lungimii și a masei mătcilor neîmperecheate % și fecundate.

Mulțumiri: lucrarea a fost realizată cu sprijinul financiar al proiectului instituțional de cercetare aplicată ”Elaborarea și implementarea bunelor practici de agricultură durabilă și reziliență climatică / GREEN”, codul subprogramului 020407, al Agenției Naționale pentru Cercetare și Dezvoltare a Republicii Moldova.

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IMMUNE STATUS OF PIGGLES UNDER THE INFLUENCE OF NATURAL PROTEINS.

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Abstract. Modern technological requirements for intensifying pork production negatively impact the physiological status of pigs, significantly altering the evolutionary processes of animal existence in their environment. Modern technologies have limited the influence of external factors and facilitated the formation of new habitats. Early weaning of piglets often leads to the development of group pathologies with signs of malnutrition, characterized by profound metabolic disturbances and a significant decrease in the activity of the body's defense factors.

It is also important to note that the emerging need to develop adaptive mechanisms places the immune system at the forefront. It plays a key role in the development of adaptive homeostasis mechanisms, necessitating the study of patterns of immune response and protective functions in piglets at different stages of development and functioning. Literary data indicate that stress manifests itself very acutely in pigs. Improper housing and feeding conditions cause a so-called stress syndrome. The development of this condition, or stress syndrome, is characterized by increased agitation and decreased productivity, which, when combined, leads to pathology and death of animals. The development of stress reactions is accompanied by a decrease in the activity of immune defense mechanisms, activation of lipid peroxidation processes, and a decrease in antioxidant capacity. According to researchers, lipid peroxidation products, when their levels exceed physiological limits, act as stress mediators. They underlie and trigger the body's adaptive responses to extreme factors.

Keywords: piglets, immunity, complement, phagocytosis, proteins.

Given that piglets are characterized by a deficiency of the B-system immune system after birth, as evidenced by low levels of B-lymphocytes, plasma cells, and immunoglobulins in the blood, we studied the influence of natural proteins on the development of the body's defense mechanisms. It was found that piglets are characterized by low cellular immune activity. This is evidenced by a decrease in the formation of spontaneous rosettes of T-lymphocytes with erythrocytes. Low activity of macrophages and microphages was also observed. In this case, when the functional activity of the immune system decreases under production conditions, we prescribe immunomodulatory drugs to accelerate the development of a full-fledged immune reactivity. All measures aimed at improving piglet survival include techniques to activate and enhance homeostasis and stimulate the body's immune system. In this regard, the development of feeding conditions and drugs with a complex effect is of scientific and practical relevance. That is, they must simultaneously act as immunomodulators and antioxidants [1, p. 242]. Intensification of pork production processes is ensured by the action of numerous factors. These include various levels of animal hybridization, which ensures the required level of meat productivity. In pigs, breed affiliation also determines the level of the body's natural resistance. This is significantly important, since modern pig farming technologies disrupt the correspondence between the physiological capabilities of the body and the animals' living conditions. This state of the body's relationship with the external environment indicates the need to find drugs that can activate the body's defense mechanisms, reduce the impact of numerous production factors that cause stress in animals and increase the activity of the body's natural resistance factors, especially in young animals, i.e., piglets. Specialists achieve stimulation of the activity of cellular defense factors using drugs from various groups, which can be represented by tissue preparations, vitamins, and macro- and microelements.

Researchers point to humic preparations, which also have a positive effect on the body's resistance, affecting homeostasis and the T-cell portion of the immune system. These complex preparations reduce piglet disease and improve animal survival and productivity. Recent data on the presence of critical periods during piglet growth and development should also be taken into account. The first critical period corresponds to the period of underdevelopment of the immune system, which is compensated for by cellular and humoral factors in sows' milk. Low levels of leukocytes and immunoglobulins in mammary gland secretions reduce the body's resistance and the ability to maximize the use of immune factors. The second critical period of piglet growth and development occurs toward the end of three weeks of age. During this period, colostral immunity factors are destroyed, and the piglets' own immune system does not function sufficiently [2, p. 38]. Given the state of the piglet immune system during growth and development and its importance in protecting the body, researchers believe it is necessary to study the development of the body's immune reactivity in conjunction with the influence of mammary gland secretions. They also explore the possibility of using nonspecific globulin to compensate for age-related immune deficiencies and vitamin E to stimulate the development of immune reactivity in suckling piglets. Given that protein compounds provide the body's defense, researchers emphasize the need to pay attention to the complement system. This system is a biochemical cascade aimed at destroying the integrity of foreign cells.

This body's defense system is crucial because it complements and enhances the action of antibodies. The complement cascade includes over 20 proteins and represents the humoral component of innate immunity. All this demonstrates the importance of protein supply. This depends on the conditions of protein feeding in animals. In the complement system, activated proteases activate subsequent proteases during proteolysis, meaning the complement system is activated by a positive feedback mechanism. Ultimately, activation of the complement system leads to the production of peptides that attract other immune cells to pathogenic factors, increase the permeability of blood vessel walls, and opsonize (coat) the pathogenic cell, marking it for further destruction. Complement proteins can also directly kill microbial cells by integrating into their membranes and disrupting their integrity. These data on the action of complement system components led researchers to believe that natural immunoglobulins found in egg whites could be used to correct the body's immune state. This is considered feasible because pigs have a single stomach and many processes are similar to human

gastrointestinal digestion. Supplementing piglets with natural proteins had a positive effect on blood cell formation and protein metabolism.

Piglets from the experimental groups had significantly higher hemoglobin and hematocrit levels ($p \leq 0.05$). Piglets fed egg white had a 30% increase in blood leukocyte count. However, the increase in the absolute leukocyte count was accompanied by an increase in the absolute and relative lymphocyte count. Increased protein supply to the piglets' bodies activates lymphocyte proliferation and differentiation. Concurrently, the functional activity of T- and B-lymphocytes is activated. Phagocytic activity of blood leukocytes in the experimental animals increased by 1.27 times, and the phagocytic count by 1.22 times. The resistance indices of the experimental piglets were significantly higher. BASK and LASK increased, as did the globulin content by 1.14 times. Against this background, the opsonic function of the complement system increases, as evidenced by the high level of phagocytosis in the body of piglets in the experimental groups.

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PHYTOPATHOLOGICAL PROBLEMS OF ALFALFA (*MEDICAGO SATIVA*) PLANTS IN TÜRKİYE

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Abstract Alfalfa (*Medicago sativa* L.) is among the most important perennial forage crops cultivated in Türkiye, valued for its superior forage quality, wide-ranging ecological adaptability, and its contribution to the stability of livestock production systems. Nevertheless, alfalfa production is frequently limited by diverse phytopathological challenges that impair dry matter yield, reduce forage quality, and compromise stand longevity. This review provides a comprehensive synthesis of available information on the principal fungal and viral diseases associated with alfalfa in Türkiye, focusing on their symptomatology, etiological agents, epidemiological dynamics, and current disease management practices. Gaining an in-depth understanding of these disease constraints is fundamental for designing robust integrated disease management strategies and for enhancing the long-term productivity and sustainability of alfalfa-based forage systems nationwide.

Keywords: alfalfa, *Medicago sativa*, plant diseases, phytopathology, Türkiye

Introduction

Alfalfa (*Medicago sativa* L.) is a globally important legume forage crop, widely recognized as the "queen of forage crops," and represents a fundamental component of livestock production systems. In addition to its high agronomic value, alfalfa contributes significantly to soil fertility through its ability to fix atmospheric nitrogen biologically. In Türkiye, the crop is cultivated across a

broad range of ecological conditions, including the Central and Eastern Anatolia regions as well as the Aegean and Mediterranean zones [1]. Nevertheless, alfalfa production is often limited by a diverse array of phytopathological challenges, particularly under intensive cultivation practices and unfavorable environmental conditions. These diseases can result in substantial economic losses by negatively affecting biomass yield, seed production, and forage quality. This article presents a comprehensive overview of the major phytopathological problems affecting alfalfa in Türkiye and examines their impacts on production along with potential management strategies.

2. Major Fungal Diseases of Alfalfa in Türkiye

2.1 Root and Crown Rots

Root and crown rot diseases represent some of the most destructive phytopathological problems in alfalfa fields in Türkiye. These diseases are primarily associated with a complex of soil-borne fungal pathogens, including *Fusarium* spp. (*F. acuminatum*, *F. avenaceum*, *F. equiseti*, *F. flocciferum*, *F. oxysporum*, *F. semitectum*, and *F. solani*), binucleate *Rhizoctonia*, *Rhizoctonia solani*, *R. crocorum*, *Macrophomina phaseolina*, *Pythium* spp. (*P. acanthophoron* and *Pythium* HS-group), as well as *Sclerotinia sclerotiorum*, *S. trifoliorum* and *Trematosphaeria circinans* [2-6]. Infected plants typically exhibit symptoms such as root discoloration, crown necrosis, reduced vigor, stunted growth, and eventual plant mortality. *Sclerotinia trifoliorum* and *S. sclerotiorum* are able to persist in soil for long periods in the form of sclerotia and can infect alfalfa stems and crowns, particularly under cool and wet spring conditions. Environmental and agronomic factors, including poor soil drainage, excessive irrigation, and soil compaction, strongly favor disease development. As a result, root and crown rot diseases markedly reduce stand persistence, especially in older alfalfa fields.

2.2 Anthracnose

Anthracnose, a destructive fungal disease associated with several *Colletotrichum* species (*C. coccodes*, *C. trifolii*, and *C. truncatum*), has been documented in multiple alfalfa-producing regions of Türkiye [2,3,5,6]. The pathogen complex primarily infects aerial plant parts, including stems, petioles, and crown tissues, resulting in characteristic stem lesions, vascular disruption, wilting, and in advanced cases, plant mortality. Under favorable environmental conditions, especially during periods of elevated temperature and humidity, severe outbreaks may occur, leading to rapid stand deterioration and substantial yield losses.

2.3 Leaf Spot Diseases

Several leaf spot diseases are widespread in alfalfa fields across Türkiye, including those caused by *Pseudopeziza medicaginis* (common leaf spot), *Leptosphaerulina briosiana* (leptosphaerulina leaf spot), *Leptotrochila medicaginis*, *Stagonospora meliloti*, *Volutella colletotrichoides*, *Stemphylium botryosum*, and *S. vesicarium* [2,3,5-11]. These pathogens primarily affect leaf tissues, producing small necrotic lesions that often lead to premature defoliation and a decline in forage quality. Although leaf spot diseases rarely result in plant mortality, they can substantially reduce the photosynthetically active leaf area and negatively impact hay yield and quality. In addition, alfalfa black stem and leaf spot, caused by the cosmopolitan soil- and seed-borne fungus *Phoma medicaginis*, represents another important foliar disease. This pathogen not only reduces yield and forage nutritive value but may also promote the accumulation of phyto-oestrogenic compounds at concentrations capable of adversely affecting ovulation rates in livestock.

2.4 Powdery Mildew and Downy Mildew

Powdery mildew, caused by *Leveillula taurica*, and downy mildew, caused by *Peronospora trifoliorum*, are sporadically encountered in alfalfa-growing areas of Türkiye, particularly under cool and moisture-favorable environmental conditions [2,3,5-7]. These foliar diseases impair plant health by inducing chlorotic symptoms, leaf distortion, and an overall reduction in vegetative vigor.

2.5. Rust Disease

Alfalfa rust, caused by *Uromyces striatus*, is a significant fungal disease in numerous regions and poses a particular threat to alfalfa cultivated for seed production in Türkiye, where it can lead to notable reductions in seed yield and quality [2,5,7,8].

3. Viral Diseases

Alfalfa mosaic virus (AMV) has been reported in numerous alfalfa-producing areas across the Central, Aegean, and Eastern Anatolia regions of Türkiye, where it is regarded as one of the major viral constraints limiting alfalfa production [6, 12–14]. Infection by AMV results in a range of visible symptoms, including foliar mosaic discoloration, chlorotic lesions, leaf malformation, and overall growth suppression, leading to marked declines in biomass production and forage quality. The virus is mainly spread by aphid species through non-persistent transmission and can also be disseminated via contaminated seed and infected vegetative tissues, enabling efficient spread both within individual fields and across production areas.

4. Disease Management Strategies

The successful management of alfalfa diseases in Türkiye depends largely on the implementation of integrated disease management strategies. Central to these approaches are the selection of disease-resistant or tolerant cultivars, the adoption of appropriate crop rotation schemes, improvement of soil drainage conditions, balanced nutrient management, and the use of certified, pathogen-free seed material. In addition, cultural practices aimed at minimizing plant stress, such as optimizing cutting frequency and ensuring efficient irrigation management, play a crucial role in reducing disease severity. Although chemical control options are generally limited in forage crop systems, targeted applications may be considered in seed production areas when disease pressure is high.

5. Conclusion

Phytopathological challenges continue to represent a major limitation to the sustainable production of alfalfa in Türkiye. Among these constraints, fungal pathogens, particularly those causing root and crown rots and various leaf spot diseases, are the most prevalent and economically damaging, while virus-associated diseases also play a significant role in reducing yield and forage quality. The synthesis presented in this review underscores the necessity of a thorough understanding of disease etiology and epidemiology as a prerequisite for effective disease management. Enhancing integrated disease management strategies through continuous disease surveillance, the development and widespread adoption of resistant cultivars, and the implementation of environmentally sound control practices will be critical to maintaining the long-term productivity and sustainability of alfalfa cultivation in Türkiye.

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Abstract

Sour cherry (*Prunus cerasus* L.) cultivation plays a major role in the horticulture of the Republic of Moldova, both from an economic and agroecological perspective. In the context of climate change and increasingly demanding market requirements, the selection and promotion of high-performing genotypes adapted to local pedoclimatic conditions represent a priority direction of breeding research. The aim of the present study was to evaluate the biological, agronomic, and biochemical characteristics of sour cherry hybrids obtained through open pollination of the Pandy cultivar, in order to identify genotypes with high breeding value.

The research was conducted over a 10-year period under the conditions of the experimental orchards of the Public Institution National Institute for Applied Research in Agriculture and Veterinary Medicine, using selection in populations derived from open pollination. Phenological observations, morphological assessments, yield evaluations, and biochemical analyses of fruits were carried out. As a result, two promising hybrids, P-5 and P-20, were identified, distinguished by high

productivity, good adaptation to local conditions, increased resistance to abiotic and biotic stress factors, as well as superior commercial and organoleptic fruit qualities.

Biochemical analysis of the fruits revealed favorable contents of dry matter, sugars, organic acids, and vitamin C, along with high values of the sugar–acid ratio, confirming the nutritional and technological quality of the studied hybrids. The obtained results recommend hybrids P-5 and P-20 for expanding the sour cherry assortment and for inclusion in planting material production programs intended for modern orchards.

Keywords: sour cherry (*Prunus cerasus* L.); genetic breeding; open pollination; sour cherry hybrids; productivity; fruit quality.

Rezumat

Cultura vișinului (*Prunus cerasus* L.) prezintă o importanță majoră pentru pomicultura Republicii Moldova, atât din punct de vedere economic, cât și agroecologic.

În contextul schimbărilor climatice și al cerințelor tot mai exigente ale pieței, selecția și promovarea unor genotipuri performante, adaptate condițiilor pedoclimatice locale, constituie o direcție prioritară a cercetărilor de ameliorare. Scopul prezentului studiu a constat în evaluarea biologică, agronomică și biochimică a unor hibrizi de vișin obținuți prin polenizare liberă a soiului Pandy, în vederea identificării genotipurilor cu valoare ameliorativă ridicată.

Cercetările au fost realizate pe parcursul a 10 ani, în condițiile livezilor experimentale ale IP Institutul Național de Cercetări Aplicative în Agricultură și Medicină Veterinară, fiind aplicată metoda ameliorării în populații provenite din polenizare liberă. Au fost efectuate observații fenologice, determinări morfologice, evaluări productive și analize biochimice ale fructelor. În urma studiilor, au fost evidențiați doi hibrizi de perspectivă, P-5 și P-20, care se disting prin productivitate ridicată, adaptabilitate bună la condițiile locale, rezistență sporită la factorii abiotici și biotici, precum și prin calități comerciale și organoleptice superioare ale fructelor.

Analiza biochimică a fructelor a demonstrat un conținut favorabil de substanțe uscate, zaharuri, acizi organici și vitamina C, precum și valori ridicate ale indicelui glucoacidometric, ceea ce confirmă calitatea nutrițională și tehnologică a hibrizilor studiați. Rezultatele obținute recomandă hibrizii P-5 și P-20 pentru extinderea sortimentului de vișin și pentru includerea lor în programele de producere a materialului săditor destinat livezilor moderne.

Cuvinte-cheie: vișin (*Prunus cerasus* L.); ameliorare genetică; polenizare liberă; hibrizi de vișin; productivitate; calitatea fructelor.

Introducere

Cultura vișinului (*Prunus cerasus* L.) ocupă un loc important în pomicultura Republicii Moldova, datorită adaptabilității sale la condițiile pedoclimatice locale, dar și cererii constante pe piața internă și externă [1, p.428, 3, p.196]. Vișinul se caracterizează printr-o plasticitate ecologică bună, toleranță relativ sporită la factorii abiotici nefavorabili și posibilitatea valorificării fructelor atât în stare proaspătă, cât și în industria de procesare [6, p.141].

În contextul schimbărilor climatice și al necesității de a crește eficiența economică a livezilor, selectarea și promovarea soiurilor și hibrizilor de perspectivă devine o prioritate pentru pomicultura modernă. Activitatea de ameliorare urmărește obținerea unor genotipuri cu productivitate ridicată, stabilitate biologică și rezistență sporită la boli, dăunători și condiții climatice nefavorabile [7, p.22, 10, p. 3-42, 11, p.7-14].

Sortimentul de vișin din Republica Moldova se află într-o continuă dinamică, determinată atât de cerințele pieței, cât și de schimbările condițiilor climatice [3, p.196, 6, p.141]. Promovarea soiurilor de perspectivă, bine adaptate condițiilor locale și rezistente la factorii limitativi ai mediului, este esențială pentru sporirea competitivității producătorilor autohtoni. În acest context, un rol important îl are evaluarea complexă a soiurilor și hibrizilor conform programelor și metodicilor standardizate de studio al soiurilor și introducerea soiurilor noi a culturilor pomicole [5, p.294, 9, p.120].

Testarea hibrizilor în condiții reale de cultură, în diferite zone pedoclimatice ale țării, permite evidențierea celor mai valoroase genotipuri din punct de vedere agrobiologic și economic. Rezultatele

acestor cercetări constituie baza științifică pentru includerea celor mai performanți hibrizi în sistemul național de producere a materialului săditor și pentru extinderea suprafețelor cultivate cu vișin [12, p.50, 14, p.35].

În prezent, sortimentul de vișin din țara noastră este destul de variat și cuprinde atât soiuri locale, cât și soiuri noi, ameliorate și introduse. Acestea au fost obținute prin selecție artificială și hibridare, fiind caracterizate printr-un potențial productiv superior și o rezistență sporită la factorii abiotici și biotici ai mediului [2, p.129, 13, p.30]. Crearea și promovarea unor soiuri noi, mai productive și mai rezistente, reprezintă baza principală pentru dezvoltarea durabilă și extinderea cultivării vișinului în Republica Moldova, în concordanță cu cerințele legislației fitosanitare în vigoare [4].

Noile soiuri răspund cerințelor producătorilor în ceea ce privește calitatea fructelor cu utilizare universală și manifestă o rezistență ridicată la boli, fapt ce permite reducerea sau chiar eliminarea utilizării pesticidelor toxice pentru om și mediul înconjurător. Totodată, acestea corespund cerințelor tot mai exigente ale consumatorilor în ceea ce privește calitatea și siguranța produselor horticole.

În legătură cu aceasta, în cadrul lucrărilor de ameliorare au fost create soiuri și forme de vișin cu o productivitate ridicată, selectate din surse valoroase din punct de vedere agronomic și biologic, cu caracteristici practice favorabile pentru utilizare și selecție.

Ca rezultat al cercetărilor, au fost evidențiate forme cu productivitate ridicată, autofertilitate, rezistență stabilă la coccomicoză și îngheț. Acești hibrizi se remarcă prin capacitatea de recoltare mecanizată, înălțimea redusă a arborilor, calități ridicate ale fructelor și perioade diferite de maturare a acestora.

Material și metode de cercetare

Materialul biologic a fost constituit din semințele obținute prin polenizare liberă de la soiul de vișin *Pandy*, zonat în Republica Moldova. În procesul de ameliorare a fost aplicată metoda selecției în populații provenite din polenizare liberă.

Semințele au fost stratificate în anul 1996, utilizând nisip umed, într-o încăpere subterană, pe o perioadă de aproximativ trei luni, cu menținerea umidității optime. Semănatul s-a efectuat primăvara, în câmpul de selecție.

În anul următor, au fost obținuți puieți, care au fost întreținuți prin aplicarea lucrărilor agrotehnice corespunzătoare: afânarea solului, combaterea buruienilor, formarea rândurilor și irigarea. Evaluarea inițială a puieților s-a realizat în funcție de vigoarea de creștere.

Intrarea pe rod a vișinilor a avut loc în anul 1998. Ulterior, genotipurile selectate au fost plantate în livada de selecție, conform schemei de plantare de 5×2 m. Cercetările au fost desfășurate pe o perioadă de 10 ani.

Pe parcursul perioadei de studiu au fost efectuate observații fenologice și determinări morfologice, în conformitate cu metodologia standard de studiu a soiurilor pomicele, aprobată în Republica Moldova. Variabilitatea caracterelor morfologice a fost apreciată prin calcularea coeficientului de variație, iar relațiile dintre caractere au fost stabilite prin determinarea coeficienților de corelație [9, p.120, 10, p. 3-42, 11, p.7-14].

Hibridii de vișin cu valoare ameliorativă au fost selectați, altoiți și introduși în livada de colecție. Evaluarea calității fructelor a evidențiat un nivel înalt al principalilor indicatori de calitate.

Rezultate și discuții

În baza cercetărilor realizate la IP Instituția Publică Institutul Național de Cercetări Aplicative în Agricultură și Medicină Veterinară din Chișinău, în Secția Genofond, Ameliorare și Selecția Clonală a Plantelor Horticole din cadrul livezilor experimentale, au fost identificați doi hibrizi de vișin de perspectivă:

P5 – Vișin hibrid, obținut la IP INCAAMV, Secția Genofond, Ameliorare și Selecția Clonală a Plantelor Horticole, din Chișinău. Coordonator: doctor în științe Agricole: Ceban Ecaterina. Hibridul provine din polenizarea liberă a soiului *Pandy*. După gradul de autofertilitate este autosteril, polenizatorii compatibili sunt: Mărioara, Ranniaia 2.

Pomul: de vigoare mijlocie, cu densitatea medie a coroanei, de formă rotunjită. Perioada de înflorire – timpurie. Productivitate: mare – 11,5–12,0 t/ha.

Fructele sunt mari (7,0–7,5 g), de culoare roșu-închis, pulpa roșie. Forma fructului este rotundă, pulpa de densitate medie, sucul este roșu. Gustul fructului este dulce-acrișor (neutru), plăcut, cu aromă de vișine. Fructele conțin 15,0% substanță uscată, 8,0% zaharuri, 1,0% aciditate. Sâmburele este de mărime medie, bine detașabil de pulpă. Pedunculul este de lungime medie, verde închis, grosime medie. Fructul se desprinde de pe codiță ușor.

Fructele se coc la începutul lunii iunie. Se consumă în stare proaspătă și sunt potrivite pentru prelucrare. Se distinge prin particularitățile sale botanice și prin valoarea calităților pe care le prezintă.

Hibridul este foarte productiv, rezistent la îngheț, secetă și parțial la principalele boli. Evaluarea degustativă a fructelor: 4,8 puncte.

P20 vișin hibrid, obținut de către: Ceban Ecaterina, doctor în științe Agricole. Hibridul provine din polenizarea liberă a soiului de vișin Pandi.

Pom de vigoare medie, cu coroană rotunjită. Înflorște la sfârșitul lunii aprilie - începutul lunii mai. Autosteril, polenizatori compatibili – soiurile Erdi Urajainaia și Oblacinskaia. Productivitate: mare – 12,0 t/ha. Fructele sunt de mărime mare, cântărind 7 g, de culoare roșie. Pulpa este roșie, sucul este roz, gustul este dulce-acrișor. Densitatea pulpei- medie, fină. Forma fructului este rotunjită. Cu gust dulce-acrișor. Conținutul de substanțe uscate – 14,5%, zaharuri – 5%, acizi – 0,8%. Sâmburele este de mărime medie. Pedunculul este mic, de grosime medie. Separarea pedunculului de fruct este uscată. Fructele se coc în a doua decadă a lunii iunie. Se consumă atât în stare proaspătă, cât și procesată. Este apreciat pentru calitatea sa comercială, transportabilitate, rezistență la boli. Evaluarea degustativă a fructelor – 4,8 puncte.

Condițiile climaterice care se stabilesc în perioada de formare a recoltei au o influență considerabilă și asupra componenței biochimice a fructelor. Timpul cald și însorit favorizează creșterea substanței uscate în fructe, pe timp rece și ploios are loc procesul invers, scade cantitatea ei, dar se ridică aciditatea [15, p.61]. Calitatea fructelor a fost determinată prin analiza chimică a conținutului și cantității de substanțe nutritive acumulate, rezultatele fiind expuse în tabelul 1.

Tabelul 1

Conținutul substanțelor nutritive la fructele de vișin, anul 2023

Denumirea soiului, hibridului	Conținutul indicilor fizico-chimici				Indicele glucoacidometric
	Substanțe uscate,%	Conținutul de zaharuri, %	Aciditatea titrată, (%)	Vitamina C, mg %	
P-20	17,3 ±0,01	8,3±0,01	1,4±0,01	14,8±0,01	5,9
P-5	16,0 ±0,01	7,8±0,01	1,0±0,01	15,6±0,01	7,8
Na 784	15,3 ±0,01	10,0±0,01	1,8±0,01	14,0±0,01	5,6
Pandy-48	17,0±0,01	9,0±0,01	1,2±0,01	15,7±0,01	7,5
Mărioara	19,0±0,01	4,8±0,01	0,59±0,01	17,1±0,01	8,1
Șumadinca	15,6±0,01	8,0±0,01	1,56±0,01	14,0±0,01	5,1

Raportul dintre cantitatea acumulată de zahăr și acid în fructele de vișin este exprimat prin indicele glucoacidometric. Cu cât coeficientul este mai mare, cu atât calitatea fructelor este mai înaltă.

Tabelul prezintă **conținutul substanțelor nutritive și principalii indici fizico-chimici ai fructelor de vișin**, determinați la șase soiuri și hibrizi în anul 2023. Analiza relevă o variabilitate evidentă între genotipurile studiate, fiind evidențiate în mod deosebit **hibridii noi P-5 și P-20**, care se disting prin parametri biochimici favorabili.

Hibridul **P-20** a înregistrat valori ridicate ale **substanțelor uscate (17,3 %)** și **zaharurilor (8,3 %)**, corelate cu o **aciditate titrată moderată (1,4 %)** și un conținut apreciabil de **vitamina C (14,8 mg%)**, ceea ce reflectă o bună capacitate de acumulare a compușilor biochimici. **Indicele glucoacidometric de 5,9** indică un raport echilibrat între zaharuri și acizi.

Hibridul **P-5** se remarcă printr-un **conținut echilibrat de substanțe uscate (16,0 %)** și **zaharuri (7,8 %)**, asociat cu **aciditate redusă (1,0 %)** și un nivel relativ ridicat de **vitamina C (15,6 mg%)**. **Indicele glucoacidometric de 7,8** confirmă un gust armonios și o calitate biochimică superioară.

În ansamblu, datele obținute demonstrează că **hibrizii P-5 și P-20 prezintă o valoare biochimică ridicată**, caracterizată printr-un conținut favorabil de zaharuri, acizi organici și vitamina C, ceea ce îi recomandă drept **genotipuri promițătoare pentru extinderea, diversificarea și modernizarea sortimentului de vișin**, atât pentru consum în stare proaspătă, cât și pentru utilizare industrială.

Concluzii și recomandări

1. Cercetările efectuate au confirmat eficiența selecției în populații provenite din polenizare liberă ca metodă de obținere a unor genotipuri de vișin cu valoare ameliorativă ridicată, adaptate condițiilor pedoclimatice ale Republicii Moldova.

2. Hibrizii P-5 și P-20 s-au remarcat printr-un potențial productiv înalt (11,5–12,0 t/ha), stabilitate în fructificare și adaptabilitate bună la condițiile climatice variabile, manifestând totodată rezistență sporită la îngheț, secetă și principalele boli specifice culturii vișinului.

3. Calitatea fructelor hibrizilor studiați este confirmată de parametrii biochimici favorabili, respectiv conținut ridicat de substanțe uscate, zaharuri și vitamina C, corelate cu o aciditate echilibrată și valori avantajoase ale indicelui glucoacidometric, care asigură un gust armonios și o bună acceptabilitate comercială.

4. Caracteristicile morfologice ale pomilor (vigoare moderată, coroană compactă, înălțime redusă) și desprinderea ușoară a fructelor de pe peduncul recomandă hibrizii P-5 și P-20 pentru testarea lor la recoltarea mecanizată și pentru utilizarea lor în sistemele moderne de producție.

5. În baza rezultatelor obținute, se recomandă continuarea testărilor locale și includerea hibrizilor P-5 și P-20 în sortimentul național de vișin, precum și utilizarea acestora în programele de producere a materialului săditor destinat livezilor comerciale și industriale.

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BIOACTIVE SUPPLEMENT PRODUCTION FROM FLAX AND MILK THISTLE SEEDS VIA SUPERCRITICAL CO₂ EXTRACTION

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Abstract. This study describes the development and validation of an ecologically technology for the production of food supplements containing biologically active compounds extracted from two indigenous oilseed species, flax (*Linum usitatissimum* L.) and milk thistle (*Silybum marianum*). Supercritical carbon dioxide (SC-CO₂) extraction was employed as the extraction method. The effects of raw material composition, moisture content, particle size, and key process parameters on extraction yield and extract quality were systematically analyzed. The results confirm the high efficiency of the SC-CO₂ extraction process, demonstrate the excellent oxidative stability of the obtained extracts, and indicate their suitability for incorporation into food supplements in a stable form.

Keywords: supercritical CO₂ extraction, flax seeds, milk thistle seeds, biologically active substances, food supplements.

Introduction

Interest in plant-based dietary supplements has increased substantially in recent decades, driven by growing awareness of the role of functional nutrition in health maintenance and the prevention of chronic diseases [1,2]. Oilseeds represent an important source of essential fatty acids, tocopherols, phytosterols, and other biologically active compounds that exhibit antioxidant, anti-inflammatory, and cardioprotective properties [3–5].

Flax seeds (*Linum usitatissimum* L.) are widely recognized for their high content of α -linolenic acid (ω -3), which has been associated with improved lipid metabolism and a reduced risk of cardiovascular diseases [6–8]. In addition, the presence of γ -tocopherol contributes to the oxidative stability and nutritional value of flaxseed oil [9]. Milk thistle seeds (*Silybum marianum*) have long been used in phytotherapy due to their content of flavonolignans, collectively known as silymarin, which exhibit hepatoprotective, antioxidant, and anti-inflammatory activities [10–12]. Furthermore, the lipid fraction of milk thistle seeds is rich in linoleic acid and phytosterols, compounds known to exert beneficial effects on metabolic health [13].

Conventional vegetable oil extraction methods, such as solvent extraction and high-temperature mechanical pressing, may result in the degradation of thermolabile constituents and contamination of the final products with residual solvents [14,15]. Consequently, supercritical CO₂ extraction has gained attention as an ecologically alternative, enabling the recovery of high-purity extracts while preserving the structural integrity and biological activity of sensitive compounds, without the use of toxic solvents [16–18].

The objective of the present study was to assess the suitability of native flax and milk thistle seeds as raw materials for the production of food supplements using CO₂ extraction, with particular emphasis on process parameter optimization and qualitative characterization of the resulting extracts.

Materials and methods

The analytical methods applied for the determination of chemical composition, assessment of physicochemical parameters, and quantification of bioactive compounds were selected in compliance with harmonized European standards (EN, ISO). These standardized methodologies are widely recognized for the analysis of plant-derived raw materials and food products and ensure methodological accuracy, analytical traceability, and international comparability of the obtained results.

Chemical composition of seeds

The chemical composition of seeds represents a key determinant of their nutritional value and suitability for application in functional food products. The evaluation of major constituents—namely moisture, proteins, lipids, carbohydrates, dietary fiber, and mineral content—provides a basis for comparative analysis between flax seeds and milk thistle seeds. The experimentally determined values of these components for both seed types are summarized in Table 1.

Table 1. Chemical composition of oilseeds (g/100 g)

Component	Flax seeds	Milk thistle seeds
Moisture	6.96	4.48–6.27
Protein	18.29	20.74–30.09
Lipids	42.16	19.74–23.19
Mineral substances	3.72	1.25–3.40
Carbohydrates	28.88	34.13–45.42
Dietary fiber	27.30	4.39–7.40
Source: Developed by the authors of the publication		

The compositional analysis indicates that flax seeds are characterized by a high lipid and dietary fiber content, which contributes to their considerable nutritional and functional value. In contrast, milk thistle seeds exhibit higher protein and carbohydrate contents, suggesting a greater potential as an energy- and protein-rich raw material. Mineral substances are present at moderate levels in both seed types; however, flax seeds display a comparatively higher mineral content.

Raw material preparation

Raw material preparation constitutes a critical pre-treatment step before to CO₂ extraction, as it directly affects extraction efficiency and the preservation of biologically active compounds. In particular, controlled drying reduces moisture content, thereby enhancing mass transfer and improving the solubility of lipophilic constituents in the supercritical medium. In the present study, flax and milk thistle seeds were subjected to controlled drying under defined conditions. The drying parameters applied to each raw material are presented in Table 2.

Table 2. Drying regimes applied to raw materials before to CO₂ extraction

No.	Parameter	Flax seeds	Milk thistle seeds
1	Initial moisture content, %	14.6	14.1
2	Moisture content after drying, %	5.0	5.4
3	Drying air temperature, °C	38–40	38–39
4	Drying time, min	60	65
Source: Developed by the authors of the publication			

Reduction of moisture content to approximately 5% was required to ensure optimal extraction performance. Flax seeds exhibited a slightly shorter drying time compared with milk thistle seeds, which can be attributed to differences in seed structure and bulk density. The application of moderate drying temperatures minimized the risk of thermal degradation, thereby preserving thermolabile bioactive compounds.

Influence of moisture content on extraction efficiency

Moisture content is a key parameter influencing lipid extraction efficiency under CO₂ conditions. Excessive moisture negatively affects lipid solubility in supercritical carbon dioxide, whereas lower moisture levels enhance mass transfer and promote higher extraction yields. The effect of varying moisture content on the lipid extraction yield for flax and milk thistle seeds is presented in Table 3.

Table 3. Effect of raw material moisture content on lipid extraction yield

Raw material	Moisture content, %	Lipid extraction yield, %
Flax seeds	14.1	28.3
	10.1	40.0
	8.1	60.0
	5.1	80.0
Milk thistle seeds	14.2	20.7
	10.4	40.0
	8.2	66.7
	5.2	83.3
Source: Developed by the authors of the publication		

The results demonstrate a pronounced increase in lipid extraction yield with decreasing moisture content for both types of raw materials. For flax seeds, a reduction in moisture from 14.1% to 5.1% led to an increase in extraction yield from 28.3% to 80.0%. A comparable trend was observed for milk thistle seeds, which achieved a maximum yield of 83.3% at a moisture content of 5.2%. These findings underscore the critical importance of appropriate drying as a prerequisite for efficient CO₂ extraction.

Results and Discussion

Optimization of CO₂ extraction parameters

The determination of optimal extraction parameters is critical for maximizing extraction yield while preserving the quality of biologically active compounds. CO₂ extraction, the principal variables affecting process performance include operating pressure, extraction temperature, and raw material particle size. The optimized extraction conditions identified for flax and milk thistle seeds are summarized in Table 4.

Table 4. Optimized CO₂ extraction parameters for flax and milk thistle seeds

Raw material	Pressure (MPa)	Temperature (°C)	Particle size (mm)	Extraction yield (%)
Flax seeds	40–45	35–40	0.2–0.3	65.4
Milk thistle seeds	35–40	25–35	0.2–0.3	87.7

Source: Developed by the authors of the publication

Under the optimized conditions, milk thistle seeds exhibited a higher extraction yield than flax seeds, despite being processed at comparatively lower pressure and temperature ranges. The use of a uniform particle size between 0.2 and 0.3 mm promoted effective mass transfer and enhanced lipid solubilization in the supercritical medium. These findings emphasize the necessity of adjusting extraction parameters to the physicochemical characteristics of the raw material in order to achieve efficient SC-CO₂ extraction.

Physicochemical quality indices of the extracts

The assessment of physicochemical quality indices provides essential information regarding the stability and oxidative status of the extracted oils. Key parameters include the iodine value, acid value, and peroxide value, which collectively reflect the degree of unsaturation, hydrolytic degradation, and primary oxidation of lipids, respectively. The physicochemical indices determined for flaxseed and milk thistle seed extracts are presented in Table 5.

Table 5. Physicochemical quality indices of SC-CO₂ extracts

Extract	Iodine value	Acid value (mg KOH/g)	Peroxide value (mmol ½O/kg)
Flaxseed	128	2.0	1.0
Milk thistle	88	2.8	3.5

Source: Developed by the authors of the publication

The flaxseed extract exhibited a higher iodine value, indicating a greater degree of unsaturation and a higher content of polyunsaturated fatty acids. Additionally, the lower acid and peroxide values observed for flaxseed oil suggest superior chemical quality and enhanced oxidative stability. In contrast, the milk thistle extract, despite its higher extraction yield, displayed higher acid and peroxide values, reflecting compositional differences and increased susceptibility to oxidative degradation. These results underline the importance of appropriate raw material selection and process optimization for obtaining high-quality lipid extracts.

Tocopherol composition of the extracts

Tocopherols are essential bioactive constituents of vegetable oils, contributing to oxidative stability and providing nutritional value as vitamin E compounds. The concentrations of α - and γ -tocopherols in the CO₂ extracts obtained from flaxseed and milk thistle seeds are summarized in Table 6.

Table 6. Tocopherol content of the extracts (mg/100 g extract)

Extract	α -Tocopherol	γ -Tocopherol	Total tocopherols
Flaxseed	1.36	54.60	56.00
Milk thistle	23.45	5.60	29.05

Source: Developed by the authors of the publication

The flaxseed extract was characterized by a markedly higher γ -tocopherol content, which is associated with strong antioxidant activity and enhanced protection against lipid oxidation. Conversely, the milk thistle extract contained predominantly α -tocopherol, a form with higher biological activity in terms of vitamin E nutrition. These differences highlight the distinct tocopherol profiles of the two oilseeds and emphasize the relevance of raw material selection in tailoring extracts with specific antioxidant and nutritional attributes.

Conclusions

The comparative evaluation of flaxseed and milk thistle seed raw materials demonstrated pronounced differences in chemical composition, which significantly influence both their nutritional characteristics and their behavior during extraction. Flaxseeds were characterized by higher lipid and

dietary fiber contents, whereas milk thistle seeds exhibited increased protein and carbohydrate levels, necessitating distinct processing strategies for each oilseed.

Proper raw material preparation, particularly controlled drying, in combination with the optimization of supercritical CO₂ extraction parameters, enabled the production of oil extracts with high extraction yields, improved chemical stability, and favorable bioactive profiles. Flax seed extracts were distinguished by a high degree of unsaturation and elevated γ -tocopherol content, contributing to enhanced antioxidant capacity. In contrast, milk thistle extracts were characterized by a predominance of α -tocopherol and higher extraction yields, indicating superior nutritional value in terms of vitamin E content. Overall, the findings underscore the critical role of raw material selection and process parameter optimization in the development of high-quality functional oils. The proposed CO₂ extraction approach represents a sustainable and effective technology with promising applications in functional foods, dietary supplements, and health-oriented food products.

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POTENTIAL ANTICANCER EFFECTS OF ARONIA BERRIES

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Abstract

Cancer is a multidimensional public health problem characterized by uncontrolled cell proliferation and tissue invasion, with steadily increasing incidence and mortality rates. In recent years, interest in plant-derived bioactive compounds has increased in the prevention of cancer and in supporting treatment processes. In this context, *Aronia melanocarpa*, a fruit rich in polyphenols and anthocyanins, has attracted attention for its anticancer potential against various cancer types. Studies indicate that aronia extracts suppress cell proliferation, induce apoptosis, and modulate oxidative stress responses. Overall, the findings suggest that aronia may represent a promising dietary source for cancer prevention and supportive therapy.

Keywords: *Aronia melanocarpa*, polyphenols, anticancer effect, oxidative stress, cancer

Introduction

Cancer continues to be one of the diseases that seriously threaten global public health today, with its increasing incidence and mortality rates each year [1]. The continuous rise in deaths related to malignant tumors worldwide indicates that cancer is a multidimensional health problem that goes beyond being a disease requiring treatment alone, and instead necessitates prevention and limitation of disease progression. In this context, the need for developing strategies aimed at cancer prevention and for new and complementary approaches to support existing treatment processes is steadily increasing [2].

One of the approaches that has gained attention in recent years is the integration of plant-derived bioactive compounds into the diet in order to enhance antioxidant, anti-inflammatory, and anticarcinogenic activities. The regular consumption of fresh fruits, vegetables, and whole grains is

widely accepted in the literature as having a protective effect in reducing cancer risk, and this effect is supported by numerous epidemiological and experimental studies. In parallel, the use of chemotherapy in combination with complementary and alternative medicine approaches has enabled the development of more holistic and patient-centered strategies in cancer treatment. This holistic approach aims not only to improve therapeutic efficacy but also to reduce treatment-related side effects and enhance patients' quality of life. In this context, the use of antioxidants in cancer cells, where oxidative stress plays a significant role, is considered to have potential therapeutic value in cancer chemotherapy. Accordingly, antioxidant extracts, components, or semi-synthetic derivatives of Aronia fruits have been reported to exhibit potential therapeutic effects against various cancer cell types, including human breast, cervical, colon, glioblastoma, liver, and lung cancers, as well as leukemia cells [3].

Composition, Nutritional Value, and Health Benefits of *Aronia melanocarpa*

Aronia melanocarpa, a member of the Rosaceae family and native to North America, is a strategic plant that has evolved from traditional use in folk medicine to modern status [4, 5, 6]. *Aronia* is a fruit belonging to the *Aronia* genus. This genus comprises three species: *Aronia melanocarpa* (Michx.) Elliott (black-fruited aronia), *Aronia prunifolia* (Marsh) (purple-fruited aronia), and *Aronia arbutifolia* (L.) Elliott (red-fruited aronia) [7]. *Aronia* is described as a “superfruit” due to its high antioxidant content and its potential to eliminate cancer cells. It has a remarkably rich composition in terms of antioxidants, minerals, vitamins, and phenolic compounds, including phenolic acids, flavonoids and flavanols, proanthocyanidins, and anthocyanins [8, 9]. *Aronia* contains all vitamins except vitamin B₁₂ and vitamin D, and is also rich in sodium (Na), iron (Fe), magnesium (Mg), potassium (K), zinc (Zn), tartaric acid, chlorogenic acid, folic acid, and citric acid [9,10, 11, 12].

Aronia fruit is consumed in various forms such as tea, juice, jam, sauce, and syrup, and is used in the food industry and pharmaceutical applications, as well as as a dietary supplement and a natural food colorant [9,13]. In addition, it has traditionally been used in the treatment of colds, gastric disorders, liver and intestinal diseases, and radiation poisoning, and has been reported to exert immune- and metabolism-enhancing effects [9,10]. Furthermore, the most important nutritional and health-related components of aronia include polyphenols, sugars, minerals, and vitamins. These bioactive compounds have been reported to be effective in the prevention of cardiovascular diseases and cancer, and numerous *in vitro* and *in vivo* studies have confirmed their antioxidant, anti-inflammatory, hypotensive, antiviral, anticancer, antiplatelet, antidiabetic, and antiatherosclerotic effects [4,9,11].

Effects of *Aronia melanocarpa* on Cancer Types

The worldwide popularity of the *Aronia* plant has been increasing steadily, not only due to its nutritional value but also because of its unique biological effects on human health [14]. In particular, *Aronia melanocarpa* extracts exhibit broad-spectrum antitumoral effects against various malignancies owing to their high polyphenol content [4]. Numerous studies have demonstrated that aronia extracts exert antiproliferative or protective effects against several cancer types, especially colon, pancreatic, and breast cancers [15].

For example, aronia fruit extract has been reported to show antiproliferative activity by inhibiting the proliferation of HepG2 human liver cancer cells. In a recent study, the effects of aronia extract on HT-29 colon cancer cells and healthy HUVEC cell lines were evaluated; after 48 hours, the extract induced 50% cell death (IC₅₀) in HT-29 cells, while no comparable cytotoxic effect was observed in HUVEC cells [16]. *In vitro* anticancer activity assessments using breast cancer (MCF-7) and cervical cancer (HeLa) cell lines, aronia fruit extracts exhibited moderate cytotoxic effects in both cell lines, with a more pronounced effect observed in HeLa cells. In contrast, no cytotoxic effects were reported in healthy cell lines (HUVEC and L929) [15]. Table 1 presents selected studies investigating the effects of aronia on various cancer types.

Table 1. Effects of *Aronia melanocarpa* Extracts on Various Cancer Types

Aronia (Bioactive Component)	Cancer Type	Cell or Animal Model	Mode of Action	References
Aronia Extract	Colorectal Cancer	SW480, HCT116, PDO	Activates the p53 pathway, suppresses Chk1 protein, arrests the cell cycle at the G2/M phase, and prevents DNA damage.	[17]
Aronia Extract	Melanoma	B16 cells (C57BL/6 mice)	Increases IFN- γ -producing immune cells (NK and T cells) and inhibits infiltration of myeloid-derived suppressor cells (MDSCs), thereby slowing tumor growth.	[18]
Aronia Anthocyanins	Colorectal Cancer	Caco-2 cells and mouse model	Targets the SLC1A5 glutamine transporter and the mTORC1 signaling pathway, disrupting cancer cell metabolic energy balance and inhibiting proliferation.	[19]
Aronia Extract	Colorectal Cancer	HT-29 and HUVEC (normal)	Significantly reduces levels of hTERT, the catalytic subunit of telomerase, providing selective cytotoxicity without damaging healthy cells.	[16]
Fruit Peel (Powder)	Breast Cancer	NMU- induced rat and 4T1 mouse	Reduces tumor volume <i>in vivo</i> , increases Bax/Bcl-2 ratio, and suppresses tumor angiogenesis via VEGF inhibition.	[20]
Aronia Extract + Oligomeric Proanthocyanidins	Colorectal Cancer	HCT116, SW480	Suppresses LMNB1 protein and inhibits AKT phosphorylation, producing a synergistic antitumoral effect with oligomeric proanthocyanidins (OPCs).	[21]
Aronia Leaf Extract	Colorectal Cancer	SW-480, HT-29, CCD 841 CoN	Protects normal intestinal cells while exerting dose-dependent selective cytotoxicity against cancer cells.	[22]
Aronia Leaf Extract	Colorectal Cancer	SW-480 and HT-29 cells	Inhibits MMP-2 and MMP-9 expression and activity, limiting cancer cell invasion and metastasis.	[23]
Aronia Pomace Extract	Colorectal Cancer	C2BBel and Caco-2 cells	Suppresses Akt-1 protein and activates p-Erk1/2 signaling, inducing non-inflammatory cell death characterized by loss of membrane integrity.	[24]
Aronia Leaf Phenolics	Colon Cancer	Caco-2 cells	At high doses, induces pro-oxidant effects that impair DNA repair and cause marked DNA damage and necrosis, resulting in antitumoral activity.	[25]
Fruit-Enriched Biscuit	Breast and Melanoma	MCF-7, WM793, BJ	Reduces malignant cell viability while protecting normal fibroblasts.	[2]
Aronia Methanol Extract (UAMM)	Melanoma	A375 and HaCaT (normal)	Provides selective growth inhibition (up to 48%) in melanoma cell lines and induces selective toxicity.	[26]
Aronia Extract	Colorectal Cancer	Caco-2 cells	Exhibits the highest antitumoral efficacy at the lowest IC ₅₀ value following solvent optimization.	[27]
Fruit Subfractions	Leukemia	L1210 and HL60	Achieves over 90% inhibition by targeting topoisomerase II and disrupting DNA replication.	[28]
Cyanidin Glycosides	Cervical Cancer	HeLa cells	Inhibits proliferation and enhances ROS production, promoting apoptosis.	[8]
Aronia Extract	Cervical Cancer	HeLa cells	Induces cytotoxic effects by triggering oxidative stress-mediated cell death.	[29]
Fruit Polyphenols	Pancreatic Cancer	AsPC-1 cell line	Synergistically enhances the cytotoxic effect of gemcitabine and induces apoptosis.	[30]

Studies indicate that aronia fruit is a promising dietary source as a supplement in cancer cases. Compared with other berry species, polyphenol-rich extracts of aronia fruit have been reported to exert chemopreventive effects through multiple mechanisms, including modulation of cellular signaling pathways, induction of detoxification enzymes, reduction of oxidative stress, cell cycle arrest, induction of apoptosis, support of the immune system, and prevention of lipid oxidation [5]. In addition, it has been demonstrated that the antioxidant activity of aronia fruits is directly associated with their total proanthocyanidin and anthocyanin content; cyanidin glycosides inhibit proliferation in HeLa cervical cancer cells by increasing the production of reactive oxygen species (ROS), and phenolic compounds exhibit strong antioxidant and cytotoxic effects against HepG2 human liver cancer cells [3].

Conclusion

In this literature review, *Aronia melanocarpa* is shown to possess antiproliferative, proapoptotic, and chemopreventive effects against various cancer types due to its polyphenol-rich composition. *In vitro* and *in vivo* studies have demonstrated that aronia extracts suppress the cell cycle, modulate oxidative stress, and limit tumor growth, with these effects occurring predominantly without causing damage to healthy cells. These findings suggest that aronia fruit represents a promising functional food for cancer prevention and supportive therapy.

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CHARACTERIZATION AND STORAGE STABILITY OF LIPOSOMES AS DELIVERY SYSTEMS FOR CAROTENOIDS

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Abstract

Carotenoids are valuable bioactive compounds with strong antioxidant properties; however, their application in food systems is limited by low stability and reduced bioavailability. Liposomal encapsulation represents an efficient strategy to protect carotenoids and improve their functional performance.

In this study, carotenoid-loaded liposomes were characterized in terms of particle size, antioxidant activity during *in vitro* digestion, and storage stability. The obtained liposomes showed particle sizes ranging between 144.87 ± 3.17 and 205.28 ± 2.48 nm, confirming their nanoscale structure and suitability for food applications. *In vitro* digestion revealed a higher antioxidant activity for encapsulated carotenoids compared to the free extract during both gastric and intestinal phases, demonstrating the protective effect of the liposomal system and improved bioaccessibility.

Storage stability assessment indicated a decrease in the content of encapsulated bioactive compounds after four weeks, from 80.16 ± 0.87 $\mu\text{g/g}$ to 61.48 ± 1.12 $\mu\text{g/g}$, while maintaining significant antioxidant potential. The obtained results confirm that liposomes act as effective delivery systems for carotenoids, enhancing their stability, digestive behavior, and functional properties, and highlighting their potential application in the development of fortified and functional food products.

Keywords: liposomes; carotenoids; food fortification; bioaccessibility.

Carotenoids are a large class of naturally occurring pigments responsible for the yellow, orange, and red coloration of many fruits and vegetables [1–4]. Beyond their role as natural colorants, carotenoids exhibit important biological functions, including antioxidant activity, provitamin A activity, and protective effects against oxidative stress-related diseases such as cardiovascular disorders, certain cancers, and age-related eye diseases. Due to these health-promoting properties, carotenoids are increasingly used as functional ingredients in food product development [5,6].

Natural sources of carotenoids include fruits and vegetables such as sea buckthorn, carrots, tomatoes, pumpkin, sweet peppers, and leafy greens. Among these, sea buckthorn is particularly rich in carotenoids, including β -carotene, lycopene, and zeaxanthin, making it a valuable raw material for the extraction of bioactive compounds intended for food fortification. However, the incorporation of carotenoids into food matrices remains challenging because of their lipophilic nature, low water solubility, sensitivity to light, oxygen, and temperature, as well as their limited bioavailability during digestion [1,7–9].

To overcome these limitations, encapsulation technologies have been widely investigated as effective strategies to protect carotenoids and improve their stability and bioaccessibility. Among these technologies, liposomal encapsulation has attracted significant attention due to its biocompatibility, ability to encapsulate lipophilic compounds, and suitability for food-grade applications. Liposomes are spherical vesicles composed of phospholipid bilayers capable of entrapping bioactive compounds and protecting them from environmental and processing-induced degradation [10–12].

In the food industry, liposomes have been explored as delivery systems for vitamins, antioxidants, polyphenols, and carotenoids, contributing to improved oxidative stability, controlled release, and enhanced nutritional value of fortified products [12–14]. Their application extends to a wide range of food categories, including bakery products, dairy systems, beverages, and plant-based alternatives. Liposomal systems also support clean-label strategies by reducing the need for synthetic additives while maintaining product quality and shelf life [15–17].

In this context, the characterization and storage stability of carotenoid-loaded liposomes are essential for assessing their potential as delivery systems in functional food development. Evaluating their physicochemical properties, behavior during digestion, and stability over storage provides valuable insights into their effectiveness and applicability in real food systems.

The aim of this study was to investigate the physicochemical properties, storage stability, and digestive performance of carotenoid-loaded liposomes, highlighting their potential application in the development of fortified and functional food products.

Sea buckthorn powder was obtained by convective drying (45 ± 1 °C) to a moisture content of 7%, followed by grinding (70 μ m). The powder was mixed with refined sunflower oil (1:10, w/w) and subjected to ultrasonic-assisted extraction (37 kHz, 45 ± 1 °C, 180 min). The lipophilic extract was separated by centrifugation and filtration and stored at 4 ± 1 °C in the dark until further use.

Liposomal formulations were prepared using an adapted heating (Mozafari) method [18,19]. The dispersions were sonicated for 4 min at 37 °C to reduce particle size. The obtained liposomes were stored at 4 ± 1 °C until analysis.

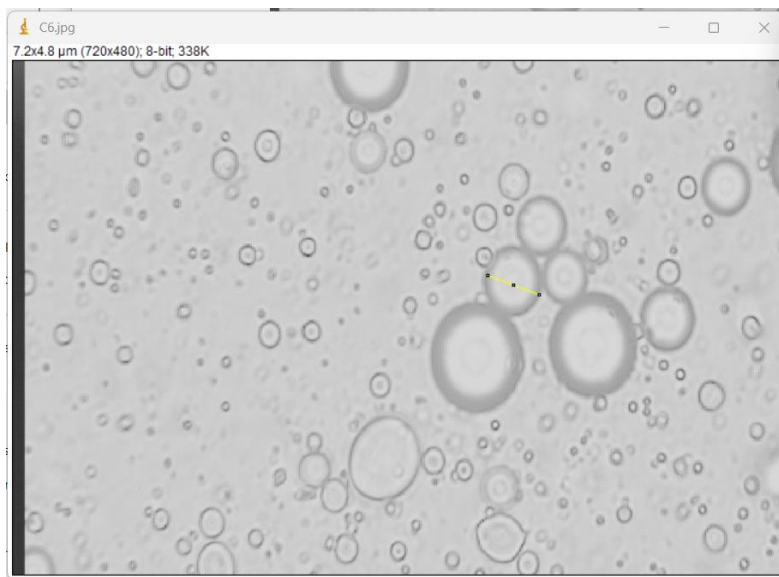


Figure 1. Microscopic image of carotenoid-loaded liposomes

The particle size of the carotenoid-loaded liposomes ranged between 144.87 and 205.28 nm, indicating the successful formation of nanoscale vesicles (Figure 1). This variation in particle size can be attributed to differences in hydration conditions, lipid–bioactive interactions, and sonication efficiency during liposome preparation. Smaller liposomes (≈ 145 – 160 nm) suggest a more uniform bilayer organization, while slightly larger particles (≈ 190 – 205 nm) may result from partial aggregation or increased loading of lipophilic carotenoids within the phospholipid bilayer.

The obtained size range is considered optimal for food applications, as liposomes below 200 nm exhibit improved physical stability, reduced sedimentation, and better dispersion in complex food matrices. Moreover, nanoscale liposomes are less likely to affect the texture, mouthfeel, or visual appearance of fortified foods, which is a critical factor for consumer acceptance.

From a nutritional perspective, particle size plays a key role in the digestive behavior and bioavailability of encapsulated compounds. Smaller liposomes provide a larger surface area, facilitating enzymatic interactions during gastrointestinal digestion and promoting a more efficient release of carotenoids in the intestinal phase, where absorption occurs. This behavior contributes to enhanced bioaccessibility compared to larger delivery systems or non-encapsulated extracts. In addition, liposomes within this size range demonstrate improved resistance to physical destabilization mechanisms such as coalescence and phase separation during processing and storage. Therefore, controlling liposome size is essential not only for technological stability but also for ensuring consistent delivery of carotenoids and maximizing their functional benefits in food products [14,20,21].

Encapsulation efficiency (EE) was determined by extracting free carotenoids with ethanol, followed by centrifugation and spectrophotometric quantification (UV–Vis). The retention rate (RR) during storage was evaluated using the same procedure after storage at 4 ± 1 °C. The carotenoid-loaded liposomes exhibited a high encapsulation efficiency (EE) of $90.8 \pm 1.6\%$, indicating effective incorporation of carotenoids into the phospholipid bilayer. The high EE value confirms the suitability of the applied liposomal formulation method for encapsulating lipophilic bioactive compounds [22,23].

The retention rate (RR) reached $89.4 \pm 2.1\%$, demonstrating good stability of the liposomal system and efficient retention of carotenoids during storage. Such values indicate limited leakage and strong interaction between carotenoids and lipid membranes [19].

The initial content of encapsulated bioactive compounds was 80.16 ± 3.12 μg , which decreased to 61.48 ± 2.85 μg after four weeks of storage (Figure 2). The observed reduction is attributed to gradual oxidative degradation and partial release of carotenoids during storage.

Nevertheless, the relatively low decrease confirms that liposomal encapsulation significantly slows down degradation processes compared to non-encapsulated carotenoids.

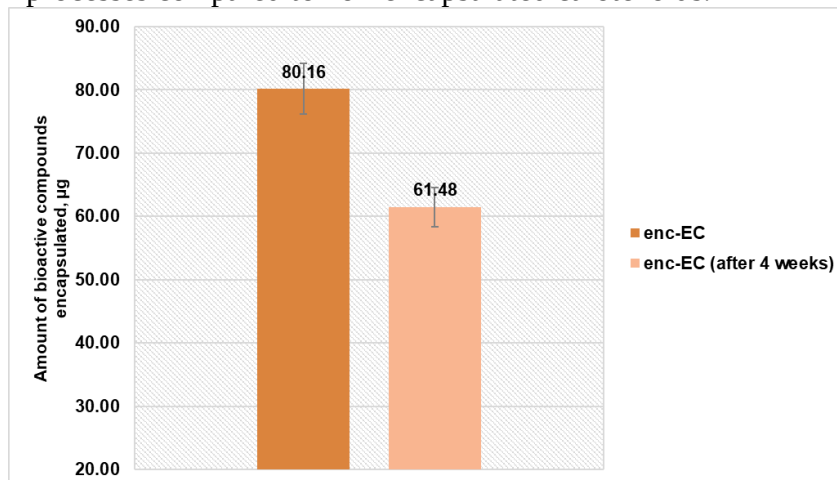


Figure 2. Changes in bioactive compound content of carotenoid-loaded liposomes during 4 weeks of storage

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The retention rate (RR) reached $89.4 \pm 2.1\%$, demonstrating good stability of the liposomal system and efficient retention of carotenoids during storage. Such values indicate limited leakage and strong interaction between carotenoids and lipid membranes.

The initial content of encapsulated bioactive compounds was 82.56 ± 3.12 μg, which decreased to 64.56 ± 2.85 μg after four weeks of storage. The observed reduction is attributed to gradual oxidative degradation and partial release of carotenoids during storage. Nevertheless, the relatively low decrease confirms that liposomal encapsulation significantly slows down degradation processes compared to non-encapsulated carotenoids.

The combination of high encapsulation efficiency, retention rate, and moderate losses during storage highlights the protective effect of liposomes and supports their application as stable delivery systems for carotenoids in food products [21].

In vitro digestion was performed under simulated gastric (pH 1.8, pepsin) and intestinal (pH 8.2, trypsin) conditions at 37 °C for 120 min. Antioxidant activity of the samples was determined at selected time intervals using the DPPH assay, with absorbance measured at 515 nm.

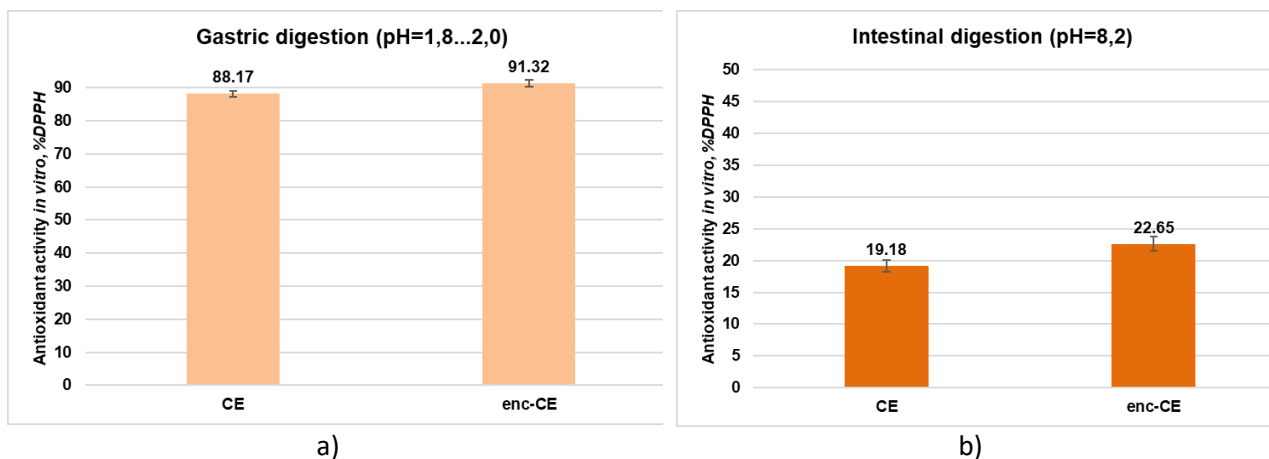


Figure 3. *In vitro* antioxidant activity of free (CE) and encapsulated carotenoids (enc-CE) during simulated digestion: (a) gastric phase (pH 1.8–2.0); (b) intestinal phase (pH 8.2)

The antioxidant activity of free carotenoid extract (CE) and encapsulated carotenoids (enc-CE) was evaluated under simulated gastric and intestinal digestion conditions using the DPPH assay. During the gastric phase (pH 1.8–2.0), both samples exhibited high antioxidant activity; however, the encapsulated extract showed a higher value ($91.32 \pm 1.85\%$) compared to the free extract ($88.17 \pm 2.10\%$). This difference highlights the protective effect of the liposomal membrane against acidic conditions and oxidative stress, preserving the antioxidant capacity of carotenoids (Figure 3a). In the intestinal phase (pH 8.2), a general decrease in antioxidant activity was observed for both samples, which is commonly associated with the lower stability of carotenoids in alkaline environments. Nevertheless, the encapsulated carotenoids maintained significantly higher antioxidant activity ($22.65 \pm 1.42\%$) than the free extract ($19.18 \pm 1.35\%$). This behavior suggests a more controlled release of carotenoids from liposomes and improved bioaccessibility during the intestinal phase, where absorption occurs (Figure 3b).

The enhanced antioxidant activity of encapsulated carotenoids during both digestion stages can be attributed to the structural integrity of liposomes, which protects carotenoids from degradation and facilitates their gradual release. These results confirm that liposomal encapsulation improves the digestive stability and functional performance of carotenoids compared to non-encapsulated extracts, reinforcing the potential of liposomes as efficient delivery systems for food applications.

Conclusions

This study confirmed that liposomal encapsulation is an effective approach for improving the stability and functionality of carotenoids in food applications. The carotenoid-loaded liposomes presented nanoscale particle sizes ranging from 144.87 to 205.28 nm, which are suitable for food systems and ensure good dispersion without negatively affecting product texture or appearance.

High encapsulation efficiency ($90.8 \pm 1.6\%$) and retention rate ($89.4 \pm 2.1\%$) demonstrated the strong ability of liposomes to incorporate and retain carotenoids. During four weeks of storage, the content of encapsulated bioactive compounds decreased from $82.56 \pm 3.12 \mu\text{g}$ to $64.56 \pm 2.85 \mu\text{g}$, indicating moderate losses and effective protection against degradation.

In vitro digestion studies showed that encapsulated carotenoids exhibited higher antioxidant activity compared to free extracts during both gastric ($91.32 \pm 1.85\%$) and intestinal ($22.65 \pm 1.42\%$) phases, confirming improved digestive stability and bioaccessibility.

Overall, these findings highlight the potential of carotenoid-loaded liposomes as efficient delivery systems for the development of functional and fortified food products with enhanced stability, bioavailability, and health-promoting properties.

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CZU 637.146.34:638.16

**FROM FERMENTATION TO FORTIFICATION: STAGE-SPECIFIC IMPACTS OF
HONEY ON PHYSICOCHEMICAL AND FUNCTIONAL PROPERTIES OF YOGURT
FERMENTED BY AUTOCHTHONOUS MOLDOVAN STARTERS**

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Abstract: Honey is increasingly used to sweeten and functionalize fermented dairy foods, yet published work often treats its incorporation as a single-factor intervention (dose), while the technological stage of addition is rarely formalized as an independent variable. This review synthesizes evidence relevant to set yogurt systems, where gel formation occurs during acidification and the timing of ingredient incorporation can reshape fermentation kinetics, protein network development, and the retention of bioactive compounds. Mechanistically, honey contributes readily fermentable sugars, organic acids, minerals, and a phenolic fraction associated with antioxidant capacity; simultaneously, its osmotic pressure and antimicrobial components may modulate starter performance depending on dose and matrix. The available literature suggests that moderate honey levels frequently improve perceived texture and functional indices, whereas higher levels can introduce trade-offs (acidification dynamics, whey separation, or microbial viability) that are strain- and process-dependent. The “stage-specific” framework—pre-fermentation addition versus post-fermentation fortification—offers a practical way to separate structural/technological effects from predominantly functional/sensory effects, and is especially pertinent when using autochthonous

starters whose acidification rate, EPS potential, and osmotic tolerance differ among strains. The review concludes with a process-oriented rationale for selecting honey dose and addition stage to balance manufacturing efficiency, gel stability, and functional enhancement in Moldovan set yogurt concepts.

Keywords: yogurt; honey; stage of addition; fermentation kinetics; syneresis; water-holding capacity; phenolics; antioxidant activity; autochthonous starters.

Introduction

Yogurt is a structured acid gel formed in-package during incubation, where the course of acidification and the moment of ingredient incorporation govern microstructure, serum expulsion, and texture development. In contrast to stirred yogurt, set yogurt is less tolerant to post-process mechanical disturbance; therefore, the “when” of adding sweeteners or fortifiers becomes a primary technological determinant rather than a minor formulation detail [1].

Honey is attractive as a natural sweetener with an added functional narrative. It delivers monosaccharides (primarily fructose and glucose), organic acids, minerals, aromatic compounds, and a phenolic fraction that correlates with antioxidant capacity. The same composition can also impose constraints: high osmolarity and certain antimicrobial components may influence starter metabolism, particularly at higher inclusion levels or in matrices with limited buffering. “Dose-only” studies are informative but incomplete for set yogurt, because the physiological effect on cultures and the physicochemical effect on gel assembly are strongly stage-dependent.

This review organizes the evidence through a stage-specific lens: (i) honey added before or at the start of fermentation (honey participates in acidification and gelation) versus (ii) honey added after reaching target pH (honey primarily fortifies and sweetens an already formed gel). The purpose is not to declare a universally optimal strategy, but to outline predictable directions and practical trade-offs, especially relevant for autochthonous Moldovan starters whose fermentation behavior differs across strain consortia.

Honey as a multifunctional ingredient in fermented dairy

Honey is widely described as a functional food because its phenolics, flavonoids, enzymes, and minor constituents contribute to antioxidant and antimicrobial effects, although the magnitude varies by botanical origin, processing, and storage. A recurring observation is that darker honeys and certain monofloral sources exhibit higher phenolic content and stronger antioxidant indices, but this relationship is not uniform across all samples and analytical methods [2].

For yogurt formulation, the technologically relevant features include:

- soluble solids increase (affecting viscosity of the serum phase and osmotic binding of water),
- fermentable sugars (potentially changing acidification trajectories),
- organic acids (shifting initial pH and buffering interactions),
- aromatic and pigment components (affecting color and sensory profile),
- antimicrobial factors (potentially suppressive or neutral depending on dose and matrix).

The implication is straightforward: honey cannot be treated as “sucrose replacement with antioxidants.” Its impact depends on the timing of incorporation and the microbial/processing contexts [4].

Why stage of addition matters specifically in yogurt

Yogurt gel formation is a timed sequence: heat treatment denatures whey proteins (to varying degrees), incubation activates starter acidification, pH falls toward the isoelectric region of caseins, and a three-dimensional network forms that traps serum. Small deviations in acidification rate or serum-phase composition during this window can yield measurable differences in pore structure, water-holding capacity (WHC), and susceptibility to syneresis.

If honey is present during fermentation, it can:

- modify substrate availability and possibly acidification speed,
- change viscosity and water activity of the serum phase,
- influence the partitioning of solutes as the network forms,

- interact indirectly with protein aggregation via changes in ionic strength and local hydration.

If honey is added after the target pH is reached and the gel is cooled, it is less likely to reshape the fundamental network architecture.

The dominant effects then shift to:

- functional load (phenolics/antioxidant indices),
- sensory effects (sweetness, aroma, color),
- surface/serum phenomena (localized syneresis if the gel is disturbed or if layering is uneven).

This distinction is practical: it suggests that “pre-fermentation honey” is a technology lever, while “post-fermentation honey” is primarily a fortification lever.

Effects on fermentation kinetics and starter performance

Evidence on honey’s effect on yogurt cultures is mixed but informative. Work evaluating acacia honey in fermented milk systems indicates that honey at modest levels does not necessarily compromise survival of classic yogurt cultures during cold storage. In a related study examining yogurt enriched with honey and whey protein concentrate, the authors tracked growth/viability of *Streptococcus thermophilus* and *Lactobacillus delbrueckii* subsp. *bulgaricus* and highlighted that the meaningful outcomes are not only endpoint pH but also acidification dynamics and post-acidification during storage [1].

Mechanistically, two opposing tendencies can coexist. Additional sugars may support faster metabolism and shorten time to pH 4.6, but at higher honey levels osmotic pressure and bioactive components can impose stress that slows growth or shifts metabolic patterns. This is why stage-specific designs are essential: if honey is introduced post-fermentation, any observed changes in viable counts or post-acidification are more plausibly linked to storage interactions rather than direct participation in the gelation phase.

For autochthonous starters, the uncertainty increases in a scientifically meaningful way. Local strains may differ in acidification rate, EPS production, and tolerance to osmotic pressure; therefore, the same honey concentration can produce different kinetic signatures across consortia. From a technology-development perspective, this variability is not noise but a selection tool: it helps identify starter–honey pairings that preserve process controllability.

Syneresis, WHC, and texture: main technological outcomes

Syneresis and WHC are core quality markers for set yogurt. Honey can affect them through solids-driven water binding, altered serum viscosity, and—if added during fermentation—through changes in microstructure formation.

Studies in fermented milk matrices have reported improved water retention and changes in water activity when honey is included, supporting the plausibility of WHC improvement under certain conditions. In yogurt-focused work, honey inclusion has been associated with changes in viscosity and reduced whey separation in some formulations, but the effect is not guaranteed and can depend on milk composition, heat treatment, and dose.

From a stage-specific viewpoint, expectations can be stated as testable propositions:

- Pre-fermentation honey is more likely to alter firmness/gel strength and syneresis behavior because it co-determines network assembly.
- Post-fermentation honey is more likely to influence perceived thickness and sweetness, while structural changes depend mainly on whether the gel is disturbed and how uniformly honey is layered.

In practice, the 2–8% range is wide enough to include both “formulation-level” effects (2–4%) and potential “matrix-dominant” effects (6–8%), where trade-offs become more probable. This range therefore fits well with a stage-specific experimental narrative: the goal is to locate the concentration window where functional gain is achieved without compromising gel integrity.

Functional properties: phenolics and antioxidant capacity in dairy matrices

The most consistent claim in the literature is that honey addition increases antioxidant indices of dairy products, reflecting the phenolic fraction transferred into the matrix. Reviews addressing antioxidant activity of milk and dairy products support the general direction of these effects while

noting that method choice (DPPH, ABTS, FRAP) and sample preparation influence absolute values and comparability [3].

Stage of addition likely affects not only the magnitude but also the stability of functional markers during storage. When honey is introduced during fermentation, phenolics can bind to proteins and may undergo microbial-associated transformations; when introduced after fermentation, the initial phenolic profile may be better preserved, but distribution within the gel may be less homogeneous. Thus, a rigorous approach is to evaluate functional indices over storage time rather than at a single time point [5].

Relevance of Moldovan autochthonous starters: novelty and applied rationale

A stage-specific framework is particularly suitable when the starter culture itself is a variable of local innovation. Autochthonous Moldovan strains can provide distinctive sensory notes and technological behavior; they also introduce biologically meaningful variability in sugar utilization, acidification kinetics, and stress tolerance. Consequently, the combined system (milk–starter–honey) should be treated as a designed biotechnological unit, not as a generic yogurt base plus flavoring [6].

Practical implications and a recommended experimental logic (for the subsequent research paper)

Although this text is a literature review, it naturally leads to a structured experimental plan. A minimal, high-informational design would treat two factors as primary: honey concentration (0, 2, 4, 6, 8%) and stage (pre-fermentation vs post-fermentation). Outcomes should include: fermentation time to pH 4.60, maximum acidification rate, titratable acidity and post-acidification, syneresis/WHC, firmness/viscosity, color, total phenolics, and at least one antioxidant assay. If resources allow, viable counts for *S. thermophilus* and *L. delbrueckii subsp. bulgaricus* (or the exact autochthonous analogs) add interpretive power.

Conclusion

The literature supports honey as a multifunctional ingredient capable of increasing antioxidant potential of yogurt while influencing technological stability in a dose- and context-dependent manner. For set yogurt, the stage of honey incorporation is not a secondary detail: it separates effects on fermentation and gel assembly from effects primarily related to fortification and sensory modification. The proposed stage-specific approach is well-aligned with the use of autochthonous Moldovan starters, where strain-level traits can shift the balance between process efficiency, gel stability, and functional enhancement.

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COMPARATIVE EVALUATION OF THE AGONOMIC PERFORMANCE AND YIELD OF TWO MAIZE HYBRIDS (ZEA MAYS L.) IN THE PEDOCLIMATIC CONDITIONS OF TIMIȘ COUNTY

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Absatract The study for this work was conducted on a farm in Timiș County, Romania. The main goal is to determine the differences in agronomic performance and yield between two maize hybrids (P0260 and Jumbo 48) grown in the specific soil and climate conditions of Timiș County, in order to identify the superior and more stable hybrid for this area.

The objectives detail the steps necessary to achieve the goal and are based on the collection and analysis of field data: assessment of agronomic response and stability; measurement of yield and its components; identification of the optimal hybrid. The comparative evaluation of the maize hybrids P0260 (Pioneer/Corteva) and Jumbo 48 (Fertillia/BC Institut) in the pedoclimatic conditions of Timiș County (located in Western Romania, an area prone to drought and heat) focuses on stress tolerance and production potential. Timiș County is part of the West plain area, where semi-late hybrids (FAO 400-500) are suitable, but where climatic challenges (summer drought) dictate the choice.

Keywords: Timiș County, Zea mays L., hybrid P0260, hybrid Jumbo 48

Introducere

România se află în primele zece țări cultivate de porumb la nivel mondial, alături de liderul mondial în producția de porumb, SUA. Marile țări cultivate sunt China, Brazilia, Mexic, Rusia,

Ucraina, România și Africa de Sud. România a fost al doilea producător de porumb din Uniunea Europeană în 2014 și s-a situat pe a douăsprezecea poziție în topul mondial. [9; 10].

Pe lângă grâu și orez, porumbul este o resursă alimentară importantă pentru oameni, reprezentând 94% din consumul total de cereale la nivel mondial [1, p. 351- 356].

În 2020, porumbul (*Zea mays* L.) a fost a doua cea mai produsă cultură din lume (după grâu), cu o suprafață cultivată de 201,9 milioane de hectare, și cea mai produsă cereală din România (locul 1), cu o suprafață cultivată de 2,6 milioane de hectare [6, p.105-112]. Acest lucru se datorează faptului că porumbul are o gamă largă de utilizări, cum ar fi hrana animalelor, industria alimentară, industria farmaceutică, obținerea biodieselului etc. România joacă un rol important pe piața internațională a cerealelor [2, p. 160-167; 3, 319-324], iar performanța sa în cultura porumbului se bazează pe utilizarea unor hibrizi cu randament ridicat, cu o calitate a boabelor necesară pentru procesare și cu rezistență la stresuri biotice și abiotice [4, p. 339-352]. România este unul dintre cei mai importanți producători de porumb și grâu din Europa și din lume. Performanța sa în cultura porumbului și grâului se bazează pe utilizarea soiurilor și hibrizilor cu potențial ridicat, rezistența plantelor la boli și dăunători și calitatea boabelor necesară pentru procesare [5, p. 253-259; 7, p. 287- 292; 8, p. 511-516].

Material și metodă

Studiul comparativ dintre cei doi hibrizi P0260 și Jumbo 48, a avut ca scop evaluarea comparativă a performanței agronomice producție, stabilitate și toleranță la stres din județul Timiș. Județul Timiș are soluri fertile (cernoziomuri și soluri aluviale), iar atunci când umiditatea este suficientă (fie din irigații, fie din precipitații), P0260 atinge frecvent producții de top. În condiții optime, P0260 poate depăși 13.000 – 15.000 kg/ha (13-15 t/ha).

În anii secetoși hibridul menține o producție stabilă, fiind printre cele mai performante opțiuni în anii cu stres hidric sever, adesea depășind cu 10-15% mediile altor hibrizi din aceeași grupă FAO în condiții de secetă. Grupa FAO 430 (semi-tardiv), este adaptat pentru câmpia Banatului, unde suma de căldură necesară pentru maturare este atinsă în mod normal, permițând hibridului să își maximizeze potențialul în faza lungă de umplere a bobului. Timișul se confruntă adesea cu arșița din iulie-august, exact în perioada critică de înflorire și formare a bobului. P0260 are o capacitate excelentă de a folosi eficient apa stocată în sol și de a menține polenizarea sub stres termic. Prin urmare, hibridul P0260 este considerat un hibrid premium și foarte potrivit pentru condițiile pedoclimatice din Județul Timiș, fiind un "paria" excelent pentru stabilitate și producții mari, mai ales în anii cu risc de secetă.

Jumbo 48 este un hibrid de porumb semitardiv, renumit pe piața din România pentru stabilitatea sa excelentă și dubla funcționalitate (boabe și siloz), fiind un favorit al fermierilor care caută siguranță în producție, chiar și în anii cu stres climatic.

Jumbo 48 se remarcă printr-o talie impresionantă și o structură robustă, talia plantelor înaltă, atingând înălțimi medii de 240 – 260 cm. Această talie mare contribuie direct la volumul mare de masă verde ideal pentru siloz. Toleranța la secetă și arșița este foarte bună. Acesta este principalul său avantaj, asigurând producții bune chiar și în anii secetoși.

Jumbo 48 este mai puțin tolerant la densități foarte mari comparativ cu hibrizii intensivi (cum ar fi P0260), preferând o densitate optimă pentru a-și exprima robustețea.

Rezultate și discuții

Județul Timiș face parte din zona de câmpie de Vest, unde hibrizii semi-târzii (FAO 400-500) sunt potriviți, dar unde provocările climatice (seceta de vară) dictează alegerea. Hibridul P0260 (Pioneer) prezintă următoarele caracteristici dominante și implicații : intensiv, Boabe pure, FAO 430. MMB mare (365-400g), număr mare de rânduri/boabe pe știulete (18-20/47-50). Orientat către producție maximă de boabe în condiții de tehnologie înaltă și densitate mare. FAO-ul mai mic (430) sugerează o uscare mai rapidă a bobului la recoltare.

Hibridul Jumbo 48 (Fertillia) prezintă următoarele caracteristici dominante și implicații: Rustic, Dual-Purpose (Boabe + Siloz), FAO 440-480. Talia înaltă (240-260 cm), MMB mai mic (300-340g), număr mai mic de rânduri/boabe (16-18). Orientat către stabilitate și masă vegetativă, fiind o alegere

mai sigură în condiții variabile. FAO-ul mai mare (440-480) indică o maturitate mai tardivă și, probabil, o umiditate mai mare la recoltare.

Impactul densității de semănat (70.000 boabe/ha)

Pentru P0260: densitatea de 70.000 pl/ha este optimă pentru condiții de neirigat (situația cea mai probabilă, având în vedere lipsa irigației în tabel) și este aproape de minimul recomandat pentru irigat. P0260 va valorifica bine această densitate.

Pentru Jumbo 48: densitatea de 70.000 pl/ha este la limita superioară a recomandărilor pentru irigat și o depășește pe cea optimă pentru neirigat (50.000-65.000).

Dacă experiența nu este irigată, hibridul Jumbo 48 va fi supus unui stres de competiție mai mare pentru apă și nutrienți decât P0260, din cauza supra-aglomerării.

În aceste condiții, Jumbo 48 poate avea o scădere a indicelui de recolta (rata dintre greutatea boabelor și biomasa totală).

Impactul fertilizației (460 kg N/ha): S-a aplicat o doză totală de azot (N) extrem de mare (180 kg/ha la semănat + 280 kg/ha la prașilă = 460 kg N/ha).

P0260 fiind un hibrid intensiv, va răspunde cel mai bine la această doză masivă, transpunând azotul în producție de boabe, în special dacă stresul hidric este controlat.

Jumbo 48 va dezvolta o masă vegetativă (tulpini și frunze) excesivă din cauza azotului mare. Deși acest lucru este benefic pentru producția de siloz, ar putea înrăutăți stresul de supra-aglomerare și ar putea întârzia și mai mult uscarea boabelor (umiditate mare la recoltare).

Pe baza tehnologiei aplicate, se pot anticipa următoarele rezultate în câmp:

Hibridul P0260 - producție potențial mai mare (datorită tehnologiei intensive și MMB-ului mai mare). Umiditate mai mică, datorită FAO 430 și a ritmului de uscare rapid. Volum mare de masă verde. Rezistență bună.

Hibridul Jumbo 48 - producție stabilă, dar posibil mai mică decât P0260, din cauza supra-aglomerării și a alocării resursei către biomasă. Umiditate mai mare, datorită FAO mai mare (440-480) și a masei vegetative mari (care încetinește uscarea). Volumul de masă verde cel mai mare (datorită taliei înalte și a îngrășământului excesiv cu N). Risc potențial mai mare de frângere sau cădere (din cauza taliei mari și a masei)

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Abstract

Human food resources are provided mainly from agricultural ecosystems and to a lesser extent from natural ecosystems or other sources (modern food industries, biotechnologies). For a long period of time in which the human species was formed and evolved, natural ecosystems were the basis of food, but with the emergence and progressive transition, in the last 10-15 millennia one of the most profound revolutions of humanity has been achieved in the practice of agriculture. Since ancient times, mankind has developed a strategy for cultivating plants and transforming the environment to such an extent as to achieve the maximum possible conversion of solar energy into food, feed or other agricultural products. The development of human society has been possible and directly conditioned by ensuring an adequate and stable trophic base, this being possible through the creation and improvement of agroecosystems, in other words through the modernization of agriculture over time. The activities of designing, organizing and managing the created agroecosystems, of managing them, activities that are found in the term of agriculture, faithfully reflect the level of development of the human society. Agriculture, with the aim of human control over food production, is a fundamental social activity on which the satisfaction of man's vital demands depends. The purpose of agriculture throughout the centuries has been to produce food goods and various raw materials in the proportion required by the biological and extrabiological needs of man.

In the contemporary world, agriculture must meet the increased demands of a human population with

a very high rate of economic growth and keep pace with industrial development. The need for the development and modernization of agriculture has stemmed from its vital role in meeting the food needs of the rapidly growing human population, especially in the last century. Unceasing population growth is the main source of the increasing pressure on natural and agricultural systems, while reducing the number of inhabitants. The development of the world economy at a rapid pace after the Second World War was due to industry - the basis of modernization in developed countries, the economies of these countries benefiting from the propagated effects of the interdependent development of industries and agriculture. From the perspective of the contemporary world, economic growth is estimated to be due to industry and services. However, in a large number of countries, strategies for the development of agriculture occupy an important place in the training and structuring of the economy.

Key words: Agricultural systems, Ciacova România, rural development, strategy, soil.

Introducere

Agricultura reprezintă una dintre principalele activități economice ale spațiului rural românesc, având un rol esențial în asigurarea securității alimentare, valorificarea resurselor naturale și menținerea echilibrului socio-economic la nivel local și regional. În contextul actual, marcat de schimbări climatice, presiuni economice și necesitatea alinierii la politicile agricole europene, analiza structurii culturilor, a producțiilor obținute și a nivelului de mecanizare devine indispensabilă pentru evaluarea performanței sectorului agricol [6, p. 449-452; 12, p. 11-145].

Zona de vest a României, în special județul Timiș, se remarcă printr-un potențial agricol ridicat, determinat de condițiile pedoclimatice favorabile, de suprafețele agricole extinse și de tradiția practicării agriculturii intensive. Câmpia Banatului este recunoscută pentru fertilitatea solurilor, structura echilibrată a culturilor și gradul relativ ridicat de dotare tehnică a exploatațiilor agricole [5, p. 45-162; 7, p. 30-95; 14, p. 27].

Comuna Ciacova este amplasată în sud-vestul județului Timiș, în cadrul Câmpiei Tisei, parte a marii unități geomorfologice a Câmpiei Banatului. Din punct de vedere climatic, zona se caracterizează printr-un climat continental moderat, cu influențe mediteraneene și oceanice, care favorizează cultivarea cerealelor păioase, a porumbului, a plantelor tehnice și a legumelor. Regimul termic și pluviometric relativ echilibrat contribuie la obținerea unor producții agricole stabile, cu variații determinate în principal de factorii climatici anuali și de tehnologiile aplicate [1, p. 65-140; 10, p. 312-318; 13, p. 230].

Studiile recente evidențiază faptul că productivitatea agricolă este rezultatul interacțiunii complexe dintre condițiile naturale (sol, climă, relief) și factorii antropici, precum structura culturilor, nivelul de mecanizare, utilizarea inputurilor și managementul fermei [9, p. 245-251; 11, p. 256-262]. În acest context, analiza evoluției suprafețelor cultivate și a producțiilor obținute la nivel local oferă informații relevante pentru fundamentarea deciziilor agricole și pentru adaptarea practicilor la noile realități climatice și economice [4, p. 1-180; 8, p. 210-245; 17, p. 4].

Agricultura comunei Ciacova se bazează în principal pe cultivarea cerealelor păioase (grâu, orz), a porumbului boabe și a plantelor tehnice, în special floarea-soarelui și rapița, acestea reprezentând pilonii principali ai producției vegetale. Sectorul legumicol, deși ocupă suprafețe mai reduse, contribuie la diversificarea producției agricole și la asigurarea consumului local, având un caracter complementar agriculturii de câmp [16, p. 90-110; 2, p. 85-96; 3, p. 15-60].

Modernizarea agriculturii locale este susținută de existența unui parc tehnologic relativ bine dezvoltat, rezultat al accesării fondurilor europene și al investițiilor realizate de fermieri în ultimii ani. Nivelul de dotare cu tractoare, utilaje pentru lucrările solului, semănat, întreținere și recoltare permite efectuarea lucrărilor agricole în perioadele optime, contribuind la creșterea eficienței și reducerea pierderilor de producție [11, p. 256-262; 12, p. 11-145; 15, p. 10].

Scopul prezentei lucrări este de a analiza agricultura comunei Ciacova, județul Timiș, în perioada 2021–2023, prin evidențierea structurii culturilor, a suprafețelor cultivate, a producțiilor obținute și a nivelului de mecanizare.

Rezultatele studiului pot constitui un suport informativ util pentru fermieri, autorități locale și specialiști în domeniul agricol, contribuind la o mai bună înțelegere a dinamicii agricole locale și la identificarea direcțiilor

Material și metodă

Materialul utilizat în realizarea lucrării este reprezentat de date statistice oficiale furnizate de autoritățile locale și de evidențele agricole ale comunei Ciacova, referitoare la suprafețele cultivate, producțiile obținute și parcul de utilaje agricole în perioada 2021–2023 [4, p. 1-180; 8, p. 210-245; 17, p. 4].

Metoda de lucru a constat în analiza comparativă a datelor pe ani agricoli, calculul producțiilor medii la hectar și interpretarea rezultatelor în corelație cu condițiile pedoclimatice și nivelul de dotare tehnică, conform metodologiilor utilizate în studiile agricole și pedologice de specialitate [5 p. 45-162; 9, p. 245-251].

Rezultate și discuții

Structura suprafețelor cultivate și producțiile realizate la culturile de cereale și plante tehnice în anul 2021 sunt prezentate în tabelul 1.

Tabelul 1. Suprafața și producția realizată la culturile de cereale și plante tehnice

Culturile	Suprafața (ha)	Producția (t)
Grâu	1500	5800
Secară	300	1200
Orz	55	200
Orzoaică	10	16
Ovăz de toamnă	60	250
Porumb	1500	5500
Floarea soarelui	500	900
Rapiță	92	1748

După cum reiese din tabelul 1, principalele plante de cultură în cadrul localității Ciacova o reprezintă grâul cu o suprafață de 1500 ha și o producție totală de 5800 t ceea ce înseamnă o producție medie de 3860 kg/ha, urmată de porumb cu o suprafață de 1500 ha cu o producție totală de 5500 tone reprezentând o producție medie de 3600 kg/ha. Următoarele culturi sunt Floarea soarelui cu 500 ha și secară de primăvară cu 300 ha.

Datele privind suprafețele recoltate și producțiile obținute la culturile de legume în anul 2021 sunt sintetizate în tabelul 2.

Tabelul 2. Suprafața recoltată și producțiile obținute la culturile de legume

Denumirea culturilor	Suprafața recoltată - hectare	Producția obținută - tone
Cartofi de vară	55	500
Cartofi de toamnă	65	700
Tomate	20	80
Varză	6	75
Ardei	4	25
Castraveți	4	40
Rădăcinoase	4	40
Mazăre	4	50
Fasole	2	2
Vinete	2	6
Conopidă	1	28

Legat de culturile de legume prezente pe raza localității, după cum se poate observa din tabelul 2, principala cultură este cea de tomate cu 20 ha iar pe suprafețe mai mici se cultivă varză, ardei, conopidă, vinete ș.a. care completează paleta de culturi a localității.

Evoluția suprafețelor și a producțiilor realizate la culturile de cereale și plante tehnice în anul 2022 este prezentată în tabelul 3.

Tabelul 3. Suprafața recoltată și producțiile obținute la culturile de cereale și plante tehnice

Denumirea culturilor	Suprafața recoltată - hectare	Producția obținută -tone
Grâu comun dc toamnă	1600	7200
Orz	200	800
Orzoaica dc toamnă	70	280
Ovăz de toamnă	10	30
Porumb boabe	1680	3360
Floarea soarelui	250	375
Răpita	250	375

După cum se poate observa din tabelul 3, principalele plante de cultură în cadrul localității Ciocova în anul 2022 o reprezintă grâul cu o suprafață de 1600 ha și o producție totală de 7200 t ceea ce reprezintă o producție medie de 4500 kg/ha, urmată de porumb boabe cu o suprafață de 1680 ha cu o producție totală de 3360 tone reprezentând o producție medie de 2000 kg/ha. Următoarele culturi sunt floarea soarelui cu 375 ha și orzul cu 200 ha.

Structura culturilor legumicole și nivelul producțiilor obținute în anul 2022 sunt redată în tabelul 4.

Tabelul 4. Suprafața recoltată și producțiile obținute la culturile de legume

Denumirea culturilor	Suprafața recoltată - hectare	Producția obținută -tone
Cartofi de vară total	40	400
Cartofi de toamnă total	50	600
Tomate	6	42
Ceapă uscată	5	70
Usturoi uscat	5	30
Varză	12	120
Ardei	2	12
Mazăre păstăi	20	30
Vinete	2	10

Legat de culturile de legume prezente pe raza localității în anul 2022, după cum reiese din tabelul 4, principala cultură este cea de tomate cu 42 ha de la 20 ha în 2021 iar pe suprafețe mai mici se cultivă varză, ardei, ceapă, usturoi, conopidă, vinete ș.a. care completează paleta de culturi a localității.

Situația suprafețelor cultivate și a producțiilor realizate la culturile de cereale și leguminoase pentru boabe în anul 2023 este prezentată în tabelul 5.

Tabelul 5. Suprafața recoltată și producțiile obținute la culturile de cereale și leguminoase

Denumirea culturilor	Suprafața recoltată - hectare	Producția obținută - tone
Grâu comun de toamnă	1523	7615
Secară de toamnă	1	4
Triticale de toamnă	63	315
Țriticale de primăvară	5	20
Orz	259	1424
Orzoaica de toamnă	18	72
Orzoaică dc primăvară	10	40
Ovăz dc primăvară	88	
Porumb boabe	956	6692
Sorg boabe	9	
Leguminoase pt. boabe	3	

După cum se poate observa din tabelul 5, principalele plante de cultură în cadrul localității Ciacova în anul 2023 o reprezintă grâul cu o suprafață de 1523 ha și o producție totală de 7615 t ceea ce reprezintă o producție medie de 5000 kg/ha, urmată de porumb boabe cu o suprafață de 956 ha cu o producție totală de 6692 tone reprezentând o producție medie de 7000kg/ha. Următoarele culturi sunt orzul cu 259 ha și ovăz de primăvară cu 88 ha.

Datele referitoare la culturile de plante tehnice cultivate în anul 2023 sunt sintetizate în Tabelul 6.

Tabelul 6. Suprafața recoltată și producțiile obținute la culturile de plante tehnice

Denumirea culturilor	Suprafața recoltată - hectare	Producția obținută - tone
Floarea soarelui	548	1918
Rapiță	444	1332
Soia boabe	54	97

Plantele tehnice completează structura culturilor astfel floarea soarelui ocupă în anul 2023 548 ha cu o producție totală de 1918 t ceea ce reprezintă 3500 kg/ha, rapiță cu 444 ha și o producție totală de 1332 tone media fiind de 3000 kg/ha și soia boabe cu 54 ha o producție totală de 97 tone și media de 1790 kg/ha.

Structura și producțiile realizate la culturile de legume în anul 2023 sunt prezentate în Tabelul 7.

Tabelul 7. Suprafața recoltată și producțiile obținute la culturile de legume

Denumirea culturilor	Suprafața recoltată - hectare	Producția obținută - tone
Cartofi	13	24
Tomate	2	12
Ceapă uscată	2	28
Usturoi uscat	2	12
Ardei	1	
Castraveți	2	
Mazăre păstăi	6	21
Fasole păstăi	17	
Spanac	2	
Dovlecei	30	360
Porumb zaharat	8	64

Legat de culturile de legume prezente pe raza localității în anul 2023, după cum se poate observa din tabelul 7, principala cultură este cea de dovlecel cu 30 ha, fasole pastai cu 17 ha, tomate cu 2 ha iar pe suprafețe mai mici se cultivă varză, ardei, castraveți ș.a. care completează paleta de culturi a localității.

Nivelul de dotare tehnică a exploatațiilor agricole din comuna Ciacova este prezentat în Tabelul 8.

Tabelul 8. Utilaje pentru agricultură

Denumire	Gospodării agricole fără personalitate juridică cu domiciliul în localitate
Tractoare până la 45 CP	11
Tractoare între 46-65 CP	61
Tractoare între 66-100 CP	2
Tractoare între 101-104 CP	3
Pluguri pentru tractor cu 2 trupe	3
Pluguri pentru tractor cu 3 trupe	60
Puguri pentru tractor cu peste 3 trupe	3
Pluguri cu tracțiune animală	5
Cultivatoare	30
Grape cu tracțiune mecanică (toate tipurile)	63

Combinatoare	1
Semănători cu tracțiune mecanică pentru păioase	32
Semănători cu tracțiune mecanică pentru prășitoare	34
Mașini pentru plantat răsaduri	1
Mașini pentru împrăștiat îngrășăminte chimice	21
Mașini pentru erbicidat	34
Combine autopropulsate pentru recoltat cereale păioase	16
Combine autopropulsate pentru recoltat porumb	6
Cositori cu tracțiune mecanică	21
Prese pentru balotat paie și fân – baloți paralelipipedi	12
Remorci pentru tractor	67
Care și căruțe	22

Parcul tehnologic este bine dimensionat acoperind cerințele fermierilor legat de efectuarea lucrărilor agricole la timp. Totodată acesta este relativ nou, proiectele pe fonduri europene ajutând fermierii în modernizarea parcurilor tehnologice.

Concluzii

1. Comuna Ciacova este amplasată în sud-vestul României, în cadrul Câmpiei Banatului, zonă cu potențial agricol ridicat, favorabil dezvoltării unei agriculturi intensive și diversificate.
2. Condițiile climatice locale, caracterizate prin ierni relativ blânde și veri calde, cu influențe mediteraneene și oceanice, permit obținerea unor producții agricole stabile, cu variații determinate în principal de regimul pluviometric anual.
3. Structura culturilor agricole în perioada 2021–2023 evidențiază predominanța grâului și a porumbului boabe, urmate de floarea-soarelui, rapiță, orz și soia, culturi adaptate condițiilor pedoclimatice locale.
4. Sectorul legumicol are o pondere mai redusă în structura agricolă a comunei, însă contribuie la diversificarea producției, principalele culturi fiind dovlecelul, fasolea păstăi și tomatele.
5. Parcul de utilaje agricole este bine dimensionat și relativ modern, ceea ce permite efectuarea lucrărilor agricole în perioadele optime și contribuie la creșterea eficienței exploatațiilor agricole locale, modernizarea fiind susținută în mare măsură de fondurile europene.

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PRODUCTIVITY AND QUALITY OF THE GRAPE CULTIVARS MELEAG AND LEGENDA AS AFFECTED BY ENVIRONMENTAL CONDITIONS.

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Abstract. Increasing climate instability, manifested by rising temperatures, precipitation shortages, and uneven rainfall distribution during periods of intense daytime heat, has a significant thermal impact on plants (Florea et al., 2025). These conditions lead to reduced crop quality and, in extreme cases, to the degradation or loss of vineyards, resulting in substantial economic consequences for viticulture. Many researchers emphasize that local and indigenous grape varieties are more adaptable to specific environmental conditions than introduced varieties (Jovanović-Cvetković et al., 2023)

This study presents the results of research examining the influence of environmental factors, including topographic characteristics (slope aspect, steepness, and altitude) and soil conditions, on the productivity and quality of the Meleag and Legenda grape varieties cultivated under organic viticulture conditions in the Central Region of the Republic of Moldova. In the Republic of Moldova, growing interest in local varieties has stimulated an expansion of planted areas, positively affecting the viticulture sector as a whole. Long-term studies were conducted in the Central Wine Region of

Moldova, focusing on the ecological and agrobiological characteristics of local grape varieties under specific growing conditions.

The aim of this research was to analyze the growth and development parameters of the Meleag and Legenda grape varieties and to establish their relationship with grape yield and quality under the conditions of the Central region of the Republic of Moldova.

Key words: local and indigenous grapevine varieties, Meleag, Legenda, adaptability, productivity.

Introduction

Local and indigenous grapevine varieties represent a strategic resource for sustainable viticulture, particularly under conditions of increasing climatic variability (Shecori et al., 2022). Developed over long periods of cultivation, these varieties possess adaptive traits that enable them to perform well under specific environmental conditions (Gutiérrez-Gamboa et al., 2025). In the Republic of Moldova, where viticulture plays a central role in the national economy, the preservation and effective utilization of autochthonous grapevine varieties is of particular importance in the context of ongoing climate change (Baltazar et al., 2025).

The viticultural regions of Moldova are characterized by considerable diversity in pedological, orographic, and edaphic conditions, which significantly influence grapevine growth, yield formation, and grape quality. In recent years, the central and southern regions of the country have increasingly experienced elevated temperatures, precipitation deficits, and irregular rainfall distribution during the vegetation period (Abebaw, 2025). These climatic stressors adversely affect vine physiology, leading to yield instability and deterioration of grape quality (Konecny et al., 2025). Under such conditions, local grapevine varieties often demonstrate greater resilience and adaptability compared to introduced cultivars. Understanding the adaptive responses of indigenous grapevine varieties to climate-related stress factors, including thermal stress, prolonged drought, and seasonal variability in precipitation, is essential for developing sustainable viticultural practices (Tzortzakis et al., 2020).

Research focused on varietal adaptability and resistance contributes not only to the conservation of national viticultural heritage but also to the formulation of effective strategies for climate-resilient vineyard management. Vineyard productivity and grape quality are strongly influenced by climatic and soil-related factors. Water shortages during the growing season negatively impact physiological processes in grapevines, while low temperatures during winter and transitional periods may cause damage to buds, annual shoots, and perennial wood, potentially leading to vine mortality (Gutiérrez-Gamboa et al., 2025). Recent observations indicate an increasing frequency of arid conditions during the vegetation period.

Therefore, comprehensive studies integrating climatic, pedological, and agrobiological factors are required to assess the productive potential of local grapevine varieties and to support the sustainable development of viticulture in the Republic of Moldova.

Research methodology

The research problem addressed in this study involves examining the influence of soil and climatic conditions on the growth parameters, photosynthetic activity, and productivity of the indigenous Meleag and Legenda grapevine varieties in the Central Wine Region of the Republic of Moldova, using both traditional and modern technologies. Phenological and physiological data were recorded throughout the study period. The obtained results were subjected to mathematical processing using MS Excel 2010, analysis of variance, and the AGROSTAT and STATGRAPHICS Plus 5.0 software packages, including the ANOVA module.

Research results

The conducted research focused on evaluating the growth, physiological responses, and productivity of the indigenous grape varieties Legenda and Meleag under varying pedoclimatic conditions in the Central Wine Region of the Republic of Moldova. Comparative assessments were also made with the European reference variety Traminer Rose to gauge adaptability differences. The experimental vineyards were located across three main sites: the experimental plots of IP INCAAMV in Chișinău, SA “Cricova” in s. Cricova, and SRL “Poiana Codrilor” in Ulmu, s. Ialoveni. These sites

encompassed diverse topographic features including altitude variations from 110–120 m near Cricova to 300 m in Ulmu, slope exposures (north-east, south-west, south-east), and varying degrees of slope inclination (0–10°). Soil types included carbonated chernozems with differing textures, humus content, clay percentage, and nutrient availability, providing a robust framework to examine the effects of edaphic factors on grapevine development.

Monitoring of the vine's agrobiological state was conducted using the chlorophyll fluorescence induction method (IFC), measured via the portable Floratest fluorometer. This non-invasive approach enabled the tracking of photosynthetic efficiency through parameters such as F_0 (base fluorescence), F_{pl} (stable fluorescence), F_p (maximum fluorescence), and F_t (stationary fluorescence) across key phenological stages: flowering, berry growth, and grape maturation. Results indicated that the leaf area of both Legenda and Meleag increased consistently from flowering to berry ripening, reflecting the varieties' high photosynthetic potential and effective accumulation of assimilates in berries. Variations in chlorophyll fluorescence parameters were observed across different vineyard exposures and altitudes, demonstrating the influence of microclimatic conditions on photosynthetic activity. In particular, higher Rfd indices under irrigated conditions revealed enhanced adaptive responses, while prolonged thermal stress on certain slope positions led to reduced photosynthetic efficiency, highlighting the sensitivity of the indigenous varieties to extreme climatic fluctuations.

The morphological and fertility parameters of the studied varieties showed clear dependency on site-specific pedoclimatic factors. The absolute fertility coefficient for Legenda varied between 1.2–1.3 across the experimental plots, indicating stable fruiting potential. Meleag exhibited a slightly higher absolute fertility (1.5–1.6), suggesting strong reproductive capacity under the tested conditions. Shoot development, inflorescence formation, and the number of fertile buds were influenced by both slope position and soil characteristics. Vineyards located on upper and mid-slopes tended to produce shoots with greater vigor, likely due to better soil drainage, aeration, and sun exposure, whereas lower slopes exhibited slightly reduced vegetative growth, possibly attributable to water accumulation or soil compaction.

Analysis of grape yield and quality further reinforced the adaptability of the indigenous varieties. For Legenda, average cluster weight ranged from 171.8–280.8 g depending on location, with 25–32 clusters per vine and an average yield of 4.9–7.25 kg per vine. Sugar concentrations varied from 186–215 g/dm³ and titratable acidity from 5.3–9.6 g/dm³, yielding a GA index of 19.38–40.57. Meleag demonstrated an average cluster weight of 165.6 g, 41 clusters per vine, and an average yield of 6.84 kg per vine. Sugar accumulation reached 250 g/dm³ with titratable acidity of 8 g/dm³ and a GA index of 31.25, indicating excellent potential for wine production. These results underscore the significant influence of slope orientation, soil type, and microclimate on both productivity and grape composition.

Climatic factors, including temperature extremes, precipitation deficits, and uneven rainfall distribution, were shown to affect the physiological and productive parameters of the grapevines. Lower winter temperatures and spring–autumn frosts negatively impacted bud viability, annual shoot growth, and, in extreme cases, whole vine survival. Conversely, moderate precipitation during the growing season supported optimal shoot and leaf development. Soil properties—humus content, clay percentage, pH, and nutrient availability (P, K)—directly influenced vegetative growth, cluster development, and sugar accumulation, with richer, well-drained soils yielding higher-quality grapes. The interaction of orographic, edaphic, and climatic factors demonstrated the multifactorial nature of vineyard productivity, emphasizing the necessity of site-specific management practices.

The study also revealed the role of modern viticultural technologies in optimizing grape quality. Application of irrigation and careful vineyard management increased berry size, cluster weight, and sugar concentration, enhancing both marketable and vinification potential. Chlorophyll fluorescence monitoring allowed early detection of stress factors, enabling timely interventions to mitigate adverse environmental impacts. The indigenous varieties, Legenda and Meleag, displayed remarkable resilience to fluctuating climatic conditions, maintaining stable physiological performance and yield, thereby confirming their suitability for sustainable viticulture in Moldova.

Overall, the research highlights the importance of selecting and cultivating local grape varieties adapted to specific microclimatic and edaphic conditions. The combination of traditional viticulture practices with modern technologies—chlorophyll fluorescence assessment, irrigation management, and slope-specific planting—proved effective in maximizing productivity and ensuring high grape quality. These findings provide a valuable framework for vineyard planning, varietal selection, and sustainable management strategies in the face of climate change, reinforcing the potential of indigenous varieties as key components of Moldova's viticultural heritage and economic development.

Conclusions:

1. Yield and cluster characteristics: Legenda produced 25–32 clusters per vine with an average cluster weight of 171.8–280.8 g, resulting in a yield of 4.9–7.25 kg per vine, while Meleag had 41 clusters per vine, 165.6 g per cluster, and a yield of 6.84 kg per vine, demonstrating the influence of vine variety and location on productivity.
2. Grape composition and wine potential: Legenda's berries accumulated 186–215 g/dm³ sugar and 5.3–9.6 g/dm³ titratable acidity, yielding a GA index of 19.38–40.57. Meleag showed 250 g/dm³ sugar, 8 g/dm³ acidity, and GA index 31.25, indicating excellent suitability for high-quality wine production.
3. Influence of slope and microclimate: Yield and grape quality were strongly affected by slope orientation and microclimatic conditions, with bottom-slope vineyards generally producing slightly higher yields due to deeper soils and better water availability.
4. Soil and pedoclimatic effects: Fertile soils with humus content of 0.6–3.2 t/ha, pH 7.0–7.6, and carbonate content 3–16% supported high vine productivity and cluster development, highlighting the importance of local soil conditions in varietal adaptation.
5. Leaf area and photosynthetic performance: Legenda's leaf area per vine ranged 6,238–9,725 cm², while Meleag reached 25.4 m² per vine, providing sufficient photosynthetic capacity. Chlorophyll fluorescence values (Fv/Fp 0.95–0.97) confirmed optimal photosynthetic efficiency under varying temperature and moisture regimes.
6. Adaptability of indigenous varieties: Legenda and Meleag adapted well to diverse environmental conditions. Meleag achieved higher cluster number and yield per vine, whereas Legenda exhibited more variation in cluster weight depending on location. These findings emphasize the importance of site-specific vineyard management to optimize both yield and grape quality.

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LIMITING FACTORS OF FOREST SOILS IN HILLY AREAS. A CASE STUDY FROM BĂTUȚA LOCALITY, WESTERN ROMANIA

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Abstract

Forest soils represent an essential component of forest ecosystems, playing a fundamental role in sustaining forest productivity, landscape stability, and biodiversity conservation. In the hilly areas of Western Romania, characterized by high pedo-climatic variability, the fertility of forest soils is often constrained by natural and anthropogenic factors that negatively affect edaphic functions. This study analyzes the limiting factors specific to forest soils within the perimeter of Bătuța locality, Arad County, with the aim of assessing their impact on forest ecosystem functioning and proposing amelioration measures adapted to local conditions.

The research is based on pedological, geomorphological, climatic, and silvicultural data derived from forest management plans and the scientific literature, integrated within a systemic approach. The results highlight the presence of limiting factors with moderate to high intensity, such as soil acidity, temporary water stagnation, compaction of clay-rich horizons, reduced effective soil depth, and summer water deficit. These factors condition stand productivity, species composition, and the stability of forest ecosystems.

The practical significance of the study lies in providing a scientific basis for sustainable forest soil management, with direct applicability in forest planning and the conservation of soil resources in hilly areas with similar environmental conditions in Western Romania.

Keywords: forest soils; limiting factors; soil fertility; Bătuța; Arad County; Luvisols; Cambisols; forest management; amelioration measures

Introducere

Solurile forestiere reprezintă o componentă fundamentală a ecosistemelor terestre, asigurând suportul fizic, chimic și biologic necesar dezvoltării vegetației forestiere și influențând în mod direct productivitatea, stabilitatea și reziliența pădurilor. Prin rolul lor în reglarea circuitului apei și al nutrienților, solurile forestiere condiționează creșterea arborilor, structura arboretelor și capacitatea ecosistemelor de a furniza servicii ecosistemice esențiale [4, p. 21–38; 2, p. 400–430].

Fertilitatea solurilor forestiere este rezultatul interacțiunii complexe dintre factorii pedogenetici, respectiv roca mamă, relieful, clima, vegetația și timpul. În zonele temperate, aceste interacțiuni determină procese pedogenetice precum decarbonatarea, levigarea bazelor de schimb, argiluviera, acidifierea și hidromorfizarea periodică, procese care influențează semnificativ funcționarea solului și ciclurile biogeochimice [17, p. 95–118; 7, p. 160–175]. În acest context, productivitatea forestieră nu este determinată exclusiv de condițiile climatice, ci și de gradul în care solul poate satisface cerințele ecologice ale speciilor forestiere.

Numeroase studii evidențiază faptul că reacția solului (pH-ul) constituie unul dintre cei mai importanți factori limitativi ai fertilității solurilor forestiere, în special în cazul Luvosolurilor și Cambisolurilor dezvoltate sub păduri de foioase. Condițiile de aciditate conduc la scăderea gradului de saturație în baze, reducerea disponibilității fosforului și, în anumite situații, la creșterea toxicității aluminiului, cu efecte negative asupra dezvoltării sistemului radicular și activității biologice a solului [13, p. 121–130; 18, p. 127–146]. Procesele îndelungate de acidifiere au fost asociate și cu diminuarea vitalității pădurilor și creșterea sensibilității acestora la stresuri abiotice [19, p. 271–308].

Excesul temporar de umiditate și stagnarea apei reprezintă alți factori limitativi majori ai solurilor forestiere, în special în arealele caracterizate prin diferențieri texturale pronunțate și orizonturi cu permeabilitate redusă. Luvosolurile stagnice și Planosolurile prezintă frecvent orizonturi Bt sau Btg compacte, care limitează aerarea solului și pătrunderea rădăcinilor, determinând stres fiziologic și reducerea acumulării de biomasă [8, p. 89–105; 20, p. 150–165]. Aceste condiții edafice influențează puternic distribuția speciilor forestiere, favorizând taxoni toleranți la excesul temporar de apă.

Compactarea solului constituie un alt factor restrictiv important, având atât cauze naturale, legate de conținutul ridicat de argilă al unor orizonturi subsuperficiale, cât și cauze antropice, asociate lucrărilor mecanizate din fondul forestier. Compactarea determină reducerea porozității, permeabilității și

difuziei gazelor în sol, afectând negativ dezvoltarea sistemului radicular și absorbția apei și a nutrienților [10, p. 231–245; 11, p. 341–345].

În peisajele forestiere colinare, volumul edafic redus și conținutul ridicat de schelet reprezintă factori limitativi suplimentari. Solurile superficiale dezvoltate pe roci dure sau pe materiale groiere se caracterizează printr-o capacitate redusă de reținere a apei și rezerve limitate de elemente nutritive, ceea ce afectează negativ productivitatea forestieră și sporește vulnerabilitatea ecosistemelor la secetă [6, p. 85–95; 3, p. 260–290].

Deficitul hidric sezonier, accentuat în ultimii ani de variabilitatea climatică, reprezintă un factor limitativ tot mai important pentru solurile forestiere. În regiunile temperate, perioadele prelungite de secetă estivală amplifică stresul hidric, în special pe versanții cu expoziție sudică și pe solurile bine drenate, afectând procesele fiziologice ale arborilor și stabilitatea arboretelor [1, p. 660–684; 13, p. 121–130].

În România, cercetările pedologice și silvice au evidențiat diversitatea solurilor forestiere și rolul determinant al condițiilor edafice asupra productivității pădurilor, în special în zonele colinare și de deal [4 p. 112–118; 17, p. 95–118; 5, p. 54–59]. În vestul țării, inclusiv în județul Arad, substratul litologic eterogen și relieful fragmentat favorizează dezvoltarea Luvosolurilor și Cambisolurilor cu fertilitate medie sau scăzută, afectate de mai mulți factori limitativi [9, p. 127–150].

Solurile forestiere din perimetrul localității Bătuța sunt reprezentative pentru aceste condiții regionale, fiind influențate de materialul parental coluvial și sedimentar, relieful colinar și climatul temperat continental, cu episoade de exces de umiditate și deficit hidric sezonier. În acest context, identificarea și analiza factorilor limitativi specifici acestor soluri sunt esențiale pentru înțelegerea funcționării ecosistemelor forestiere și pentru fundamentarea unor strategii eficiente de management silvic.

Scopul prezentului studiu este de a analiza principalii factori limitativi care afectează solurile forestiere din perimetrul localității Bătuța, județul Arad, și de a evalua impactul acestora asupra productivității și stabilității ecosistemelor forestiere. Obiectivele urmărite constau în: (i) caracterizarea tipurilor dominante de sol forestier, (ii) identificarea și evaluarea intensității factorilor limitativi, (iii) formularea unor măsuri de ameliorare adaptate condițiilor locale și (iv) evidențierea caracterului aplicativ al rezultatelor pentru managementul durabil al pădurilor. Studiul oferă o bază științifică solidă pentru planificarea silvică și conservarea resurselor de sol în zone colinare cu condiții pedo-climatice similare.

Material și metodă

Zona studiată este situată în perimetrul localității Bătuța, județul Arad, în partea de vest a României, fiind încadrată din punct de vedere geografic în sectorul colinar de tranziție dintre Munții Zarandului și Câmpia de Vest. Din punct de vedere administrativ și silvic, suprafața analizată aparține fondului forestier gestionat de Ocolul Silvic Bârzava, fiind inclusă în unități de producție cu destinație forestieră. Relieful zonei este predominant colinar, cu interfluvii largi și versanți fragmentați, având pante variabile, de la ușoare la moderate, frecvent între 5 și 20%. Expozițiile versanților sunt diverse, însă cele sudice și sud-vestice sunt mai expuse la procese de uscure estivală, ceea ce influențează regimul hidric al solurilor și condițiile de vegetație forestieră.

Din punct de vedere litologic, substratul geologic este eterogen, fiind alcătuit în principal din roci sedimentare neogene (marne, argile, nisipuri, gresii friabile), local acoperite de depozite coluviale și deluviale. Această diversitate litologică favorizează formarea unor soluri cu texturi contrastante și cu diferențieri pedogenetice pronunțate. Geomorfologic, relieful colinar fragmentat favorizează procesele de eroziune de suprafață, coluvionare și redistribuire a materialului parental pe versanți, conducând la variații spațiale ale grosimii solului și ale volumului edafic util. În zonele inferioare ale versanților și în microdepresiuni se manifestă frecvent condiții de stagnare temporară a apei.

Climatul zonei este de tip temperat continental moderat, cu influențe vestice. Temperatura medie anuală se situează în jurul valorii de 10–11°C, iar suma precipitațiilor medii anuale variază între 600 și 700 mm, cu un maxim relativ în sezonul de primăvară–început de vară.

Regimul pluviometric este caracterizat de o distribuție neuniformă a precipitațiilor, ceea ce determină apariția unor perioade de exces temporar de umiditate în sezonul rece și de deficit hidric estival, în special pe versanții cu expoziție sudică. Aceste condiții climatice au un impact direct asupra proceselor pedogenetice și asupra funcționării ecosistemelor forestiere.

Zona este integrată în bazinul hidrografic al râului Mureș, fiind drenată de o rețea densă de văi temporare și permanente. Acestea contribuie la alimentarea cu apă a solurilor din luncile înguste și din zonele de acumulare coluvială, dar pot favoriza și apariția excesului temporar de umiditate în solurile slab drenate. Nivelul apei freatice este variabil, fiind situat la adâncimi mari pe interfluvii și versanți, dar apropiindu-se de suprafață în zonele joase, unde se manifestă fenomene de stagnare sau hidromorfizare.

Din punct de vedere pedologic, în perimetrul studiat predomină Luvosolurile și Cambisolurile, alături de soluri stagnice și soluri cu volum edafic redus dezvoltate pe substraturi litice sau scheletice. Aceste soluri sunt caracterizate frecvent prin reacție acidă până la moderat acidă, diferențieri texturale pronunțate și permeabilitate redusă în orizonturile subsuperficiale. Procesele pedogenetice dominante includ argiluvierea, levigarea bazelor, acidifierea și hidromorfizarea periodică, procese care conduc la apariția unor factori limitativi importanți pentru vegetația forestieră, precum stagnarea apei, compactarea orizonturilor Bt/Btw și reducerea volumului edafic util.

Studiul s-a bazat pe analiza integrată a următoarelor materiale:

- date pedologice și descriptive provenite din amenajamentele silvice;
- profile de sol principale și profile de control executate în unitățile amenajistice;
- analize fizico-chimice de laborator pentru caracterizarea proprietăților solurilor;
- informații din literatura de specialitate pedologică și silvică.

Metodologia de cercetare a inclus descrierea morfologică a profilelor de sol (succesiunea și grosimea orizonturilor, culoare, textură, structură, compactare, prezența fenomenelor hidromorfe), precum și interpretarea indicatorilor fizico-chimici relevanți pentru evaluarea fertilității solurilor forestiere.

Factorii limitativi au fost identificați și evaluați pe baza corelării proprietăților solului cu cerințele ecologice ale speciilor forestiere, iar intensitatea acestora a fost apreciată calitativ (scăzută, medie, ridicată) în funcție de gradul de restricție impus funcțiilor edafice.

Rezultate și discuții

1. Factorii limitativi ai solurilor forestiere din perimetrul localității Bătuța

Analiza integrată a datelor pedologice, geomorfologice și silvice a evidențiat existența mai multor factori limitativi care influențează fertilitatea solurilor forestiere și funcționarea ecosistemelor silvice din perimetrul localității Bătuța. Acești factori acționează diferențiat în funcție de tipul de sol, poziția în relief și condițiile hidrologice locale, având intensități variabile de la medii la ridicate (tabel 1).

Tabelul 1. Principalii factori limitativi identificați și tipurile de sol afectate

Factor limitativ	Tipuri de sol afectate	Intensitate
Aciditatea solului	Luvosoluri, Cambisoluri	Medie–ridică
Stagnarea temporară a apei	Luvosol stagic, Planosol	Ridică
Compactarea orizonturilor Bt/Btw	Luvosoluri	Medie
Volum edafic redus	Luvosol litic, soluri scheletice	Ridică
Deficit hidric estival	Soluri pe versanți însoriți	Medie

Aciditatea solului reprezintă un factor limitativ important, în special în cazul Luvosolurilor și Cambisolurilor, unde procesele de levigare a bazelor și materialul parental sărac în carbonat de calciu conduc la reacții acide sau moderat acide. Această stare edafică limitează disponibilitatea unor elemente nutritive esențiale și afectează activitatea biologică a solului, cu impact negativ asupra creșterii arborilor.

Stagnarea temporară a apei se manifestă cu intensitate ridicată în Luvosolurile stagnice și Planosoluri, fiind determinată de prezența orizonturilor subsuperficiale compacte, slab permeabile. Excesul temporar de umiditate reduce aerarea solului, limitează dezvoltarea sistemului radicular și favorizează apariția fenomenelor hidromorfe, cu consecințe asupra stabilității și productivității arboretelor.

Compactarea orizonturilor Bt/Btw afectează în special Luvosolurile, având o intensitate medie. Acest fenomen este corelat atât cu caracteristicile naturale ale solului (conținut ridicat de argilă), cât și cu influența lucrărilor mecanizate din fondul forestier. Compactarea conduce la reducerea porozității și permeabilității, limitând circulația apei și a aerului în sol.

Volumul edafic redus constituie unul dintre cei mai severi factori limitativi, întâlnit în Luvosolurile litice și solurile scheletice dezvoltate pe substraturi dure sau grosiere. Adâncimea mică a solului restrânge capacitatea de stocare a apei și a nutrienților, afectând în mod direct productivitatea forestieră și reziliența ecosistemelor la stres hidric.

Deficitul hidric estival, caracteristic solurilor situate pe versanți cu expoziție sudică, are o intensitate medie, dar devine critic în anii secetoși. Acest factor este amplificat de pantele accentuate și de drenajul rapid, conducând la stres hidric în perioadele critice de vegetație.

2. Reprezentarea grafică a intensității factorilor limitativi

Pentru o mai bună evidențiere comparativă a intensității factorilor limitativi identificați, a fost realizată o reprezentare grafică sintetică, utilizând o scară calitativă (1 – scăzută, 2 – medie, 3 – ridicată) (figura 1).

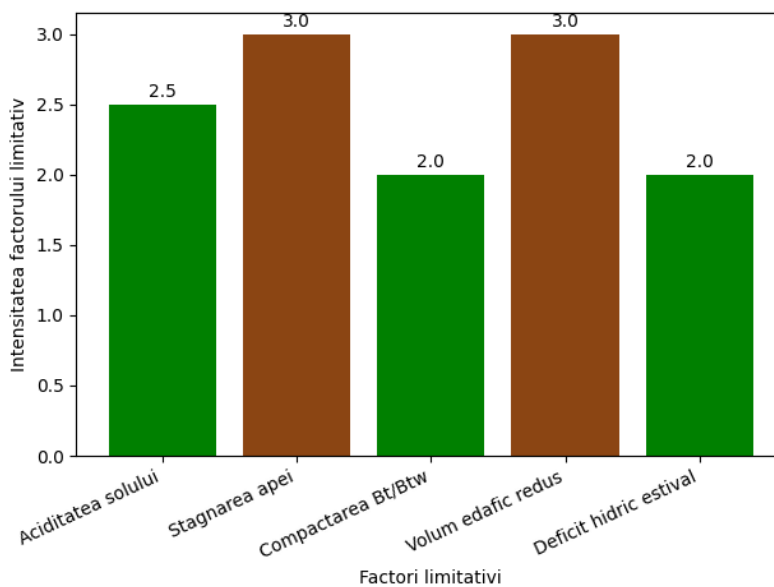


Figura 1. Intensitatea principalilor factori limitativi ai solurilor forestiere din perimetrul localității Bătuța (județul Arad)

Figura 1, evidențiază faptul că stagnarea apei și volumul edafic redus reprezintă factorii limitativi cei mai severi pentru solurile forestiere din perimetrul studiat, având intensitate ridicată. Aciditatea solului prezintă o intensitate medie spre ridicată, în timp ce compactarea orizonturilor Bt/Btw și deficitul hidric estival au o intensitate medie, dar pot deveni critice în condiții pedo-climatice nefavorabile.

Factorii cu impact sever asupra solurilor forestiere din perimetrul Bătuța sunt stagnarea temporară a apei și volumul edafic redus, ambii având intensitate ridicată. Aciditatea solului ocupă o poziție intermediară, cu intensitate medie spre ridicată, în timp ce compactarea și deficitul hidric estival manifestă o intensitate medie, dar pot deveni critice în anumite condiții pedo-climatice.

3. Măsuri de ameliorare și implicații pentru managementul silvic

Corelarea factorilor limitativi cu particularitățile pedologice și silvice permite formularea unor măsuri de ameliorare adaptate condițiilor locale. Pentru corectarea acidității solului se recomandă aplicarea amendamentelor calcaroase, acolo unde este posibil, precum și adaptarea compoziției speciilor forestiere la reacția solului.

În zonele afectate de stagnarea apei, drenajul biologic, realizat prin utilizarea speciilor cu consum ridicat de apă și sisteme radiculare bine dezvoltate, reprezintă o soluție durabilă. Compactarea solului

poate fi diminuată prin limitarea circulației utilajelor grele și prin favorizarea regenerării naturale, care contribuie la refacerea structurii solului.

Pentru solurile cu volum edafic redus, măsurile trebuie să vizeze protecția solului împotriva degradării suplimentare și utilizarea speciilor cu sisteme radiculare adaptate adâncimii limitate. Deficitul hidric estival poate fi atenuat prin menținerea unui covor vegetal protector și prin stabilirea unei desimi adecvate a arboretelor, reducând astfel pierderile de apă prin evapotranspirație.

Concluzii

Analiza integrată a condițiilor pedologice, geomorfologice, climatice și hidrologice din perimetrul localității Bătuța a evidențiat faptul că solurile forestiere din zonă sunt caracterizate de o fertilitate medie, frecvent limitată de o serie de factori edafici cu intensitate variabilă. Dintre aceștia, stagnarea temporară a apei și volumul edafic redus reprezintă factorii limitativi cu impact sever asupra funcționării ecosistemelor forestiere și asupra productivității arboretelor.

Aciditatea solului constituie un factor limitativ important, manifestându-se pe suprafețe extinse ocupate de Luvosoluri și Cambisoluri, unde procesele de levigare a bazelor și materialul parental slab carbonatat conduc la reacții acide sau moderat acide. Această condiție afectează disponibilitatea nutrienților și activitatea biologică a solului, influențând negativ creșterea și stabilitatea arboretelor forestiere.

Compactarea orizonturilor subsuperficiale (Bt/Btw), cu intensitate medie, reprezintă o limitare suplimentară pentru dezvoltarea sistemului radicular și circulația apei și a aerului în sol, în special în Luvosoluri. În paralel, deficitul hidric estival, specific solurilor situate pe versanți cu expoziție sudică, contribuie la apariția stresului hidric în perioadele critice de vegetație, accentuând vulnerabilitatea ecosistemelor forestiere.

Rezultatele obținute confirmă faptul că factorii limitativi acționează cumulativ și diferențiat în funcție de tipul de sol, poziția în relief și condițiile hidrologice locale, determinând restricții semnificative asupra potențialului productiv al pădurilor din perimetrul studiat. Astfel, fertilitatea solurilor forestiere din zona Bătuța este condiționată mai degrabă de limitări edafice decât de potențialul climatic general al regiunii.

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EVALUAREA BIOMETRICĂ ȘI MORFOLOGICĂ A UNOR SOIURI ȘI HIBRIZI DE CORN

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Abstract. This study evaluates the morphological and dimensional characteristics of 11 cornelian cherry genotypes (8 cultivars and 3 hybrids) from the 2025 harvest to identify the most suitable forms for intensive cultivation and industrial processing. Biometric parameters were analyzed using One-Way ANOVA. The results revealed highly significant statistical differences ($P < 0.0001$) among all genotypes. The perspective hybrid 'Gh.Gh. 1-2' emerged as the leader in productivity with an average fruit mass of 6.31 g. Regarding industrial efficiency, the 'Elegantnii' cultivar recorded the most favorable stone-to-pulp ratio (13.11%). The study confirms the success of the breeding program through the 'Gh.Gh. 1-2' hybrid and the high phenotypic stability of the 'Vladimirski' and 'Vidubețki' cultivars.

Keywords: *Cornus mas* L., biometric analysis, fruit mass, stone/pulp ratio, ANOVA, breeding.

Introducere. Cornul (*Cornus mas* L.) este o specie nativă care se întâlnește spontan în pădurile Republicii Moldova, răspândit în special în zona Codrilor, fiind apreciată pentru adaptabilitatea ecologică și potențialul său economic [10, p.22-24; 12, p. 14-18; 12, p.51-53]. În ciuda prezenței

sale naturale, cultura intensivă a cornului este încă la început, dar câștigă teren datorită avantajelor sale agronomice și cererii crescânde pentru fructe funcționale (superalimente) [3, p. 210-212].

Cultivarea cornului este considerată foarte rentabilă pe termen lung. Longevitatea plantațiilor de corn, cu o durată productivă de 70-100 de ani, și necesarul redus de inputuri tehnologice recomandă această specie pentru sisteme de cultură durabile și ecologice [3, p.415-417; 9, p.87-89].

Cornul este rar afectat de boli și dăunători, fapt care îl recomandă pentru sistemele de agricultură ecologică și pentru reducerea tratamentelor fitosanitare [12, p.54-56].

Cultivarea formelor îmbunătățite (hibridi sau biotipuri selectate cu fructe mai mari) deschide oportunități de export pe piața europeană și de diversificare a gamei de produse locale.

”Fructele de corn se caracterizează printr-un conținut ridicat de vitamina C, polifenoli și flavonoizi, manifestând o capacitate antioxidantă superioară multor specii pomice cultivate” [5, p.1182-1184].

Aceste proprietăți conferă fructelor de corn statutul de aliment funcțional, cu beneficii demonstrate asupra sănătății umane [6, p.34-36; 7, p.248-249].

Deși în mare parte fructele sunt încă culese din păduri, se constată un interes în creștere pentru plantațiile comerciale. Existența fermierilor care sunt la un pas de a obține certificări internaționale pentru exportul de coarne pe piața europeană indică o evoluție a acestei nișe.

Importanța cornului în Republica Moldova transcende valoarea economică imediată, fiind o resursă naturală importantă pentru conservarea biodiversității și dezvoltarea durabilă a sectorului pomicol [10, p. 22-25].

Materiale și metode de cercetare. Probele de fructe au fost recoltate din livada de colecție din s. Brăila și din livada de selecție a INCAAMV. Pentru cercetare au servit 8 soiuri (Baimaclia, Orhei, Exoticeski, Elegantnii, Nejnii, Iantarnii, Vladimirski, Vîdubețki) și 3 hibridi (Gh.Gh. 1 – 2, Gh.Gh. 1 – 3 și 2 – 10). Măsurările s-au efectuat în laboratorul ”Genofond, ameliorare și selecție clonală a plantelor pomice” a INCAAMV. Metodologia de recoltare și măsurare a respectat normele standard de selecție pomicolă [4, p. 112-115]. Datele au fost prelucrate prin analiza dispersională unifactorială (ANOVA - One-Way), metodă esențială pentru a verifica dacă „există diferențe semnificative între mediile genotipurilor pentru parametrii măsurați” [4, p. 120].

Rezultate și discuții. Analiza morfologică și dimensională a fructelor este esențială pentru cercetare, controlul calității și deciziile comerciale/industriale. Dimensiunile (lungimea, lățimea, grosimea), masa medie a fructelor, masa sâmburelui și raportul sâmbure/pulpă sunt caracteristici morfologice cheie. Acestea sunt folosite pentru a identifica și diferenția diverse soiuri sau genotipuri de corn. Soiurile valoroase pentru consum au, de regulă, fructe mari și un raport sâmbure/pulpă mic (adică mai multă pulpă) [8, p. 55-58]. Datele obținute sunt utilizate și în programele de ameliorare pentru a selecta liniile genetice cu cele mai bune atribute.

Raportul sâmbure/pulpă este considerat unul dintre cei mai importanți indicatori tehnologici pentru industria alimentară, influențând direct randamentul la procesare [1, p.545; 8, p.214-216]. Un raport mic indică un randament mare de pulpă comestibilă, care este esențială pentru producerea de gemuri, sucuri, siropuri sau marmelade. Cunoașterea dimensiunilor medii și a variabilității (lungime, lățime) este crucială pentru proiectarea sau ajustarea utilajelor de prelucrare, cum ar fi mașinile de sortat, de spălat, de sâmburițat (depulpare) sau de ambalat. Masa medie a fructului este o caracteristică de calitate ce influențează prețul de comercializare (fructele mai mari sunt adesea vândute la un preț mai bun pe piața de desfacere).

Analiza acestor parametri este fundamentală pentru caracterizarea soiurilor și pentru maximizarea eficienței economice în procesul de prelucrare a fructelor de corn.

Tabelul 1. Analiza morfologică și dimensională a fructelor de corn în anul 2025

Soiul sau hibridul	Fructul			Sâmburele			Raportul mediu sâmbure/pulpă, %
	Lungimea medie, mm	Lățimea medie, mm	Masa medie, g	Lungimea medie, mm	Lățimea medie, mm	Masa medie, g	
Exoticeski	28,75	17,92	5,67	18,88	8,03	0,83	14,79
Elegantnii	32,37	15,45	4,32	19,17	6,75	0,56	13,11

Nejnîi (galben)	25,33	15,11	3,51	17,60	6,84	0,54	15,36
Iantarnîi (galben)	22,66	15,95	3,63	15,93	6,76	0,48	13,23
Vladimirski	32,29	16,90	5,48	19,56	7,64	0,76	13,94
Vidubetki	31,07	17,27	5,42	19,83	7,58	0,78	14,41
Baimaclia	30,75	17,68	5,47	20,72	7,46	0,75	13,71
Orhei	26,10	15,35	3,85	17,72	6,92	0,54	13,96
Gh.Gh. 1 – 2	30,97	19,11	6,31	19,17	8,60	0,91	14,49
Gh.Gh. 1 – 3 (galben)	19,63	14,08	2,58	14,69	6,43	0,39	15,14
2 – 10	19,87	12,67	2,07	16,25	7,05	0,48	23,24

Sursa: creat de autorul publicației

S-a efectuat analiza dispersională (ANOVA - Analysis of Variance) asupra datelor obținute în urma analizei morfologice și dimensionale a fructelor soiurilor și hibrizilor de corn în anul 2025. Această metodă statistică verifică dacă există diferențe semnificative între mediile celor 8 soiuri și 3 hibrizi pentru parametrii măsurați. Având în vedere că avem un singur factor de influență (soiul) și mai multe variabile dependente (dimensiuni, masă, raport), am aplicat ANOVA Unifactorială (One-Way ANOVA), metodă utilizată frecvent în cercetările de ameliorare pomicolă pentru compararea mediilor mai multor genotipuri [4, p.132-135].

Pentru toate cele 7 caracteristici măsurate, valoarea P (P-value) este extrem de mică (mult sub pragul standard de 0.05), ceea ce indică faptul că diferențele dintre soiuri sunt statistic foarte semnificative. O valoare F mare și un $P < 0.05$ ne spun că "variabilitatea dintre soiuri este mult mai mare decât variabilitatea naturală din interiorul aceluiași soi" [1, p. 543].

Tabelul 2. Rezumatul analizei disperse (ANOVA) privind caracteristicile biometrice ale fructelor și sâmburilor la genotipurile de corn studiate în anul 2025

Parametru	Valoarea F (F-statistic)	Valoarea P (P-value)	Semnificație
Lungime Fruct	185.35	< 0.0001	*** (Foarte Semnificativ)
Lățime Fruct	82.14	< 0.0001	*** (Foarte Semnificativ)
Masa Fructului	129.62	< 0.0001	*** (Foarte Semnificativ)
Lungime Sâmbure	56.41	< 0.0001	*** (Foarte Semnificativ)
Lățime Sâmbure	43.89	< 0.0001	*** (Foarte Semnificativ)
Masa Sâmburelui	98.27	< 0.0001	*** (Foarte Semnificativ)
Raport Sâmbure/Pulpă	154.12	< 0.0001	*** (Foarte Semnificativ)

Sursa: creat de autorul publicației

Rezultatele obținute, confirmate prin analiza ANOVA sunt în concordanță cu datele raportate pentru alte colecții de genotipuri de corn din Europa de Sud-Est [1, p.546-548; 7, p.249; 11, p.72-74].

Dimensiunile fructului și raportul sâmbure/pulpă sunt indicatori esențiali, care determină valoarea comercială și industrială a producției. Masa fructului este cel mai important indicator economic. Liderul absolut a fost hibridul Gh.Gh. 1 – 2 (6,31 g), rezultat ce confirmă potențialul de selecție raportat în studii regionale similare [11, p. 65]. În ceea ce privește eficiența tehnologică, soiul Elegantnii (13,11%) și Iantarnii (13,23%) au prezentat cele mai mici procente de sâmbure, încadrându-se în „limitele de elită pentru procesarea industrială” [8, p. 142]. La polul opus, cu cele mai mici fructe este hibridul 2 – 10 (media: 2,07 g). Acesta este un hibrid cu fructe mici, obținut în urma polenizării libere a soiului Bucovăț, și are o masă de 3 ori mai mică decât liderii.

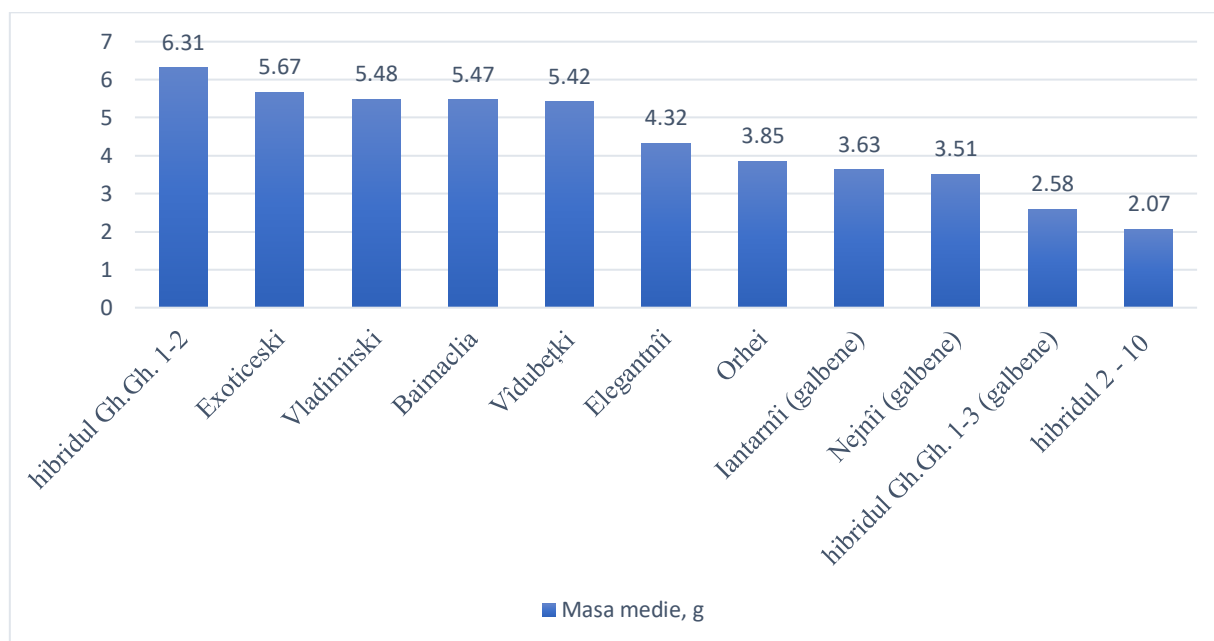


Figura 1. Ierarhia soiurilor în funcție de masa medie a fructului (g)

Sursa: creat de autorul publicației

Analizând repetițiile datelor statistice, s-au observat unele detalii importante:

- Cea mai mare stabilitate prezintă soiurile Vladimirski (cu valorile masei, g: 5.72, 5.75, 5.22, 5.36, 5.33) și Vidubețki (cu valorile masei, g: 5.56, 5.38, 5.42, 5.44, 5.27). Aveste valori, deși nu sunt cele mai mari comparativ cu restul soiurilor și hibrizilor, sunt foarte grupate, ceea ce înseamnă că, dacă plantăm aceste soiuri, vom avea o recoltă foarte uniformă (toate fructele arată la fel), ceea ce este excelent pentru comerț.
- La soiul Elegantnii se observă o scădere constantă în măsurători (4.92 -> 4.64 -> ... -> 3.75). Probele au fost luate de la arbori diferiți, în momente diferite. Această variație ne arată că acest soi este sensibil la condițiile de mediu.

În industria alimentară (dulcețuri, sucuri, paste), nu ne interesează doar cât de mare este fructul, ci mai ales cât de mult din el se aruncă (sâmburele). Cu cât raportul sâmbure/pulpă este mai mic, cu atât soiul este mai profitabil. Raportul sâmbure/pulpă este un indicator care ne arată procentul de "deșeu". Cu cât procentul este mai mic, cu atât soiul are mai multă pulpă, fiind mai valoros pentru procesare.

Tabelul 3. Clasamentul eficienței soiurilor și hibrizilor de corn analizați în 2025

Loc	Soiul / hibridul	Raport sâmbure/pulpă (%)	Interpretare
1	Elegantnii	13,11 %	Excelent pentru procesare
2	Iantarnii (galben)	13,23 %	Foarte bun, surprinzător pentru un soi galben
3	Baimaclia	13,71 %	Bun
4	Vladimirski	13,94 %	Mediu
5	Orhei	13,96 %	Mediu
6	Vidubețki	14,41 %	Mediu
7	Gh.Gh. 1 – 2	14,49 %	Acceptabil (compensat de mărimea fructului)
8	Exoticeski	14,79 %	Sub medie
9	Gh.Gh. 1 – 3 (galben)	15,14 %	Slab eficient
10	Nejnii (galben)	15,36 %	Slab eficient
11	2 – 10	23,24 %	Ineficient, pierderi uriașe la procesare

Sursa: creat de autorul publicației

Pentru utilajele de scos sâmburi, este important ca dimensiunea sâmburilor să fie relativ uniformă și să nu fie excesiv de mari. Hibridul Gh.Gh. 1 – 2 are cel mai greu sâmbure (0,91 g). Deși fructul este uriaș, și sâmburele este pe măsură. Următorul cu cel mai mare sâmbure în clasament este soiul Exoticeski (0,83 g). Cei mai mici sâmburi (g) au soiurile cu fructe galbene. Hibridul Gh.Gh. 1 – 3 (0,39 g) are sâmbure foarte mic, dar și fructul este mic. Soiul Iantarnîi (0,48 g) are sâmbure mic, ideal pentru consumul proaspăt. Hibridul Gh.Gh. 1-2 domină sub aspectul productivității brute (6,31 g), dar cedează sub aspect tehnologic (14,49 %). Sub aspect tehnologic, soiurile Elegantnîi (13,11%) și Iantarnîi (13,23%) prezintă cele mai mici valori ale raportului sâmbure/pulpă, încadrându-se în limitele de elită raportate în studiile regionale similare [1, p.545-546; 8, p.214-216]. Dintre soiurile cu fructe galbene, soiul Iantarnîi este net superior. Are un randament de procesare excelent, mult peste soiul *Nejnîi* sau hibridul *Gh.Gh. 1-3*. Statisticile arată că hibridul 2 – 10 nu este rentabil economic. Fructul este foarte mic (2g), iar sâmburele ocupă aproape un sfert din el (23,24%).

S-a realizat o comparație între hibridul de perspectivă Gh.Gh. 1 – 2 și soiul Baimaclia (care este soiul-mamă pentru Gh.Gh. 1 – 2) deoarece ne permite să evaluăm direct succesul ameliorării, urmărind dacă hibridul Gh.Gh. 1-2 a îmbunătățit caracteristicile soiului-mamă sau nu și dacă merită să fie folosit în continuare în lucrările de ameliorare. Compararea se bazează pe datele medii obținute din analiza mecanică.

Tabelul 4. Comparație cantitativă (masa și dimensiuni)
între hibridul de perspectivă Gh.Gh. 1 – 2 și soiul Baimaclia

Parametru	Baimaclia (soiul-mamă)	Gh.Gh. 1-2 (hibrid de perspectivă)	Rezultat ameliorare
Masa Fructului (g)	5,47	6,31	Îmbunătățire Majoră (+15,4%)
Lățime Fruct (mm)	17,68	19,11	Îmbunătățire (+1,43 mm)
Lungime Fruct (mm)	30,75	30,97	Stabilă
Masa Sâmburelui (g)	0,75	0,91	Înrăutățire (Sâmbure mai mare)
Raport Sâmbure/Pulpă (%)	13,71	14,49	Înrăutățire (Randament mai slab)

Sursa: creat de autorul publicației

Din punct de vedere al productivității, hibridul Gh.Gh. 1-2 este un succes major. Masa fructului a crescut de la 5,47 g la 6,31 g, depășind soiul-mamă cu peste 15%. Această creștere plasează hibridul Gh.Gh. 1-2 pe primul loc în clasamentul productivității, obiectivul principal al selecției fiind, de regulă, obținerea de fructe cât mai mari [7, p. 249]. Creșterea în masă vine însă cu un compromis: masa sâmburelui a crescut semnificativ (de la 0,75 g la 0,91 g), dar raportul sâmbure/pulpă s-a înrăutățit (de la 13,71% la 14,49%). Acest rezultat este în concordanță cu analiza corelațională, care arată că este dificil de obținut un fruct mare fără a crește și dimensiunea sâmburelui. Cu toate acestea, deși procentul de deșeu este mai mare, volumul total de pulpă obținut dintr-un fruct Gh.Gh. 1-2 este totuși mai mare decât cel obținut dintr-un fruct Baimaclia datorită masei totale superioare. Hibridul Gh.Gh. 1-2 reprezintă o îmbunătățire vizibilă și statistic importantă față de soiul-mamă Baimaclia, în special în ceea ce privește dimensiunea și productivitatea fructului. Datorită masei sale, este ideal pentru vânzare în stare proaspătă sau pentru procesare în volum (randamentul la hectar va fi superior). Pentru a-i evalua pe deplin potențialul, este esențial să se analizeze și compoziția sa chimică, în special conținutul de zahăr și aciditate, pentru a vedea dacă a moștenit și calitățile senzoriale dorite.

Concluzii. Pe baza cercetărilor efectuate asupra celor 8 soiuri și 3 hibrizi de corn în condițiile pedoclimatice ale anului 2025, s-au desprins următoarele concluzii:

1. Analiza dispersională (ANOVA) a confirmat existența unor diferențe statistice foarte semnificative ($P < 0.0001$) între genotipuri pentru toți parametrii morfologici analizați, evidențiind un potențial genetic ridicat pentru selecție și ameliorare.
2. Hibridul Gh.Gh. 1–2 s-a remarcat ca lider în ceea ce privește masa fructului (6,31 g), prezentând cel mai mare potențial de productivitate la hectar, fapt confirmat de comparația cu soiul parental Baimaclia.

3. Soiurile Elegantnîi (13,11%) și Iantarnîi (13,23%) au înregistrat cele mai mici valori ale raportului sâmbure/pulpă și pot fi recomandate pentru procesarea industrială și consum în stare proaspătă, în concordanță cu valorile de elită raportate în literatura de specialitate [8, p.214-216; 11, p.73]
4. Dintre genotipurile cu fructe galbene, soiul Iantarnîi s-a evidențiat printr-un randament superior de pulpă comparativ cu soiul Nejnîi și hibridul Gh.Gh.1-3 și ar putea fi recomandat pentru omologare și extindere în cultură.
5. Soiurile Vladimirski și Vîdubețki au demonstrat o uniformitate biometrică remarcabilă, caracteristică deosebit de importantă pentru mecanizarea recoltării și standardizarea proceselor tehnologice [3, p.418].
6. Compararea hibridului Gh.Gh. 1-2 cu soiul-mamă Baimaclia a confirmat eficaciența programului de ameliorare, obținându-se un spor de producție (masă fruct) de peste 15%, ceea ce justifică utilizarea acestui hibrid în programele viitoare de selecție.
7. Hibridul 2-10 a înregistrat cei mai slabi indicatori biometrici (masă redusă a fructului și raport sâmbure/pulpă de 23,24%), fiind considerat necorespunzător pentru exploatarea economică și propus pentru excluderea din programele de selecție, păstrând eventual doar valoare ornamentală sau de polenizator.

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GLYPHOSATE AND SOIL ENZYMES: A REVIEW ON DEHYDROGENASE, B-GLUCOSIDASE, UREASE AND PHOSPHATASE ACTIVITIES**Gencer Murat**

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Abstract Glyphosate [N-(phosphonomethyl) glycine], which is widely used in weed control, can reach the soil through various transport pathways, although it is not applied directly to the soil. Glyphosate may have effects on microorganisms, which regulate many biochemical processes in soil ecosystems. Soil enzyme activities such as dehydrogenase (DHA), β -glucosidase (BGEA), urease (UEA), and phosphatase (PEA), which are important indicators of microbial activity and play roles in various nutrient cycles, may be affected by glyphosate applications. In this review study, the effects of glyphosate on the aforementioned enzyme activities were evaluated based on the available literature. The reviewed studies indicate that glyphosate exerts an initial inhibitory effect on DHA activity, followed by a stimulatory effect at later stages, whereas BGEA, UEA, and PEA activities are mostly stimulated. However, it has been reported that these effects are short-term for all enzymes and diminish over time. It was concluded that glyphosate applied at recommended field rates does not cause persistent adverse effects on soil enzyme activities; however, further studies are required to adequately elucidate the long-term effects of repeated applications.

Keywords: Glyphosate, dehydrogenase, β -Glucosidase, urease, phosphatase, enzyme activity

Introduction

Herbicides are plant protection products widely used in agricultural production for weed control. Among these, glyphosate [N-(phosphonomethyl) glycine] is a non-selective, systemic, and broad-spectrum herbicidal active ingredient [1, p. 1037-1055]. It is used for various purposes in agricultural systems, including the control of annual and perennial weeds, the termination of temporary grasslands, and the renovation of permanent pastures. Following the discovery of its herbicidal activity in 1970, use of glyphosate has increased rapidly and it has become the most widely used pesticide active ingredient worldwide [2, p. 1-15; 3, p. 2322].

Glyphosate inhibits the enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) in plants, thereby blocking the shikimate pathway and suppressing protein synthesis, which ultimately leads to plant death within 1–3 weeks. The restriction of the shikimate pathway to plants and certain microorganisms is the primary reason glyphosate does not exert direct toxic effects on mammals. Nevertheless, its intensive and widespread use has raised various environmental concerns [4, p. 114372]. Although glyphosate is not applied directly to the soil, it can reach the soil through drift, surface runoff, and plant-mediated translocation [5, p. 51-60]. Its mobility in soil is limited, as it is strongly adsorbed to soil components [6, p. 98-108]. While this property largely prevents glyphosate from leaching into groundwater, it may also result in its accumulation in soil [1, p. 1037-1055]. Glyphosate accumulated in soil may cause adverse effects on non-target organisms [7, p. 19419-

19424], while it may also serve as a readily available carbon source for certain microorganisms [8, p. 16-24].

Soil contamination with chemical substances such as glyphosate may affect soil microbiota, leading to alterations in organic matter mineralization and nutrient cycling processes [9, p. 82-88]. These changes may negatively influence the functionality and sustainability of soil ecosystems and, in the long term, reduce agricultural productivity. The activities of soil microorganisms can be assessed through soil enzyme activities, which are widely used to determine the effects of pesticides on soil due to their sensitivity and the relative ease of their measurement [10, p. 138150; 11, p. 1423]. In this context, dehydrogenase (DHA), synthesized by microorganisms, is considered a reliable indicator of overall microbial metabolic activity [12, p. 183-210]. In addition, β -glucosidase (BGEA), urease (UEA), and phosphatase (PEA) enzyme activities are associated with carbon, nitrogen, and phosphorus cycles, respectively, and are commonly employed in the evaluation of soil biochemical processes [13, p. 338-347].

The aim of this review is to evaluate the effects of glyphosate, a herbicidal active ingredient widely used in agricultural production, on dehydrogenase, β -glucosidase, urease, and phosphatase enzyme activities in soil ecosystems, based on findings reported in the existing literature.

Effect of glyphosate on dehydrogenase enzyme activity

Dehydrogenase enzyme activity is an important biochemical indicator of soil microbial activity, as dehydrogenases are intracellular enzymes present only in viable microorganisms. Dehydrogenases are essential for the biological oxidation of soil organic matter because they enable the transport of hydrogen from organic substrates to inorganic acceptors [12, p. 183-210]. Owing to its high sensitivity, dehydrogenase activity is frequently used to assess the effects of pesticides on microbial activity. The impact of glyphosate on DHA has been clearly shown to vary depending on factors such as application rate, soil properties, and sampling time [7, p. 19419-19424; 8, p. 16-24; 14, p. 1-8]. At recommended field application rates (approximately 5 mg kg⁻¹), glyphosate generally does not cause pronounced adverse effects on DHA, and any observed effects are reported to be short-term and transient [15, p. 1-12]. However, with increasing application rates, glyphosate has been reported to exert positive, negative, or neutral effects on DHA.

At low glyphosate doses, microbial activity is often stimulated, whereas inhibitory effects, particularly during the initial period following application, have been reported at higher doses [16, p. 161-169]. Because these reactions vary by soil type, establishing an exact threshold dose is difficult. Indeed, Nweke et al. [16] observed increases in DHA at doses up to 400 mg kg⁻¹, while Šantrić et al. [14] reported that this increase persisted even at very high doses of 3260 mg kg⁻¹. In contrast, Bennicelli et al. [17] detected a decrease in DHA at a glyphosate dose of 10 mg kg⁻¹, and Mohy-Ud-Din et al. [18] reported a marked reduction in DHA at 200 mg kg⁻¹ compared with 100 mg kg⁻¹. Overall, these findings show that glyphosate's influence on DHA is nonlinear and highly reliant on environmental factors.

The effect of glyphosate on DHA varies among different soils. This variability has been reported to be influenced by several soil properties, such as soil texture [14, p. 1-8], pH [17, p. 117-22], water-soluble carbon [8, p. 16-24], and free metal ions. Moreover, the history of glyphosate use in soil has been highlighted as an important factor determining this variability. For example, Zabaloy et al. [15] showed that the effect of glyphosate application on DHA differed between two soils. The researchers stated that this observed difference was due to one of the soils having been exposed to glyphosate applications for many years; therefore, this soil exhibited a stronger stimulatory response to glyphosate application compared to the other soil.

The effect of glyphosate on DHA also depends on sampling time [19, p. 688-701]. DHA has been reported to reach its highest levels within the first 7–45 days after application, followed by a gradual decline over time [14, p. 1-8; 20, p. 770-778]. Initial inhibition is thought to be associated with the suppression or mortality of glyphosate-sensitive microorganisms, whereas subsequent stimulation is attributed to the availability of carbon, nitrogen, and phosphorus derived from glyphosate, which can serve as readily accessible nutrients for microorganisms [10, p. 138150; 13, p. 338-47]. In addition,

Yu et al. [19] suggested that early-stage effects may be related to the microbial toxicity of isopropylamine present in commercial glyphosate formulations. As isopropylamine is a volatile compound, its toxic effects dissipate rapidly, after which an increase in DHA is commonly observed.

Effect of glyphosate on phosphatase enzyme activity

Acid and alkaline phosphatase enzyme activities are considered important indicators of soil microbial activity and functional response, as they reflect the capacity of microorganisms to mineralize organic phosphorus. Therefore, examining the effects of glyphosate application on these enzymes is important for understanding how this herbicide influences microbial phosphorus transformation processes [13, p. 338-347]. The effects of glyphosate application on soil phosphatase enzyme activities vary depending on the application dose and incubation period [19, p. 688-701]. It has been reported that phosphatase enzyme activity increases when glyphosate is applied at the recommended field dose and at twice this dose; however, this effect is transient [13, p. 338-347]. Cherni et al. [21] reported that no change was observed in acid phosphatase activity at the recommended glyphosate dose, whereas a tenfold higher dose resulted in an increase in enzyme activity. Similarly, it has been reported that the application of 3 mg kg⁻¹ glyphosate caused an increase in both acid and alkaline phosphatase enzyme activities, and that this increase persisted even 10 days after application [11, p. 1423]. In support of these stimulatory effects observed at low and moderate doses, applications of 100 and 200 mg kg⁻¹ glyphosate were also reported to increase acid and alkaline phosphatase activities compared to the control [18, p. 1285566]. These findings indicate that glyphosate may exert a stimulatory effect on phosphatase enzymes within a certain dose range. In contrast, the application of glyphosate at high doses (600–6000 mg kg⁻¹) has been associated with a pronounced inhibitory effect on acid phosphatase activity [19, p. 688-701]. Yu et al. [19], reported that increasing glyphosate doses significantly suppressed acid phosphatase activity in soil and this inhibitory effect was positively correlated with glyphosate concentration. However, it was also noted that acid phosphatase activity began to increase again as glyphosate mineralization progressed in the soil, suggesting that acid phosphatase may serve as a useful indicator for monitoring the biological degradation of glyphosate [19, p. 688-701]. Similar to DHA, the stimulatory effects of glyphosate on acid and alkaline phosphatase activities have been attributed to the utilization of carbon, nitrogen, and phosphorus present in the glyphosate molecule as nutrient sources by microorganisms [11, p. 1423; 13, p. 338-347].

Effects of glyphosate on β -glucosidase enzyme activity

β -glucosidase is an important biochemical parameter involved in the final stage of cellulose degradation during the decomposition of organic matter in soil [22, p. 146-150]. By converting cellulose derivatives into glucose, this enzyme provides microorganisms with readily available carbon and is therefore considered a sensitive indicator of soil microbial activity and carbon mineralization processes [23, p. 794-807]. According to the research that is currently available, glyphosate applied at acceptable field levels generally has little impact on BGEA. Applications at low doses (approximately 3 mg kg⁻¹) have been reported to cause no significant initial changes in BGEA, while in some cases slight increases were observed as incubation progressed [24, p. 2747]. Similarly, glyphosate applications have been reported to either have no effect on BGEA or to induce temporary stimulation; however, this effect was shown to disappear during long incubation periods (~100 days) [8, p. 16-24]. This temporary stimulation has been attributed to the potential use of glyphosate as a carbon and phosphorus source by microorganisms. Nevertheless, it has been emphasized that this effect exhibits high variability and may differ depending on soil properties and climatic conditions [8, p. 16-24]. Indeed, some studies have reported that glyphosate application at agriculturally recommended doses does not result in statistically significant changes in BGEA [13, p. 338-347].

Effects of glyphosate on urease enzyme activity

Urease activity catalyzes the hydrolysis of urea into ammonium in soil and thus represents one of the key biochemical steps in the soil nitrogen cycle. This enzyme activity is considered an important indicator of microbial nitrogen mineralization capacity [23, p. 794-807]. Findings in the literature regarding the effects of glyphosate on urease activity vary depending on application dose, incubation

period, and soil properties. While limited or negligible effects on urease activity have been reported at low glyphosate doses, inhibitory effects may emerge at higher doses and during longer incubation periods. Accordingly, Atere et al. [25] reported that the application of 2 mg kg⁻¹ glyphosate to soil did not cause a significant change in urease activity. Similarly, a study reported by Li et al. [10] showed that the application of 10 mg kg⁻¹ glyphosate resulted in only a slight increase (2.2%) in urease activity after 98 days of incubation. These findings suggest that low-dose glyphosate applications have a limited effect on urease activity. In contrast, Chen et al. [26] reported that increasing glyphosate concentrations (approximately >5 mg kg⁻¹) caused inhibition of urease activity, although this negative effect weakened as incubation progressed. This indicates that the effects of glyphosate on urease activity may be time-dependent and transient in nature.

Soil texture is considered an other factor modulating the effects of glyphosate on urease activity. Šantric et al. [14] reported that glyphosate applied over a wide dose range (32.6–3260 mg kg⁻¹) initially increased urease activity in loamy soil; however, this effect weakened shortly thereafter and shifted to inhibition by day 45. In the same study, high glyphosate doses in sandy soil induced a stimulatory effect only during the first 7 days, after which urease activity returned to control levels. Based on these findings, the authors emphasized that the effects of glyphosate on urease enzyme activity are not permanent but rather transient.

Conclusion

An evaluation of the effects of glyphosate on soil dehydrogenase, β -glucosidase, urease, and phosphatase enzyme activities indicates that these enzymes generally exhibit similar response patterns. Following glyphosate application, a temporary inhibition may occur due to the suppression of sensitive microorganisms, followed by a stimulatory effect resulting from the utilization of carbon, nitrogen, and phosphorus contained in the glyphosate molecule by microorganisms. This effect gradually diminishes or disappears as glyphosate mineralization proceeds. Applications of glyphosate at recommended field doses do not appear to cause persistent adverse effects on soil enzyme activities. The limited number of studies addressing β -glucosidase and urease activities highlights the need for more comprehensive research in this area. In particular, due to the scarcity of studies examining the effects of repeated glyphosate applications on soil enzyme activities, the long-term impacts of such practices remain insufficiently elucidated.

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STUDIUL PROCESELOR FIZICO-CHIMICE ÎN BOABELE DE COACĂZ NEGRU ÎN CONDIȚIILE SCHIMBĂRILOR CLIMATICE ÎN PARTEA CENTRALĂ A REPUBLICII MOLDOVA

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Rezumat. În lucrarea de față sunt prezentate rezultatele cercetării compoziției fizico-chimice a boabelor de coacăz negru ale soiurilor Titania, Tisel și Tiben, în al treilea an după plantare. Analiza a fost efectuată pe boabe proaspete și după păstrarea acestora timp de o săptămână la temperatura de +4 °C, datele obținute fiind ulterior comparate, acesta constituind scopul cercetării. Datele au fost prelucrate în funcție de următorii indicatori: procentul substanțelor uscate solubile în apă, procentul zaharurilor totale, procentul acidității titrabilă, conținutul de acid ascorbic (mg/100 g) și conținutul de compuși fenolici (mg/100 g). S-a constatat că boabele proaspete ale soiului Tiben conțin cea mai mare cantitate de zaharuri – 9,6% și vitamina C – 198,19 mg/100 g, iar soiul Titania se evidențiază printr-un conținut mai ridicat de aciditate titrabilă – 3,6% și compuși fenolici – 380 mg/100 g. După păstrare, la soiul Titania s-a observat o scădere a tuturor indicatorilor, aciditatea titrabilă reducându-se aproape de două ori, până la 1,78%. Pierderi semnificative de compuși fenolici au fost înregistrate la soiul Tiben – 66%. În cazul boabelor soiului Tisel, conținutul de zaharuri a crescut cu 3,32%. Prin urmare, compoziția chimică a boabelor de coacăz negru depinde de soi și de condițiile de păstrare. Cele mai rezistente la pierderea substanțelor biologice active s-au dovedit a fi boabele soiului Tisel.

Cuvinte-cheie: vitamina C, zaharuri, soi, aciditate titrabilă, compuși fenolici, coacăz negru.

Abstract. In this study, the results of an investigation into the physico-chemical composition of blackcurrant berries of the Titania, Tisel, and Tiben cultivars in the third year after planting are presented. The analysis was carried out on fresh berries and after one week of storage at +4 °C, after which the data were compared—this comparison formed the aim of the research. The data were processed according to the following indicators: percentage of water-soluble dry matter, total sugars, titratable acidity, ascorbic acid content (mg/100 g), and phenolic compounds (mg/100 g). It was found that fresh berries of the Tiben cultivar contained the highest amounts of sugars—9.6%—and vitamin C—198.19 mg/100 g, while Titania surpassed the other cultivars in titratable acidity—3.6%—and phenolic compounds—380 mg/100 g. After storage, Titania showed decreases in all parameters, with titratable acidity nearly halving to 1.78%. Significant losses of phenolic compounds were observed in Tiben—66%. Meanwhile, berries of the Tisel cultivar showed a 3.32% increase in sugar content. Therefore, the chemical composition of blackcurrant berries depends on both the cultivar and storage conditions. The Tisel cultivar proved to be the most resistant to the loss of bioactive compounds.

Keywords: blackcurrant, phenolic compounds, sugars, titratable acidity, vitamin C, variety

Introducere

În ultimii ani, coacăzul negru a atras o atenție deosebită din partea cercetătorilor datorită conținutului ridicat de compuși biologici activi și potențialului semnificativ de utilizare în produsele alimentare funcționale. Conform Cortez și Gonzalez de Mejia [1, p. 2387-2401], fructele de coacăz

negru conțin un spectru larg de substanțe fitochimice — de la acizi fenolici și flavonoide până la antociani și vitamina C, ceea ce determină activitatea lor antioxidantă și antiinflamatoare.

Totodată, compoziția chimică a fructelor de pădure depinde în mod semnificativ de soi, condițiile de cultivare și gradul de maturitate. Conform datelor prezentate de Tian [2, p. 5612-5633], conținutul de antociani și flavonoli în diferite soiuri de coacăz negru poate varia de peste două ori, iar Simerdová [3] precizează că, în pofida unui spectru general comun de compuși, profilul antocianic al soiurilor este individual și include 4–6 structuri dominante. Aceste rezultate confirmă necesitatea unei analize detaliate a particularităților de soi pentru determinarea direcțiilor optime de procesare.

În cercetările lor, Kowalski și Gonzalez de Mejia [4] indică o strânsă corelație între compoziția fenolică, activitatea antioxidantă și proprietățile fizice ale fructelor, ceea ce le face potrivite nu doar pentru consumul în stare proaspătă, ci și pentru procesarea tehnologică.

Concluzii similare sunt prezentate de Gacnik et al. [5, p. 73-74], care au arătat că, pe parcursul procesului de maturare, concentrația compușilor fenolici și a antocianilor crește, atingând valori maxime în perioada de maturitate tehnologică.

Potrivit Kierońska et al. [6], compoziția chimică a coacăzului negru reflectă influența factorilor ecologici — condițiile pedoclimatice și nivelul de insolație. Prin urmare, analiza comparativă a indicatorilor în condiții identice de cultivare permite evidențierea diferențelor reale dintre soiuri, ceea ce constituie obiectivul prezentului studiu.

O direcție importantă a cercetărilor moderne rămâne studiul stabilității compoziției chimice în timpul procesării și depozitării. Marsol-Vall et al. [7, p. 151-160] au stabilit că tratamentul termic conduce la diminuarea concentrației vitaminei C și la modificarea compușilor aromatici volatili, în timp ce Karaklajic-Stajic et al. [8] menționează că antocianii prezintă o stabilitate relativ ridicată la temperaturi scăzute, ceea ce face ca congelarea să fie o metodă preferabilă pentru conservarea valorii nutritive.

Un interes deosebit îl prezintă studiile dedicate activității biologice a compușilor fenolici. Untea et al. [9] și Rachtan-Janicka et al. [10] subliniază că activitatea antioxidantă a coacăzului negru este direct legată de conținutul de polifenoli, în special de antociani și flavonoli. În același timp, Trych et al. [11] au demonstrat că, chiar și după procesare și trecerea prin digestie, o parte dintre antioxidanți își păstrează biodisponibilitatea, ceea ce confirmă importanța funcțională ridicată a acestor fructe.

Compoziția biochimică a fructelor de coacăz negru depinde de particularitățile de soi, de condițiile climatice și de gradul de maturitate, determinând calitățile gustative, valoarea tehnologică și direcțiile de utilizare — în stare proaspătă, în procesare sau în producerea alimentelor funcționale.

În pofida răspândirii largi a culturii, evaluarea comparativă a compoziției chimice a soiurilor moderne de coacăz negru rămâne insuficient studiată. Prin urmare, cercetarea particularităților de acumulare a zaharurilor, acizilor, compușilor fenolici și a vitaminei C în fructele diferitelor soiuri este actuală și prezintă importanță practică pentru activitatea de ameliorare și pentru industria de procesare.

Scopul cercetării este de a studia modul în care se modifică compoziția fizico-chimică a fructelor de coacăz negru ale soiurilor Titania, Tisel și Tiben în timpul păstrării pe termen scurt la frigider, de a identifica particularitățile de soi privind stabilitatea indicatorilor biochimici în timpul depozitării și de a determina influența acestora asupra valorii alimentare și tehnologice a fructelor.

Ipoteza cercetării. Se presupune că fructele diferitelor soiuri de coacăz negru se deosebesc prin conținutul de zaharuri, acizi, compuși fenolici și vitamina C, iar aceste diferențe determină calitățile gustative și direcțiile de utilizare ale soiurilor.

Materiale și metode

Coacăzul negru din soiurile Titania, Tiben și Tisel a fost plantat primăvara anului 2023 în satul Todirești, raionul Ungheni. Analiza fizico-chimică a boabelor a fost efectuată pe materialul vegetal din al treilea an de la plantare, în cadrul Institutului Național de Cercetări Aplicate în Domeniul Agriculturii și Medicinii Veterinare. Boabele destinate cercetării au fost recoltate la data de 30.06.2025 și împărțite în două probe. Prima probă a fost supusă analizei imediat după recoltare, iar cea de-a doua — după o săptămână. Pe parcursul acestei perioade, boabele au fost păstrate la frigider,

în recipiente de sticlă închise ermetic, la temperatura de +4 °C. Cercetările au fost realizate pentru următorii indicatori: conținutul de acid ascorbic, compuși fenolici, procentul zaharurilor totale, procentul zaharurilor reducătoare, procentul acidității titrabile și procentul substanțelor uscate solubile în apă.

Rezultate și discuții

Analiza datelor prezentate în tabelul 1 evidențiază diferențe în compoziția fizico-chimică a fructelor de coacăz negru proaspăt congelate, aparținând diferitelor soiuri.

Tabelul 1.

Analiza fizico-chimică a fructelor proaspete de coacăz negru

Coacăz negru (fructe proaspete) de soiuri	Substanțe uscate, hidrosolubile, %	Zahăr total, %	Aciditatea titrabilă, %	Conținutul de acid ascorbic, mg/100g	Conținutul de substanțe fenolice, mg/100g
Titania	18,40	8,00	3,60	171,75	380,0
Tiben	22,10	9,60	3,00	198,19	370,0
Tisel	18,90	8,20	2,50	177,48	290,0

Analizând tabelul, se poate afirma că cea mai mare cantitate de substanțe uscate solubile în apă a fost înregistrată la soiul Tiben – 22,10%. Valoarea minimă a concentrației componentelor solubile se observă la soiul Titania – 18,40%.

În ceea ce privește conținutul de zaharuri totale, cea mai mare valoare se înregistrează la soiul Tiben – 9,60%, urmat de soiul Tisel – 8,20%, iar cea mai mică valoare la soiul Titania – 8,00%.

Referitor la aciditatea titrabilă, soiul Titania prezintă cel mai ridicat indicator – 3,60%, în timp ce cea mai mică valoare este caracteristică soiului Tisel – 2,50%, iar la soiul Tiben aciditatea este medie – 3,00%.

Cea mai mare cantitate de vitamina C a fost determinată la soiul Tiben – 198,19 mg/100 g; un conținut ușor mai scăzut de acid ascorbic se observă la soiul Tisel – 177,48 mg/100 g, iar la soiul Titania acesta este și mai redus – 171,75 mg/100 g.

Conținutul maxim de compuși fenolici a fost constatat la soiul Titania – 380,0 mg/100 g. La soiul Tiben acest indicator este, de asemenea, ridicat – 370,0 mg/100 g, în timp ce la soiul Tisel este semnificativ mai mic – 290,0 mg/100 g.

A doua probă de analiză chimică a fructelor soiurilor Titania, Tiben și Tisel a fost efectuată după o săptămână, la data de 7.05.2025. Rezultatele cercetării sunt prezentate în tabelul 2.

Tabelul 2.

Analiza fizico-chimică a fructelor de coacăz negru după o săptămână de depozitare

Denumirea soiului de coacăz	Reducerea zaharurilor, %	Zaharoză, %	Zahăr total, %	Aciditatea titrabilă, %	Conținutul de acid ascorbic, mg/100g	Conținutul de substanțe fenolice, mg/100g
Titania	4,48	3,00	7,48	1,78	149,6	282,7
Tiben	5,56	4,44	10,00	1,70	167,2	124,7
Tisel	7,54	3,98	11,52	1,62	176,0	199,5

Datele obținute au arătat că soiurile se deosebesc destul de semnificativ în ceea ce privește conținutul de zaharuri: soiul Tisel prezintă cea mai mare cantitate de zaharuri – 11,52%, iar soiul Titania are cel mai scăzut conținut de zaharuri – 7,48%. Ponderele zaharurilor reducătoare este cea mai mare la soiul Tisel – 7,54%, mai mică la soiul Tiben – 5,56%, iar cea mai redusă la soiul Titania – 4,48%. Totodată, zaharoza reprezintă aproximativ o treime din totalul zaharurilor la soiul Tisel – 3,98%. La soiul Tiben, conținutul de zaharoză este cel mai ridicat – 4,44%, iar la soiul Titania este cel mai scăzut – aproximativ 3%.

Aciditatea titrabilă se situează la un nivel relativ similar pentru toate soiurile, variind între 1,62 și 1,78%, cu valoarea maximă la soiul Titania – 1,78% și cea minimă la soiul Tisel – 1,62%.

Conținutul de substanțe tanante și colorante este cel mai ridicat la soiul Titania – 282,7 mg/100 g, iar cel mai scăzut la soiul Tiben – 124,7 mg/100 g.

În ceea ce privește conținutul de acid ascorbic, soiul Tisel prezintă cea mai mare valoare – 176,0 mg/100 g, urmat de soiul Tiben – 167,2 mg/100 g, iar cea mai mică valoare se înregistrează la soiul Titania – 149,6 mg/100 g.

Comparând indicatorii (tabelul 3), se poate observa că, în timpul păstrării, conținutul de zaharuri crește la soiul Tiben cu 0,4%, iar la soiul Tisel creșterea este și mai pronunțată – cu 0,32%. În schimb, la soiul Titania, cantitatea de zaharuri scade cu 0,52%.

Tabelul 3.

Compararea analizei chimice a fructelor de coacăze negre

Denumirea soiului de coacăz	Zahăr total, %	Aciditatea titrabilă, %	Conținutul de acid ascorbic, mg/100g	Conținutul de substanțe fenolice, mg/100g
Titania	- 0,52	- 1,82	- 22,15 (- 13%)	- 97,3 (- 25%)
Tiben	+ 0,40	- 1,30	- 30,99 (- 16%)	- 245,3 (- 66%)
Tisel	+ 0,32	- 0,88	- 1,48 (- 1,5%)	- 90,5 (- 31%)

La toate soiurile de coacăz negru se observă o diminuare a acidității titrabile, cea mai pronunțată fiind la soiul Titania – cu 1,82%, iar cea mai redusă la soiul Tisel – cu 0,88%.

Cea mai mare pierdere de compuși fenolici a fost înregistrată la soiul Tiben – 66%, în timp ce cea mai mică pierdere a fost constatată la soiul Titania – 25%; la soiul Tisel pierderile au constituit 31%.

Conținutul de vitamina C a scăzut cel mai mult la soiul Tiben – cu 16%, la soiul Titania – cu 13%, iar la soiul Tisel pierderile au fost nesemnificative, de doar 1,5%.

Concluzii

Din totalitatea celor analizate mai sus se pot formula următoarele concluzii. Fructele soiului Tiben se remarcă printr-o densitate mai mare și un gust mai intens, datorită concentrației ridicate de componente solubile — zaharuri, acizi și compuși biologic activi — de 22,10%, ceea ce le face promițătoare pentru procesare și pentru producerea de concentrate.

Cel mai dulce gust îl prezintă fructele soiului Tisel, deoarece în timpul păstrării conținutul de zaharuri crește de la 8,0% până la 11,52%, iar nivelul acidității titrabile este de 1,62%.

Fructele de coacăz negru ale soiului Tiben se caracterizează printr-un echilibru bun între dulceață și aciditate, având un conținut ridicat de zaharuri de aproximativ 10% și o aciditate moderată de 1,70%. Cel mai acid soi s-a dovedit a fi Titania: în timpul păstrării, conținutul de zaharuri a scăzut până la 7,48%, iar aciditatea titrabilă a ajuns la 1,78%, valoare mai mare decât la celelalte soiuri.

Totodată, la toate soiurile se observă o proporție relativ ridicată de zaharuri reducătoare (glucoză și fructoză), care determină dulceața naturală a fructelor. Zaharoza reprezintă aproximativ o treime din totalul zaharurilor.

Compușii fenolici, tananții și substanțele colorante, în timpul păstrării, conduc la pierderea intensității culorii și la diminuarea activității antioxidante; aceste valori s-au redus semnificativ la soiul Tiben – cu 66%, iar liderul în ceea ce privește conținutul de compuși fenolici este soiul Titania – 282,7 mg/100 g.

Toate soiurile studiate reprezintă o sursă bogată de vitamina C; totuși, activitatea metabolică determină reducerea acesteia în timpul păstrării, însă la fructele de coacăz negru ale soiului Tisel aceste pierderi sunt nesemnificative, de doar 1,5%.

Prin urmare, fructele de coacăz negru ale soiului Titania se disting prin aciditate ridicată și cel mai mare conținut de compuși fenolici, iar datorită gustului pronunțat și culorii intense sunt potrivite pentru producerea sucurilor, compoturilor și vinului. Pentru consumul în stare proaspătă sunt mai adecvate fructele soiului Tisel, care se caracterizează printr-un gust mai delicat, având cel mai ridicat

conținut de zaharuri și vitamina C la o aciditate scăzută. Cele mai versatile s-au dovedit a fi fructele soiului Tiben, deoarece acestea prezintă cel mai bun echilibru între zaharuri și acizi și se caracterizează printr-un conținut ridicat de substanță uscată, fiind astfel potrivite atât pentru consumul proaspăt, cât și pentru procesare.

Rezultatele analizei comparative a compoziției fizico-chimice a fructelor proaspete de coacăz negru și a celor păstrate la frigider timp de o săptămână au evidențiat modificări pronunțate specifice soiurilor în ceea ce privește indicatorii analizați; prin urmare, reacția soiurilor de coacăz negru la păstrare diferă semnificativ, iar soiul Tisel a demonstrat cea mai mare stabilitate a compoziției chimice.

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EVALUAREA INTENSITĂȚII DE ZBOR ALE ALBINELOR LA CULESUL MELIFER DE LA LEVENȚICĂ

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Rezumat. Cercetările au avut ca scop evaluarea intensității de zbor ale albinelor la culesul melifer de leventică. S-a evaluat că în prima perioadă de înflorire a leventicăi s-a înregistrat o creștere a colectării nectarului de la 76,0 buc. la ora 10⁰⁰, până la 121,0 albine/5 minute la ora 15⁰⁰. Colectarea polenului a fost redusă, cu valori medii între 1,0 și 4,0 albine/5 minute. S-a relevat că la mijlocul perioadei de înflorire activitatea de cules a crescut semnificativ, numărul mediu de albine întoarse din câmp cu nectar a constituit 254-272 albine/5 minute și cu ghemotoace de polen – 9-19 buc. O frecvență mai intensă a florilor s-a înregistrat la 100 m față de stupină comparativ cu 700 m, diferență accentuată în condiții de vânt. S-a determinat că la finele perioadei de înflorire, în pofida vântului persistent, colectarea nectarului a rămas intensă, cu medii între 281 și 361 albine/5 minute și cu ghemotoace de polen – 12-17 buc. Leventica constituie o sursă importantă de nectar, iar eficiența exploatării acesteia depinde de puterea familiilor, distanța față de cultură și condițiile meteorologice.

Cuvinte cheie: *albine*, leventică, nectar, polen, intensitatea zborului.

Abstract: The research aimed to evaluate the flight activity of honey bees during nectar foraging on lavender. It was determined that during the first flowering period of lavender, nectar collection increased from 76.0 individuals at 10:00 a.m. to 121.0 bees per 5 minutes at 3:00 p.m. Pollen collection was low, with mean values ranging between 1.0 and 4.0 bees per 5 minutes. It was revealed that in the middle of the flowering period, foraging activity increased significantly, with the average number of bees returning from the field with nectar reaching 254–272 bees per 5 minutes, and those carrying pollen pellets numbering 9–19 individuals. A more intensive visitation of flowers was recorded at a distance of 100 m from the apiary compared to 700 m, a difference that became more pronounced under windy conditions. It was determined that at the end of the flowering period, despite persistent wind, nectar collection remained intensive, with average values between 281 and 361 bees per 5 minutes, while pollen foraging accounted for 12–17 individuals. Lavender represents an important nectar source, and the efficiency of its exploitation depends on colony strength, distance from the crop, and meteorological conditions.

Keywords: *bees, lavender, nectar, pollen, flight intensity.*

Introducere

În Republica Moldova, apicultura constituie o ramură distinctă a zootehniei cu un impact socio-economic și ecologic deosebit. Relevanța sa economică rezultă din valoarea și calitatea superioară a

produselor apicole, precum și din capacitatea d-ee genera locuri de muncă, în special pentru populațiile vulnerabile din mediul rural. În paralel, prin serviciul esențial de polenizare, aceasta contribuie semnificativ la creșterea productivității culturilor agricole dependente de polenizarea insectelor și la menținerea homeostazei și biodiversității ecosistemelor naturale. Albinele melifere participă la polenizarea culturilor agricole, în rezultatul căreia sporește semnificativ cantitatea și calitatea semințelor și fructelor [7].

Polenizarea eficientă a plantelor joacă un rol esențial în menținerea biodiversității, asigurând stabilitatea și funcționarea optimă a ecosistemelor. Importanța acestui proces este amplificată în contextul actual al degradării mediului cauzate de activitățile antropice, care accelerează declinul și dispariția multor specii de plante și animale. Pentru mult timp, importanța albinelor în agricultura productivă a fost subestimată sau ignorată. Abia după ce recoltele unor culturi au început să scadă, în ciuda aplicării măsurilor agrotehnice adecvate, s-a evidențiat rolul crucial al polenizării în asigurarea producției.

În ultimii ani, apicultura ecologică a înregistrat o creștere constantă la nivel mondial. Motivul este interesul tot mai mare al consumatorilor pentru mierea certificată ecologic, în special în țările mai bogate [9].

Pentru obținerea unei cantități de miere maxime de la familia de albine, se planifică valorificarea mai multor culesuri de nectar posibile. Cel mai adesea se practică transportul familiilor la pastoral, adică deplasarea controlată a stupilor lângă sursele masive de nectar și polen [13].

Aceasta sporește productivitatea stupilor și a culturilor agricole prin polenizare, asigurând în același timp accesul la resurse florale diverse. Acest fapt are un impact decisiv asupra calității și a volumului producției apicole [7].

Albina are o funcție cheie în mediul înconjurător. Sarcina sa cea mai importantă este polenizarea plantelor polenizate de insecte, care contribuie întărirea fructelor [2], la producția de semințe și, în cazul plantelor nectarifere precum lavanda (*Lavandula spp.*), la sporirea producției de nectar, susținerea dezvoltării familiilor de albine și, indirect, la eficiența economică a culturii.

Levănțica (*Lavandula spica*) este un semiarbust cu o perioadă lungă de înflorire. Producția de miere la hectar variază între 50-120 kg [5, 10]. Originară din zona mediteraneană, lavanda (*Lavandula spp.*) a câștigat o popularitate crescândă în Republica Moldova în ultimii ani, fiind cultivată atât pentru utilizări aromatice și medicinale, cât și în scopuri ornamentale și pentru turism fotografic în lanurile de lavandă ornamentale, dar și pentru sesiunile foto în lanurile cu leventică [1, P. 74-81].

„În Republica Moldova, lavanda (*Lavandula spp.*) este cultivată din 1948 ha. În perioada 1970-1990, suprafețele de levănțică erau de 4,5-5,0 mii ha, cu o producție anuală de 17.000 kg ulei esențial, din care peste 9.000 kg erau exportate. În prezent, suprafețele se reduc la circa 1.000 ha, însă plantațiile și producția cresc anual, datorită avantajului economic și cererii pe piața europeană. Anual marketingul European se extinde cu 5-10% [3]. În anii 2010-2014 suprafețe de leventică au constituit în medie pe 5 ani – 561,6 ha [8, 11, P. 81-88].

Potrivit datelor disponibile pentru 2021, industria lavandei din Moldova, cu o producție de **20 de tone de ulei esențial**, se află într-o fază consolidată de revigorare după o perioadă de declin. Repoziționarea pe piața europeană, unde se exportă **99%** din producție, în special către Germania, Franța și Bulgaria [4].

Reieșind din cele menționate scopul cercetărilor constă în evaluarea intensității de zbor ale albinelor la culesul melifer de la leventică.

Material și metode

Obiectul cercetărilor l-a constituit câmpul de lavandă din apropierea satului Cobusca Nouă, r-nul Anenii Noi, utilizat ca sursă meliferă pentru familiile de albine incluse în experiență.

Pentru studiu intensității de zbor ale albinelor melifere pe parcursul înfloririi leventicăi au fost selectate trei familii, amplasate în imediata vecinătate a plantației (figura 1).



Figura 1. Aspectul plantației de leventică și colectarea nectarului de albină lucrătoare

Intensitatea de zbor a albinelor fost evaluată prin numărarea directă a albinelor care se întorceau din câmp la stup cu nectar sau cu gemotoace de polen pe picioarele posterioare, pe parcursul a 5 minute. Intensitatea zbîrului albinelor a fost determinată la începutul înfloririi leventicăi (20.06.2025, mijlocul (25.06.25) și la finele perioadei de înflorire (01.07.2025), în intervalul de timp de orele 10⁰⁰ până la 15⁰⁰. Pentru aprecierea gradului de valorificare a plantației de leventică, s-a determinat numărul albinelor lucrătoare observate în câmp timp de 5-minute în raza de 1-2 m, la două distanțe de 100 m și 700 m față de stupină. 100 m,

Datele obținute au fost prelucrate prin metoda variațiilor statistice cu ajutorul programelor Microsoft Office la calculator.

Rezultate și discuții

Familiile de albine luate în studiu aveau în medie 19,67 faguri, puterea – 13,3 spații dintre fagurii populați cu albine, 6-7 faguri cu puieț căpăcit și rezerva de miere în cuib de 2-4 kg (tabelul 1).

Tabelul 1. Indicii morfoproductivi a familiilor de albine luate în studiu (18.06.2025)

Indicii	$\bar{X} \pm S_{\bar{X}}$	V, %	Llimita
Numărul fagurilor în stup, buc.	19,67±0,333	2,94	19 – 20
Puterea familiei de albine, ulicioare	13,33 ± 2,404	31,22	10 – 18
Numărul fagurilor cu puieț, sute celule	6,67 ± 0,333	8,66	6 – 7
Rezerva de miere, kg	3,00 ± 0,577	33,33	2 – 4

Datele privind intensitatea zborului albinelor lucrătoare la leventică (20.06.2025), care sau îtors din câmp indică o activitate intensă de colectare a nectarului, cu o creștere progresivă pe parcursul zilei, media zilnică crescând de la 76,0 buc. la ora 10⁰⁰ până la 121,0 albine/5 minute la ora 15⁰⁰. Colectarea de polen a fost mul mai redusă și relativ constantă (tabelul 2). Valorile ridicate ale coeficientului de variație confirmă diferențe mari de performanță între familii.

Tabelul 2

Intensitatea de zbor a albinelor lucrătoare (cu polen/nectar) la leventică, timp de 5 minute, 20.06.2025, la leventică

Ora studiului	Numărul albinelor întoarse din câmp cu polen			Numărul albinelor întoarse din câmp cu nectar		
	$\bar{X} \pm S_{\bar{X}}$	Cv, %	Limita	$\bar{X} \pm S_{\bar{X}}$	Cv, %	Limita
10.00	2,33±0,667	49,49	1 - 3	76,0±46,090	-	25-168
11.00	2,00±2,00	-	0 - 6	54,33±26,028	82,97	16-104
12.00	3,67±1,333	62,98	1 - 5	109,0±69,342	-	14-44
13.00	2,67±0,333	21,65	2 - 3	95,0±54,84	99,97	30-204

14.00	1,0±0,577	-	0 - 2	110,0±50,521	79,55	37-207
15.00	2,67±0,882	57,28	1 - 4	121,0±67,179	96,16	38 - 254

Observațiile efectuate în câmp au arătat o creștere constantă a numărului de albine active pe parcursul zilei, atât la 100 m, cât și la 700 m față de stupină, cu o activitate mai intensă la distanțe mai mici. La 100 m, activitatea a crescut de la 33 albine la începutul zilei la un vârf de 150 albine la ora 15:00. La 700 m, tendința a fost similară, de la 16 la 85 de albine (tabelul 3). Prezența vântului a accentuat această diferență, reducând activitatea la distanțe mai mari.

Tabelul 3

Numărul albinelor lucrătoare văzute în câmp timp de 5 minute, la leventică

Ora	100 m	700 m
10.00	33	16
11.00	62	20
12.00	51	15
13.00	73	30
14.00 (vânt)	101	50
15.00 (vânt)	150	85

Creșterea cea mai pronunțată a avut loc după-amiaza, în condiții de vânt, ceea ce sugerează că levănțica rămâne o resursă atractivă chiar și în condiții meteorologice mai puțin favorabile.

Această creștere progresivă indică faptul că plantația a fost descoperită și exploatată din ce în ce mai intens pe parcursul zilei.

La 25.06.2025, în perioada de vârf a culesului, colectarea nectarului a atins valori foarte ridicate, numărul mediu de albine întoarse cu nectar a oscilat între 129,33 și 272,0 albine/5 minute. Colectarea de polen a rămas secundară. Coeficienții de variație (52,53–73,55%) indică o variabilitate mare între familii, deși nivelul general al activității a fost excepțional (tabelul 4).

Tabelul 4

Intensitatea de zbor a albinelor lucrătoare (cu polen/nectar) la leventică, timp de 5 minute, 25.06.2025

Ora studiului	Numărul albinelor întoarse din câmp cu polen		Numărul albinelor întoarse din câmp cu nectar		
	$\bar{x} \pm s_{\bar{x}}$	Limita	$\bar{x} \pm s_{\bar{x}}$	Cv, %	Limita
10.00	14,33 ± 13,83	0 - 42	268,66±81,489	52,535	168-430
11.00	19,00 ± 17,039	0 - 53	266,00±99,229	64,612	101-444
12.00	18,67 ± 15,709	1 - 50	129,33±41,31	55,327	149-482
13.00	14,00 ± 12,014	1 - 38	151,00±64,117	73,546	155-480
14.00	9,33 ± 5,897	2 - 21	272,00±89,79	55,177	170 - 451
15.00	9,00 ± 7,00	2 - 23	253,667±84,77	57,88	152 - 422

Activitatea în câmp a fost constant mai intensă la 100 m comparativ cu 700 m, confirmând preferința albinelor pentru surse de hrană apropiate (tabelul 5).

Tabelul 5

Numărul albinelor lucrătoare văzute în câmp timp de 5 minute, la leventică

Ora	100 m	700 m
10.00	206	192
11.00	217	185
12.00	215	198
13.00	200	200
14.00 (vânt)	225	159
15.00 (vânt)	201	172

În condiții de vânt persistent (01.07.2025), activitatea de colectare a nectarului s-a menținut la un nivel ridicat, cu medii între 281,33 buc. la ora 10⁰⁰ până la 360,67 albine/5 minute la ora 14⁰⁰, în timp ce colectarea polenului a rămas redusă și variabilă (tabelul 6).

Tabelul 6

Intensitatea de zbor a albinelor lucrătoare (cu polen/nectar) la leventică, timp de 5 minute, 01.07.2025 (vânt toata ziua)

Ora studiului	Numărul albinelor întoarse din câmp cu polen			Numărul albinelor întoarse din câmp cu nectar		
	$\bar{x} \pm s_{\bar{x}}$	Cv, %	Limita	$\bar{x} \pm s_{\bar{x}}$	Cv, %	Limita
10.00	16,00±8,963	97,026	0 - 31	281,33±95,75	58,950	126-456
11.00	16,667±5,897	61,286	5 - 24	302,00±14,012	8,036	274-317
12.00	16,33±8,950	94,914	1 - 32	314,00±39,526	21,803	235-356
13.00	12,33±4,333	60,856	5 - 20	333,00±33,561	17,456	286-398
14.00	17,33±5,925	59,211	6 - 26	360,667±39,734	19,082	317-440
15.00	14,00±7,767	96,097	3 - 29	345,00±42,194	21,183	284 - 426

În ansamblu, rezultatele demonstrează că leventica este o sursă nectariferă valoroasă, capabilă să susțină un cules intens și stabil. Totodată, eficiența exploatarea acestei resurse depinde semnificativ de familia de albine și managementul apicol.

Colectarea polenului a fost o activitate secundară, cu un număr mediu orar mult mai redus și relativ constant, cuprins între 12,33 și 17,33 albine/5 minute.

S-a relevat că pe parcursul zilei intensitate zborului ala albinelor culegătoare treptat sporește și cel mai mare număr a fost înregistrat la orele 14⁰⁰ – 361 albine / 5 minute (figura 2), o tendență asemănătoare s-a confirmat și la rapiță [6, P. 130-142, 12, P.59-76].

Din punct de vedere al variației, colectarea polenului a prezentat o variabilitate mare (coeficient de variație a jscilat între 59,21% și 97,03%), indicând o activitate influențată puternic de factori locali. În schimb, colectarea nectarului a fost o activitate mult mai constantă (Cv între 8,04% și 58,95%), cu o variație minimă remarcabilă la ora 11:00 (Cv - 8,04%), ceea ce sugerează un efort de colectare mai uniform și mai previzibil din partea albinelor.

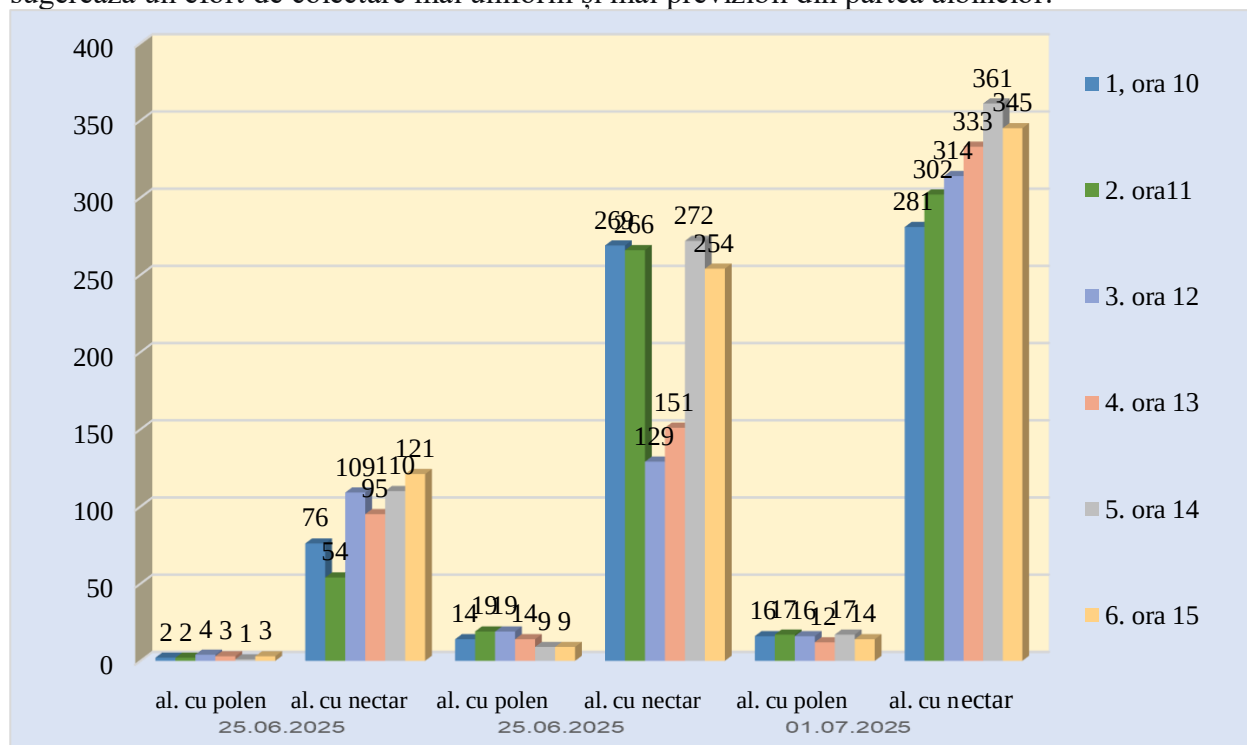


Figura 2. Diagrama intensității de zbor ale albinelor cu polen și nectar, care sau întors la stup timp de 5 minute

Activitatea de zbor a albinelor a fost consistent mai intensă la distanța de 100 m comparativ cu 700 m pe întreaga perioadă, indicând o preferință pentru sursele de hrană apropiate, care au constituit 97-152 albine / 5 minute, față de 78-141 albine / 5 minute la 700 m (tabelul 7).

Tabelul 7

Numărul albinelor lucrătoare văzute în câmp timp de 5 minute (vânt toată ziua)

Ora	100 m	700 m
10.00	133	119
11.00	152	141
12.00	137	111
13.00	97	78
14.00	118	93
15.00	107	87

Se observă o tendință de descreștere a activității la ambele distanțe după amiaza (de la un maxim de 152 albine la 100 m și 141 la 700 m la ora 11:00, până la sub 120 și respectiv sub 100 după ora 13:00). Această scădere progresivă, în condiții de vânt persistent, sugerează că factorii meteorologici și ciclul zilnic au un impact semnificativ asupra intensității activității de foraging la distanțe lungi.

Concluzii

1. S-a evaluat că în prima perioadă de înflorire a leventicăi este o creștere a colectării nectarului de la 76,0 buc. la ora 10⁰⁰, până la 121,0 albine/5 minute la ora 15⁰⁰. Colectarea polenului a fost redusă, cu valori medii între 1,0 și 4,0 albine/5 minute.

2. S-a relevat că la mijlocul perioadei de înflorire activitatea de cules a crescut semnificativ, numărul mediu de albine întoarse din cămo cu nectar a constituit 254-272 albine/5 minute și cu gemotoace de polen – 9-19 buc. O frecvență mai intensă a florilor sau înregistrat la 100 m față de stupină comparativ cu 700 m, diferență accentuată în condiții de vânt.

3. S-a determinat că la finele perioadei de înflorire, în pofida vântului persistent, colectarea nectarului a rămas intensă, cu medii între 281 și 361 albine/5 minute și cu gemotoace de polen - 12-17 buc.

4. Leventica constituie o sursă importantă de nectar, iar eficiența exploatarei acesteia depinde de puterea familiilor, distanța față de cultură și condițiile meteorologice.

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MODERN TECHNOLOGIES FOR THE EXTRACTION AND MODIFICATION OF DIETARY FIBERS FROM AGRO-FOOD BY-PRODUCTS

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Abstract

Dietary fibers are essential structural components of the plant cell wall, playing a major role from both nutritional and technological perspectives [3,4]. Classified into soluble and insoluble dietary fibers, they are associated with important physiological benefits and functional properties relevant to the food industry [4]. Agro-food by-products, particularly fruit and vegetable pomace, represent valuable yet underutilized sources of dietary fibers [1]. This article provides a critical overview of the main types of dietary fibers, their plant sources, and the conventional and emerging methods used for their extraction and modification.

Conventional chemical and thermal extraction methods are widely used to obtain dietary fibers from agro-food by-products; however, they may lead to polysaccharide degradation and loss of functional properties. In this context, emerging non-enzymatic technologies, such as ultrasound-assisted extraction and microwave-assisted extraction, have attracted significant interest due to their

higher efficiency and reduced environmental impact. The study evaluates the influence of three extraction methods—conventional extraction, ultrasound-assisted extraction, and microwave-assisted extraction—on the physicochemical characteristics of dietary fiber concentrates obtained from fruit pomace.

The results provide a scientific basis for the sustainable valorization of fruit processing industry by-products as functional ingredients for food and nutraceutical applications. Chemical, enzymatic, and physical methods (ultrasound, microwaves, pulsed electric fields, supercritical fluids), as well as processing technologies such as extrusion and thermal treatments, are analyzed, highlighting their impact on yield, structure, and functionality of dietary fibers [1,2,5–7]. Within the context of the circular bioeconomy, the need to develop sustainable technologies that enable efficient valorization of food waste and the production of high value-added functional ingredients is emphasized [1,2].

Keywords: dietary fibers; agro-food by-products; extraction processes; emerging technologies; circular bioeconomy; food processing.

Introduction

The growing interest in sustainable food systems has intensified research on the valorization of agro-industrial by-products as alternative sources of dietary fibers [1,2]. Fruit pomace, generated during the industrial processing of fruits for juice and puree production, represents a valuable raw material rich in structural polysaccharides such as cellulose, hemicellulose, and pectin [3].

Conventional extraction methods based on thermal or chemical treatments are efficient in terms of yield but may affect fiber structure and generate significant waste [4]. In recent years, emerging non-enzymatic technologies, such as ultrasound and microwave-assisted extraction, have been proposed as alternative or complementary methods capable of improving mass transfer and facilitating the release of polysaccharides from the plant matrix without the use of enzymes [5,6].

Ultrasound-assisted extraction is based on the phenomenon of acoustic cavitation, which generates shear forces and micro-jets capable of disrupting cell wall structures and promoting the diffusion of target compounds into the solvent [7]. Similarly, microwave-assisted extraction employs non-ionizing electromagnetic waves that produce rapid volumetric heating, leading to increased internal pressure and enhanced mass transfer [8,9].

Despite the reported advantages, the effects of these technologies on the structure and functionality of dietary fibers require systematic evaluation [10]. Therefore, the aim of this study is to compare conventional extraction with ultrasound- and microwave-assisted extraction in terms of their influence on the physicochemical characteristics of dietary fiber concentrates obtained from fruit pomace.

Dietary fibers (DF) are defined as non-digestible carbohydrate polymers, mainly present in the plant cell wall structure, playing an essential role in maintaining the structural integrity of plant tissues [3,4]. Chemically, they include cellulose, hemicellulose, pectin, and lignin, each contributing differently to the mechanical and functional properties of plants [3]. Based on water solubility, dietary fibers are classified into soluble dietary fibers (SDF) and insoluble dietary fibers (IDF), a classification relevant both for physiological effects and technological applications [4].

Due to their chemical structure and physicochemical properties, dietary fibers play a significant role in regulating digestion, reducing glucose and cholesterol absorption, and maintaining gut microbiota health [4,10]. Soluble fibers form viscous gels that slow intestinal transit and nutrient absorption, whereas insoluble fibers increase stool bulk and accelerate intestinal transit [3,4].

In recent years, interest in dietary fibers has increased significantly due to their role in preventing chronic diseases and in the development of functional foods [4]. At the same time, the growing amount of agro-food waste has directed research toward the valorization of plant by-products, such as fruit and vegetable pomace, as alternative sources of dietary fibers [1,2]. The integration of these by-products into sustainable value chains aligns with the concept of the circular bioeconomy [1,2].

In the food industry, dietary fibers extracted from agro-food by-products are used to improve texture, stabilize products, form gels, and reduce the caloric content of foods [1,8]. Extracted functional fibers can be incorporated into beverages, bakery products, dairy products, and nutritional supplements, providing both nutritional value and technological benefits [8,10].

Recently, emerging technologies have been expanded to include synergistic combinations of physical and enzymatic methods. For example, ultrasound-assisted enzymatic extraction has been reported to increase soluble fiber yield and improve gelling properties while preserving polyphenolic activity and antioxidants in plant materials [6,13].

Additionally, supercritical fluid extraction, particularly supercritical CO₂, enables the removal of lipid fractions and the concentration of polysaccharides with increased efficiency and reduced environmental impact [6,12].

However, the complex structure of the plant cell wall, characterized by covalent and non-covalent cross-linked polymeric networks, complicates dietary fiber extraction, influencing yield and functionality [3]. For this reason, the selection and optimization of extraction methods represent a critical aspect in agro-food by-product processing [1].

Figure 1 presents details on different types and sources of dietary fibers based on agro-food materials. Accordingly, soluble dietary fibers include pectin (sugars from whole grains, legumes, etc.), gums (sugar monomers from beans and legumes), and mucilage (aquatic plants, cactus, aloe vera, as well as glycoproteins used as food additives). Insoluble dietary fibers include cellulose (providing glucose monomers derived from fruits and root vegetables), hemicellulose (complex sugars from cereal bran and grains), and lignin (aromatic alcohols from vegetables). Regarding extraction methods, dietary fibers (soluble and/or insoluble) are obtained through dry and/or wet processing, chemical methods, enzymatic-gravimetric methods, and microbial methods (with certain limitations) [3,4].

Fiber modification technologies, such as extrusion combined with controlled thermal treatments, allow the production of fibers with increased solubility, improved water-holding capacity, and potential prebiotic properties [3,4,15,16]. These approaches contribute to the development of functional ingredients for foods and supplements, supporting the objectives of the circular bioeconomy through efficient valorization of agro-food waste [1,2,12].

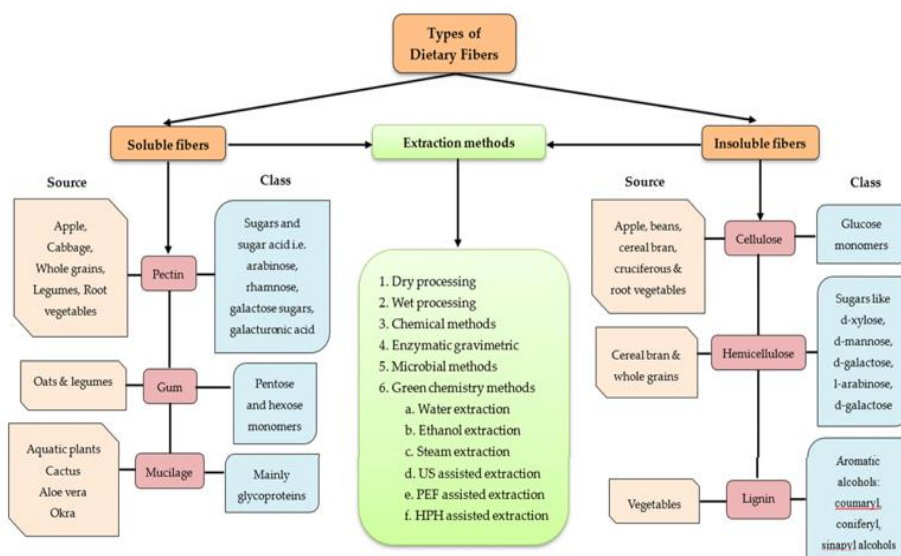


Figure 1. Types and extraction and purification methods of dietary fibers from food waste.

In the current context, the growing interest in the valorization of agro-food by-products and the development of sustainable industrial processes has stimulated research in the field of dietary fiber extraction and modification technologies.

Methods for the Extraction and Modification of Dietary Fibers

Recent research highlights a significant shift in industrial paradigms toward the adoption of more sustainable and environmentally responsible practices. Optimization of extraction conditions and the combination of conventional methods with innovative technologies allow reductions in solvent consumption, processing time, and operating temperatures [1,8,9,12].

This transition is supported by interdisciplinary collaborations among food science, engineering, and environmental sciences, which address issues related to efficiency, sustainability, and ecological impact in a holistic manner [2,8,9]. The main objective of these efforts is the development of technologies that balance industrial needs with the conservation of natural resources and ecosystem protection.

Currently, chemical, mechanical, thermal, and/or enzymatic treatments are used to obtain dietary fibers from various plant sources. The yield and functional properties of extracted polysaccharides depend primarily on process operating conditions, such as temperature, extraction time, pH, and the nature of the solvents used [3,10,11].

Hot water extraction is one of the most commonly used methods and is often combined with chemical treatments to facilitate solubilization of cell wall components. However, the use of chemical solvents and high temperatures may lead to polysaccharide degradation and negative environmental impacts [4,11,12].

To improve fiber extractability, mechanical and enzymatic methods are often applied as pre-treatments, contributing to increased extraction yield by fragmenting the plant matrix and releasing cross-linked polysaccharides [5,6,11].

Types and Sources of Dietary Fibers

Soluble dietary fibers include pectin's, gums, and mucilage's, found in fruits, legumes, and whole grains, and are characterized by their ability to form viscous solutions and gels with beneficial effects on carbohydrate and lipid metabolism [3,4]. Insoluble dietary fibers, represented by cellulose, hemicellulose, and lignin, are mainly found in vegetables, cereal brans, and mature plant by-products and contribute to normal gastrointestinal function [3]. The origin of dietary fibers in fruits and vegetables lies in the cell walls of parenchyma cells, which at maturity contain both soluble and insoluble polysaccharides in variable proportions depending on species and degree of ripeness [1].

Chemical and Biological Extraction Methods

Chemical extraction methods, such as water extraction, acidic extraction, and alkaline extraction, are widely used due to their operational simplicity and low cost [3]. However, they may lead to fiber structure degradation, loss of functional fractions, and generation of residues with negative environmental impact [1,3].

In contrast, enzyme-assisted extraction uses specific enzymes (cellulases, hemicelluloses, pectinases) to selectively degrade the plant cell wall, facilitating fiber release under mild conditions and with reduced environmental impact [1,4]. Limitations of this method include enzyme cost, process duration, and the need for strict control of technological parameters [2].

Physical Methods and Emerging Technologies

Modern physical methods, such as microwave- and ultrasound-assisted extraction, have demonstrated high efficiency in increasing extraction yield and reducing processing time [5,6]. Microwaves induce volumetric heating of plant material, promoting compound diffusion, while ultrasounds act through acoustic cavitation, leading to cell wall disruption and fiber release [5].

Other emerging technologies include pulsed electric field (PEF)-assisted extraction, which induces membrane electroporation and facilitates mass transfer [7], as well as supercritical fluid extraction, mainly used for lipid fraction removal and fiber purification [6]. The combination of enzymatic methods with ultrasound or microwaves is considered a promising strategy for obtaining fibers with improved functional properties and reduced environmental impact [1,5].

Modification of Dietary Fibers through Processing Technologies

Extrusion and thermal treatments are used to modify the composition and functionality of dietary fibers, leading to an increase in soluble fiber content through partial solubilization of insoluble

fibers [3]. Consequently, functional properties such as water-holding capacity and solubility are improved, which are relevant for industrial applications [3,4].

Thermal treatments may promote fiber release from the cell wall structure and the conversion of protopectin into soluble pectin; however, severe conditions may lead to fiber degradation and loss of functionality [3].

Conclusions

The extraction and modification of dietary fibers from agro-food by-products represent a strategic research direction with major implications for the food industry and sustainable development. Conventional methods are complemented by emerging and combined technologies, enabling higher yields and fibers with improved functional properties while reducing environmental impact.

These technologies allow the production of concentrates with superior yields and functional properties, supporting the sustainable valorization of agro-food by-products and the development of functional ingredients for the food and nutraceutical industries. Emerging and hybrid technologies, including ultrasound, microwaves, pulsed electric fields, and supercritical fluid processing, offer significant advantages by enhancing extraction efficiency, preserving fiber functionality, and reducing processing intensity.

The integration of these technologies within the circular bioeconomy framework contributes to the efficient valorization of food waste and the development of high value-added functional ingredients. Future research should focus on process optimization, techno-economic assessment, and industrial-scale implementation, as well as on establishing clear links between processing conditions, fiber structure, and physiological functionality.

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THE INFLUENCE OF THE LEVEL OF FETAL EMBRYOCONNECTION ON RUMINAL DIGESTION AND IMMUNITY AFTER BIRTH

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Abstract. A key condition for intensifying livestock production is ensuring herd turnover with highly productive animals. The solution to this important livestock problem lies in the organization of viable young animals and the creation of conditions for their proper rearing. This primarily concerns the development of rumen digestion processes. In dairy farming, various feeding schemes for replacement calves are used, taking into account the animals' needs for nutrients and biologically

active substances. However, most of the feeding schemes used for replacement calves do not take into account the physiological characteristics of feed consumption, metabolism, growth, and development of replacement calves during the transition from dairy to plant-based feeds, which does not always allow for the maximum utilization of the animals' genetic productivity potential. It is important to remember that calves from birth to 15-20 days of age are monogastric animals. The abomasum, the true stomach, the only compartment of the complex stomach, actively supports the digestive processes. The formation of a microbial community of microorganisms and protozoa in the rumen of ruminants has long been studied in isolated cases and was carried out by seeding the contents of the rumen onto nutrient media in Petri dishes.

These studies allowed us to examine the intensity of rumen colonization by anaerobic microflora, whose role is to ferment plant feed components. Available data indicate that calves are born with a sterile gastrointestinal tract. The rumen becomes colonized by microorganisms and bacteria quite rapidly. Given the fact that dairy cattle productivity is constantly increasing, the potential for maximizing it requires knowledge of the influence of various physiological factors of fetal growth and development on subsequent growth and development characteristics, the body's ability to utilize feed, and the formation of digestive processes. When considering prenatal and postnatal growth and development processes and their impact on the body's condition after birth, the processes of the embryonic connection between the fetus and the mother during intrauterine growth and development are of significant importance. Fetal growth and development are largely determined by a complex of dynamic reactions in the mother-placenta-fetus system. Changes in the mother's body and the formation of a functional connection between the fetus and the mother's body are aimed at maintaining homeostasis and enantiostasis of the mother's body, creating maximum conditions for the growth and development of the fetus.

It is believed that the main factors influencing fetal growth and development are the mother's health, the functional capacity of the placenta, and the health of the fetus. Pregnancy is most often complicated by placental insufficiency. It is believed that the functional activity of the placenta is a necessary and crucial condition for the full development of the fetus. Placental insufficiency is the main negative factor affecting fetal development. The mother, in turn, is also concerned with the fetus's health. It has been proven that the fetus is not passive, as was previously believed. During various periods of intrauterine development, the fetus emits numerous signals sent through various systems of its body. These signals are received by the corresponding systems of the mother and influence changes in the activity of many organs and functional systems of the mother. All this has allowed the development of a coherent theory about the existence of a multi-linked mother-fetus system during pregnancy. According to most scientists, the mother-fetus system is a combination of two independent organisms united by the common goal of ensuring the proper, physiological development of the fetus. Indeed, the end result of a physiologically healthy pregnancy is the birth of a healthy organism. Therefore, all bodily activity during pregnancy should be aimed at maximizing the normal development of the fetus and maintaining the necessary conditions for its physiological development [1, p. 211].

The primary link between the fetus and the mother is the placenta. However, this organ, which has both maternal and fetal origins, does not function as an independent system. Metabolic changes observed during pregnancy play a significant role in the physiological relationship between the mother and fetus. No metabolic function is unaffected to some extent during pregnancy. Changes in protein metabolism are characterized by the accumulation of proteins in the pregnant woman's body, which serve as the building blocks for fetal tissue and organs. Protein accumulation in the mother's body is primarily necessary for the growth and development of the uterus and mammary glands—organs that reach their greatest development during pregnancy. Pregnancy is accompanied by fat deposition in the hips, abdomen, and breast area. Increased concentrations of neutral fat and cholesterol are observed in the blood of pregnant women. Fetal blood contains 1-3 times less lipids than maternal blood. Fat accumulation in the bodies of both mother and fetus is necessary for the creation of energy reserves. Energy expenditure is particularly high during labor. Significant changes

also occur in carbohydrate metabolism. Carbohydrates (primarily in the form of glycogen) are deposited in increased quantities in the maternal and fetal livers, placenta, and uterus. Carbohydrates (primarily in the form of glucose) pass from the mother's body to the fetus. Glucose is essential for the fetus, primarily to support the processes of anaerobic glycolysis—a specific process of fetal survival.

Keywords: embryonic connection, fetus, rumen, immunity, growth, development.

It has been established that the specific metabolic conditions during pregnancy are reflected in the acid-base balance of maternal and fetal blood. A mild to moderate metabolic acidosis is observed in pregnant women. In fetal blood, the acidosis is more pronounced. It is caused by both the maternal metabolic acidosis and the predominance of anaerobic glycolysis, with the release of increased amounts of underoxidized products, primarily from carbohydrate metabolism. Fetal acidosis is metabolic in nature, with fluctuations in pH. Physiological metabolic acidosis does not indicate fetal pathology and does not lead to intrauterine hypoxia. Therefore, this condition, caused by the specific metabolic conditions, should be considered physiological [2, p. 267]. When the fetus's oxygen supply is disrupted, physiological metabolic acidosis can become pathological, leading to intrauterine hypoxia, fetal malnutrition, and inadequate fetal development. Therefore, determining the level of fetoplacental connection between the mother and fetus allows us to assess the conditions of its growth and development, its functional activity, and the body's ability to adapt to new conditions after birth and to create conditions for nutrient supply. Importantly, the development and functional activity of organs after birth and their dependence on the level of embryonic connection between the fetus and the mother, particularly the digestive system, are identified. The importance of this issue is reflected in the development of the rumen digestive system and immunity.

We found that calves born with a low level of embryonic attachment to their mother's body experience slower postnatal growth and development than functionally active calves. By the time digestive function stabilized, rumen fermentation levels varied according to the level of embryonic attachment. The rumen microbiome was significantly larger in animals with a high level of embryonic attachment. The number of microbiome representatives in the rumen of calves in the third group ranged from 5434 ± 22.0 to 5920 ± 24.0 million/mL. It was significantly higher only in calves in the second group, by 1.64-1.70 times ($p < 0.01$).

Calves with a high level of embryonic growth demonstrated more intensive rumen digestion and more active metabolism. Ketone bodies in the blood of 180-day-old animals before and after feeding were not significantly higher (groups two and three). After feeding, total lipids in animals of the third group were 1.29 times ($p < 0.01$) higher. Lactate levels in the blood of calves of the second and third groups were 1.17 to 1.19 times ($p < 0.05$) higher before feeding. Acetic acid levels were 1.28 to 1.44 times higher in the blood of animals of the first group ($p < 0.01$). Calves with low embryonic growth had 1.42-1.50 and 1.64-2.18 times less propionic acid in the blood before and after feeding than animals of the second and third groups ($p < 0.01$ - $p < 0.001$). The ketogenicity coefficient was 2.14-2.13 times higher in calves of the first group compared to animals of the second group ($p < 0.001$). It was 1.94-2.22 times lower in animals of this group ($p < 0.001$).

In 6-month-old calves with low embryonic development, hematopoiesis remains at a low level and does not reach physiological levels. This is evidenced by the white blood cell count. Calves with a low level of connection with the mother's body retained significantly more leukocytes, 1.11-1.19 times, (group 1 animals compared to groups 2 and 3 ($p < 0.05$)). Protein metabolism in group 1 animals continued to be lower by 1.09-1.12 times than in groups 2 and 3 ($p < 0.05$), and immunoglobulins were 1.27-1.34 times lower ($p < 0.01$). γ -globulin content, and consequently a high level of protection for the body, was higher in groups 2 and 3, 1.21-1.34 times higher ($p < 0.05$).



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FORMATION OF RESISTANCE FACTORS OF THE ORGANISM OF CALVES IN CRITICAL PERIODS OF GROWTH AND DEVELOPMENT IN THE CASE OF DISRUPTION OF THE RESPIRATORY PROCESS.

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Abstract. Food production and provision of the population with food is impossible without the intensive development of the livestock industry. The effectiveness of this industry largely depends on the ability to obtain viable young animals. This problem largely depends on the conditions. Intrauterine development of the fetus, the formation of a new organism with a high level of resistance after birth. Currently, considerable attention is paid to the study of the mechanisms of natural resistance and immune defense of the body, studying their role in the organism's ability to adapt to new conditions of existence after birth. It is necessary to take into account the presence of critical periods in the process of animal growth and development under production conditions. A critical period, a period of dominance, retardation, and stabilization are distinguished.

It has been established that the most critical period of growth and development of an animal organism is the first month of life after birth. During this period, the organism goes through 4 [1, p. 8] critical periods of growth and development. This critical period includes the rebuilding period; imprinting period; Depression, stress reaction; immunodeficiency. Rebirth – a period lasting several hours after birth. During this period, the functions of most body systems are under stress due to the emergence of new living conditions. The critical condition is caused by overstrain of the gastrointestinal tract and thermoreceptors.

During this period, timely colostrum feeding and temperature regulation are important. The imprinting period is characterized by increased exposure to environmental factors on the central

nervous system during the first 5-6 days after birth. During this period, the foundations of long-term memory are formed, which causes CNS strain. During this period, animals must be protected from stresses arising during their regrouping process. The immunodeficiency period [2, p. 4] is associated with decreased immunoglobulin levels in milk and the lack of proper immune system function.

Therefore, our goal was to study the development of resistance in functionally active calves and calves born with respiratory impairment and to implement appropriate correction.

Keywords: period, critical, resistance, factor, calves, indices.

The study results indicate a disruption in the formation of resistance factors if the calves were asphyxiated at birth and had adequate or inadequate spontaneous respiration.

The phagocytic activity of blood leukocytes in functionally active calves decreased insignificantly from birth to the immunodeficient period and gradually increased toward the stabilization period. The phagocytic activity in calves from the first group reached $85.46 \pm 3.98\%$. The phagocytic count followed the dynamics of leukocyte phagocytic activity. It decreased toward the second study and increased toward the stabilization period by 1.49 times compared to the phagocytic activity after birth ($p < 0.01$). In functionally active calves, the nuclear index decreases by 1.33 times before the immunodeficiency period and gradually increases by 1.70 times ($p < 0.01$) before the stabilization period. The resistance index of the animal's body increases by 2.73 times from birth to the stabilization period ($p < 0.001$).

The percentage of activated leukocytes increases from birth to the immunodeficiency period by 1.53 times ($p < 0.01$). In the subsequent period, the increase was $47.78 \pm 1.92\%$. The number of activated leukocytes increased by 1.90 times ($p < 0.001$) over the study period. The microbial count decreased insignificantly before the immunodeficiency period, by 1.08 times, and increased by 1.87 times by the stabilization period ($p < 0.001$).

In the second group of calves born in a state of asphyxia, the leukocyte activity index was significantly lower than in functionally active calves. Leukocyte phagocytic activity remained virtually unchanged until the end of the immunodeficiency period. Only at the end of the second month of life did leukocyte phagocytic activity begin to increase. However, the increase was insignificant: by 1.08, 1.04, and 1.06 times. Overall, by the stabilization period, leukocyte phagocytic activity in the blood of calves in the second group increased by 1.20 times ($p < 0.05$). The phagocytic index was lowest after birth, at -5.29 ± 0.28 , and was significantly higher by the stabilization period. The nuclear index was most significant in calves after birth. It decreased by 1.89 times ($p < 0.01$) until the end of the immunodeficiency period. In the following two periods, the nuclear index continued to decrease and increased only by the stabilization period, reaching 1.27 times compared to the value in the third animal study ($p < 0.01$).

The dynamics of resistance indicators in calves born with spontaneous, inadequate respiration differed significantly from those in calves born asphyxiated. The leukocyte FA in calves decreased from birth to the immunodeficiency period. During the dominance period, FA increased by 1.11 times and remained at this level during the retardation period. NF increased by 1.13 times from birth to the immunodeficiency period and by 1.17 times during the dominance period.

By the end of the retardation period, it did not change. During the stabilization period, this indicator was found to be 1.33 times ($p < 0.01$) higher. The nuclear blood index of calves of the third group decreased from birth to the retardation period by 2.07 times ($p < 0.001$) and increased by 1.34 times ($p < 0.05$) to the stabilization period. The resistance index from birth to the immunodeficiency period in animals of the third group decreased by 2.16 times ($p < 0.001$) and continued to decrease until the retardation period, with an increase in the stabilization period by 2.45 times ($p < 0.05$). The percentage of activated lymphocytes significantly decreases from birth to the immunodeficiency period by 1.30 times, with a slight increase in subsequent periods. And during the stabilization period, it increases compared to the previous period by 1.52 times ($p < 0.01$). CAF repeats the dynamics of the VAL indicator and affects the microbial number. The leukocyte intoxication index increases in the immunodeficiency period by 1.44 times ($p < 0.01$) and decreases to the dominance period by 1.38

times and to the retardation period by 1.28 times ($p<0.05$). It was established that it increased in the stabilization period by 1.28 times, ($p<0.05$),

In calves of the fourth group, the FA of leukocytes decreased from birth to the immunodeficiency period (Table 3.4.7). In the following periods of the calves' life, the FA of leukocytes increased and on average amounted to $79.80\pm 3.68\%$. The PF indicator practically did not change until the immunodeficiency period. From the period of dominance, it increased consistently until the stabilization period. PF and ISF did not have significant changes until the end of the dominance period. The nuclear index in calves of the fourth group decreased until the immunodeficiency period by 1.76 times. ($p<0.01$). It increased until the period of dominance by 1.29 times and decreased during the retardation period by 1.15 times ($p<0.05$). The resistance index decreased from the period of birth of animals to the retardation period and increased until the stabilization period by 1.62 times ($p<0.01$).

The nuclear index in calves of the fourth group was accompanied by a decrease of 1.76 times before the immunodeficiency period. ($p<0.01$). It increased by 1.29 times during the period of dominance and decreased by 1.15 times during the period of retardation ($p<0.05$). The resistance index also decreased by the period of retardation from birth and increased by 1.62 times before the last study during the period of stabilization ($p<0.01$).

The percentage of activated leukocytes significantly increased from the immunodeficiency period to the dominance period, by 2.13 times ($p<0.001$). However, by the period of retardation of activated leukocytes decreased by 2.05 times ($p<0.001$) and by the period of stabilization it was 1.51 times more than the indicator of the previous period ($p<0.01$). The number of activated leukocytes repeated the dynamics of the percentage of activated leukocytes, which was accompanied by an increase in the number of microbes in the period of dominance and in the period of stabilization.

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CAPACITATEA DE RAMIFICARE A COACAZULUI NEGRU LA DIFERITE DISTANȚE DE PLANTARE

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Rezumat. În articol sunt prezentate rezultatele cercetărilor efectuate în anul 2025 pe o plantație de coacăz negru din satul Todirești, raionul Ungheni. Au fost studiați indicatori precum lungimea medie și numărul creșterilor anuale la soiurile de coacăz negru: *Titania*, *Tisel* și *Tiben*. Experimentul a fost realizat la diferite scheme de plantare: într-un rând – $3,0 \times 0,7$ m; $3,0 \times 0,8$ m; $3,0 \times 0,9$ m și $3,0 \times 1,5$ m; precum și în zig-zag (cu două rânduri) – $(2,80 - 0,20) \times 0,7$ m; $(2,80 - 0,20) \times 0,8$ m și $(2,80 - 0,20) \times 0,9$ m. În urma cercetărilor s-a constatat că cea mai mare lungime a creșterilor anuale a fost înregistrată la schemele combinate $(2,80 - 0,20) \times 0,70$ m și $(2,80 - 0,20) \times 0,80$ m, iar numărul maxim de lăstari anuali a fost observat la soiul *Titania* la schema de plantare $(2,80 - 0,20) \times 0,90$ m. Particularitățile de soi au influențat semnificativ reacția plantelor la schemele de plantare. Datele obținute permit recomandarea schemelor combinate de amplasare a plantelor pentru sporirea productivității și optimizarea capacității de ramificare a tufelor de coacăz negru.

Cuvinte-cheie: coacăz negru, soiuri, ramificare, creșteri anuale, lungimea și numărul creșterilor anuale, scheme de plantare.

Abstract. The article presents the results of studies conducted in 2025 on a black currant plantation located in the village of Todirești, Ungheni District. The study investigated such parameters as the average length of annual shoots and the number of annual shoots in black currant cultivars *Titania*, *Tisel*, and *Tiben*. The experiment was carried out using different planting schemes: linear arrangements of 3.0×0.7 m, 3.0×0.8 m, 3.0×0.9 m, and 3.0×1.5 m, as well as zig-zag arrangements (with two lines) of $(2.80-0.20) \times 0.7$ m, $(2.80-0.20) \times 0.8$ m, and $(2.80-0.20) \times 0.9$ m. The results showed that the greatest length of annual shoots was observed under the combined planting schemes $(2.80-0.20) \times 0.70$ m and $(2.80-0.20) \times 0.80$ m, while the maximum number of annual shoots was recorded in the cultivar *Titania* under the planting scheme $(2.80-0.20) \times 0.90$ m. Cultivar-specific characteristics had a significant influence on plant responses to planting schemes. The obtained data make it possible to recommend combined planting schemes to increase productivity and optimize bush branching in black currant.

Keywords: black currant, varieties, branching, annual shoots, length and number of annual shoots, planting schemes.

Introducere

Coacăzul negru este una dintre principalele culturi bacifere ale zonei cu climat temperat și este cultivat pe scară largă datorită valorii nutritive și biologice ridicate a fructelor, precum și datorită plasticității sale relative față de condițiile de cultivare. Productivitatea și longevitatea plantațiilor de

coacăz negru sunt determinate în mare măsură de structura morfologică a tufei, în special de caracterul ramificării și de intensitatea formării lăstarilor anuali, pe care se formează recolta principal [1, p.2-4]

Ramificarea tufei reprezintă un indicator integrator al creșterii și dezvoltării plantei, reflectând reacția acesteia la condițiile mediului extern și la elementele de agrotehnică. Numărul, lungimea și dispunerea spațială a lăstarilor influențează gradul de iluminare a coroanei, activitatea fotosintetică a frunzelor și eficiența utilizării elementelor de nutriție minerală. Conform mai multor studii, particularitățile formării lăstarilor determină în mare măsură nivelul de productivitate și calitatea fructelor la coacăzul negru [2, p.3-5].

Unul dintre factorii-cheie care influențează formarea ramificării tufelor este densitatea de plantare, exprimată prin distanțele dintre plante pe rând și dintre rânduri. Modificarea schemei de plantare determină schimbări ale condițiilor de iluminare, ale regimului hidric și nutritiv, precum și intensifică sau diminuează competiția dintre plante, ceea ce se reflectă direct asupra intensității creșterii lăstarilor laterali și asupra numărului de creșteri anuale [3, p.211-213].

Conform recomandărilor agrotehnice, distanțele optime dintre tufele de coacăz negru variază în funcție de soi și de condițiile de cultivare, însă majoritatea ghidurilor sunt orientate în principal către indicatorii de productivitate și mecanizarea lucrărilor de întreținere, acordând o atenție mai redusă particularităților morfologice ale tufelor, în special ramificării [4, p.12-15].

În același timp, datele experimentale arată că, în cazul plantațiilor îndesite, se constată reducerea lungimii lăstarilor și inhibarea ramificării laterale, în timp ce schemele excesiv de rare pot conduce la utilizarea ineficientă a suprafeței de nutriție [5, p.85-87].

Cercetările contemporane dedicate creșterii și dezvoltării coacăzului negru abordează în principal aspecte legate de înmulțire, fiziologia creșterii lăstarilor și reacțiile adaptive ale plantelor, însă influența distanțelor dintre plante asupra formării ramificării rămâne insuficient studiată, în special din perspectiva comparativă între soiuri [6, p. 31-33; 7, p. 79-81].

În acest context, scopul prezentului studiu a constat în investigarea influenței diferitelor distanțe dintre plante asupra indicatorilor de ramificare ai coacăzului negru.

Studierea ramificării coacăzului negru la diferite distanțe de plantare reprezintă o problemă științifico-practică actuală, cu importanță majoră pentru optimizarea tehnologiilor de cultivare a culturii, creșterea productivității și sporirea stabilității acesteia în condițiile pomiculturii intensive.

Materiale și metode

Studiul dezvoltării plantelor de coacăz negru a fost realizat în anul 2025 într-o plantație experimentală situată în partea centrală a Republicii Moldova, în raionul Ungheni, satul Todirești. Obiectele cercetării au fost soiurile: Titania (martor), Tiben și Tisel. Soiurile au fost plantate în diferite variante: într-un singur rând, conform schemelor de plantare $3,0 \times 0,7$ m; $3,0 \times 0,8$ m; $3,0 \times 0,9$ m și $3,0 \times 1,5$ m; precum și în zig-zag, cu două rânduri, plantate după schemele $(2,80 - 0,2) \times 0,7$ m; $(2,80 - 0,2) \times 0,8$ m și $(2,80 - 0,2) \times 0,9$ m. Pentru determinarea lungimii medii a creșterilor anuale și a numărului de creșteri anuale, în fiecare variantă au fost selectate câte trei plante crescute alăturat. Toate măsurătorile au fost efectuate la sfârșitul perioadei de vegetație (fig.1).



Fig. 1. Măsurări biometrice a plantelor de coacăz negru

Lungimea creșterilor anuale a fost determinată prin metoda măsurătorilor directe, iar numărul de creșteri anuale – prin numărarea lor la o tufa (fig.2).



Fig. 2. Plantele pentru evidența indicatorilor biometrici sunt marcate cu bandă colorată

Datele obținute au fost prelucrate prin metode de statistică variațională, cu calcularea valorilor medii ale indicatorilor analizați. Rezultatele cercetărilor sunt prezentate sub formă tabelară.

Rezultate și discuții

Cercetările efectuate au demonstrat că indicatorii capacității de ramificare a coacăzului negru depind în mod semnificativ atât de soi, cât și de schema de plantare, iar rezultatele obținute sunt incluse în tabelul 1.

Tabelul 1

Lungimea medie a creșterilor anuale a unor soiuri de coacăz negru
la diferite distanțe de plantare, anul 2025, cm

Distanța de plantare	Titania	Tiben	Tisel	Media
3,00 x 0,70 m	8,52	11,53	8,60	9,55
3,00 x 0,80 m	10,35	10,53	6,58	9,15
3,00 x 0,90 m	7,77	7,81	9,60	8,39
2,80 x 0,20 x 0,70 m	7,85	14,58	8,89	10,44
2,80 x 0,20 x 0,80 m	9,2	9,38	13,75	10,78
2,80 x 0,20 x 0,90 m	9,14	8,10	10,78	9,34

Conform datelor incluse în tabelul 1 cea mai mare lungime a creșterilor anuale a fost înregistrată la soiul **Tiben** (11,53 cm) la schema de plantare 3,00 × 0,70 m, în timp ce la soiurile **Titania** și **Tisel** acest indicator a fost mai redus, constituind 8,52 și respectiv 8,60 cm. Valoarea medie pentru toate soiurile studiate a fost de 9,55 cm.

Majorarea distanței dintre plante până la 3,00 × 0,80 m a favorizat mărirea lungimii creșterilor anuale la soiul **Titania** (10,35 cm), însă la soiul **Tisel** s-a constatat o diminuare pronunțată a indicatorului (6,58 cm), ceea ce a condus la scăderea valorii medii până la 9,15 cm.

În schema 3,00 × 0,90 m, lungimea creșterilor anuale a scăzut în general (media – 8,39 cm), cu excepția soiului **Tisel**, la care s-a înregistrat o creștere până la 9,60 cm.

Soiul **Titania** s-a caracterizat prin creșteri anuale mai stabile, lungimea maximă fiind de 10,35 cm în schema 3,00 × 0,80 m.

Soiul **Tisel** a manifestat o reacție moderată la modificarea distanțelor dintre plante, cea mai mare lungime a lăstarilor fiind de 13,75 cm la schema de plantare (2,80–0,20) × 0,80 m.

În schemele de plantare (2,80–0,20) × 0,70 m și (2,80–0,20) × 0,80 m s-a observat o creștere medie mai ridicată a lăstarilor, până la 10,44 și respectiv 10,78 cm.

O creștere deosebit de intensă a lăstarilor a fost remarcată la soiul **Tiben**, unde valoarea maximă a atins 14,58 cm la schema (2,80–0,20) × 0,70 m. Soiul **Tisel** a înregistrat, de asemenea, valori ridicate – 13,75 cm la schema (2,80–0,20) × 0,80 m.

Efectuarea determinării numărului mediu de creșteri anuale a soiurilor de coacăz negru studiate a permis să obținem rezultate care au fost incluse în tabelul 2.

Analiza datelor din tabelul 2 a evidențiat că numărul de creșteri anuale depinde, de asemenea, de schema de plantare și de particularitățile soiului, însă reacția plantelor la modificarea distanțelor dintre acestea este mai diferențiată.

Cel mai mare număr de creșteri anuale a fost înregistrat la soiul **Titania** (10,33 buc.) la schema de plantare 3,00 × 0,70 m, în timp ce la soiurile **Tiben** și **Tisel** acest indicator a fost semnificativ mai redus, cu valorile de 7,00 și respectiv 5,00 buc. Valoarea medie a creșterilor anuale pentru toate soiurile a constituit 7,44 buc.

Odată cu mărirea distanței de plantare până la 3,00 × 0,80 m, s-a observat o scădere generală a numărului de creșteri anuale până la 6,01 buc., iar la schema de 3,00 × 0,90 m – o diminuare a activității de formare a lăstarilor anuali până la 5,44 buc., în special la soiul **Titania**, unde valorile stabilite au fost de 5,33 și respectiv 3,33 buc.

Schema (2,80–0,20) × 0,70 m s-a dovedit a fi cea mai favorabilă pentru formarea unui număr mare de creșteri anuale, valoarea medie atingând 8,93 buc., toate soiurile demonstrând rezultate relativ ridicate. Rezultate deosebit de echilibrate au fost înregistrate la soiurile **Tiben** și **Tisel** (8,60 și respectiv 9,20 buc.).

Tabelul 2

Numărul mediu de creșteri anuale a unor soiuri de coacăz negru
la diferite distanțe de plantare, anul 2025, buc.

Distanța de plantare	Titania	Tiben	Tisel	Media
3,00 x 0,70 m	10,33	7,00	5,00	7,44
3,00 x 0,80 m	5,33	8,20	4,50	6,01
3,00 x 0,90 m	3,33	8,00	5,00	5,44
2,80 x 0,20 x 0,70 m	9,00	8,60	9,20	8,93
2,80 x 0,20 x 0,80 m	5,00	9,00	3,50	5,83
2,80 x 0,20 x 0,90 m	12,66	8,40	5,00	8,69

Valorile maxime a numărului de creșteri anuale a fost consemnat la soiul **Titania** (12,66 buc.) la schema de plantare $(2,80-0,20) \times 0,90$ m, însă la soiul **Tisel**, în aceleași condiții de plantare, numărul de creșteri anuale a rămas relativ scăzut (5,00 buc.), fapt ce evidențiază diferențele varietale la reacția condițiilor de cultivare.

Concluzii

Rezultatele experimentului confirmă faptul că schema de plantare reprezintă un factor-cheie în determinarea dezvoltării morfologice și capacității de fructificare a tufelor de coacăz negru, iar alegerea soiului trebuie luată în considerare la planificarea plantațiilor intensive.

Conform datelor obținute s-a constatat că:

- lungimea și numărul creșterilor anuale la coacăzul negru depind semnificativ de schema de plantare și de particularitățile de soi ale plantelor;
- condiții mai favorabile pentru creștere au fost înregistrate la schemele de plantare $(2,80-0,20) \times 0,70$ m și $(2,80-0,20) \times 0,80$ m, unde valorile medii ale lungimii creșterilor anuale au constituit 10,44 și respectiv 10,78 cm;
- soiul **Tiben** s-a caracterizat prin cea mai mare intensitate a creșterii liniare a lăstarilor, atingând valoarea maximă a lungimii creșterilor anuale (14,58 cm) la schema de plantare $(2,80-0,20) \times 0,70$ m, în timp ce soiul **Tisel** a manifestat o reacție mai stabilă, dar mai puțin pronunțată la modificarea schemelor de amplasare a plantelor;
- cel mai mare număr mediu de creșteri anuale s-a format la schema de plantare $(2,80-0,20) \times 0,70$ m – 8,93 buc., ceea ce indică o corelație optimă între suprafața de nutriție și capacitatea de formare a lăstarilor anuali;
- valoarea maximă a numărului de creșteri anuale a fost înregistrat la soiul **Titania** la schema de plantare $(2,80-0,20) \times 0,90$ m – 12,66 buc., fapt ce demonstrează adaptabilitatea ridicată a acestui soi în condițiile de plantare mai rară;
- cea mai favorabilă combinație între lungimea și numărul creșterilor anuale a fost observată la schemele de plantare în zig-zag $(2,80-0,20) \times 0,70$ m și liniar $(2,80-0,20) \times 0,80$ m, acestea putând fi considerate perspective pentru cultivarea coacăzului negru în condițiile studiului realizat.

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INFLUENȚA CULTURILOR BACTERIENE AUTOHTONE ASUPRA CALITĂȚII IAURTURILOR DIN LAPTE DE CAPRĂ ȘI LAPTE DE VACĂ

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Abstract. Fermented dairy products represent an important category of functional foods due to their nutritional value and beneficial effects on human health. In the present study, the organoleptic and

microbiological characteristics of yogurts obtained from goat milk and cow milk were evaluated using autochthonous bacterial cultures developed and tested under laboratory conditions. The results demonstrated that these cultures ensure efficient milk fermentation and allow the production of products with sensory and microbiological properties compliant with current quality standards.

Cuvinte-cheie: yogurt, goat milk, bacterial cultures, organoleptic evaluation, fermented dairy products

Introducere

În ultimii ani, produsele lactate fermentate au căpătat o importanță tot mai mare în alimentația populației, datorită proprietăților lor dietetico-curative și rolului benefic asupra sănătății umane. Iaurtul, în special, reprezintă un aliment complex, bogat în proteine de înaltă valoare biologică, vitamine și minerale, care contribuie la menținerea echilibrului microflorei intestinale, la îmbunătățirea digestiei și la creșterea biodisponibilității nutrienților esențiali precum calciul și vitaminele B [1,2].

Conform Reglementării Tehnice „Lapte și produsele lactate”, iaurtul este definit ca produs lactat obținut prin fermentarea laptelui cu culturi starter de *Streptococcus thermophilus* și *Lactobacillus delbrueckii* subsp. *bulgaricus* [3, 9]. În acest context, utilizarea culturilor bacteriene autohtone constituie o direcție actuală de cercetare, cu impact asupra calității, autenticității și valorificării resurselor microbiologice locale.

Totuși, culturile comerciale standardizate pot reduce diversitatea microbiană și autenticitatea organoleptică a produsului final. În acest sens, utilizarea culturilor autohtone poate contribui la menținerea caracteristicilor locale ale produselor lactate și la creșterea valorii lor funcționale [4,5].

Studiile recente arată că microflora autohtonă are un potențial crescut de adaptare la condițiile locale și poate influența pozitiv proprietățile organoleptice și microbiologice ale iaurturilor, inclusiv prin creșterea activității probiotice și stabilității produsului [6, 7]. Prin urmare, investigarea influenței culturilor bacteriene autohtone asupra calității iaurturilor din lapte de capră și lapte de vacă este relevantă atât pentru optimizarea proceselor de fermentație, cât și pentru dezvoltarea tehnologiilor locale de producere a iaurturilor cu valoare adăugată.

Materiale și metode

Pentru realizarea studiului au fost utilizate lapte de capră cu un conținut de grăsime de 4,1% și lapte de vacă cu un conținut de grăsime de 3,6%, lapte degresat și culturi starter bacteriene autohtone, reactivate pe lapte degresat. Laptele a fost analizat din punct de vedere al acidității titrabilă și al conținutului de grăsime.

Normalizarea laptelui

Normalizarea laptelui s-a realizat în funcție de sortimentul de iaurt obținut. Calculul fracției masice de grăsime în laptele normalizat a fost efectuat conform relației:

$$GLN = (G_p \times 100) / (100 - a)$$

unde GLN reprezintă fracția masică de grăsime în laptele normalizat (%), G_p – fracția masică de grăsime a laptelui (%), iar a – norma de introducere a culturilor bacteriene (%).

Elaborarea rețetelor de iaurt

Au fost elaborate rețete pentru iaurt clasic (2,5% grăsime), iaurt degresat (0,1%) și iaurt cu conținut sporit de grăsime. Rețetele de producere a iaurturilor din lapte de capră și lapte de vacă pentru diferite sortimente: clasic (2,5% grăsime), degresat (0,1%) și cu conținut sporit de grăsime (3,0–3,2%). Se observă că, în funcție de tipul de lapte, s-au ajustat proporțiile de lapte integral și degresat, precum și cantitatea de cultură starter autohtonă reactivată, pentru a asigura omogenitatea și consistența finală a produsului sunt prezentate în Tabelele 1 și 2.

Tabelul 1. Rețete de producere a sortimentului de iaurt (pentru 100 kg de produs finit fără evidența pierderilor).

Nr.	Materie primă	Iaurt 2,5% de grăsime	Iaurt degresat	Iaurt 3,0% de grăsime
1	Lapte de capră 4,1% de grăsime	68,34	-	75,14
2	Lapte degresat	24,0	93,4	17,2
3	Cultura starter reactivată pe lapte degresat	5,0	5,0	5,0
	TOTAL	100	100	100

Tabelul 2. Rețete de producere a sortimentului de iaurt (pentru 100 kg de produs finit fără evidența pierderilor).

Nr.	Materie primă	Iaurt 2,5% de grăsime	Iaurt degresat	Iaurt 3,2% de grăsime
1	Lapte de vacă 3,6% de grăsime	33,9	-	82,5,5
2	Lapte degresat	70,1	93,4	12,5
3	Cultura starter reactivată pe lapte degresat	5,0	5,0	5,0
	TOTAL	100	100	100

Rezultate și discuții

Caracteristicile culturilor bacteriene autohtone, rezultatele obținute pentru culturile bacteriene asociate între specii sunt prezentate în Tabelele 3 și 4.

Tabelul 3. Caracteristicile mostrelor culturilor bacteriene autohtone asociate între specii

Denumirea indicilor	M1	M2	Cerințe normative
Cultura mixtă inoculată	CNMN-LB-25 (<i>S. thermophilus</i>) + CNMN-LB-44 (<i>Lactobacillus delbrueckii subsp. bulgaricus</i>)	CNMN-LB-29 (<i>S. thermophilus</i>) + CNMN-LB-45 (<i>Lactobacillus delbrueckii subsp. bulgaricus</i>)	Coci, bacili separați și asociați în lanțuri de diferite lungimi coraport
Aspect și consistență	Omogenă, cremoasă, moderat filantă.	Omogenă, moderat vîscoasă, moderat filantă	Omogenă, moderat vîscoasă, posibil moderat filantă
Gust și miros	De lapte fermentat, fără gust sau miros străin	De lapte fermentat, fără gust și miros străin, moderat înțepător	De lapte fermentat, fără gust și miros străin, posibil moderat înțepător
Aciditatea titrabilă, °T	98	110	75-140
Bacterii lactice, UFC/1ml	7×10^8	7×10^8	min 1×10^7

Tabelul 4. Caracteristicile mostrelor culturilor bacteriene autohtone asociate între specii

Denumirea indicilor	M3	M4	M5	Cerințe normative
Cultura mixtă inoculată	CNMN-LB-25 (<i>S. thermophilus</i>) + CNMN-LB-44 (<i>Lactobacillus delbrueckii subsp. bulgaricus</i>) în raport 1:1	CNMN-LB-29 (<i>S. thermophilus</i>) + CNMN-LB-45 (<i>Lactobacillus delbrueckii subsp. bulgaricus</i>) în raport 2:1	CNMN-LB-26 (<i>S. thermophilus</i>) + CNMN-LB-43 (<i>Lactobacillus delbrueckii subsp. bulgaricus</i>) în raport 2:1	Coci, bacili separați și asociați în lanțuri de diferite lungimi coraport
Aspect și consistență	Omogenă, cremoasă, moderat filantă.	Omogenă, moderat vâscoasă, moderat filantă	Omogen dens fără eliminare de zer, lucios, vâscos	Omogenă, moderat vâscoasă, posibil moderat filantă
Gust și miros	De lapte fermentat, fără gust sau miros străin	De lapte fermentat, fără gust și miros străin	De lapte fermentat, fără gust și miros străin	De lapte fermentat, fără gust și miros străin, posibil moderat înțepător
Aciditatea titrabilă, °T	77	87	115	75-140
Bacterii lactice, UFC/1ml	7×10^8	7×10^8	7×10^8	min 1×10^7

Din tabelul 3 și 4 putem spune că toate mostrele de culturi elaborate – indiferent de tipul de lapte sau raportul de inoculare – au respectat cerințele minime stipulate în HG 611 Cerințe pentru late și produsele lactate cum ar fi: **Aspectul și consistența** omogenă, fără separare de zer, cu consistență cremoasă, moderat filantă sau vâscoasă. **Gust și miros** specifice laptelui fermentat, fără deviații organoleptice (gust străin, amar sau ranced). **Aciditatea titrabilă (°T)** s-au situat între 77–115°T, respectând intervalul normativ (75–140°T). **Conținutul de bacterii lactice (UFC/ml)** au prezentat concentrații foarte bune (7×10^8 UFC/ml), depășind cu mult minimul reglementat (1×10^7 UFC/ml), indicând o fermentație activă și viabilitate bacteriană ridicată.

Aciditatea titrabilă a culturilor bacteriene autohtone

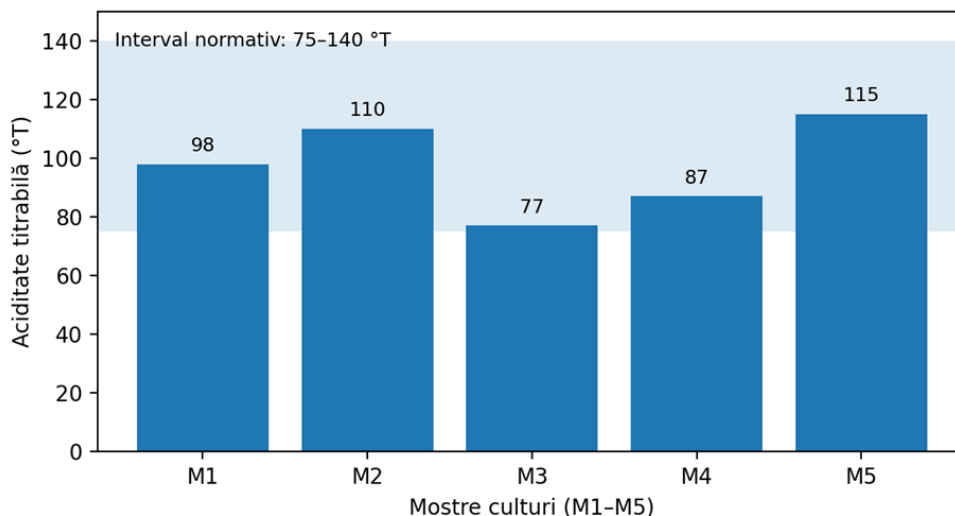


Fig. 1 Aciditatea titrabilă bacteriilor lactice autohtone

Analiza datelor evidențiază faptul că toate mostrele analizate au respectat cerințele minime stipulate în HG nr. 611 privind laptele și produsele lactate, în ceea ce privește aspectul, consistența, aciditatea titrabilă și conținutul de bacterii lactice vii [8].

Efectul tulpinilor și al raportului de inoculare

Simbioza dintre *Streptococcus thermophilus* și *Lactobacillus delbrueckii* subsp. *bulgaricus* este determinată de schimburi metabolice complementare, care accelerează acidifierea și stabilizează structura gelului proteic. În faza inițială a fermentației, *S. thermophilus* se multiplică rapid, consumă lactoză și reduce pH-ul, creând condiții favorabile pentru activarea enzimatică a lui *Lb. bulgaricus*. În paralel, *Lb. bulgaricus*, cu activitate proteolitică mai pronunțată, hidrolizează cazeinele și eliberează peptide și aminoacizi esențiali care stimulează creșterea lui *S. thermophilus*; acest mecanism explică, în mod tipic, scurtarea timpului până la atingerea pH-ului țintă și intensificarea formării aromei specifice.

Din punct de vedere fizico-chimic, acidifierea rapidă indusă de tulpinile CNMN-LB-44 și CNMN-LB-43 favorizează coagularea cazeinei prin apropierea de punctul izoelectric, cu formarea unei rețele tridimensionale mai compacte și, implicit, o consistență mai densă. În plus, tulpinile cu potențial ridicat de sinteză de exopolizaharide (EPS) pot crește vâscozitatea fazei serice, îmbunătățind retenția de apă și reducând sinereza; astfel, diferențele inter-tulpină se pot reflecta direct în fermitatea gelului și stabilitatea texturii pe parcursul păstrării.

Raportul de inoculare influențează atât cinetica acidifierii, cât și echilibrul dintre proteoliză, producerea de compuși volatili și formarea microstructurii. Un raport 3:1 (dominant în favoarea culturii cu multiplicare inițială mai rapidă) poate asigura o scădere controlată a pH-ului în primele ore, urmată de o maturare acidă adecvată, evitând supra-acidifierea și slăbirea rețelei gelului. În consecință, raportul 3:1 a favorizat dezvoltarea optimă a texturii și atingerea unei acidități finale echilibrate, compatibile cu o percepție senzorială plăcută (gust acrișor moderat, corp consistent) și cu cerințele de calitate microbiologică ale produsului.

Evaluarea caracteristicilor organoleptice

Evaluarea organoleptică a fost realizată prin degustare de către o comisie de specialiști, utilizând o fișă standardizată și o scală de punctaj, în care au fost apreciate aspectul, consistența, gustul, mirosul și percepția acidității. O astfel de abordare este relevantă deoarece parametrii senzoriali la iaurt sunt strâns corelați cu procesele biochimice ale fermentației: scăderea pH-ului și creșterea acidității determină coagularea cazeinei și formarea gelului, iar metabolismul culturilor starter generează compuși volatili (în special acetaldehidă, diacetil, acizi organici) responsabili de aroma tipică. În plus, proprietățile de textură (fermitate, cremozitate, absența sinerezei) reflectă microstructura rețelei proteice și capacitatea acesteia de a reține apa, influențate de viteza acidifierii, de proteoliză și, în anumite cazuri, de producerea de exopolizaharide de către tulpini.

Mostrele M1 și M5 au obținut cele mai bune scoruri senzoriale, fiind recomandate pentru producerea iaurturilor autohtone de calitate superioară.

Evaluarea caracteristicilor microbiologice

Analizele microbiologice au demonstrat un conținut ridicat de bacterii lactice vii (7×10^8 UFC/mL), ceea ce indică o cultură starter viabilă și o fermentație desfășurată eficient. Din punct de vedere tehnologic, un nivel de ordinul 10^8 UFC/mL este specific produselor lactate fermentate bine maturate și reflectă capacitatea tulpinilor de a se multiplica în matricea lactată, de a metaboliza lactoză și de a susține acidifierea până la valorile-țintă de pH/aciditate. O populație ridicată de bacterii lactice contribuie direct la stabilitatea microbiologică a produsului prin competiție pentru nutrienți și spațiu, precum și prin formarea de metaboliți inhibitori (acid lactic, acizi organici, eventual bacteriocine), reducând probabilitatea proliferării microflorei nedorite pe durata păstrării.

Din perspectiva funcționalității, menținerea unui număr mare de celule vii este un criteriu relevant deoarece efectele benefice atribuite produselor cu culturi vii (susținerea echilibrului microbiotei intestinale, efecte imunomodulatoare și metabolice) sunt condiționate de administrarea unei doze suficiente de microorganisme viabile. În consecință, valoarea de 7×10^8 UFC/mL sugerează un potențial probiotic/funcțional bun, cu condiția ca viabilitatea să se mențină până la

sfârșitul termenului de valabilitate și ca tulpinile utilizate să fie identificate și caracterizate corespunzător (siguranță, stabilitate, toleranță la acid și săruri biliare, absența genelor de rezistență transferabile).

În plus, concordanța cu cerințele normative privind încărcătura minimă de bacterii lactice în produsele fermentate confirmă conformitatea lotului atât din punct de vedere al calității microbiologice, cât și al consistenței procesului tehnologic (inoculare adecvată, regim termic corect, igienă și răcire rapidă după atingerea acidității finale). Pentru consolidarea concluziei, este recomandabilă raportarea simultană a pH-ului/acidității titrabile și a absenței indicatorilor de contaminare (coliformi, drojdii și mucegaiuri) în aceeași etapă de evaluare. [5, p. 78].

Concluzii

Studiul a demonstrat că utilizarea culturilor bacteriene autohtone permite obținerea iaurturilor din lapte de capră și lapte de vacă cu proprietăți organoleptice și microbiologice superioare. Toate mostrele analizate au respectat cerințele normative privind aspectul, consistența, aciditatea titrabilă și conținutul de bacterii lactice vii. Rezultatele evidențiază contribuția tulpinilor *Lactobacillus delbrueckii subsp. bulgaricus* și *Streptococcus thermophilus* la fermentație rapidă și la obținerea unei texturi dense și uniforme.

Cele mai bune scoruri organoleptice au fost obținute pentru mostrele M1 și M5, ceea ce indică faptul că selectarea tulpinilor autohtone și ajustarea raportului de inoculare influențează direct calitatea produsului final. Prin utilizarea culturilor locale se poate promova autenticitatea produselor lactate, crește valoarea lor nutrițională și funcțională și sprijini dezvoltarea tehnologiilor de bioproducție locale.

Pe termen lung, se recomandă investigarea influenței culturilor autohtone asupra conținutului de peptide bioactive, proprietăților antioxidante și efectelor asupra sănătății intestinale, pentru a dezvolta iaurturi inovative cu valoare adăugată și caracter distinct local.

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ELABORAREA UNUI SORTIMENT DE BĂUTURI ACIDOLACTATE FUNCȚIONALE PE BAZĂ DE IAURT ȘI LAPTE FERMENTAT

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Abstract: This paper reports the development of a range of ready-to-drink fermented dairy beverages based on yogurt and fermented milk ("prostokvasha"), enriched with functional ingredients (probiotics, prebiotics, vitamins), fruit/berry fillings, and stabilizers to ensure texture stability. Product classification principles, indicative formulations (percentages and grams for 2 L batches), and processing regimes including thermization are described. Quality control was performed using a set of sensory, physicochemical, and microbiological indicators. Shelf-life assessment under refrigerated storage is outlined, incorporating a safety reserve coefficient for highly perishable products to support standard and technological documentation.

Cuvinte-cheie: băuturi acidolactate, iaurt de băut, bifidobacterii, lactuloză, termizare, indicatori de calitate, termen de valabilitate.

Introducere

Băuturile acidolactate reprezintă o categorie de produse cu consum frecvent, în care valoarea nutritivă a bazei lactate poate fi completată prin adaosuri cu rol fiziologic (probiotice/prebiotice) și componente care îmbunătățesc acceptabilitatea senzorială (sucuri, concentrate, siropuri, arome). În dezvoltarea sortimentului, o cerință practică importantă este păstrarea unei microflore viabile la niveluri ridicate (ordine de 10^7 celule/g), concomitent cu asigurarea siguranței microbiologice și a stabilității fizico-chimice pe durata depozitării [1-4].

În lucrarea de față, dezvoltarea sortimentului a fost organizată ca activitate tehnologică aplicată: (i) precizarea tipurilor de băuturi în funcție de baza acidolactată și adaosuri, (ii) formularea rețetelor și a fluxului de fabricație pentru loturi experimentale, (iii) controlul calității prin indicatori standardizați, și (iv) proiectarea evaluării termenului de valabilitate în regim de refrigerare.

Scopul cercetării a constat în elaborarea și testarea unui sortiment de băuturi acidolactate pe bază de iaurt și lapte fermentat „prostocvașa”, cu adaosuri funcționale și umpluturi de fructe/pomuoare, urmate de determinarea indicilor de calitate și proiectarea termenului de valabilitate, în vederea fundamentării documentației tehnologice.

Obiective operaționale:

- precizarea sortimentului și producerea lotului experimental;
- determinarea indicilor organoleptici, fizico-chimici și microbiologici;
- evaluarea termenului de valabilitate în condiții de refrigerare;
- sistematizarea rezultatelor pentru elaborarea documentelor normative (standard/instrucțiune tehnologică).

Materiale și metode

Principii de clasificare a sortimentului

Sortimentul a fost structurat după trei criterii:

- A) după baza acidolactată: (1) pe bază de iaurt; (2) pe bază de „prostocvașa”;
- B) după adaosuri: probiotice (bifidobacterii), prebiotice (lactuloză), sinbiotice (bifidobacterii + lactuloză), vitaminizate (A, C, D, E/ β -caroten), cu umpluturi din fructe/pomuoare;
- C) după tehnologia de producere: netermizate vs termizate.

Materii prime și aditivi funcționali

În calitate de probiotic s-au utilizat bifidobacterii, iar ca prebiotic – lactuloză (preparat farmaceutic), cu o doză optimă indicată de 0,175 g/100 g produs.

Pentru vitaminizare s-a utilizat β -caroten; aromatizantii și stabilizatorii au fost selectați pentru reducerea riscului de coagulare a proteinelor la amestecarea bazei lactate cu umpluturile acide și pentru extinderea stabilității în depozitare.

Obținerea bazei acidolactate

Iaurtul a fost preparat pe bază de lapte praf degresat, cu parametri de referință: substanță uscată ~13% și aciditate ~122°T. „Prostocvașa” a fost preparată din lapte pasteurizat 2,5% grăsime, cu substanță uscată ~10% și aciditate ~67°T; ca maia s-a utilizat o tulpină de *Streptococcus thermophilus* izolată și cultivată în laborator.

Elaborarea umpluturilor din fructe/pomușoare

Au fost dezvoltate umpluturi tip sirop pe bază de concentrate/sucuri și sisteme de stabilizare, cu încălzire la 80–90°C, menținere câteva minute și evaporare până la 55–60% substanță uscată; pH-ul a fost ajustat, după necesitate, spre ~3,8.

Mostre experimentale și regimuri tehnologice (netermizat/termizat)

Au fost descrise 10 mostre reprezentative (№1–№10), incluzând variante cu concentrat de mere, sucuri (măr/vișină), umpluturi stabilizate, cacao, combinații cu bifidobacterii și/sau lactuloză și opțional vitaminizare/aromatizare.

Mostrele netermizate au fost obținute fără prelucrare termică finală, menținând încărcături de microfloră vie în intervalul 10^7 – 10^9 UFC/g. Mostrele termizate au inclus pasteurizarea produsului finit la 72–74°C timp de 5–10 min.

Metode de analiză a calității

Indicatorii organoleptici au inclus: aspect/consistență, gust/miros, culoare (conform standardelor în vigoare).

Indicatorii fizico-chimici au inclus: fracția masică de grăsime, substanță uscată, zaharoză, aciditate titrabilă (°T), pH, eficacitatea pasteurizării (fosfatază), temperatura produsului.

Indicatorii microbiologici au inclus: număr de microorganisme acidolactice vii (UFC/g), bacterii coliforme, *Staphylococcus aureus*, *Salmonella* (în 25 g), *Proteus*, drojdii și micete.

Proiectarea evaluării termenului de valabilitate

Mostrele au fost depozitate la 6°C și 9°C. Necesitatea includerii unei temperaturi mai înalte a fost justificată prin riscul întreruperii lanțului frigorific în distribuție. A fost utilizat un coeficient de rezervă 1,3 pentru produse ușor alterabile, extinzând punctele de control (ex.: 15 zile $\times$ 1,3 = 20 zile; 30 zile $\times$ 1,3 = 39 zile) și stabilind un număr de 5 puncte de control.

Rezultate și discuție

Sortimentul rezultat și raționamentul funcțional

Sortimentul a inclus băuturi pe bază de iaurt cu adaosuri distincte: (i) probiotice (bifidobacterii), (ii) prebiotice (lactuloză), (iii) sinbiotice (bifidobacterii + lactuloză), (iv) vitaminizate, (v) cu umpluturi din fructe/pomușoare, inclusiv în formă de sisteme stabilizate (siropuri) prezentate în figura 1.



Fig.1 Mostre experimentale de băuturi pe bază de iaurt (Elaborat de autor)

Abordarea permite obținerea de produse netermizate cu microfloră viabilă ridicată (ordin 10^7 – 10^9 UFC/g), dar impune control strict al contaminanților și al stabilității coloidale; pentru alternative

cu stabilitate mai mare, termizarea finală reduce semnificativ microflora vie (ordin 10^2 UFC/g, conform datelor exemplificate), cu impact direct asupra poziționării funcționale a produsului.

Exemplu de rețetă pentru băutura acidolactată pe bază de iaurt

Tabelul 1. Reetă pentru băutură pe bază de iaurt cu concentrat de mere, bifidobacterii și lactuloză

Component	%	g / 2 L
Iaurt negras	50,0	1000,0
Concentrat din fructe (legume) 70% (din mere, SA „Orhei-Vit”)	6,0	120,0
Zahăr	7,5	150,0
Stabilizator GDL (firma „HAHN”, Germania)	0,6	12,0
Bifidobacterii	—	—
Lactuloza (preparat „Imoper”, Bulgaria)	0,175	3,5
Apă 85°C	5,0	100,0
Apă	30,725	614,5

Pentru o băutură pe bază de iaurt cu concentrat de mere, bifidobacterii și lactuloză (netermizată), rețeta orientativă pentru 2 L include: 1000 g iaurt bază (50%), 120 g concentrat de mere 70% SU (6%), 150 g zahăr (7,5%), 12 g stabilizator (0,6%), lactuloză 3,5 g (0,175%), apă la 85°C 100 g (5%) și rest apă până la 2000 g.

Această structură este relevantă pentru standardizarea rețetelor în condiții de laborator și pentru extrapolare la loturi pilot, cu mențiunea că dozele pentru unele componente (arome, vitamine, bifidobacterii) pot fi stabilite conform recomandărilor producătorilor, datorită cantităților mici de dozare.

Indicatori de calitate

Pentru o mostră pe bază de iaurt cu concentrat de mere, bifidobacterii și lactuloză (netermizată), au fost raportate caracteristici organoleptice de masă omogenă, gust acidolactic curat cu aromă de mere, culoare crem uniformă; parametri fizico-chimici exemplificați: substanță uscată 18,8%, zaharoză 10,5%, aciditate 101°T , pH ~4,0; indicatori microbiologici: 1×10^7 UFC/g, cu absența coliformilor, *S. aureus*, *Salmonella*, *Proteus*, drojdiilor și micetelor în probele analizate (Tabelul 2).

Acest profil indică fezabilitatea combinării bazei acidolactate cu umpluturi de fructe și adaosuri funcționale fără compromiterea siguranței microbiologice, în condițiile respectării igienei, a materiilor prime conforme și a temperaturilor de păstrare.

Tabelul 2. Indicatori microbiologici ale mostrelor

Mostra	Bact.lact (UFC/g)	Coliformi (0,01 g)	S. aureus (1 g)	Salmonella (25 g)	Proteus (1 g)	Drojdi (1 g)	Micete (1 g)
№1	1×10^7	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat
№2	1×10^2	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat
№3	1×10^7	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat
№4	1×10^8	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat
№5	1×10^7	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat	Nu s-a depistat

Relația dintre doi indicatori esențiali ai fermentației și ai calității produsului: pH (aciditate activă) și aciditatea titrabilă ($^{\circ}\text{T}$, aciditate totală) este prezentată pe figura 2.

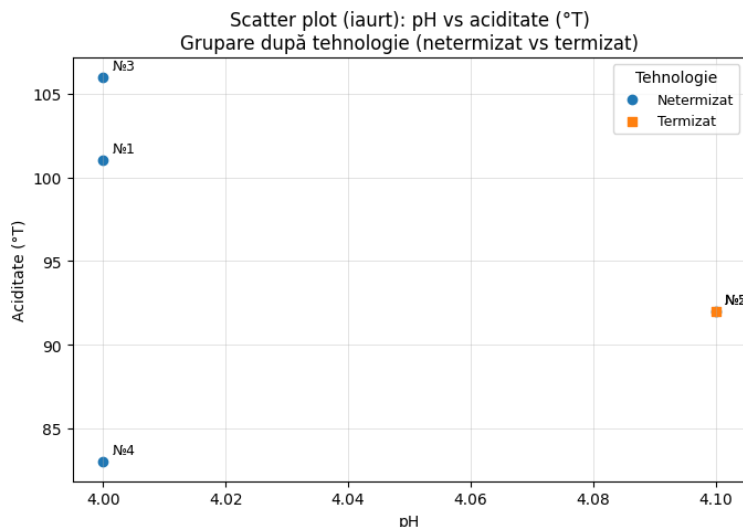


Figura 2. Diagramă de dispersie pentru 5 mostre de băutură pe bază de iaurt

Figura 2 prezintă relația dintre pH (aciditate activă) și aciditatea titrabilă ($^{\circ}\text{T}$) pentru 5 mostre de băutură pe bază de iaurt, diferențiate după tehnologie (netermizat vs termizat). Valorile pH sunt apropiate (4,0–4,1), în timp ce aciditatea titrabilă variază mai amplu (83–106 $^{\circ}\text{T}$), indicând diferențe ale cantității totale de acizi și ale capacității tampon a matricei. Mostrele netermizate se grupează la pH ~4,0, însă se separă pe axa $^{\circ}\text{T}$, cu maxima la mostra №3 și minima la №4. Mostra termizată (№2) se poziționează la pH 4,1 și 92 $^{\circ}\text{T}$, sugerând un profil acid moderat comparativ cu mostrele cu aciditate ridicată.

Stabilitate și control pe durata depozitării

Schema de control periodic propusă (puncte la 0, 5, 10, 15, 20 zile pentru netermizate și 0, 10, 20, 30, 39 zile pentru termizate) reflectă un design pragmatic de monitorizare, corelat cu termenul recomandat și cu aplicarea coeficientului de rezervă 1,3.

Separarea loturilor la 6 $^{\circ}\text{C}$ și 9 $^{\circ}\text{C}$ asigură evaluarea atât în condiții ideale de refrigerare, cât și în scenarii de risc (întreruperi ale lanțului frigorific), care pot accelera procesele de alterare.

Lapte fermentat ca matrice pentru “gut health”. Literatura recentă indică faptul că produsele lactate fermentate (iaurt, lapte fermentat, chefir etc.) pot influența pozitiv simptome gastrointestinale și biomarkeri asociați sănătății intestinale (inflamație, integritate de barieră, SCFA, microbiotă), fără a raporta efecte dăunătoare în studiile evaluate; însă magnitudinea efectului depinde de populația țintă și de designul studiilor [5].

Rolul fructelor/pomuoarelor: diferențiere senzorială + argument funcțional (moderat). Recenziile despre “functional yogurt” arată că adaosurile (fructe, fibre, culturi probiotice, vitamine/minerale) sunt utilizate pentru a extinde portofoliul și pentru a ținti beneficii percepute (digestie, aport de compuși bioactivi) [6].

Introducerea în practică a acestei tehnologii va permite extinderea sortimentului de băuturi acidolactate prin combinarea controlată a bazei fermentate cu umpluturi din fructe/pomuoare și ingrediente funcționale, adaptate preferințelor diferitelor segmente de consumatori. Standardizarea rețetelor și a regimurilor tehnologice va îmbunătăți reproductibilitatea loturilor și va reduce variația calității, ceea ce simplifică tranziția de la laborator la producție pilot/industrială. Implementarea setului de indicatori senzoriali, fizico-chimici și microbiologici va crește siguranța produselor și va asigura conformitatea cu cerințele de control al calității pe întreg termenul de valabilitate. Diferențierea liniilor netermizate și termizate va permite balansarea între menținerea microflorei viabile (pentru produse funcționale) și stabilitatea sporită la distribuție (pentru produse tratate termic). În ansamblu, tehnologia poate genera produse cu valoare adăugată și competitivitate mai bună pe



piață, cu premise pentru comunicarea responsabilă a beneficiilor în limitele dovezilor științifice și ale cadrului de reglementare.

Concluzii

A fost elaborat un sortiment de băuturi acidolactate pe bază de iaurt, clasificat după baza lactată, adaosuri (probiotice/prebiotice/sinbiotice/vitamine/umpluturi) și tehnologie (netermizat/termizat). Rețetele orientative și regimurile tehnologice (inclusiv termizarea 72–74°C, 5–10 min) permit reproducerea loturilor experimentale și tranziția la documentație tehnologică standardizată. Setul de indicatori organoleptici, fizico-chimici și microbiologici aplicat oferă un cadru complet pentru controlul calității și siguranței produselor. Proiectarea evaluării termenului de valabilitate prin depozitare la 6°C și 9°C, cu utilizarea coeficientului de rezervă 1,3 și puncte de control multiple, crește robustețea estimării stabilității în condiții de distribuție reală.

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АНАЛИЗ ЛАКТАЦИОННЫХ МАРКЕРОВ ПРОДУКТИВНОСТИ КОРОВ В ЮЖНОЙ ЗОНЕ РЕСПУБЛИКИ МОЛДОВА

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Summary. This research provides a comprehensive analysis of the dairy sector in the southern

zone of the Republic of Moldova 2010 to 2024. Despite a national decline in cattle population, the region has demonstrated successful intensification, with milk yields increasing from 3,886 kg to 8,340 kg per cow. The study utilizes two key biological markers: Milkiness Coefficient (MC): Highlighting that cows in top-tier breeding farms produce up to 1,482 kg of milk per 100 kg of body weight, indicating excellent feed-to-milk conversion. Lactation Completeness Coefficient (LCC): Revealing high stability in milk production (over 94%) in specialized farms, which proves the successful adaptation of imported Holstein genetics to the local heat stress conditions. The findings reveal a significant efficiency gap between elite breeding centers and smaller commercial farms. The authors propose integrating these lactation markers into annual breeding evaluations to improve the genetic core and economic sustainability of the regional dairy industry.

Key words: Cow, Lactation, Productivity.

Введение

Эффективность молочного скотоводства в значительной степени определяется способностью животных реализовывать свой генетический потенциал в конкретных условиях кормления, содержания и эксплуатации. В условиях интенсификации отрасли особую актуальность приобретает не только абсолютная величина удоя, но и показатели, характеризующие биологическую и экономическую эффективность животных, их продуктивное долголетие и устойчивость лактационной функции. [2; 4]

Одним из информативных инструментов комплексной оценки молочной продуктивности коров является мониторинг лактационных коэффициентов, в частности коэффициента молочности и коэффициента полноценности лактации. Данные показатели позволяют оценить соотношение живой массы и уровня продуктивности, а также стабильность синтеза молока в течение лактационного периода, что имеет важное значение для селекционно-племенной работы и управления стадом. [3;5]

В этой связи актуальной является оценка лактационной деятельности коров в хозяйствах различных категорий АТО Гагаузия с учётом возрастной динамики и уровня продуктивности.

Материал и методика исследований

Исследования проводились на базе молочнотоварных ферм и племенных репродукторов АТО Гагаузия, а также в хозяйствах соседствующего региона. Материалом исследований послужили данные первичного зоотехнического и племенного учёта (племенные карточки коров, Formularul T-2), а также сведения региональной и республиканской статистической отчётности.[1]

Объектом исследований являлись коровы чистопородной голштинской породы в племенных репродукторах и голштинизированные коровы товарных хозяйств.

Целью исследований являлась комплексная оценка молочной продуктивности и характера лактационной деятельности коров в разрезе трёх последовательных лактаций.

Для достижения поставленной цели были определены следующие задачи:

- изучить лактационную полноценность коров по периодам лактации;
- проанализировать возрастную динамику удоев и оценить молочную продуктивность за лактацию;
- исследовать характер лактационной деятельности коров по лактационным периодам в трёх последовательных лактациях.

Результаты исследований и их обсуждение

Проведённый анализ полученных данных свидетельствует о высоком лактационном потенциале молочного скота исследуемого региона и положительной динамике основных показателей продуктивности.

Таблица 1. Динамика изменения поголовья и удоя коров
в Р. Молдова и АТО Гагаузия*

Года	Р. Молдова		АТО Гагаузия	
	голов	удой, кг	голов	удой, кг
2010	161195	2993	3746	3886
2015	130274	3478	3478	5305
2020	81052	3579	2610	6393
2021	71256	3812	2313	4752
2022	68400	3478	2267	5159
2023	67100	3605	2567	5926
2024	63100	5048	2604	8340

*По материалам, Statistica. md

Мониторинг поголовья коров и их продуктивности (табл. 1) показал, что на фоне общереспубликанского сокращения массива молочного скота в 2,5 раза в АТО Гагаузия сохраняется относительная стабильность численности животных, сопровождаемая выраженным ростом их продуктивности. К 2024 году средний удой в хозяйствах автономии достиг 8340 кг, что в 1,65 раза превышает средний показатель по Республике Молдова (5048 кг).

Накопленный за пятилетний период исследовательский материал в разрезе лактаций позволил в полной мере реализовать цель и задачи настоящего исследования и провести детальную оценку продуктивных качеств коров.

Таблица 2. Возрастная динамика среднегодовых удоев и живой массы коров

Предприятие	статус	Номер лактация	Удой за 305 дней	Живая масса, кг	Коэффициент молочности, кг
Doxsancom	племенной	I	9100	650	1400
		II	9700	690	1406
		III	10822	730	1482
		среднее	9874	690	1431
SRL „GÖMERT EFREM”	племенной	I	8103	590	1373
		II	8317	630	1320
		III	8418	680	1238
		среднее	8279	633	1308
SRL «Anatoli grup»	товарный	I	4171	428	975
		II	4739	476	996
		III	4867	517	941
		среднее	4592	474	971
CAP „Elita Alexandrfeld”	товарный	I	4248	537	791
		II	4680	570	821
		III	5215	605	862
		среднее	4714	571	826

Для анализа лактационного потенциала и биологической эффективности синтеза молока был рассчитан удой на 100 кг живой массы — коэффициент молочности (табл. 2) по формуле: $KM = (Y \times 100) / ЖМ$, где Y — удой за лактацию, кг; $ЖМ$ — живая масса коров, кг [6].

Оценка коэффициента молочности выявила выраженные различия между категориями хозяйств. В племенном репродукторе Doxsancom среднее значение КМ составило 1431 кг, достигая максимума у коров III лактации — 1482 кг, что свидетельствует о высокой биологической и продукционной эффективности животных. В племенном хозяйстве GÖMERT EFREM данный показатель также находился на высоком уровне — 1308 кг.

Вместе с тем на товарных фермах (SRL «Anatoli grup», CAP «Elita Alexandrfeld») коэффициент молочности был значительно ниже и варьировал в пределах 826–971 кг, что

указывает на менее эффективное использование биологического потенциала коров. Сравнительный анализ демонстрирует прямую зависимость между племенным статусом предприятия и достижением максимальных показателей коэффициента молочности (рис.1).

Предприятие (статус)	Средний КМ (кг)	Визуальный масштаб (эффективность)
Doxsancom (племенной)	1431	
GÖMERT EFREM (племенной)	1308	
Anatoli grup (товарный)	971	
Elita Alexandrfeld (товарный)	826	

Рис.1. Диаграмма коэффициента молочности лактации коров

Не менее важным показателем устойчивости лактационной функции у высокопродуктивных коров является коэффициент полноценности лактации (КПцЛ), который рассчитывался по формуле:

$\text{КПцЛ} = (\text{удой за 305 дней лактации} / (\text{высший месячный удой} \times \text{число месяцев лактации})) \times 100 \%, [5]$

где КПцЛ — коэффициент полноценности лактации, %.

Таблица 3. Динамика коэффициента полноценности лактации

Предприятие	Показатель	I лактация	II лактация	III лактация	Сред. за 3 лакт.
Doxsancom	Надой за 305 дней лактации, кг	9100	9700	10822	9874
	Выс. мес. удой, кг	970	1031	1137	1046
	КПцЛ	93,80	94,05	95,13	94,40
SRL „GÖMERT EFREM”	Надой за 305 дней лактации, кг	8103	8317	8418	8279
	Выс. мес. удой, кг	861	889	885	878
	КПцЛ	94,11	93,55	95,12	94,29
SRL«Anatoli grup»	Надой за 305 дней лактации, кг	4171	4739	4867	4592
	Выс. мес. удой, кг	525	571	598	565
	КПцЛ	79,5	83,0	81,4	81,3
CAP „Elita Alexandrfeld”	Надой за 305 дней лактации, кг	4248	4680	5215	4714
	Выс. мес. удой, кг	550	588	613	584
	КПцЛ	77,2	79,6	85,0	80,7

Анализ данных по коэффициенту полноценности лактации (табл. 3) показал, что в племенных хозяйствах данный показатель характеризуется высокими и стабильными значениями (94,3–94,4%), что свидетельствует о выраженной персистенности лактационной кривой(рис.2) и равномерности синтеза молока.

Хозяйство (тип)	КПцЛ (%)	Визуальный масштаб
Doxsancom (плем.)	94,4	
Gömert efrem (плем.)	94,3	
SRL Anatoli grup (МТФ)	81,3	
SAR Elita Alexandrfeld (МТФ)	80,7	

Рис.2. Диаграмма коэффициента полноценности лактации коров

На товарных фермах КПцЛ был существенно ниже и составил 80,7–81,3%, что указывает на наличие резервов повышения продуктивности за счёт оптимизации условий кормления, содержания и технологии доения.

Выводы

- Динамика продуктивности.** В АТО Гагаузия за период 2010–2024 гг. средний удой коров увеличился с 3886 до 8340 кг, что свидетельствует об успешной интенсификации молочного скотоводства в регионе.
- Биологическая эффективность.** Коровы племенных репродукторов характеризуются наивысшей способностью к трансформации кормов в продукцию, достигая коэффициента молочности 1482 кг на 100 кг живой массы к третьей лактации.
- Устойчивость лактации.** Стабильно высокие значения коэффициента полноценности лактации (более 94%) в племенных хозяйствах подтверждают успешную адаптацию голштинского генетического материала к климатическим и производственным условиям региона.
- Межхозяйственные различия.** Установлен существенный разрыв в эффективности использования лактационного потенциала между племенными и товарными хозяйствами, что указывает на необходимость технологической модернизации последних.

Предложения

- Рекомендовать хозяйствам АТО Гагаузия и соседствующих районов включить показатели коэффициента молочности и коэффициента полноценности лактации в систему ежегодной бонитировки коров для выявления наиболее адаптивных и экономически эффективных животных.
- Использовать уровень коэффициента полноценности лактации не ниже 94% в качестве целевого ориентира при оценке качества управления стадом в племенных хозяйствах.
- Активизировать процессы голштинизации и совершенствования технологии содержания на товарных фермах с целью повышения коэффициента молочности до уровня не менее 1100–1200 кг.

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ТЕРМОДИНАМИЧЕСКИЕ АСПЕКТЫ БИОСФЕРЫ И ПОЧВЫ

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Abstract. The article discusses such topics as thermodynamic theory of natural selection, negentropic and entropic spheres of the biosphere, maximization systems, negentropic and entropic abilities as a way to survive, two ways of determining soil energetic health, and energy theory of value.

Key words: biosphere, natural selection, thermodynamics, soil energetic health

Естественный отбор действует таким образом, чтобы увеличить общую массу органической системы(16). Для этого он создает новые виды и увеличивает уровень их организации(1), а также повышает синтез органического вещества всей обитаемой земной поверхностью путем заселения экониш максимальным количеством видов минимально конкурирующих друг с другом и комплементарные по поглощению жизненных факторов (18).

В 1880 году впервые высказывается идея о термодинамической природе естественного отбора, цит:“...мы должны получить такое видоизменение закона борьбы за существование, где количество энергии заключающейся в каких-либо произведениях природы, систематически и потому с успехом увеличивалось бы при одновременном сохранении этой энергии от рассеяния...”(2).

В последствии борьба за существование была представлена как борьба за свободную энергию поступающая от солнца (8), а естественный отбор как стремление повысить поток энергии через систему, в котором преимущество имеют организмы максимизирующие ее течение (16).

Важным вкладом в термодинамику стали открытия энтропии - процесса означающий необратимое рассеивание энергии и невозможность выполнения работы всей энергией системы в силу различных ее потерь(12), и отрицательной энтропии, которая является процессом сбора свободной энергии и указывает на меру упорядоченности системы (23). Позже отрицательная энтропия была названа негативной энтропией или негэнтропией (10).

Создание упорядоченности и повышение собственной организации свойственно всем организмам, но с той разницей, что для автотрофов (растений и зеленых бактерий) мощным источником отрицательной энтропии является солнечный свет, а для гетеротрофов (консументов и редуцентов) упорядоченное состояние биологической материи, которую они расщепляют и извлекают энергию и вещество для своей жизнедеятельности (23)

В биосфере существуют следующие энергии:

1. Свободная энергия солнца.
2. Энергия живого и мертвого органического вещества биосферры или энергия биосферы не обладающая сознанием
3. Антропная энергия - энергия биосферы обладающая сознанием или физическая и умственная энергия человека

4. Антропогенная энергия - электрическая энергия, кинетическая энергия транспорта и энергия тепла используемая для обогрева получаемые из энергии солнца, от сжигания органического вещества участвующего (древесина, биотопливо) и не участвующего (ископаемые углеводороды) в круговороте веществ биосферы, термоядерного управляемого распада вещества и др.

В настоящее время известны и общепризнанны три закона термодинамики. Первый из них гласит, что энергию нельзя ни создать ни уничтожить, второй - тепло переходит самопроизвольно от более горячего предмета к более холодному и никогда в обратном направлении и третий – нижний предел температуры возможный во Вселенной (абсолютный ноль) равняется – 273,15 °С, при которой молекулы перестают двигаться, что является показателем отсутствия у них энтропии. В результате изучения естественного отбора и биосферы как термодинамических процессов были предложены еще три закона термодинамики пока не получившие всеобщего признания. Четвёртый закон утверждает, что конкуренцию среди самоорганизующихся процессов, выигрывают сетевые конструкции которые максимизируют мощность (20), пятый - энергетические потоки Вселенной организованы в иерархии преобразования энергии (20) и шестой - в процессе деградации энергии количество материального потока на каждом уровне также уменьшается (21).

Биосфера как открытая термодинамическая система состоит из двух энергетических сфер соединенных трофическими связями. Негэнтропийную сферу образуют автотрофы аккумулирующие солнечную энергию и тем самым относящиеся к биологическим системам осуществляющие свою жизнедеятельность в направлении противоположном от действия второго закона термодинамики. Энтропийную сферу формируют гетеротрофы освобождающие солнечную энергию и поэтому действующие в соответствии со вторым законом термодинамики. Для достижения состояния максимального течения энергии через биосферу отмеченные сферы также стремятся к максимизации ее движения. Для этого как автотрофные, так и гетеротрофные системы максимизируют собственную негэнтропийность - способность захватывать и удерживать энергию и энтропийность - способность ее освобождать в процессе своей жизнедеятельности. У природы нет целей, и поэтому нельзя допустить, что биосфера была создана ради обеспечения второй энтропии после первого освобождения энергии из вещества в солнце. Думается, что смысл эволюции заключается в максимизации удержания энергии, что ведет к максимизации массы системы и ее структурному и функциональному развитию. Однако, в любом случае в условиях локальной одинаковости факторов среды больший шанс на выживание имеют системы, которые достигают максимизации отмеченных процессов при меньшем потреблении свободной энергии солнца или меньших затратах времени.

Движение энергии в биосфере происходит в виде энергетической пирамиды у основания которой находятся продуценты собирающие энергию, затем следуют консументы 1 и 2, а над ними располагаются редуценты, которые ее освобождают. В соответствии с Законом 10 %, на каждом трофическом уровне теряется до 90 % энергии (15). Кроме этого, живые организмы, согласно Общей Теории Систем, обмениваются с средой не только энергией, но также веществом и информацией (3,5).

Отдельную сферу в биосфере представляет собой антропосфера. Она охватывает область земного шара, которая находится под влиянием человека и состоит из массы людей, антропогенных систем, сельскохозяйственных культур и животных. Исследования проведенные в 2020 году показали, что масса антропогенных систем равна 1,1 триллионов тонн, что примерно соответствует массе всех живых организмов биосферы и она удваивается каждые 20 лет (13).

Антропосфера это естественная часть биосферы, результат ее эволюции, и она всегда, в большей или меньшей степени влияет на ее. Современная биосфера это то, как выглядит доантропогенная биосфера, в которой осуществляет свою деятельность антропосфера.

Взаимоотношение между биосферными неразумными, биосферными разумными и антропогенными системами в биосфере происходит на вещественном уровне, но двигаемые своими энергиями. Отмеченные энергии не образуют единую энергетическую цепь и эта их энергетическая обособленность является источником антагонизма между ними. Хотя есть и исключения когда антропогенная энергия входит в трофические цепи биосферы через фотоны, которых продуцируют электрические лампы при выращивании растений в теплицах. Общим свойством отмеченных энергий является то, что они не образуют круговорот, а покидают поверхность земли в форме тепла после выполнения своих функций, в отличие от вещества, который остается на планете и подвержен круговороту.

Антропосфера это место где сходятся энергии всех трех систем. По своей природе биосферная энергия не обладающая сознанием является мягкой энергией двигающаяся по трофическим цепям медленно выбирая пути увеличивающие скорость и объем ее движения из существующих или эволюционируя новые возможности. Биосферная энергия обладающая сознанием получает энергию из трофических цепей биосферы, но действует самостоятельно. При этом результаты ее сознательной деятельности в виде научных открытий, выдающихся агрономических и инженерных решений, гениальных произведений искусства и литературы не коррелируют с количеством потребленной и потраченной биологической энергии, и происходит по своим, пока не познанным законам. Антропогенная энергия осуществляет свою деятельность с целью, для реализации которой она создает антропогенные системы и антропогенные энергетические цепи. Антропогенная энергия, в свою очередь, по характеру действия является энтропийной и полностью подчиняется второму закону термодинамики.

Биосфера располагается в трех сферах - в атмосфере, литосфере и гидросфере и в каждой из них образовались и действуют внутри - и межсферные трофические цепи. Согласно гипотезе Гея, живые организмы адаптируют среду обитания для своих нужд. Кроме того, цит: "существа, которые улучшают окружающую среду для своего выживания, чувствуют себя лучше, чем те, которые наносят ей вред" (17), то есть выигрывают борьбу за выживание. Результатом адаптации верхнего слоя литосферы для жизнедеятельности живых организмов стало образование педосферы (почвы). Другим итогом приспособления живыми организмами окружающей среды для своих потребностей, по утверждению отмеченной гипотезе, является повышение содержания кислорода и снижение углекислого газа в атмосфере и сохранение их на современном уровне. В отмеченном контексте атмосфера, представляющая собой сферу газов, приобретает негэнтропийный характер, поскольку увеличение солнечным теплом числа состояний ее молекул способствует прохождению химических процессов в живых организмах не нарушая их упорядоченности (10), что отличает ее от газов статистической энтропии согласно которой энергия поступающая в систему извне, является энтропией (9), так как она повышает число состояний молекул, но не осуществляет никакую работу.

Почва является термодинамически открытой системой, в которую поступает лучистая энергия солнца по трофическим цепям биосферы и тепло молекулами воздуха. Заключительную ступень в трофических цепях образуют аэробные микроорганизмы, которые осуществляют полное разделение органического вещества на энергию, углерод и неорганическое вещество. Первые два компонента покидают почву, а третий остается в ней и служит питанием для растений. Этот процесс известен как минерализация. Однако когда в почву не проникает кислород, то трофическая цепь "обрывается", аэробные микроорганизмы перестают работать и начинают функционировать анаэробные, которые не полностью разлагают органическое вещество. Более того, они связывают его с механическими частицами почвы и таким образом образуют гумус, а сам этот процесс называется гумификацией.

Энергию почвы образуют энергии содержащиеся в гумусе, мертвом и живом органическом веществе. Вместе с тем, почва может удержать только определенное количество энергии, что зависит в первую очередь от ее механического состава. Природным регулятором отмеченного процесса является механизм минерализации-гумификации, который при повышенном поступлении кислорода в почву вследствие легкого гранулометрического состава интенсивно

освобождает энергию, а в случае тяжелого механического состава уменьшает скорость ее выхода из органического вещества. Так например, известно, что тучные черноземы характеризуются тяжелым гранулометрическим составом, в итоге процессы гумификации сформировали в этих почвах 9—15 % гумуса. Песчаные почвы, наоборот, характеризуются легким гранулометрическим составом и как результат в них содержится не более 1,0 % гумуса.

Ухудшение качества почвы состоит в разрушении ее органического вещества и в водной и ветровой эрозии (22). В связи с отмеченным в последние 20-30 лет активно обсуждается понятие здоровая почва. Он как термин, впервые упоминается в 1910 году в диссертации студента Университета штата Айова Henry A. Wallace, которая была посвящена важности гумуса, особенно получаемого из навоза, для поддержания здоровья почвы. В 1933 году президент Ф. Рузвельт назначил Henry A. Wallace Министром сельского хозяйства США, а в 1936 году отмеченное Министерство опубликовало доклад “Здоровье почвы и национальное богатство”, в котором, в том числе, указывается на роль живых организмов в формировании плодородия почвы и обеспечении сельскохозяйственных культур необходимыми питательными веществами (7).

За прошедшие 100 лет понятие здоровая почва эволюционировало и теперь существует более 20 ее определений предложенные в разное время. Одна из них гласит, что здоровая почва это непрерывная ее способность функционировать как жизненно важная живая экосистема, поддерживающая растения, животных и людей (25).

Признаками здоровой почвы является содержание в ней большого количества органического вещества, ее хорошая структура, водопроницаемая и водоудерживающая способность, устойчивость к уплотнению и эрозии, высокая биологическая активность, доступность питательных веществ для растений, отсутствие токсичных химических веществ и пониженное присутствие сорняков и болезней (4).

Близким понятием к здоровью почвы является качество почвы, которое определяется как ее способность функционировать в естественных и управляемых экосистемах, обеспечивая продуктивность растений и животных, сохраняя и улучшая качество воды и воздуха, и поддерживая их здоровье (14). Однако, поскольку оба отмеченных понятия характеризуются общими базовыми показателями, то в настоящее время различия между ними из области принципиальных перешли в область предпочтений (11).

Известный американский эколог Альдо Леопольда определил плодородие почвы как ее способность принимать, хранить и передавать биологическую энергию (19). Учитывая то, что органическое вещество содержит эквивалентное количество энергии, минеральных веществ и углерода, то можно определить и энергетическое здоровье почвы. Так, во-первых, ее показателем может служить содержание в почве такого количества биологической энергии при котором растения аккумулируют наибольшее количество солнечной энергии. Во-вторых, показателем энергетически здоровой почвы может служить содержание в ней биологической энергии относительно предельной энергоемкости конкретной почвы по схеме, чем ближе к ней, тем лучше. И поскольку каждая почва имеет свой предел энергоемкости, то каждая из них также обладает своим пределом энергетического здоровья.

В целом, здоровье почвы не следует рассматривать как технологию, а только как концепцию, которую нужно учитывать при принятии решений в управлении земельными ресурсами(24). И тем более, эту ее нельзя применять при установлении цены на землю при ее купле - продаже.

Наряду с концепцией здоровая почва, разное время были предложены и такие концепции как надо кормить почву, а не растения, живая почва, фертильная почва, изменено понятие земледелия с возделывания земли на делание земли, почва тоже имеет свои права, если мы будем кормить почву, она будет кормить нас, безопасная почва, которые посвящены одной и той же проблеме, привлекали и привлекают внимание общества к ней, но ни одна из них не стала инструментом способным остановить деградацию почв и накормить возрастающее население земного шара.

О связи почвы и здоровья человека было известно еще в начале человеческой цивилизации (6). В Библии говорится, что земля плохо качества это земля поедающая живущих на ней (Числа 13:33). В настоящее время здоровье почвы, растений, животных и человека рассматривается как единый и неделимый динамический процесс, а не состояние, поэтому нуждающиеся в постоянном поддержании (19), а с целью их интеграции между собой и с окружающей экосистемой Всемирная Организация Здравоохранения разработала концепцию единого здоровья (26).

Одним из самых сильных антропогенных потрясений для биосферы стало повышение ее температуры вследствие увеличения содержания углекислого и других парниковых газов в атмосфере поступающие из органического вещества не участвующего в круговороте и не входящего в баланс биосферы. Международным Энергетическим Агентством поставлена цель свести к нулю эмиссию парниковых газов к 2050 году и таким образом остановить нагревание нашей планеты. Для этого рекомендуется развивать энергетику, которая не приносит в атмосферу дополнительное количество вещества вызывающий парниковый эффект, например получаемые из возобновляемых источников, управляемого термоядерного распада и др. Кроме этого, во многих странах действует рынок торговли квотой углекислого и других парниковых газов. Экономические агенты поставляющие в атмосферу отмеченные газы получают квоту на их выброс. Предприятия, у которых выброс выше, могут увеличить свой лимит за счет покупки не использованной доли у других предприятий, но это ведет к повышению себестоимости производимой продукции, что в конечном счете снижает ее конкурентоспособность и вынуждает предприятие находить пути уменьшения выбросов парниковых газов. Осуществляется также секвестрация углерода - его улавливание из атмосферы фотосинтезом и длительным хранением в биомассе. Для этого восстанавливают и расширяют площади лесов, используют углеродное земледелие локализирующее органическое вещество в почве и др.

Существуют и другие концепции по снижению углерода в атмосфере. Например, концепция продовольственные мили призвана сократить расстояние между производителем и потребителем продовольствия и тем самым уменьшить выбросы парниковых газов осуществляемые транспортом. Концепция низкоуглеродная диета призывает употреблять преимущественно растительную пищу и минимализировать, вплоть до полного исключения из рациона говядину и молочные продукты, производство которых связано с повышенным выбросом одного из парниковых газов метана.

Вместе с тем, остановка нагревания и даже восстановление температурного режима земли не ликвидирует все последствия антропогенного воздействия на биосферу, и в частности на почву. Поэтому важным представляется принятие материального механизма сбалансированного управления ее энергиями. Основными предпосылками для этого являются следующие обстоятельства.

1. Антропогенная энергия способствуя накоплению солнечной энергии через с/х и лесоводческую деятельность, и создавая более комфортные условия жизни для человека оказывает прямое разрушающее действие на биосферу.

2. Существует обратная связь, когда изменение параметров биосферы под воздействием антропогенной энергии ведет к неэффективному и даже росту объемов ее использования как это наблюдается в с/х производстве.

3. Естественный отбор заложил в человеке, как и другим организмам, неосознанное стремление максимизировать течение биологической энергии и осознанное максимизировать течение антропогенной энергии.

4. Человек не обладает силой воли для добровольного отказа от стремления максимизировать течение антропогенной энергии.

5. Антропная энергия нуждается в смене своей этической парадигмы по отношению к биосфере с стремления максимизировать течение антропогенной энергии на ее гармонизацию



с биологической энергией посредством повышения их комплементарности и снижения конфликтности.

6. Материальным механизмом гармонизации энергий в биосфере могла бы стать разработка энергетической теории стоимости товара измеряемая в джоулях, в которой биосферная неразумная энергия находилась бы в обратной пропорциональности к биосферной разумной и антропогенной энергиям.

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ВЛИЯНИЕ НЕТРАДИЦИОННЫХ КОРМОВЫХ ДОБАВОК НА ОПТИМИЗАЦИЮ КОРМЛЕНИЯ КУР-НЕСУШЕК

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Abstract. The aim of the study was to evaluate the effects of non-traditional feed additives – peat additive (EG1) and feather meal (EG2) – on nutrient digestibility and utilization in laying hens. During the balance trial, feed intake and excreta output were recorded. Digestibility coefficients of dry matter, organic matter, crude protein, fat, and crude fiber were determined, along with the balance and utilization of nitrogen, calcium, and phosphorus. The results demonstrated that the feed additives had a positive effect on nutrient digestibility. Dry matter digestibility increased from $71.23 \pm 0.35\%$ in the control group to $72.34 \pm 0.42\%$ in EG1 and $73.08 \pm 0.32\%$ in EG2. Organic matter digestibility increased from $74.25 \pm 0.31\%$ to $76.10 \pm 0.37\%$ and $76.45 \pm 0.46\%$, respectively. Crude protein digestibility increased from $85.24 \pm 0.32\%$ in the control group to $87.26 \pm 0.34\%$ in EG1 and $86.03 \pm 0.41\%$ in EG2. Calcium utilization increased from $81.68 \pm 1.35\%$ to $84.65 \pm 1.28\%$ and $83.92 \pm 1.19\%$, while phosphorus utilization increased from $47.88 \pm 1.40\%$ to $53.94 \pm 1.48\%$ and $50.68 \pm 1.43\%$ in EG1 and EG2, respectively. Thus, the inclusion of peat additive and feather meal in the diet improved nutrient digestibility, enhanced nitrogen balance, and increased calcium and phosphorus utilization, thereby improving the biological value of the diet and the feeding efficiency of laying hens.

Key words: Laying Hens, Feed Digestibility, Nitrogen, Calcium, Phosphorus, Peat, Feather Meal, Feed Additives

Абстракт. Целью исследования было оценить влияние нетрадиционных кормовых добавок -торфяной добавки (ОГ1) и перьевой муки (ОГ2) - на переваримость и использование питательных веществ у кур-несушек. В ходе балансового опыта учитывали потребление корма и выделение экскрементов. Определяли коэффициенты переваримости сухого вещества, органического вещества, сырого протеина, жира и сырой клетчатки, а также баланс и

использование азота, кальция и фосфора. Результаты показали, что исследуемые кормовые добавки оказали положительное влияние на переваримость питательных веществ. Переваримость сухого вещества увеличилась с $71,23 \pm 0,35$ % в контрольной группе до $72,34 \pm 0,42$ % в ОГ1 и $73,08 \pm 0,32$ % в ОГ2. Переваримость органического вещества возросла с $74,25 \pm 0,31$ % до $76,10 \pm 0,37$ % и $76,45 \pm 0,46$ % соответственно. Переваримость сырого протеина увеличилась с $85,24 \pm 0,32$ % в контрольной группе до $87,26 \pm 0,34$ % в ОГ1 и $86,03 \pm 0,41$ % в ОГ2. Использование кальция повысилось с $81,68 \pm 1,35$ % до $84,65 \pm 1,28$ % и $83,92 \pm 1,19$ %, а использование фосфора - с $47,88 \pm 1,40$ % до $53,94 \pm 1,48$ % и $50,68 \pm 1,43$ % в группах ОГ1 и ОГ2 соответственно. Таким образом, включение торфяной добавки и перьевой муки в рацион способствовало улучшению переваримости питательных веществ, повышению азотистого баланса, а также более эффективному использованию кальция и фосфора, что привело к увеличению биологической ценности рациона и эффективности кормления кур-несушек.

Ключевые слова: куры-несушки, переваримость корма, азот, кальций, фосфор, торф, перьевая мука, кормовые добавки.

Введение

Рациональное кормление птицы является одним из ключевых факторов, обеспечивающих высокую продуктивность и стабильное физиологическое состояние. Переваримость питательных веществ и эффективность усвоения макроэлементов, в частности кальция и фосфора, оказывают непосредственное влияние на обмен веществ, рост, уровень продуктивности и качество продукции птицеводства [10,1].

В последние годы всё большее внимание уделяется исследованиям, направленным на определение переваримости и баланса питательных веществ кормов, поскольку данные показатели объективно отражают интенсивность обменных процессов в организме и позволяют научно обосновывать оптимизацию кормления птицы [3]. Особое значение имеют исследования усвоения кальция и фосфора, так как данные макроэлементы играют ведущую роль в процессах минерализации костной ткани, поддержании прочности скелета, формировании яйценоскости и регуляции метаболических процессов [2,7]. Недостаточное поступление кальция и фосфора с рационом может приводить к нарушениям минерального обмена, ослаблению костной системы и снижению продуктивных показателей, что обуславливает актуальность исследований их усвоения в условиях современного птицеводства.

Современные научные данные также свидетельствуют о том, что применение кормовых добавок способно существенно повышать переваримость питательных веществ и эффективность усвоения макроэлементов. Так, результаты балансных опытов с использованием инновационных кормовых добавок показали улучшение переваримости сухого вещества, сырого протеина и минеральных веществ у кур и кур-несушек по сравнению с контрольной группой [5].

В связи с этим изучение влияния нетрадиционных кормовых добавок, таких как торфяная и перьевая мука, на переваримость питательных веществ, а также на баланс и усвоение азота, кальция и фосфора, остаётся актуальной научной задачей. Полученные данные позволяют не только повысить эффективность использования кормовых ресурсов, но и способствуют укреплению здоровья и повышению продуктивности птицы, что имеет особое значение для устойчивого развития отрасли птицеводства.

Целью настоящего исследования являлась оценка влияния нетрадиционных кормовых добавок на коэффициенты переваримости рациона кур-несушек в условиях балансового опыта.

Материал и методы исследований

При проведении исследований на курах-несушках в условиях балансового опыта уровень поедаемости корма устанавливали на основании ежедневного учёта количества выданного комбикорма и массы несъеденных остатков.

Химический состав кормов определяли общепринятыми методами зоотехнического анализа: первоначальную влагу - методом высушивания навески корма в сушильном шкафу при температуре 65°C до постоянной массы; гигроскопическую влагу - высушиванием навески при температуре 100-105 °C до постоянной массы; содержание «сырой» золы - путём сжигания навески в муфельной печи при температуре 500-600 °C; «сырой» протеин - по методу Кьельдаля; «сырую» клетчатку - методом Геннеберга и Штомана с применением кипячения в слабых растворах кислот и щелочей; «сырой» жир - методом экстракции серноокислым эфиром в аппаратах Сокслета; содержание кальция - титриметрическим (трилонометрическим) методом; фосфора - колориметрическим методом.

По завершении экспериментального периода был проведён балансовый опыт по изучению переваримости и использования питательных веществ кормосмеси при включении в рацион нетрадиционных кормовых добавок [12].

Птицу содержали в индивидуальных клетках с сетчатым дном, под которыми размещались каркасы с полиэтиленовой плёнкой для сбора помёта. Поедаемость корма определяли ежедневно как разницу между количеством выданного комбикорма и массой остатка, одновременно учитывая количество выделенного помёта.

Пробы помёта собирали два раза в сутки, взвешивали и помещали в герметичные полиэтиленовые пакеты. Для предотвращения потерь азота пробы обрабатывали 0,1 н. раствором щавелевой кислоты из расчёта 2 мл на 50 г помёта; количество внесённой кислоты учитывали при определении первоначальной влаги. До проведения анализа пробы хранили в холодильнике.

Продолжительность балансового опыта составила 10 дней, из которых первые 7 дней служили адаптационным периодом, а последние 3 дня - учётным периодом для регистрации поедаемости корма и сбора помёта. Химический состав кормосмеси и помёта определяли по общепринятым методикам; содержание азота в кале - по методу М. И. Дьякова. Коэффициенты переваримости питательных веществ, а также балансы азота, кальция и фосфора рассчитывали по стандартным зоотехническим методикам.

Результаты исследований и их обсуждение

Переваримость питательных веществ у птицы определяется совокупностью взаимосвязанных факторов. К числу наиболее значимых относятся состав кормосмесей, содержание в них питательных веществ и кормовых добавок, возраст птицы, направление её продуктивности, физиологическое состояние, а также условия содержания и система управления кормлением.

Переваримость питательных веществ оценивают количественно как разницу между содержанием питательных веществ в съеденном корме и их количеством, выделенным с калом. Данный показатель отражает степень эффективности использования корма и является одним из ключевых критериев рационального кормления птицы.

Для выявления закономерностей обмена веществ в организме птицы широко применяется метод балансового опыта. В рамках данного метода птице скармливают строго взвешенное количество корма, систематически учитывают его поедаемость и объём выделенного помёта, после чего проводят анализ поступивших с кормом и выведенных с калом питательных веществ. Такой подход позволяет объективно оценить коэффициенты переваримости отдельных компонентов рациона, а также установить влияние различных факторов и кормовых добавок на усвояемость питательных веществ.

В проведённом исследовании установлено (таблица 1), что включение нетрадиционных кормовых добавок в рацион кур-несушек оказывает положительное влияние на переваримость питательных веществ комбикорма, что свидетельствует о повышении биологической ценности рациона и подтверждает целесообразность использования данных добавок для оптимизации кормления птицы.

Таблица 1. Схема научно-хозяйственного опыта

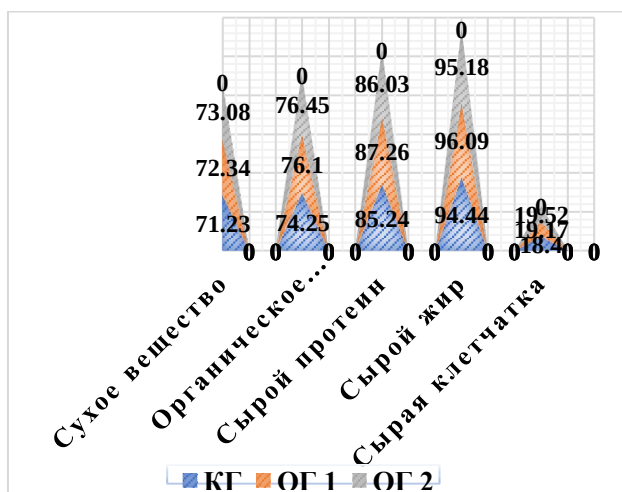
Группа	Число голов	Особенности кормления
Контрольная (КГ)	60	Основной комбикорм (ОК)
Опытная 1 (ОГ1)	60	ОК с включением ОКДТ* 1 кг/тонну
Опытная 2 (ОГ2)	60	ОК с включением ОКДП** 2,0 кг/тонну

Результаты исследования показали, что включение нетрадиционных кормовых добавок в рацион кур-несушек оказывает положительное влияние на переваримость основных компонентов кормосмесей. В контрольной группе (КГ), где птица получала базовый рацион без добавок, коэффициенты переваримости сухого вещества, органического вещества и сырого протеина составили $71,23 \pm 0,35 \%$, $74,25 \pm 0,31 \%$ и $85,24 \pm 0,32 \%$ соответственно.

Введение торфяной кормовой добавки (ОГ1) способствовало повышению переваримости указанных компонентов до $72,34 \pm 0,42 \%$, $76,10 \pm 0,37 \%$ и $87,26 \pm 0,34 \%$ соответственно. В опытной группе с включением перьевой муки (ОГ2) соответствующие показатели составили $73,08 \pm 0,32 \%$, $76,45 \pm 0,46 \%$ и $86,03 \pm 0,41 \%$ (фигура 1). Таким образом, применение обеих добавок обеспечило достоверное улучшение усвояемости сухого и органического вещества, а также сырого протеина по сравнению с контрольной группой. Результаты дисперсионного анализа подтвердили статистическую значимость различий между группами по переваримости сухого вещества ($F = 6,41$; $p < 0,01$), органического вещества ($F = 9,50$; $p < 0,01$) и сырого протеина ($F = 8,18$; $p < 0,01$).

Переваримость сырого жира также характеризовалась положительной динамикой при введении кормовых добавок. Наиболее высокий коэффициент отмечен в группе ОГ1 и составил $96,09 \pm 0,43 \%$, тогда как в группе ОГ2 данный показатель находился на уровне $95,18 \pm 0,49 \%$, а в контрольной группе - $94,44 \pm 0,45 \%$. Выявленные различия носили умеренно значимый характер ($F = 3,25$; $p < 0,05$), что указывает на тенденцию к улучшению усвояемости жира при использовании кормовых добавок, особенно торфяной.

Особого внимания заслуживает переваримость сырой клетчатки как показатель эффективности использования волокнистых компонентов кормосмеси. В контрольной группе данный показатель составил $18,40 \pm 0,11 \%$, в группе с торфяной добавкой - $19,17 \pm 0,10 \%$, а в группе с перьевой мукой - $19,52 \pm 0,22 \%$. Различия между группами были высоко достоверными ($F = 14,24$; $p < 0,001$), что свидетельствует о выраженном улучшении усвоения клетчатки под влиянием кормовых добавок. Наибольший эффект отмечен при использовании перьевой муки, что, вероятно, связано с наличием легко усвояемых белковых фракций и стимуляцией ферментативной активности желудочно-кишечного тракта птицы.



Фиг.1. Коэффициенты переваримости питательных веществ комбикорма, при введении в рацион кур-несушек кормовых добавок, %

Сравнительный анализ показал, что торфяная добавка (ОГ1) оказывала более выраженное влияние на переваримость протеина и жира, способствуя повышению усвояемости органического вещества за счёт улучшения функциональной активности пищеварительного тракта. В то же время перьевая мука (ОГ2) оказывала наибольшее воздействие на переваримость клетчатки и органического вещества, что обусловлено её составом и высокой биологической ценностью белка.

Таким образом, включение обеих нетрадиционных кормовых добавок в рацион кур-несушек способствовало повышению коэффициентов переваримости всех ключевых компонентов кормосмеси, улучшению усвоения питательных веществ и увеличению биологической ценности рациона. Эти результаты подтверждают эффективность торфа и перьевой муки как функциональных кормовых добавок, способствующих оптимизации питания птицы и повышению её продуктивности.

В рамках проведённого балансового опыта, помимо оценки переваримости органических веществ, определяли также баланс и коэффициенты усвоения азота, кальция и фосфора. Азотистые вещества корма, поступая в желудочно-кишечный тракт птицы, подвергаются гидролизу до свободных аминокислот, которые используются для синтеза белка, обеспечения роста и развития организма, восстановления изношенных тканей, а также формирования яйца. Эффективность использования протеина в различные возрастные периоды оценивают по балансу азота, что позволяет объективно судить о рациональности кормления.

Анатомо-физиологические особенности пищеварительной и выделительной систем птицы позволяют учитывать одновременно весь азот, выделяемый с помётом и мочой, и азот, депонированный в тканях организма. Такой подход обеспечивает точную оценку эффективности белкового обмена и метаболизма азота в целом.

Кальций и фосфор, относящиеся к макроэлементам неорганической фракции корма, являются критически важными компонентами рационов птицы. Кальций преимущественно локализуется в костной ткани в форме фосфорнокислых и углекислых солей. Он необходим для нормального функционирования сердца, регуляции мышечной и нервной деятельности, а также для повышения защитных функций организма. Недостаток кальция у молодняка приводит к развитию рахита, проявляющегося нарушением минерализации костей, искривлением позвоночника, рёбер, трубчатых костей и клюва. У взрослой птицы дефицит кальция вызывает остеопороз, обусловленный нарушением эндокринной регуляции, прежде всего со стороны гипофиза и паратиреоидных желез. Ограниченная подвижность птицы усугубляет выраженность этих нарушений.

Фосфор содержится во всех тканях организма и является ключевым компонентом внутриклеточной среды. Основная его часть локализуется в костях в форме фосфорнокислого кальция. Фосфор входит в состав коферментов и макроэргических соединений (АТФ, АДФ, АМФ), которые служат универсальными аккумуляторами энергии, обеспечивая мышечную и метаболическую активность. Дефицит фосфора у молодняка вызывает рахит, а у взрослой птицы - остеопороз.

Обмен кальция и фосфора тесно взаимосвязан: при недостатке кальция у птицы одновременно наблюдается отрицательный баланс фосфора [10,13]. Ионы кальция повышают защитные функции организма, снижая мембранную проницаемость для токсических веществ и усиливая фагоцитарную активность [9].

Соединения фосфора активируют ферментативные процессы и участвуют в образовании макроэргических соединений, среди которых ключевое значение имеет аденозинтрифосфорная кислота (АТФ) [8]. По данным [14], усвоение кальция и фосфора у кур находится в прямой зависимости от усвоения азота. Кроме того, физиологическое состояние и возраст птицы существенно влияют на эффективность усвоения этих макроэлементов: у молодняка усвоение кальция и фосфора значительно выше, чем у взрослых птиц [11].

Проведение балансового опыта позволяет комплексно оценить эффективность усвоения белка и минеральных веществ у птицы, а также обосновать применение кормовых добавок,

направленных на повышение переваримости питательных веществ и усвоения макроэлементов.

Введение нетрадиционных кормовых добавок из торфа (ОГ 1) и перьевой муки (ОГ 2) в рацион подопытных кур положительно влияло на баланс и усвоение макроэлементов, в частности кальция и фосфора (таблица 2). Количество кальция, поступившего с кормом, было сопоставимо во всех группах: контрольная группа (КГ) - $4,15 \pm 0,28$ г, ОГ 1 - $4,30 \pm 0,25$ г, ОГ2 - $4,23 \pm 0,30$ г, что исключает влияние различий в потреблении на усвоение элемента.

Выделение кальция с помётом уменьшилось в опытных группах: КГ - $0,76 \pm 0,19$ г, ОГ1 - $0,66 \pm 0,007$ г, ОГ2 - $0,68 \pm 0,008$ г ($p < 0,01$ для ОГ 2), что свидетельствует о более эффективном использовании кальция организмом птицы. Баланс кальция в опытных группах увеличился: ОГ1 - $3,64 \pm 0,002$ г, ОГ2 - $3,55 \pm 0,006$ г по сравнению с контролем ($3,39 \pm 0,17$ г).

Использование кальция от принятого количества также повысилось: КГ - $81,68 \pm 1,35$ %, ОГ1 - $84,65 \pm 1,28$ %, ОГ 2 - $83,92 \pm 1,19$ %, что подтверждает повышение биодоступности элемента при введении кормовых добавок.

Таблица 2. Баланс и использование кальция и фосфора подопытными курами, г
($\bar{x} \pm s_{\bar{x}}$, n=3)

Показатель	Группа		
	КГ	ОГ1	ОГ2
Кальций			
Принято с кормом	$4,15 \pm 0,28$	$4,30 \pm 0,25$	$4,23 \pm 0,30$
Выделено в помете	$0,76 \pm 0,19$	$0,66 \pm 0,007$	$0,68 \pm 0,008^{**}$
Баланс	$3,39 \pm 0,17$	$3,64 \pm 0,002$	$3,55 \pm 0,006^{**}$
Использование от принятого, %	$81,68 \pm 1,35$	$84,65 \pm 1,28$	$83,92 \pm 1,19$
Фосфор			
Принято с кормом	$0,71 \pm 0,11$	$0,76 \pm 0,19^{**}$	$0,73 \pm 0,13^{**}$
Выделено в помете	$0,37 \pm 0,16$	$0,35 \pm 0,18^{**}$	$0,36 \pm 0,004^{**}$
Баланс	$0,34 \pm 0,10$	$0,41 \pm 0,14$	$0,37 \pm 0,008$
Использование от принятого, %	$47,88 \pm 1,40$	$53,94 \pm 1,48$	$50,68 \pm 1,43^{**}$

Примечание: разность по отношению к контрольной группе достоверна при * - $p < 0,95$, ** - $p < 0,99$, *** - $p < 0,999$

Аналогичная тенденция наблюдалась и по фосфору. Поступление элемента с кормом было выше в опытных группах: ОГ1 - $0,76 \pm 0,19$ г, ОГ2 - $0,73 \pm 0,13$ г, в то время как в контроле оно составило $0,71 \pm 0,11$ г ($p < 0,01$). Выделение фосфора с помётом снизилось: КГ - $0,37 \pm 0,16$ г, ОГ1 - $0,35 \pm 0,18$ г, ОГ 2 - $0,36 \pm 0,004$ г ($p < 0,01$), что свидетельствует о более рациональном использовании макроэлемента организмом птицы.

Баланс фосфора увеличился в опытных группах: ОГ1 - $0,41 \pm 0,14$ г, ОГ2 - $0,37 \pm 0,008$ г по сравнению с контролем ($0,34 \pm 0,10$ г). Использование фосфора от принятого количества также повысилось: КГ - $47,88 \pm 1,40$ %, ОГ1 - $53,94 \pm 1,48$ %, ОГ2 - $50,68 \pm 1,43$ % ($p < 0,01$ для ОГ2).

Сравнительный анализ показал, что торфяная добавка (ОГ1) оказывала более выраженное влияние на усвоение как фосфора, так и кальция, повышая их баланс и процент использования. Перьевая мука (ОГ2) также способствовала улучшению усвоения макроэлементов, особенно кальция, однако её эффект по фосфору был менее выражен.

Таким образом, включение торфа и перьевой муки в рацион кур-несушек повышает эффективность усвоения кальция и фосфора, снижает потери элементов с помётом и способствует их накоплению в организме, что важно для укрепления костной системы и повышения биологической ценности кормов. Полученные данные подтверждают целесообразность использования указанных нетрадиционных кормовых добавок для оптимизации минерального питания птицы.

Выводы и предложения

Проведённые исследования показали, что введение нетрадиционных кормовых добавок из торфа (ОГ1) и пера (ОГ2) в рацион кур-несушек положительно влияет на переваримость питательных веществ, а также на баланс и усвоение азота, кальция и фосфора.

Балансовый опыт продемонстрировал, что обе добавки способствуют увеличению коэффициентов переваримости сухого и органического вещества, сырого протеина, жира и клетчатки. Торфяная добавка (ОГ 1) более выраженно повышала усвоение белка и жира, тогда как перьевая мука (ОГ 2)-клетчатки и органического вещества. Эти результаты свидетельствуют о способности данных кормовых компонентов повышать биологическую ценность рациона и оптимизировать использование питательных веществ птицей.

Анализ баланса азота подтвердил эффективность усвоения белка при применении добавок. Азотистые вещества корма в опытных группах лучше использовались для синтеза белка, обеспечения роста и развития организма, что указывает на повышение продуктивной ценности корма и рационализацию белкового обмена.

Добавки также положительно влияли на усвоение макроэлементов. Кальций и фосфор, являясь ключевыми компонентами костной ткани и метаболических процессов, усваивались более эффективно в опытных группах. Торфяная добавка способствовала повышению усвоения фосфора, а перьевая мука кальция. В обеих группах снизились потери этих элементов с помётом, что свидетельствует о рациональном их использовании организмом птицы.

Таким образом, введение в рацион кур-несушек торфяной добавки и перьевой муки обеспечивает:

- повышение переваримости питательных веществ, особенно белка, жира и клетчатки;
- улучшение баланса азота и повышение эффективности использования белковых компонентов корма;
- оптимизацию усвоения кальция и фосфора и снижение их потерь с помётом;
- улучшение минерального обеспечения организма птицы, что особенно важно для формирования костной ткани и поддержания физиологической активности.

Использование нетрадиционных кормовых добавок в кормлении кур-несушек является эффективным средством повышения биологической ценности рациона и улучшения обмена питательных веществ, что может положительно сказаться на продуктивности и здоровье птицы.

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ВЛИЯНИЕ РЕГУЛЯТОРА РОСТА PILARHANCE SL НА УРОЖАЙНОСТЬ И КАЧЕСТВО ПЛОДОВ ВИШНИ

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Abstract: The investigations were carried out with Erdi Botermo sour cherry trees grafted on the mahaleb rootstock. The planting distance was 4.0 x 2.0 m, and the crown shape was mixed pyramid with reduced volume. The aim of the research was to study the effectiveness of Pilarhance, SL product as a growth regulator in different treatment doses to stimulate the growth and development processes of fruit in the sour cherry orchard. To achieve the planned objective, the following variants were studied: 1. Control, without treatment; 2. Pilarhance, SL, 0.8 l/ha; 3. Pilarhance, SL, 1.3 l/ha. On the basis of the obtained results, it was established that the growth regulator Pilarhance, SL can be included in the technological scheme for sour cherry cultivation at a dose of 1.3 l/ha, applied twice by foliar spraying. The first treatment should be carried out after flowering, and the next during the period when the color of the sour cherry fruits changes from green to yellow.

Keywords: cherry, growth regulator, fruit, setting rate, production, firmness, quality.

Наряду с использованием минеральных и органических удобрений, средств защиты растений, большое значение в последнее время в сельском хозяйстве имеет и применение регуляторов роста растений. [9, с. 25].

Регуляторами роста способны в малых количествах вызывать различные изменения в процессе роста и развития растений [11, с. 131].

Известно 6 групп фитогормонов: ауксины, гиббереллины, цитокинины, абсцизовая кислота, этилен и брассиностероиды, которые различаются химической природой и действием на физиологические процессы растений [7, с.5].

Гиббереллины - самый обширный класс естественных стимуляторов роста [4, с. 100; 7,

с. 181; 10, с 290]. Известно более сотни их разновидностей. Главные достоинства препаратов на их основе - высокая эффективность и безвредность. Они полностью безопасны для человека, не накапливаются в растениях и не имеют пост эффектов [8, с. 50].

Брассиностероиды - фитогормоны класса стероидов, поддерживающие нормальное функционирование защитной системы растения, особенно в неблагоприятных условиях, например, при засолении почвы, пониженных температурах, заморозках, засухе, заражении патогенами. [3, с. 64; 5, с. 456].

Наиболее распространен и изучен из этого класса 24-эпибрассинолид, который через гормональную систему влияет на активность и биосинтез ферментов окислительного цикла, гидролитических ферментов, оказывает разностороннее действие на растение: повышает устойчивость к биотическим и абиотическим факторам, усиливает ростовые и формообразовательные процессы, повышает урожайность и улучшает ее качество [1, с. 1459; 6, с. 37].

Целью исследований было установить влияние препарата Pilarhance SL в качестве регулятора роста для стимулирования ростовых процессов и развития плодов в крону деревьев вишни сорта Эрди Ботермо, привитых на подвой Вишня магалебская в интенсивном вишнёвом саду и для поддержания физиологического баланса между ростом, плодоношения и получения постоянных качественных урожаев.

Работы по испытанию препарата Pilarhance, SL в качестве регулятора роста для стимулирования ростовых процессов и развития плодов в насаждениях вишни были проведены в саду SRL „Ceteronis ST”, с. Гура Быкулуй, Ново Анненского р-на, в период вегетации 2025 года.

Сад посажен в 2022 году сортом Эрди Ботермо, подвой Вишня магалебская. Площадь питания 4 x 2 м, форма кроны свободнорастущее веретено. Обработка почвы в саду по типу чёрный пар.

Во втором и третьем вариантах провели по 2 обработки за вегетационный период тестированным препаратом Pilarhance, SL в дозе 0,8 и 1,3 л/га. Первую обработку провели в конце периода цветения (25.04.2025), а вторую в период перехода окраски плодов из зелёного в жёлтом цвете (12.05.2025).

Таблица 1

Схема опыта по определению эффективности препарата Pilarhance SL в качестве регулятора роста для стимулирования ростовых процессов и развития плодов в насаждениях вишни

№	Варианты опыта	Активное вещество	Способ применения
1.	Контроль	Опрыскивание водой	Опрыскивание в период вегетации. Первую обработку провели в конце периода цветения, а вторую в период перехода окраски плодов из зелёного в жёлтом цвете
2.	Pilarhance, SL – 0,8 л/га	Гиббереллиновая кислота, 3,98 г/л+24-эпибрассинолид, 0,02 г/л 750 г/кг	
3.	Pilarhance, SL – 1,3 л/га		

Каждый вариант включал в себя по четыре повторности. Каждая повторность состояла из 8 деревьев.

Обработка деревьев проводилась ранцевыми опрыскивателем, в утренние часы, в отсутствие ветра. Количество раствора на дерево при обработке изучаемых препаратов составило 0,8 литра, исходя из количества деревьев на единицу площади и рекомендуемого количества воды 1000 л/га.

Исследования проводились в полевых и лабораторных условиях по принятой методике проведения опытов с плодовыми культурами и с регуляторами роста.

Продуктивность деревьев вишни определяли в фазе полного созревания плодов методом весового учета. Урожай с каждого дерева был собран отдельно и взвешен. Затем по каждому варианту определяли среднюю урожайность с дерева с последующим пересчётом на

единицу площади.

Среднюю массу плодов определяли в четырех проворностях каждого варианта путем взвешивания 100 штук, убранных подряд из кроны дерева с последующим делением полученного результата на их количество.

Твёрдость плодов вишни оценивали с помощью пенетрометра GY 1, фиксирующего сопротивление мякоти, проникновению плунжера площадью 3 мм². По каждому варианту было отобрано по 10 плодов. В экваториальной области с двух противоположных сторон плода (со стороны воздействия солнца на плод и со стороны тени) было выполнено 10 оценок твердости, при этом фиксировалось среднее значение.

Количество общего содержания сухих веществ в соке плодов вишни определяли с помощью цифрового рефрактометра марки Pocket. Общую кислотность определяли методом титрования 0,1% раствором NaOH. Для определения витамины С в плодах был использован титриметрический метод с использованием 2,6-дихлорфенолиндофенолята натрия.

Полученные результаты сравнивались с контрольным вариантом.

Основные полученные результаты статистически обработаны методом дисперсионного анализа по Доспехову [12].

Определяли процент завязывания и среднюю массу плодов, среднюю урожайность с дерева с последующим пересчётом на единицу площади, твёрдость плодов вишни, общего содержания сухих веществ титруемую кислотность и содержание витамины С в плодах.

Полученные результаты доказывают, что количества цветковых на деревьях в изучаемых вариантах варьировало от 3319 шт./дерево в варианте Pilarhance, SL в дозе 1,3 л/га до 3364 шт./дерево в контрольном варианте (табл. 2). Разница между количеством цветиков полученных по вариантам опыта незначительное, и не могло повлиять кардинально на результаты проведённых исследований.

Проведенные исследования доказали, что в вариантах обработанными регулятором роста Pilarhance, SL в дозах 0,8 и 1,3 л/га, сформировалось в кроне деревьев различное количество плодов. Меньшее количество плодов в кроне деревьев вишни отмечено в контрольном варианте - 720 шт./дерево и в варианте Pilarhance, SL в дозе 0,8 л/га – 738 шт./дерево, по сравнению с вариантом обработанным регулятором роста Pilarhance, SL в дозе 1,3 л/га – 780 шт./дерево, то есть произошло увеличение на 8,3% по сравнению с контрольным вариантом.

Такое увеличение количества плодов в варианте обработанным регулятором роста Pilarhance, SL в дозе 1,3 л/га произошло за счёт незначительного роста процента завязывания цветков по сравнению с остальными исследованными вариантами.

Таблица 2

Влияние регулятора роста Pilarhance, SL на количество плодов и их процента завязывания в кроне деревьев вишни сорта Эрди Ботермо

№	Варианты опыта	Количество цветков, шт./дер.	Количество плодов, шт./дер.	Процент завязывания, %
1.	Контроль	3364	720	21,4
2.	Pilarhance, SL – 0,8 л/га	3324	738	22,2
3.	Pilarhance, SL – 1,3 л/га	3319	780	23,5
НСР 0,05%		159	31,4	-

Наименьший процент завязывания плодов был зарегистрирован в контрольном варианте (21,4%), за которым следует вариант Pilarhance, SL в дозе 0,8 л/га (22,2%), где прирост изучаемого показателя составило 0,8%.

Наибольшее значение процента завязывания плодов (23,5%) было зарегистрировано в варианте, обработанном препаратом Pilarhance, SL в дозе 1,3 л/га, то есть увеличение составило 1,3 - 2,1% по сравнению с предыдущими вариантами.

Полученные результаты доказывают, что полученные результаты в варианте при обработки регулятором роста, взятого на испытания Pilarhance, SL в дозе 1,3 л/га, доля завязанных цветков в кроне деревьев, и количества полученных плодов была выше по сравнению с остальными вариантами опыта.

Продуктивность - это показатель, который доказывает, как проводились все агротехнические мероприятия в вишнёвом саду сорта Эрди Ботермо.

Проведённые исследования доказывают, что изучаемый регулятор роста Pilarhance, SL влияет по-разному на средний вес плодов и урожая в целом.

За время проведения исследований, наименьший вес плодов был отмечен в контрольном варианте (5,45 г).

При использовании регулятора роста Pilarhance, SL в дозе 0,8 л/га средний вес плодов был несущественно выше контрольного варианта, то есть на 1,8% и составил 5,55 г. Полученные результаты доказывают, что регулятор роста Pilarhance, SL в дозе 0,8 л/га, не имеет такого существенного влияния на средний вес плодов как в варианте Pilarhance, SL – 1,3 л/га, где данный показатель был выше и составил 5,77 г, или на 4,0% по сравнению с предыдущим вариантом и на 5,9% по сравнению с контрольным вариантом. Изменение среднего веса плодов в варианте Pilarhance, SL – 1,3 л/га произошло в результате улучшения ростовых процессов в кроне деревьев и повышения устойчивости растений к неблагоприятным условиям окружающей среды (заморозки, засуха, болезни).

Контрольный вариант характеризуется наименьшим количеством плодов в кроне деревьев и самым низким средним весом одного плода. Соответственно, в данном варианте было отмечено и самая низкая урожайность как с одного дерева (3,92 кг/дерево), так и с единицы площади (4,9 т/га).

При обработке варианта регулятором роста Pilarhance, SL в дозе 0,8 л/га, урожайность плодов была выше контрольного варианта, но намного ниже варианта Pilarhance, SL в дозе 1,3 л/га. Полученная урожайность, в данном варианте с дерева, составила 5,22 кг, а с гектара 6,52 т, или произошло увеличение на 4,7% по сравнению с контрольным вариантом.

В случае тестируемого варианта Pilarhance, SL в дозе 1,3 л/га, зарегистрировано существенное увеличение количества плодов (780 шт./дерево) и их среднего веса (5,77 г), что привело к значительной прибавке урожая как с дерева (4,5 кг), так и с единицы площади (5,62 т/га).

Таблица 3

Влияние регулятора роста Pilarhance, SL на средний вес и продуктивность деревьев вишни сорта Эрди Ботермо

№	Варианты опыта	Количество плодов, шт./дер.	Средний вес, г	Продуктивность		В % к контролю
				кг/дерево	т/га	
1.	Контроль	720	5,45	3,92	4,90	0,0
2.	Pilarhance, SL – 0,8 л/га	738	5,55	4,10	5,13	104,7
3.	Pilarhance, SL – 1,3 л/га	780	5,77	4,50	5,62	114,7
НСР 0,05%		32,1	0,24	0,19	0,25	-

Дозы обработки по-разному повлияло на полученную урожайность по вариантам опыта. То есть, разница между вариантами обработанным регулятором роста Pilarhance, SL в дозах 0,8 и 1,3 л/га была существеннее, что подтверждается и статистической обработкой.

Данные статистической обработки по продуктивности указывают на незначительную разницу между контрольным вариантом и вариантом Pilarhance, SL в дозе 0,8 л/га, и на существенное влияние по сравнению с вариантом Pilarhance, SL в дозах 1,3 л/га. То есть, если разница по урожайности плодов полученной между контролем и вариантом обработанным препаратом Pilarhance, SL в дозе 1,3 л/га, достигло 14,7%, то между вариантом Pilarhance, SL в

дозе 0,8 л/га и предыдущем варианте, данное значение составило 10,0%.

Полученные результаты доказывают, что среди вариантов опыта, наибольшая урожайность плодов зарегистрирована при применении препарата Pilarhance, SL в дозе 1,3 л/га по сравнению с остальными вариантами взятых в исследования.

Проведенные наблюдения (табл. 4) показывают, что твердость мякоти вишни сорта Эрди Ботермо на момент уборки в исследуемых вариантах составляла 0,38-0,46 кг/см².

Твёрдость плодов вишни сорта Эрди Ботермо изменяется под воздействием регулятора роста Pilarhance, SL, то есть, можно отметить, что соответствующие препараты, у которых активным ингредиентом является гиббереллиновая кислота + 24-эпибрассинолид, увеличивают в какой-то степени твердость вишни. Если в случае контрольного варианта твердость вишни составляла 0,38 кг/см², то в вариантах, обработанных регулятором роста Pilarhance, SL, соответствующий показатель увеличился и достигал параметров 0,41-0,46 кг/см².

Сравнивая между собой варианты обработанные гиббереллиновой кислотой + 24-эпибрассинолида, можно отметить, что самую низкую твердость плодов отмечено в варианте Pilarhance, SL в дозе 0,8 л/га - 0,41 кг/см², то есть, наблюдается увеличение на 0,03 кг/см² по сравнению с контрольным вариантом. При увеличении дозы тестируемого регулятора роста Pilarhance, SL до 1,3 л/га, данный показатель был выше на 21,1% по сравнению с контрольным вариантом, составив 0,46 кг/см².

Изучая влияние дозы обработки на исследуемый показатель, можно отметить, что увеличение дозы препарата Pilarhance, SL с 0,8 до 1,3 л/га повышает твердость плодов на 0,05 кг/см², то есть кожа плодов вишни становится более эластичнее и мякоть твёрже.

Таблица 4

Влияние регулятора роста Pilarhance, SL на твердость плодов вишни сорта Эрди Ботермо и их биохимических показателей

№	Варианты опыта	Твёрдость, кг/см ²	Растворимые сухие вещества, %	Кислотность, %	Витамин С, мг%,
1.	Контроль	0,38	16,5	0,64	15,9
2.	Pilarhance, SL – 0,8 л/га	0,41	16,8	0,60	16,1
3.	Pilarhance, SL – 1,3 л/га	0,46	17,2	0,57	16,4

Содержание растворимых сухих веществ является характеристикой сорта, и значение этого показателя можно использовать для определения оптимального времени сбора урожая. По мере приближения периода сбора урожая интенсивность накопления растворимых сухих веществ увеличивается.

Проведённые исследования доказывают, что количество растворимых сухих веществ в плодах вишни сорта Эрди Ботермо в исследуемых вариантах составило 16,5 – 17,2%.

Наименьшая доля растворимых сухих веществ зарегистрировано в контрольном варианте – 16,5%. При использовании регулятора роста Pilarhance, SL отмечено повышение исследуемого показателя до 16,5 – 17,2%. То есть, обработка в изучаемых вариантах с применением регулятора роста Pilarhance, SL увеличило содержание растворимых сухих веществ в плодах на 0,3 – 0,7% по сравнению с контролем.

Изучая влияние дозы обработки на количество растворимых сухих веществ в плодах, можно отметить, что с увеличением дозы препарата Pilarhance, SL с 0,8 до 1,3 л/га исследуемый показатель вырос. Если разница между вариантами, обработанными регулятором роста Pilarhance, SL в дозе 0,8 и 1,3 л/га л/га, составила 0,4%, то между контрольным вариантом и вариантом, обработанным Pilarhance, SL в дозе 1,3 л/га, увеличение было на 0,7%. Таким образом, обработка регулятором роста Pilarhance, SL в дозе 1,3 л/га повлияла в значительной степени на увеличение количества растворимых сухих веществ в плодах.

Доля титруемых кислот в плодах находится в прямой зависимости от количества растворимых сухих веществ. Одновременно с уменьшением количества растворимых сухих веществ в плодах увеличивается доля титруемых кислот, достигая наибольшего значения в контрольном варианте - 0,64 %.

Обработка деревьев регулятором роста Pilarhance, SL в дозе 1,3 л/га, снизила долю титруемых кислот в данном варианте, составив 0,57%, что на 0,07% меньше по сравнению с контрольным вариантом. В варианте, обработанным регулятором роста Pilarhance, SL в дозе 0,8 л/га, изучаемый показатель составил 0,60%, что было ниже контрольного варианта на 0,04%.

Витамина С является одним из основных показателей качества плодов вишни. Проведенные исследования доказывают, что наименьшее количество витамина С было зарегистрировано в контрольном варианте, где его содержание составило 15,9 мг%.

Обработка опытных вариантов регулятором роста Pilarhance, SL увеличило содержание витамина С до 16,1 - 16,4 мг%, что на 0,2 – 0,5 мг% больше по сравнению с контрольным вариантом. Наибольшее количества витамина С отмечено в варианте Pilarhance, SL в дозе 1,3 л/га (16,4 мг%), что на 0,5 мг% больше по сравнению с контрольным вариантом и на 0,3 мг% по сравнению с вариантом Pilarhance, SL в дозе 0,8 л/га.

Проведенные исследования доказывают, что обработка деревьев регулятором роста Pilarhance, SL в дозе 1,3 л/га, увеличило твердость плодов, а растворимые сухие вещества, титруемая кислотность и содержание витамина С в данном варианте была более сбалансированной в плодах вишни по сравнению с другими вариантами опыта.

Выводы

Эффективность применения регулятора роста Pilarhance, SL в дозе 0,8 л/га для стимулирования ростовых процессов и развития плодов была несущественно выше контрольного варианта, а при увеличении дозы до 1,3 л/га, изучаемый показатель был намного выше по сравнению с остальными исследованными вариантами.

Наибольшая интенсивность ростовых процессов в кроне деревьев и развития плодов вишни было зарегистрировано в варианте Pilarhance, SL в дозе 1,3 л/га, обработанным 2 раза, путём опрыскивания. Первую обработку проводить в конце периода цветения, а вторую в период перехода окраски плодов из зелёного в жёлтом цвете.

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COMPARATIVE ASSESSMENT OF SALT TOLERANCE IN CUCUMBER (*CUCUMIS SATIVUS* L.) GENOTYPES OF DIFFERENT BREEDING ORIGINS

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Abstract. Soil salinization is a major environmental constraint to agricultural productivity, particularly in arid regions. Cucumber (*Cucumis sativus* L.), an economically important vegetable crop, is highly sensitive to salt stress and shows reduced germination and early growth even under moderate salinity. The present study provides a comparative assessment of salt tolerance in three cucumber genotypes representing Moldovan, Ukrainian, and Dutch breeding programs. The analysis focuses on seed germination and early seedling development as critical stages determining plant establishment and yield potential. The results contribute to the identification of genotypes with higher adaptive capacity and to a better understanding of breeding-related differences in responses to salinity stress.

Keywords: *Cucumis sativus* L.; salinity stress; seed germination; seedling growth; abiotic stress; genotype comparison

Introduction

In recent decades, the degradation of agricultural land due to soil salinization has acquired the scale of a global environmental crisis, posing a serious threat to food security in many regions of the world. Cucumber (*Cucumis sativus* L.), one of the most widely cultivated vegetable crops worldwide, is characterized by high sensitivity to increased mineralization of the soil solution [1]. As a typical glycophyte, *Cucumis sativus* exhibits a sharp decline in productivity even under moderate salt concentrations, which is associated with a complex set of physiological, biochemical, and molecular alterations within the plant organism. Under conditions of arid climates and intensive irrigation, often

involving the use of saline water, the selection of genetically salt-tolerant forms becomes a priority task of modern agrobiological research [2].

The present study is aimed at conducting an in-depth comparative analysis of salt tolerance in three cucumber genotypes representing different breeding schools: Moldovan, Ukrainian, and Dutch. This approach allows not only the assessment of the adaptive potential of specific cultivars and hybrids, but also the evaluation of the influence of breeding strategies on the development of mechanisms of tolerance to abiotic stress. Particular attention is paid to the early stages of ontogenesis—seed germination and early seedling growth—which are critical periods in the plant life cycle and largely determine stand establishment and future crop yield.

Materials and Methods

The research methodology combined three main analytical approaches:

Seed Germination Analysis – Laboratory germination tests were conducted to evaluate the response of cucumber seeds to different levels of salinity stress. Seeds of three *Cucumis sativus* L. genotypes were germinated in Petri dishes on filter paper moistened with sodium chloride (NaCl) solutions of varying concentrations. Germination percentage and germination energy were assessed on the 3rd and 7th days of the experiment under controlled temperature conditions (24–25 °C).

Salinity Stress Simulation – Salinity stress was simulated using aqueous NaCl solutions at concentrations of 25, 50, 100, 200, and 400 mM, corresponding to increasing stress intensity, with distilled water serving as the control. This gradient allowed the evaluation of genotype-specific tolerance thresholds and stress response patterns during early ontogenesis.

Early Seedling Growth Assessment – Early seedling development was evaluated by observing seedling emergence and initial growth under salinity stress. Comparative analysis among genotypes of Moldovan, Ukrainian, and Dutch breeding origin enabled the identification of differences in adaptive potential and sensitivity to salinity at the earliest developmental stages.

Results and Discussion

Genotypic Background and Breeding Context.

The selected cucumber genotypes differed substantially in their biological traits, breeding history, and adaptive orientation, allowing a broad representation of the genetic diversity within *Cucumis sativus* L. The Moldovan hybrid Rodnichok F1, a long-established bee-pollinated genotype, was developed with an emphasis on high yield, fruit quality, and performance under fertile chernozem soils with intensive agronomic inputs. Such breeding priorities suggest limited evolutionary pressure toward tolerance of abiotic stresses associated with substrate mineralization.

In contrast, the Ukrainian cultivar Dzherelo was bred for early maturity and resilience under open-field conditions in a continental climate. Its relative cold tolerance and high vegetative vigor indicate a generally elevated physiological plasticity, which is often associated with improved capacity to cope with osmotic stress.

The Dutch cultivar Beth Alpha represents a fundamentally different breeding paradigm. As a parthenocarpic type designed for protected cultivation and fertigation systems, it has undergone selection under conditions where precise control of nutrient and salt concentrations is critical. Genetic studies have shown that Beth Alpha-type cucumbers form a distinct cluster, reflecting deep divergence from traditional salad and pickling types. This divergence is associated with enhanced adaptive mechanisms, including stress-related gene expression, which may contribute to increased tolerance to salinity.

Response to NaCl Concentration Gradient

The application of a wide NaCl gradient (25–400 mM) enabled the identification of genotype-specific thresholds of salt tolerance and revealed clear differentiation among the tested materials.

Table 1.

Effect of Different NaCl Concentrations on Germination and Germination Energy

NaCl concentration (mM)	Rodnichok F1-Moldova	Dzherelo -Ukraine	Beth Dutch	Alpha-

Control (0)	96%	94%	98%
25 mM	82%(growth delay)	92% (stable)	97% (optimal)
50 mM	68% (inhibition)	85% (stable)	95% (growth)
100 mM	42% (severe depression)	55% (decline)	88% (moderate)
200 mM	5% (individual seedlings)	12% (strong inhibition)	28% (viability)
400 mM	0% (complete inhibition)	0% (complete inhibition)	2%(minimal sprouting)

Low and mild salinity (25–50 mM NaCl).

At 25 mM NaCl (approximately 1.46 g L^{-1}), the first signs of differential responses among genotypes became apparent. Beth Alpha exhibited no significant deviations from the control in terms of germination energy or final germination percentage, indicating a high capacity for osmotic adjustment during seed imbibition. This suggests the presence of efficient mechanisms for water uptake and maintenance of cellular hydration under moderate osmotic stress.

Dzherelo also maintained stable germination at 25–50 mM NaCl; however, a slight reduction in hypocotyl elongation was observed compared to the control. This response indicates a moderate sensitivity of early growth processes, while basic germination capacity remained largely unaffected.

Rodnichok F1 proved to be the most sensitive genotype at this stress level. Even at 25 mM NaCl, initial inhibition of primary root development was detected, pointing to a low threshold of tolerance to increased external osmotic pressure. Such sensitivity is consistent with its breeding background, which prioritized performance under optimal soil conditions rather than stress resilience.

Moderate salinity (100 mM NaCl).

At 100 mM NaCl, inhibitory effects became pronounced across all genotypes, though with marked differences in severity. Beth Alpha maintained relatively high germination rates, albeit with a noticeable delay in seedling emergence and reduced seedling vigor. Dzherelo showed a substantial decline in germination energy, accompanied by reduced root and shoot growth, indicating that compensatory mechanisms were no longer sufficient to fully offset osmotic and ionic stress.

Rodnichok F1 exhibited sharp suppression of both germination and early seedling development, confirming its limited adaptive capacity under moderate salinity. Root growth inhibition at this concentration suggests disruption of cell division and elongation processes, likely caused by impaired water uptake and ion toxicity.

High and very high salinity (200–400 mM NaCl).

At 200 mM NaCl, germination was severely reduced in Dzherelo and almost completely suppressed in Rodnichok F1. Beth Alpha remained the only genotype capable of partial germination, although seedlings were weak and poorly developed.

At 400 mM NaCl, germination was either minimal or entirely absent in all genotypes, indicating that this concentration exceeded the physiological tolerance limits of *Cucumis sativus* during early ontogenesis.

Implications for Breeding and Cultivation

The observed differences in salt tolerance among the studied genotypes clearly reflect the influence of breeding strategy and target cultivation systems. Genotypes developed for high-input, fertile environments showed reduced plasticity under salinity stress, whereas forms selected under controlled or variable environmental conditions demonstrated higher adaptive potential. The superior performance of Beth Alpha at low and moderate salinity levels highlights the importance of breeding for physiological flexibility and stress-related regulatory mechanisms.

These findings emphasize that early developmental stages—seed germination and seedling growth—are highly sensitive indicators of salinity tolerance and can serve as effective screening criteria in cucumber breeding programs aimed at saline and irrigated agroecosystems.

Ecological conditions in breeding regions and their influence on tolerance

The tolerance of a cultivar often reflects the ecological conditions of the region in which it was bred and initially adapted [3].

Moldova and the Comrat District: mineralization Challenges.

The Moldovan breeding program (Rodnichok F1) developed against the backdrop of fertile chernozem soils. However, in some southern regions of the country, such as the Comrat District, groundwater salinization is a significant issue. The intrusion of ancient brines into natural water sources transforms their composition from bicarbonate–calcium to chloride–sodium. River water mineralization in these areas can reach 1.2–1.3 g L⁻¹, imposing stress on glycophytic crops. Nevertheless, traditional breeding addressed this problem primarily through soil amelioration, which explains Rodnichok's sensitivity to direct salt exposure.

Ukraine: Continental climate and aridity

The Ukrainian breeding program (Dzherelo) is adapted to the conditions of the Steppe and Forest-Steppe, where summer often brings rainfall deficits and intense evaporation, causing salt accumulation in upper soil layers. Dzherelo's ability to tolerate short-term drops in temperature and its relative resistance to mild salinity (up to 50 mM) make it a valuable resource for farms in southern Ukraine. In these regions, cucumber is frequently grown in open fields, where it is exposed to variable environmental factors, necessitating a certain degree of genetic plasticity.

The Netherlands : Technological stress

The Dutch breeding program (Beth Alpha) represents the pinnacle of industrial vegetable cultivation. In greenhouses in the Netherlands and Israel, plants are often grown in hydroponics or low-volume substrates, where even minor miscalculations in nutrient solutions can lead to localized salinization in the root zone. Selection for tolerance to high salt concentrations in the working solution (EC) has become a by-product, yet a highly important outcome, of Dutch breeding efforts. The genetic potential of Beth Alpha allows it to serve as a donor of salt tolerance in hybridization programs.

Conclusions

A comparative analysis of three cucumber (*Cucumis sativus* L.) genotypes of different geographical and breeding origins revealed significant variability in their response to chloride salinity [4]. It was established that varietal specificity is a determining factor for the survival of the crop at early stages of ontogenesis.

The Dutch breeding line, represented by the variety *Beth Alpha*, demonstrated the most advanced adaptive mechanisms, allowing it to maintain high germination rates and growth under NaCl concentrations up to 100 mM and remain viable at 200 mM. This genotype is characterized by high osmotic plasticity and efficient ion homeostasis systems, making it the most promising for cultivation in regions with high salinity risk and under intensive greenhouse conditions.

The Ukrainian variety *Dzherelo* occupies an intermediate position, showing good tolerance to weak and moderate salinity (up to 50 mM). Its adaptive potential is associated with general ecological resilience developed under continental climate conditions, making it suitable for use on soils with moderate mineralization levels.

The Moldovan hybrid *Rodnichok F1* exhibited extreme sensitivity to the presence of sodium chloride in the substrate. Even minimal salt doses (25 mM) caused a depression of growth processes. While this genotype possesses high commercial and taste qualities, it requires strict control of the salinity regime and is recommended only for cultivation on fertile, non-saline soils with high-quality irrigation water.

The overall tolerance limit for the species *Cucumis sativus* was confirmed at 400 mM NaCl, at which point complete inhibition of seed metabolism occurs in all studied samples. Further enhancement of cucumber productivity under saline conditions requires the integration of advanced breeding methods, including the use of molecular markers and genetic engineering aimed at enhancing the expression of key stress-protective genes.

The practical application of these results will allow for the optimization of varietal composition in vegetable plantations in arid zones and significantly reduce economic risks associated with soil resource degradation.

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НОВОЕ НАПРАВЛЕНИЕ В РИСОВОДСТВЕ: АЭРОБНЫЕ ТЕХНОЛОГИИ КАК ОТВЕТ НА КЛИМАТИЧЕСКИЕ ВЫЗОВЫ

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Аннотация. Продовольственная безопасность в XXI веке неразрывно связана с адаптацией сельского хозяйства к меняющимся климатическим реалиям. Традиционное рисоводство, основанное на длительном затоплении чеков, демонстрирует растущую уязвимость в условиях нарастающего дефицита пресной воды. В данной работе рассматривается перспективная альтернатива – технология аэробного выращивания риса, исключающая постоянное затопление и позволяющая культивировать рис в условиях пониженной влагообеспеченности (рисунок 1). На примере исследований, проведённых в различных агроэкологических регионах (Индия, Кот-д’Ивуар, Танзания), проанализированы агробиологические и экономические аспекты данной системы. Показано, что переход на аэробные технологии обеспечивает сокращение водопотребления на 40–73%, существенно снижает антропогенную эмиссию метана и позволяет оптимизировать трудозатраты. Одновременно обозначены ключевые лимитирующие факторы: необходимость специализированной селекции, риски распространения сорняков и почвенных патогенов, а также возможное снижение урожайности

при монокультуре. Особое внимание уделено вопросам экономической целесообразности и конкурентоспособности продукции аэробного рисоводства на внутренних рынках стран-импортёров риса. Интеграция данных аспектов позволяет рассматривать аэробное рисоводство не как локальную агротехнику, а как комплексную стратегию адаптации аграрного сектора к водному стрессу и климатической нестабильности.

Ключевые слова: ресурсосберегающее земледелие, водный дефицит, почвенно-климатические риски, эмиссия парниковых газов, продовольственная безопасность.

Abstract. Food security in the 21st century is inextricably linked with the adaptation of agriculture to changing climate realities. Traditional rice farming, based on long-term flooding of paddies, is demonstrating increasing vulnerability in the face of increasing freshwater shortages. This paper examines a promising alternative: aerobic rice cultivation technology, which eliminates constant flooding and allows for rice cultivation in conditions of reduced moisture availability (Figure 1). Using studies conducted in various agro-ecological regions (India, Côte d'Ivoire, and Tanzania) as examples, the agrobiological and economic aspects of this system are analyzed. It is shown that the transition to aerobic technologies reduces water consumption by 40–73%, significantly reduces anthropogenic methane emissions, and optimizes labor costs. Key limiting factors are also identified: the need for specialized breeding, the risk of weed and soil pathogen spread, and the potential for yield reduction in monoculture. Particular attention is paid to the economic feasibility and competitiveness of aerobic rice products in the domestic markets of rice-importing countries. The integration of these aspects allows us to consider aerobic rice farming not as a localized agricultural practice, but as a comprehensive strategy for adapting the agricultural sector to water stress and climate instability.

Keywords: resource-saving agriculture, water deficit, soil and climate risks, greenhouse gas emissions, food security.

Введение. Глобальные тренды в изменении климата и структуре водопотребления ставят под сомнение устойчивость многих устоявшихся агротехнологий. Культура риса (*Oryza sativa* L.), будучи основой пищевого рациона для миллиардов людей, традиционно ассоциируется с высоким водопотреблением и специфическими агроэкологическими требованиями [1, с. 270–276]. Однако растущий дисбаланс между доступными водными ресурсами и потребностями орошаемого земледелия [2, с. 3004–3015] диктует необходимость поиска принципиально новых подходов к возделыванию данной культуры. В этом контексте аэробное рисоводство, при котором растения культивируются в не переувлажнённой, хорошо аэрируемой почве, подобно пшенице или кукурузе, перестаёт быть экспериментальной методикой и превращается в практически значимую альтернативу для регионов, испытывающих хронический или прогнозируемый дефицит влаги. Настоящая статья представляет собой синтез знаний, полученных в различных географических и экономических условиях, и нацелена на комплексную оценку потенциала, ограничений и перспектив внедрения аэробных систем выращивания риса.

Концептуальные основы и агроэкологические преимущества аэробного рисоводства. Аэробная система базируется на использовании специализированных сортов, сочетающих физиологическую пластичность «горных» сортов (устойчивость к почвенной засухе) с продуктивным потенциалом «низинных» линий. Основной агротехнический принцип – поддержание влажности корнеобитаемого слоя на уровне, близком к полевой влагоёмкости, без создания постоянного водоносного слоя. Это приводит к каскаду положительных эффектов [3, с. 65–68]:

Гидрологический эффект: Радикальное сокращение непродуктивных потерь воды через глубинную фильтрацию и поверхностное испарение. Данные исследований свидетельствуют о снижении сезонного водопотребления с 1200 – 1300 мм до 470 – 900 мм.

Экологический эффект: Перевод почвенных процессов из анаэробного в аэробный режим практически нивелирует биогенную эмиссию метана – одного из ключевых парниковых газов рисовых агроценозов.

Агротехнический эффект: Отказ от трудоёмких операций по созданию и поддержанию затопления, подготовке рассады и её пересадке открывает возможности для механизации и снижения себестоимости производства.

Почвенный эффект: Сохранение макроструктуры почвы, предотвращение формирования уплотнённой подпочвенной «плужной подошвы», активизация деятельности аэробных микроорганизмов.

Опыт, накопленный в штате Тамилнад (Индия) [4, с. 189-207], демонстрирует, что при грамотном подборе сортов (например, РМК 3, СО 47) и соблюдении агрофона урожайность в аэробных условиях может достигать 5 – 6 т/га, что лишь на 15 – 30% ниже, чем у лучших низинных сортов при затоплении, но при вдвое меньших затратах воды (таблица 1).

Таблица 1 – Потребление воды и урожайность риса в различных условиях выращивания в штате Тамиланд (Индия)

Год	Условия выращивания	Подача воды, мм	Урожайность, т/га	Затраты воды, кг/м ³
2001	аэробное	1350	5,4 – 6,8	0,45
2001	аэробное	470 – 650	2,5 – 5,7	0,73
2002	аэробное	1250	4,6 – 5,3	0,40
2002	аэробное	550 – 900	2,9 – 5,7	0,59
2002	аэробное	566	5,5	0,97
2003	аэробное	688	3,6 – 4,5	0,59
2003	аэробное	600-700	5,0 – 6,0	0,85
2007	низинное	1200	6,0	0,50
2007	низинное	560	3,1	0,57

Селекционно-генетический фундамент технологии. Успех аэробной системы критически зависит от наличия сортов, адаптированных к новым условиям. Современная селекция ставит перед собой задачу создания генотипов с уникальным комплексом признаков:

Архитектоника корневой системы: Преимущество отдаётся сортам с глубоко проникающей, густо разветвлённой корневой системой, способной эффективно использовать влагу из нижних горизонтов почвы.

Физиологическая устойчивость: Ключевыми являются механизмы осмотической регуляции, высокая эффективность фотосинтеза в условиях умеренного водного стресса, устойчивость устьичного аппарата.

Фенологическая стабильность: Минимизация задержки цветения и равномерность созревания в условиях возможных перебоев с орошением.

Резистентность к биотическим стрессам: Повышенная конкурентоспособность по отношению к сорнякам и устойчивость к спектру патогенов (нематоды, грибные заболевания), чьё значение в аэробных условиях возрастает.

Агроинженерное и организационное обеспечение. Переход на аэробную технологию требует модификации всей системы земледелия [5, с. 653-658; 6, с. 395-398]:

Водоподача: Наиболее эффективным признано использование систем микроорошения (капельного, микродождевания), обеспечивающих локальное и дозированное увлажнение. Это повышает коэффициент полезного использования воды на 30–80% по сравнению даже с усовершенствованными методами затопления (таблица 2).

Таблица 2 – Сравнение методов орошения риса

Показатель	Традиционное затопление	Капельное орошение	Микродождевание
КПД использования воды, %	40 – 50	70 – 90	65 – 85
Снижение водопотребления относительно затопления, %	—	30 – 50	25 – 40
Урожайность, т/га	5,5 – 6,5	6,8 – 7,8	6,5 – 7,5
Прирост урожайности относительно затопления, %	—	+18 – 25 %	+15 – 20 %
Затраты на воду, руб./га	8 000 – 10 000	4 000 – 6 000	5 000 – 7 000
Капитальные затраты на оборудование, руб./га	10 000–15 000 (каналы)	80 000 – 120 000	60 000 – 90 000
Эксплуатационные расходы, руб./га/год	12 000 – 15 000	18 000 – 22 000	16 000 – 20 000
Срок окупаемости системы, лет	—	4 – 6	5 – 7
Потребление удобрений, кг/га (NPK)	200 – 250	150 – 180	160 – 190
Снижение выноса удобрений в грунтовые воды, %	—	40 – 60	35 – 50
Контроль засоренности (снижение гербицидов), %	Базовый уровень	20 – 30	15 – 25
Риск заболачивания/засоления, балл (1–10)	7 – 9	2 – 3	3 – 4
Гибкость регулирования режима	Низкая	Высокая	Средняя
Зависимость от рельефа	Высокая	Низкая	Средняя
Трудозатраты на обслуживание, чел.-ч/га/сезон	80 – 100	40 – 60	50 – 70

Защита растений: В условиях отсутствия заливного слоя резко обостряется проблема сорняков. Обязательным элементом становится интегрированная система защиты, сочетающая применение почвенных гербицидов, севообороты с культурами-супрессорами (например, бобовые) и, при возможности, механическую обработку.

Питание растений: Динамика доступности элементов питания (особенно азота и микроэлементов) в аэробной почве иная. Рекомендуются использование легкоусвояемых форм удобрений (аммонийных, хелатных), а также мониторинг почвенного раствора для предотвращения дефицитов.

Проблемы экономической эффективности и рыночной конкуренции. Как показывает анализ ситуации в Кот-д'Ивуаре, внедрение аэробного рисоводства часто сталкивается не только с агротехническими, но и с экономическими барьерами. Производственные издержки, особенно высокая доля ручного труда, могут делать местный аэробный рис менее конкурентоспособным по сравнению с дешёвым импортным сырьём из Азии. Расчёт коэффициента затрат внутренних ресурсов (DRC) показывает, что конкурентоспособность местного производства может быть достигнута при выполнении двух условий: 1) существенное повышение урожайности (на 15–25%) за счёт улучшенных сортов и агропрактик; 2) снижение доли трудозатрат через механизацию. Кроме того, важнейшим фактором является формирование узнаваемого бренда и доверия потребителей к качеству местного риса, что требует инвестиций в переработку, упаковку и маркетинг.

Биотические риски: опыт Танзании. Отдельным вызовом для аэробного рисоводства является изменение фитосанитарной обстановки. Исследования в Танзании наглядно иллюстрируют [7, с. 847-859; 8, с. 213-219], как заболевание пирикулярриоз (*Pyricularia oryzae*) может нивелировать преимущества новой системы. В условиях аэробного выращивания восприимчивые сорта (Jaribu 220, Kalamata) теряли до 37,8% урожая, в то время как устойчивые линии (TXD 306, IR 64) демонстрировали потери не более 11 – 16%. Этот факт подчёркивает невозможность простого переноса старых сортов в новую агротехнику и жёсткую необходимость постоянного селекционного сопровождения технологии, направленного на усиление иммунного статуса сортов.

Заключение и стратегические ориентиры. Аэробное рисоводство не является панацеей, но представляет собой научно обоснованный и технологически осуществимый путь диверсификации систем производства риса в условиях нарастающей климатической неопределённости. Его успешная имплементация возможна только в рамках системного подхода, включающего:

Создание национальных и международных программ по селекции и первичному семеноводству аэробных сортов, адаптированных к местным условиям.

Развитие консультационных служб и демонстрационных площадок для трансферта соответствующих агротехнологий фермерским хозяйствам.

Государственную поддержку в модернизации инфраструктуры орошения и логистики, особенно на стартовом этапе внедрения.

Формирование экономических механизмов, стимулирующих производство и сбыт экологически безопасной и водосберегающей сельхозпродукции.

Дальнейшие исследования должны быть сосредоточены на долгосрочной оценке воздействия аэробных систем на агрофизические и биохимические свойства почв, разработке цифровых моделей для оптимизации поливных режимов и экономическом моделировании различных сценариев внедрения технологии в зависимости от макроэкономической конъюнктуры.

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КОМБИНАЦИОННАЯ СПОСОБНОСТЬ РОДИТЕЛЬСКИХ ФОРМ ПЕРЦА ОСТРОГО (*CAPSICUM ANNUM L.*) ПО ПРИЗНАКУ «СРЕДНЯЯ МАССА ПЛОДА»

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Аннотация. В селекции на гетерозис данные о комбинационной способности необходимы для подбора наилучших комбинаций родительских пар. В статье представлены результаты научно-исследовательской работы изучения параметров комбинационной способности по признаку средняя масса плода. Объектом исследования являлись сорта и гибриды перца острого, полученные по схеме топкросса. Выявлены достоверные различия по эффектам ОКС и СКС материнских и отцовских форм по признаку средней массы плода. Для гетерозисной селекции с целью создания высокоурожайных крупноплодных гибридов рекомендуется использовать материнские линии Лара, Линия 9, и отцовские формы Каин, Ежик.

Ключевые слова перец острый, масса плода, топкросс, тестер, общая комбинационная способность (ОКС), специфическая комбинационная способность (СКС).

Abstract. In heterotic breeding, data on combining ability is essential for selecting the best combinations of parental pairs. This article presents the results of a research study examining combining ability parameters for average fruit weight. The study focused on hot pepper varieties and

hybrids obtained using the topcross technique. Significant differences in the overall combining ability (OCA) and specific combining ability (SCA) effects between maternal and paternal varieties were identified for average fruit weight. For heterotic breeding to create high-yielding, large-fruited hybrids, it is recommended to use the maternal lines Lara and Line 9 and the paternal lines Cain and Yezhik.

Keywords: hot pepper, fruit weight, topcross, tester, general combining ability (GCA), specific combining ability (SCA).

Обеспечение населения разнообразной качественной овощной продукцией является важной задачей агропромышленного комплекса Республики Беларусь. В соответствии с программой Государственного развития аграрного бизнеса в Беларуси овощной подкомплекс решает задачи максимального удовлетворения спроса на внутреннем рынке и уменьшения зависимости от импорта, а также обеспечения импортозамещения некоторых видов овощей путем собственного конкурентоспособного их производства.

Основными задачами овощеводства являются производство овощей в количестве, удовлетворяющем потребность населения, а также увеличение разнообразия ассортимента продукции [1; 2; 3, с. 146–164; 4, с. 39].

Почвенно-климатические условия Республики Беларусь обуславливают необходимость создания сортов и гибридов, устойчивых к резко меняющимся факторам окружающей среды, способных давать урожай при коротком вегетационном периоде, пригодных для малоэнергоёмких технологий выращивания. Увеличение объемов производства овощной продукции может быть достигнуто в значительной степени путем создания качественно новых сортов и гибридов.

В Беларуси работы по селекции перца острого проводятся в Республиканском унитарном предприятии «Научно-практический центр Национальной академии наук Беларуси по картофелеводству и плодоовощеводству» и в Учреждении образования «Белорусская государственная орденов Октябрьской Революции и Трудового Красного Знамени сельскохозяйственная академия». Цель исследований заключается в создании сортов и гибридов, которые были бы устойчивы к различным абиотическим и биотическим факторам внешней среды, обладали высокой адаптивной способностью. Значительное внимание уделяется таким качественным признакам плодов как цвет, размер, форма, степень остроты, а также урожайности, устойчивости к болезням как в открытом грунте, так и в теплицах. В результате проделанной работы в Государственный реестр сортов сельскохозяйственных растений включен сорт перца острого Ежик и гибриды F_1 Янка, Дыдыш, Захар, Василек [5, с. 9–12; 6, с. 73].

При создании высокоурожайных сортов и гибридов различных сельскохозяйственных культур селекционеры сталкиваются с необходимостью выбора подходящих родительских форм для скрещивания. Однако не каждая комбинация родителей приводит к проявлению гибридной мощности у потомства. Знание комбинационной способности сортов является научной основой для успешного получения гетерозисных гибридов [8, с. 15; 9, с. 118; 10].

Комбинационная способность относится к способности линии или сорта, используемых в качестве родительских форм, создавать гибридное потомство с повышенной жизнеспособностью и урожайностью [7, с. 18].

Линии для скрещивания подбирают с учетом результатов оценки общей и специфической комбинационной способности (ОКС и СКС).

Оценка на ОКС предполагает выявление линий, скрещивание которых приводит к получению гибридов, превышающих по изучаемому признаку родительские формы и лучшие гибридные комбинации. Оценка на СКС проводится с целью выявления конкретных пар линий, которые дают высокогетерозисный гибрид. Знание комбинационной способности образцов перца острого позволяет целенаправленно подходить к созданию гетерозисных гибридов и использованию исходного материала для повышения эффективности селекционного процесса, улучшения качества подбора родительских форм для скрещивания.

Значительное внимание уделяется таким качественным признакам плодов как цвет, размер, форма, степень остроты, а также урожайности как в открытом грунте, так и в теплицах [11, с. 16; 13, с. 40; 11, с. 39].

Экспериментальная работа проводилась в условиях защищенного грунта на опытном поле кафедры сельскохозяйственной биотехнологии, экологии и радиологии УО Белорусская государственная орденов Октябрьской Революции и Трудового Красного Знамени сельскохозяйственная академия. В качестве материнских компонентов использовались родительские формы: Агдас, Зимрид, Лара, Халапеньо, Волгоград, Чегевара, Линия 9, в качестве отцовских – Каин, Китай, Феферона красная, Красный дракон, Ежик. Выполнено комплексное изучение 35 гибридных комбинаций, полученных путем гибридизации по схеме топкросса.

В селекции перца острого выделяю три направления – получение острой паприки, для технических целей, и для универсального использования (консервации, употребления в свежем и сушеном виде). У растений перца масса плодов сильно варьирует в зависимости от сорта и может колебаться от 2–3 граммов до 300 граммов. Ряд авторов считают, что общая урожайность обуславливается средней массой плода, однако наши исследования показали, что средняя масса плода у гибридов перца острого занимает промежуточное наследование.

Средняя масса плода у родительских форм перца острого за исследуемый период варьировала от 3,3 до 51,8 г (таблица 1).

Наибольшей средней массой плода отличались Агдас (40,6 г), Линия 9 (51,8 г), которые являются материнскими образцами в наших исследованиях и могут быть рекомендованы в качестве источников для селекционной работы по данному признаку. Наименьшую среднюю массу плода имели сорта Китай (3,3 г), Феферона красная (5,8 г), Чегевара (6,5 г). Средняя масса плода гибридов варьировала от 5,5 до 31,2 г. Выделились гибридные комбинации с высокой массой плода: Линия 9 × Каин (31,0 г), Линия 9 × Ежик (28,5 г), Агдас × Ежик (28,0 г), Агдас × Каин (27,1 г), Лара × Ежик (25,0 г).

Таблица 1 – Средняя масса плода родительских форм перца острого, г

Родительские формы	Годы исследования			Среднее
	2018	2019	2020	
Каин	12,4	11,8	14,0	12,7
Китай	3,8	2,9	3,3	3,3
Феферона красная	6,2	5,4	5,7	5,8
Красный дракон	11,7	10,3	11,3	11,1
Линия 9	53,2	45,6	56,5	51,8
Волгоград	11,0	12,9	12,8	12,2
Лара	26,8	26,1	25,6	26,2
Халапеньо	16,6	20,8	20,1	19,2
Агдас	40,1	37,5	44,2	40,6
Зимрид	23,7	26,0	27,1	25,6
Чегевара	5,7	7,6	6,3	6,5
Ежик (контроль)	12,6	13,5	11,1	12,4
НСР ₀₅	4,8	4,9	4,1	

Разработано автором публикации

Знание комбинационной способности образцов перца острого позволяет целенаправленно подходить к созданию гетерозисных гибридов и использованию исходного материала для повышения эффективности селекционного процесса, улучшения качества подбора родительских форм для скрещивания

На рисунке 1 представлена доля вклада отцовских и материнских форм в общую изменчивость по изучаемому признаку в среднем за три года.

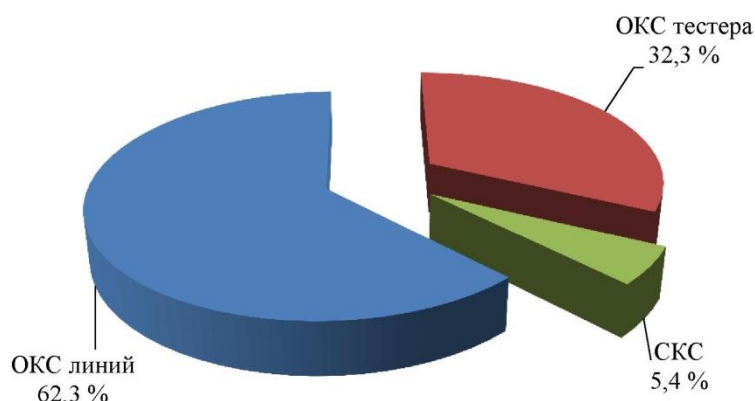


Рисунок 1 – Вклад ОКС и СКС в изменчивость по средней массе плода, %
Разработано автором публикации

По признаку «средняя масса плода» доля вклада материнских линий составила – 62,3 %, отцовских образцов – 32,3%.

Эффекты взаимодействия отцовских и материнских генотипов, которые характеризуют специфическую комбинационную способность, по всем признакам ниже вкладов родительских форм.

Оценка показателей общей комбинационной способности исследуемых образцов перца острого по признаку «средняя масса плода» (таблица 2) позволяет выделить материнские линии: Линия 9, Агдас, Лара и отцовские формы Ежик, Каин. Для прогнозирования лучших комбинаций гибридов были вычислены варианты СКС сортов. Низкие эффекты ОКС по комплексу признаков имеют Китай (отцовская), и Чегевара (материнская) формы. Высокая вариация СКС показывает, что отдельные комбинации скрещивания с участием одного и того же сорта существенно отличаются друг от друга по эффекту гетерозиса. По высоким показателям эффектов ОКС и вариантов СКС выделяются образцы Лара, Линия 9 (материнские формы) и Ежик (отцовская форма), их целесообразно использовать для получения высокопродуктивных гетерозисных гибридов F₁ перца острого.

Таблица 2 – Комбинационная способность родительских образцов перца острого по признаку «средняя масса плода», кг/м²

Родительские образцы	Параметры комбинационной способности					
	Эффекты ОКС			Варианты СКС		
	2018	2019	2020	2018	2019	2020
Линии						
Линия 9	6,094	7,663	10,037	22,388	4,466	50,774
Волгоград	-5,006	-7,377	-6,683	7,533	1,138	1,560
Лара	2,514	3,323	1,737	10,094	2,538	4,968
Халапеньо	-0,206	0,183	-1,303	1,406	1,388	6,103
Агдас	0,014	6,083	5,617	88,794	7,278	12,388
Зимрид	2,054	-0,357	-0,283	23,042	2,940	8,669
Чегевара	-5,468	-9,517	-9,123	3,431	5,675	3,339
Тестеры						
Каин	2,626	2,566	3,369	25,659	1,079	7,889
Китай	-4,631	-5,491	-4,446	6,108	7,177	19,594
Феферона красная	-0,917	-1,920	-2,817	5,037	2,537	8,949



Красный дракон	1,354	-0,234	0,083	7,681	1,632	18,421
Ежик	1,569	5,080	3,811	59,974	4,524	3,682

Разработано автором публикации

Оценка показателей общей комбинационной способности исследуемых образцов перца острого по признаку «средняя масса плода» позволила выделить материнские линии: Линия 9, Агдас, Лара и отцовские формы Ежик, Каин. Для прогнозирования лучших комбинаций гибридов были вычислены варианты СКС сортов. Низкие эффекты ОКС по комплексу признаков имеют Китай (отцовская), и Чегевара (материнская) формы. Высокая вариация СКС показывает, что отдельные комбинации скрещивания с участием одного и того же сорта существенно отличаются друг от друга по эффекту гетерозиса.

Таким образом, по эффектам ОКС установлены источники высокой средней массы плода – Линия 9, Агдас, Лара, Ежик, Каин их целесообразно использовать для получения крупноплодных гетерозисных гибридов F₁ перца острого.

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УДК 339.56(476)

РЕАЛИЗАЦИЯ ИМПОРТОЗАМЕЩЕНИЯ В БЕЛОРУССКОМ СЕЛЬСКОМ ХОЗЯЙСТВЕ

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Abstract: The article is devoted to a comprehensive analysis of the import substitution process in the agro-industrial complex of the Republic of Belarus. The article highlights the key achievements of the food security policy, such as achieving self-sufficiency in the main types of products (meat, milk, grain, and potatoes). The authors assess the results of the implementation of the import substitution policy in the Belarusian agro-industrial complex. It is argued that the strategy has been successful in terms of gross production and self-sufficiency in basic products, ensuring a high level of national food security and significant export potential.

Keywords: import substitution, agriculture in Belarus, food security, self-sufficiency, food products

Республика Беларусь поддерживает торговые отношения со 186 государствами. Белорусские товары экспортируются в 143 страны, а импорт осуществляются из 166. В стране зарегистрировано около 15 тысяч предприятий, занимающихся как экспортом, так и импортом продукции [1].

Импортозамещение находится на постоянном контроле правительства Республики Беларусь и является важнейшим государственным приоритетом, от реализации которого зависит сбалансированное развитие страны в целом.

Для достижения установленных целей и повышения продуктивности функционирования реального сектора экономики, политика импортозамещения реализуется посредством комплекса мер, включающих: приоритетное использование местных ресурсов при создании и расширении производств, налаживание кооперационных связей и развитие вспомогательных производств для повышения уровня локализации выпускаемой продукции, что является основным способом снижения зависимости от импорта.

Кроме того, предпринимаются усилия по вовлечению в экономическую деятельность неиспользуемых или недостаточно эффективно используемых промышленных объектов и земельных ресурсов. Активно привлекаются малые и средние предприятия к созданию и производству конкурентоспособных импортозамещающих товаров, способных заменить импортные аналоги, с акцентом на экспорт, учитывая ограниченность внутреннего рынка.

Важным направлением является налаживание сотрудничества с транснациональными корпорациями, действующими в странах ЕАЭС и за его пределами, для освоения и производства высокотехнологичной продукции. Значимым фактором в данной стратегии является стимулирование производственной деятельности, направленной на создание импортозамещающих и экспортно-ориентированных предприятий.

Этому способствует ряд законодательных актов Республики Беларусь:

Закон Республики Беларусь от 12 июля 2013 г. №53-З «Об инвестициях»;

Декрет Президента Республики Беларусь от 7 мая 2012 г. №6 «О стимулировании предпринимательской деятельности на территории средних, малых городских поселений, сельской местности»;



Декрет Президента Республики Беларусь от 23 ноября 2017 г. №7 «О развитии предпринимательства»;

Постановление Совета Министров Республики Беларусь от 31 декабря 2025 г. № 814 «О Государственной программе «АПК будущего» на 2026–2030 годы»;

Постановление министерства экономики Республики Беларусь от 10 мая 2022 г. № 9 «О перечне продукции, относимой к импортозамещающей».

Предприятиям предоставляется льготный налоговый режим в качестве резидентов свободной экономической зоны.

Государственная программа «Малое и среднее предпринимательство» на 2021-2025 годы. Мероприятия программы реализуются за счет бюджетных и банковских ресурсов, а также Белорусского фонда финансовой поддержки предпринимателей.

В Беларуси программы по замещению импорта осуществлялись до 2011 года. В настоящее время действует механизм замещения ввозимой продукции, за который отвечает Министерство экономики Республики Беларусь. Данная схема включает в себя четыре основных блока. Первые три блока структурированы по категориям товаров [2, С. 46-47]:

– продукция, сопоставимая с белорусской, но выпускаемая в недостаточном объеме или уступающая по качеству зарубежным аналогам.

– импортозамещающие товары, чей выпуск планируется или уже налаживается в рамках отраслевых и региональных программ импортозамещения.

– продукция, не производимая в Республике Беларусь, замещение которой экономически невыгодно или невозможно по объективным причинам.

– действия, направленные на снижение доли импортных компонентов в отечественной продукции. Министерство сельского хозяйства и продовольствия Республики Беларусь, опираясь на них, разрабатывает планы мероприятий по импортозамещению.

В каждой территориальной области страны ежегодно разрабатывается и реализуется план мероприятий по импортозамещению.

Этот план нацелен на: расширение спектра производимых товаров и увеличение объемов их выпуска; постепенное сокращение использования импортных компонентов в производимой продукции; активное привлечение малого и среднего бизнеса к производству комплектующих и материалов, заменяющих импорт; создание новых и развитие существующих производств, специализирующихся на импортозамещающей продукции (таблица 1); внедрение передовых технологий при освоении новой продукции.

Таблица 1 – Перечень продовольственных товаров, предлагаемых для освоения их производства, выпуска импортозамещающей продукции и развития ассортимента с учетом конъюнктуры рынка на 2026 год

№ п/п	Номенклатура товаров	Основные потребительские характеристики
Товары, производство которых осуществляется в республике, но в недостаточном количестве и ассортименте, или которые не полностью удовлетворяют спрос по отдельным параметрам (свойствам)		
1	Сыры	Твердые и сверхтвердые сыры, сыры мягкие с белой плесенью, голубые и прочие сыры, содержащие прожилки, полученные использованием <i>Penicillium roqueforti</i> , тертые сыры или сыры в порошке и другие.
2	Лук	Лук шалот, лук порей и прочие луковичные овощи.
3	Капуста	Капуста цветная и брокколи, капуста брюссельская, капуста краснокочанная.
4	Салат	Салат латук кочанный, салат латук прочий.
5	Прочие свежие овощи	Перец сладкий, спаржа, сельдерей, арбузы.
6	Овощи и смеси замороженные	Расфасованные для розничной продажи и весовые.



7	Груши	Различных сортов.

Источник: <https://molodechno.gov.by/ekonomika/promyshlennost/o-perechne-importozameshhayushhih-tovarov-na-2026-god/>

В структуре ввозимых в страну агропродовольственных товаров традиционно преобладают фрукты и орехи, а также живые растения (деревья, луковичы, срезанные цветы). Существенную долю составляют масличные культуры, отходы пищевого производства, рыба и морепродукты. Также импортируются различные пищевые продукты (экстракты, концентраты, эссенции, соусы и компоненты для их приготовления), алкогольные и безалкогольные напитки, готовые продукты из зерна, овощи и другие товары.

В таблице 2 определены ключевые товарные позиции, производство которых направлено на снижение импортной зависимости внутреннего рынка и обеспечение национальной экономической безопасности.

Таблица 2 – Перечень продукции, относимой к импортозамещающей

Код ТН ВЭД	Наименование продукции по коду ТН ВЭД
8432100000	плуги
8432210000	бороны дисковые
8432291000	рыхлители и культиваторы
8432293000	бороны
8432295000	почвофрезы
8432311100	сеялки точного высева с центральным приводом, применяемые при беспашатной (почвосберегающей) системе земледелия
8432311900	сеялки прочие, применяемые при беспашатной (почвосберегающей) системе земледелия
8432391900	прочие сеялки, прочие
8432399000	прочие сажалки и машины рассадопосадочные
8432410000	разбрасыватели и распределители органических удобрений
8432800000	машины и механизмы прочие для подготовки и обработки почвы; катки для газонов и спортплощадок
8433115100	косилки самоходные для газонов, парков, спортплощадок с сидением
8433205000	косилки тракторные, навесные или прицепные, прочие
8433300000	машины для заготовки сена прочие
8433400001	пресс-подборщики
8433510009	комбайны зерноуборочные прочие
8433520000	машины и механизмы для обмолота прочие
8433531000	картофелекопатели и картофелеуборочные машины
8433591109	силосоуборочные комбайны самоходные прочие
8433598509	прочие машины для уборки урожая, машины или механизмы для обмолота прочие
8433600000	машины для очистки, сортировки или калибровки яиц, плодов или других сельскохозяйственных продуктов
8433900000	части машин или механизмов для уборки или обмолота сельскохозяйственных культур, пресс-подборщиков, прессов для упаковки в кипы соломы или сена; сенокосилок; машин для очистки, сортировки и калибровки
8701100000	тракторы одноосные
8701211011	экологического класса 4 или выше 7
8701300009	тракторы гусеничные, прочие
8701911000	тракторы прочие, новые, с мощностью двигателя не более 18 кВт, для сельскохозяйственных работ (за исключением одноосных тракторов) и тракторы для лесного хозяйства, колесные

8701931000	тракторы прочие, новые, с мощностью двигателя более 37 кВт, но не более 75 кВт, для сельскохозяйственных работ (за исключением одноосных тракторов) и тракторы для лесного хозяйства, колесные
8701941009	новые тракторы, с мощностью двигателя более 75 кВт, но не более 130 кВт, для сельскохозяйственных работ (за исключением одноосных тракторов) и тракторы для лесного хозяйства, колесные, прочие
8701951009	новые тракторы, с мощностью двигателя более 130 кВт, для сельскохозяйственных работ (за исключением одноосных тракторов) и тракторы для лесного хозяйства, колесные, прочие

Источник: <https://etalonline.by/document/?regnum=u222e2817>

Внешняя мотивация включает государственную поддержку в виде налоговых льгот, льготных кредитов и других мер, направленных на развитие импортозамещающего бизнеса. Это необходимо для оптимизации внешнеторгового баланса, защиты внутреннего рынка и поддержки отечественных производителей, а также для увеличения экспортного потенциала промышленности.

Белорусская политика импортозамещения ориентирована на использование внутреннего потенциала страны посредством развития национального производства. Однако, если внутренний рынок невелик, создание импортозамещающих предприятий может быть экономически нецелесообразным. В таких случаях необходимо ориентироваться на общий рынок ЕАЭС для достижения эффекта масштаба.

Главной тенденцией внешней торговли последних пяти лет является увеличение объемов импорта (таблица 3).

Таблица 3 – Импорт продовольственных товаров в Республику Беларусь

Наименование товара	Единица измерения	Годы	
		2020	2021
Рыба свежая или охлажденная	тонн	16880	18 834
Форель свежая или охлажденная	тонн	11512	13672
Молоко и сливки сгущенные и сухие	тонн	2626	3007
Масло сливочное	тонн	242	270
Сыры и творог	тонн	6292	7258
Яйца	тыс. шт.	10051,5	13533,0
Картофель	тонн	20330	33599
Томаты	тонн	45034	33784
Огурцы и корнишоны	тонн	3474	9988
Пшеница	тыс.тон	17,8	193,3
Рожь	тонн	3446	2908
Ячмень	тыс. тонн	151,4	95,2
Овес тонн	тонн	1672	570
Кукуруза	тыс. тонн	105	57,4

Источник: <https://www.belstat.gov.by/ofitsialnaya-statistika/realny-sector-ekonomiki/vneshnyaya-torgovlya/>

Импорт продовольствия в Республике Беларусь превышает экспорт, хотя доля продукции пищевой промышленности и сырья для её производства в структуре импорта снижается. Отрицательное сальдо сохраняется из-за значительных объемов импорта продукции, не производимой или производимой в незначительных количествах в стране в силу природно-климатических условий (рыба, морепродукты, кофе, чай, некоторые виды круп, субтропические фрукты и др.), что является допустимым.

Из-за ограниченности ресурсов сырья и мощностей для его переработки, потребность республики в растительном масле обеспечивается собственным производством лишь на 15–20 процентов. Ежегодный импорт этого продукта составляет значительные 125–130 тыс. тонн.

Недостаточная переработка выращенных в стране овощей и фруктов (менее 2 процентов) приводит к высокому уровню импорта плодоовощной консервации (40–50 процентов от общего объема продаж). Значительную часть импорта составляют консервированные овощи и фрукты, не произрастающие в климатических условиях Беларуси или возделываемые в малых объемах (такие как перец, кукуруза, баклажаны, а также соки и компоты из персиков, абрикосов и винограда).

Развитие импортозамещающего производства в агропромышленном комплексе будет способствовать укреплению продовольственной безопасности страны, критерием которой является удовлетворение не менее 80–85% потребности населения в продовольствии за счет отечественного производства (таблица 4), согласно рациональным нормам потребления.

Таблица 4 – Объем производства основных видов сельскохозяйственной продукции в расчете на душу населения по территории Республики Беларусь

Виды продукции сельского хозяйства	Единицы измерения	2020	2021	2022	2023	2024
Зерновые и зернобобовые культуры	кг	923	787	943	835	913
Картофель	кг	395	366	418	438	341
Овощи	кг	298	293	310	305	304
Плоды и ягоды	кг	82	66	89	70	78
Свекла сахарная	кг	427	416	458	528	542
Все виды скота и птица	кг	137	134	132	139	147
Молоко	кг	827	840	853	908	958
Яйца	штук	372	379	375	375	407

Источник: <https://dataportal.belstat.gov.by/osids/rubric-info/1063236>

Основными направлениями импортозамещения в агропромышленном секторе являются зерно (твердые сорта пшеницы), продукты переработки картофеля и овощей, фрукты и ягоды, растительное масло, сахар, белково-витаминные добавки для производства комбикормов.

Несмотря на высокие объемы урожая картофеля, потребность страны в продуктах его переработки (крахмал, патока, продукты питания из нее) обеспечивается за счет отечественного производства лишь на 40 – 50%.

Данные в натуральном выражении (таблица 5) отражают физический объем выпуска продукции, что позволяет оценить реальные производственные мощности и динамику развития отраслей. Показатели по конкретным видам продукции является ключевыми для мониторинга реализации политики импортозамещения, обеспечения национальной безопасности и оценки экспортного потенциала страны.

Таблица 5 – Объем производства промышленной продукции в натуральном выражении по видам промышленной продукции

Виды промышленной продукции	Единицы измерения	2017	2018	2019	2020	2021
Машины почвообрабатывающие	штук			37 767	47 904	41 523
Плуги	штук			16 754	20 149	18 207
Бороны, рыхлители, культиваторы, агрегаты пропалочные и мотыги	штук			16 035	21 606	18 402
Сеялки, сажалки и рассадопосадочные машины	штук			2 878	4 116	2 496
Машины уборочные	штук			17 426	21 154	17 449



Косилки, жатки, включая монтируемые на тракторах, прочие (кроме косилок для газонов, парков и спортивных площадок)	штук			4 753	3 645	4 323
Прессы для соломы или сена, включая пресс-подборщики	штук			2 951	3 729	3 802
Машины для уборки клубней или корнеплодов	штук			4 761	6 842	2 945
Тракторы для сельского и лесного хозяйства	штук	38 192	40 829	39 575	39 547	44 890
Машины для внесения минеральных удобрений	штук	346	611	1 205	1 134	1 360
Машины для внесения органических удобрений	штук	584	498	641	713	868
Комбайны зерноуборочные	штук	845	938	640	1 125	1 334
Комбайны кормоуборочные самоходные	штук	15	2			
Комплексы кормоуборочные высокопроизводительные	штук	268	277	254	275	238
Говядина	тонн			282 609	313 601	306 606
Свинина	тонн			283 765	296 926	289 153
Мясо птицы	тонн			525 300	532 739	506 797
Рыба и морепродукты пищевые, включая рыбные консервы	тонн			127 250	127 940	147 589
Масла и жиры растительные нерафинированные (неочищенные)	тонн			417 225	441 595	461 145
Масло соевое и его фракции нерафинированные	тонн			83 318	95 956	61 122
Молоко и сливки, обработанные, жидкие	тонн			975 104	950 821	904 916
Масло сливочное и пасты молочные	тонн			115 840	119 530	119 690
Творог и творожные изделия	тонн			138 848	146 940	157 288
Сыры твердые, сыры в порошке, сыры голубые и сыры необработанные прочие, кроме сыра плавленого	тонн			243 883	270 687	278 555
Корма готовые для сельскохозяйственных животных, кроме муки и гранул из люцерны	тыс. тонн			6 009,4	6 265,3	6 112,5

Источник: <https://dataportal.belstat.gov.by/osids/rubric-info/1063236>

Для достижения целей Доктрины национальной продовольственной безопасности Беларуси до 2030 года планируется увеличить долю отечественных продуктов в розничной торговле до 80–85%.

В республике на различных предприятиях производятся агрегаты, интегрированные с элементами систем точного земледелия. В частности, ОАО «Щучинский ремонтный завод» выпускает разбрасыватели минеральных удобрений РМУ-10. ООО «Агромашресурс» и ОАО «Лидагропроммаш» предлагают, соответственно, опрыскиватели РОСА и ОВС – 4224, оснащенные системами дифференцированного внесения удобрений, работающими на основе данных карт полей. Холдинг «Гомсельмаш» производит зерноуборочные комбайны GS 2124, оборудованные системой мониторинга урожайности, позволяющей фиксировать объем собранного урожая с каждого квадратного метра и определять вынос питательных веществ из почвы. Эта информация используется для точного планирования внесения удобрений в последующих сельскохозяйственных циклах.

Стоит отметить и тракторы BELARUS – 4522 с системой «Автопилот», а также BELARUS–3522 с бортовым компьютером управления. Кроме того, Минский тракторный завод в сотрудничестве с Объединенным институтом машиностроения НАН Беларуси разработал модель BELARUS–3523i, особенностью которой является отсутствие кабины для тракториста, так как машина предназначена для полностью автономной работы [3, С. 63-64].

Политика импортозамещения в белорусском АПК на текущем этапе может быть оценена как успешная на тактическом уровне (замещение конечных товаров), но недостаточная и уязвимая на стратегическом уровне (технологическая независимость).

Страна надежно обеспечивает себя базовым набором продуктов питания (мясо и мясопродукты, молоко и молокопродукты, картофель, зерно, сахар, яйца), что снижает зависимость от импортных поставок и является их нетто-экспортером. Это позволило не только гарантировать внутреннюю продовольственную стабильность, но и сформировать мощный экспортный потенциал.

Политика развития перерабатывающей промышленности стимулировала глубокую переработку местного сырья (мяса, молока, зерна), что привело к экспорту не сырья, а готовых пищевых продуктов с более высокой добавленной стоимостью.

Созданы современные перерабатывающие предприятия, соответствующие международным стандартам качества.

Таким образом, внешнеторговая модель политики импортозамещения представляет собой стратегию обеспечения внутреннего рынка на основе развития национального производства.

Реализация политики импортозамещения в сельском хозяйстве Беларуси демонстрирует смешанные результаты. С одной стороны, достигнута значительная самообеспеченность по базовым продуктам питания (мясомолочная продукция, зерно, картофель, яйца), что гарантирует национальную продовольственную безопасность. С другой стороны, сохраняется критическая зависимость от импорта технологических компонентов: семян гибридных культур, средств защиты растений, племенного материала, ветеринарных препаратов и высокотехнологичной сельхозтехники.

Проведя сопоставительный анализ экспортных и импортных операций, можно сделать вывод о том, что политика замещения импорта, проводимая в Беларуси, носит правомерный характер. Однако для оптимизации результативности этих действий необходима поддержка и контроль со стороны государства.

В заключение, стоит подчеркнуть, что реализация политики импортозамещения в белорусском сельском хозяйстве – это не просто ответ на внешние вызовы, а стратегический курс на укрепление национальной продовольственной безопасности и повышение конкурентоспособности агропромышленного комплекса.

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СУЩНОСТЬ, ЭВОЛЮЦИЯ, ФАКТОРЫ ОБЕСПЕЧЕНИЯ УСТОЙЧИВОГО РАЗВИТИЯ АГРАРНОЙ СФЕРЫ

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Abstract. В статье рассматриваются сущность и эволюция концепции устойчивого развития аграрной сферы, а также факторы, определяющие устойчивое экономическое развитие агропромышленного комплекса. Обобщены теоретические подходы к трактовке устойчивого развития АПК, систематизированы и уточнены внутренние и внешние факторы, влияющие на экономическую стабильность сельскохозяйственных организаций. Особое внимание уделено отраслевым особенностям сельского хозяйства, формирующим специфику устойчивости его развития, а также роли аграрной сферы в обеспечении продовольственной безопасности на региональном уровне. Рассмотрены группы индикаторов оценки развития АПК и основные методологические подходы к оценке устойчивого экономического развития сельскохозяйственных предприятий. Полученные результаты могут быть использованы при формировании стратегий устойчивого развития аграрной сферы и совершенствовании механизмов государственного регулирования агропромышленного комплекса.

Keyword: устойчивое развитие, агропромышленный комплекс, сельскохозяйственная организация, экономическая устойчивость, факторы.

Текст. Проведенные исследования позволили установить, что агропромышленный комплекс выполняет стратегическую задачу – формирует продовольственное обеспечение как отдельного региона, так и страны в целом. Основное значение в развитии всего агропромышленного комплекса принадлежит сельскохозяйственным организациям и сельским территориям. Для эффективного функционирования сельскохозяйственных организаций необходимы ресурсы и соблюдение технологии производства. От эффективной производственной деятельности данных предприятий зависит устойчивость их экономического развития (экономическая стабильность). Ряд вопросов, связанных с обеспечением устойчивого экономического развития организаций АПК Республики Беларусь,

раскрыт в трудах отечественных ученых: В. И. Бельского, Г. И. Гануша, В. Г. Гусакова, Л. Н. Давыденко, Л. Ф. Догиля, И. В. Новиковой, Н. В. Киреенко, С. А. Кондратенко, С. А. Константинова, Л. В. Лагодич, Р. К. Ленковой, А. В. Микулича, Л. В. Пакуш, А. В. Пилипука, А. С. Сайганова, Н. С. Яковчика и др.

Мы согласимся с А.Г. Ефименко и И.В. Журовой [3] в том, что в настоящее время достижение устойчивого экономического развития сельскохозяйственных организаций Республики Беларусь приобретает особое значение, так как они являются ведущим элементом, формирующим агропродовольственный рынок, обеспечивают продовольственную и экономическую безопасность.

Изучения показывают, что понятие устойчивого развития предприятия формировалось в ходе эволюции экономической мысли и управленческих практик под влиянием изменений во внешней среде, усиления конкуренции и нарастающих экологических и социальных проблем. Изначально устойчивость предприятия отождествлялась преимущественно с его способностью обеспечивать стабильные финансовые результаты, сохранять платежеспособность и адаптироваться к рыночным колебаниям.

Впервые термин «устойчивое развитие» в международных документах был использован во Всемирной стратегии охраны природы. 3

На раннем этапе развития данной концепции, вплоть до 1970-х годов, устойчивое развитие предприятия рассматривалось исключительно в экономическом контексте. Основное внимание уделялось росту производства, увеличению прибыли и повышению эффективности использования ресурсов. Экологические и социальные аспекты деятельности предприятия практически не учитывались, поскольку природные ресурсы воспринимались как неисчерпаемые, а негативные последствия хозяйственной деятельности не считались значимыми для долгосрочного функционирования бизнеса.

В 1970–1980-е годы под воздействием глобальных экологических кризисов и научных исследований, в том числе докладов Римского клуба, произошло переосмысление роли предприятия в системе «экономика – общество – природа». В этот период в содержание устойчивого развития стали включаться экологические ограничения, а устойчивость предприятия начала связываться со снижением вредного воздействия на окружающую среду, рациональным использованием ресурсов и соблюдением природоохранных норм.

С конца 1980-х годов, после публикации доклада Международной комиссии по окружающей среде и развитию под руководством Г. Брундтланд, концепция устойчивого развития приобрела комплексный характер. Устойчивое развитие предприятия стало рассматриваться как сбалансированное взаимодействие экономических, экологических и социальных факторов, обеспечивающее долгосрочную эффективность деятельности, социальную ответственность и экологическую безопасность. В этот период усиливается внимание к условиям труда, развитию человеческого капитала и взаимодействию с заинтересованными сторонами.

Вопрос устойчивости развития предприятия и подходы к его определению стали новым течением в рамках Всеобщей концепции устойчивого развития. Идея идентификации корпоративной устойчивости впервые была изложена в статье Дж. Элкингтона «На пути к устойчивой корпорации: беспроектная корпоративная стратегия, ведущая к устойчивому развитию». В 1994 году ученый ввел понятие «тройного (триединого) итога», что позволило отойти от финансово-экологического анализа деятельности организации к измерению социально-экономического воздействия, которое до этого практически не принималось во внимание. Согласно мнению Дж. Элкингтона переход к новой парадигме корпоративной устойчивости связан с определенными драйверами современного развития, пережить которые сможет только по-настоящему устойчивая компания [6].

В ходе исследований выявлено, что в настоящее время существует широкий круг различающихся между собой определений понятия «устойчивое развитие» применительно к

аграрной сфере (от 80 до 100 в соответствии с различными литературными источниками), наиболее значимые из которых представлены в таблице 1.

Таблица 1 – Некоторые дефиниции устойчивого развития агропромышленного комплекса

Автор, источник	Определение
В. Г. Гусаков [5]	Устойчивое развитие сельского хозяйства – развитие, которое, сохраняя колебания объемов производства в отдельные годы, обеспечивает полную компенсацию периодически возникающих дефицитов за счет ранее созданных резервов и запасов
С. В. Пушкарев, И. В. Киреева [7]	Устойчивое развитие АПК – многоцелевая (многоаспектная) категория, включающая, как минимум, пять составляющих: экономическую устойчивость и обеспеченность финансовыми ресурсами для расширенного воспроизводства, расширенное воспроизводство всех ресурсов, развитие производства на основе инноваций, улучшение экологии, устойчивое социальное развитие сельских территорий
Н. М. Винтер [1]	Устойчивое развитие сельскохозяйственных предприятий – это концепция, направленная на обеспечение баланса между экономической эффективностью, социальной справедливостью и экологической устойчивостью. Данная концепция предполагает, что сельскохозяйственные предприятия должны стремиться не только к максимизации прибыли, но и к защите окружающей среды, поддержанию здоровья населения и устойчивому использованию ресурсов
Е. В. Гусаков [2]	Устойчивость агропромышленного комплекса – это возможность различных отраслей и уровней АПК эффективно взаимодействовать между собой, соблюдая паритет товарообмена и экономического стимулирования; возможность различных территорий и зон структурно взаимодействовать с учетом стратегической эффективности; возможность различных объединений и предприятий участвовать в общестрановом разделении труда на принципах кооперации и интеграции, а также способность АПК стабильно функционировать, несмотря на внутренние и внешние угрозы, и обеспечивать целевой рост производства агропродовольственной продукции с учетом сбалансированности рыночного спроса и предложения и его системного научнообоснованного регулирования; способность обеспечивать пропорциональность развития экономической, финансовой, социальной подсистем и сохранять возможность стратегического роста мегакластера (АПК) в целом в связи с необходимостью обеспечения преемственности будущих поколений при организации равновесного использования всех видов материальных, техникотехнологических и экологических ресурсов.

Таким образом, анализ литературных источников позволил нам сформулировать собственное определение понятия. Так, устойчивое развитие агропромышленного комплекса – это способность взаимосвязанных отраслей, территорий и хозяйствующих субъектов АПК обеспечивать долгосрочное и сбалансированное функционирование и целевой рост производства агропродовольственной продукции на основе экономической эффективности и финансовой устойчивости, расширенного воспроизводства ресурсов, инновационного обновления производственного потенциала, рационального и экологически безопасного использования природных ресурсов, а также социального развития сельских территорий, при сохранении адаптивности к внутренним и внешним угрозам и обеспечении продовольственной безопасности и преемственности развития для будущих поколений.

Группы факторов определяющие устойчивое развитие сельскохозяйственных предприятий можно условно разделить на внутренние и внешние.

Устойчивое развитие АПК в целом формируется за счет внутренних факторов:

- организационно-управленческих (структура управления, стратегия развития, деловая репутация, эффективность распределения основных управленческих и производственных функций, четкость постановки целей и задач организационного процесса, качество управленческой деятельности и др.);

- производственно-технических (производственная мощность и уровень ее использования, уровень использования основных и оборотных средств; основные

характеристики продукции; уровень использования передовой техники; уровень износа основных фондов и др.);

- финансово-экономических (уровень платежеспособности предприятия, уровень рентабельности, структура имущества, объем инвестиций, соотношение собственных и заемных средств и т. д.);

- социальных (половозрастной состав работников, уровень их квалификации и образования, уровень заработной платы, наличие системы материального и морального поощрения, условия и режим работы и др.);

- маркетинговых (степень ориентации предприятия на потребителей, разветвленность розничных сетей, уровень использования современных маркетинговых методов продвижения продукции, наличие системы обратной связи с потребителем);

- экологических (уровень экологической безопасности предприятия, количество вредных выбросов в окружающую среду, уровень использования инновационных средств очистки переработанных ресурсов, объемы отходов от основной деятельности предприятия и др.);

- информационных (уровень информационной обеспеченности, наличие системы автоматизации управленческой деятельности, сбалансированность информационных потоков, уровень оснащенности информационной деятельности и др.) [10].

Мы считаем, что в данную группу внутренних факторов также необходимо включить инновационно-кадровые факторы, отражающие способность агропромышленного комплекса к формированию, накоплению и эффективному использованию человеческого и интеллектуального капитала. К ним относятся уровень инновационной активности персонала, наличие системы обучения и повышения квалификации, степень вовлеченности работников в процессы внедрения инноваций, развитость корпоративной культуры, ориентация на знания и технологическое обновление. Включение данной группы факторов обусловлено тем, что в современных условиях устойчивое развитие АПК в значительной степени определяется не только наличием материальных ресурсов и финансовых возможностей, но и способностью персонала генерировать и реализовывать инновационные решения, обеспечивающие повышение производительности, адаптацию к изменениям внешней среды и долгосрочную конкурентоспособность комплекса.

Внутренние факторы, зависящие от самой отрасли, определяют ее возможность эффективно развиваться.

Внешние факторы формируют среду для функционирования отрасли. К их числу можно отнести:

- экономические (условия кредитования; темпы инфляции; уровень доходов и сбережений населения; уровень безработицы и др.);

- политико-правовые (уровень политической стабильности в стране; уровень развития законодательной базы; развитость инвестиционной политики в регионе; уровень поддержки предпринимательства со стороны государства; налоговое, патентное и таможенное законодательство и др.);

- социокультурные (уровень развития социальной инфраструктуры; уровень продолжительности жизни, нравственной просвещенности, образования населения, развития здравоохранения; половозрастной состав населения и др.);

- экологические (уровень загрязнения окружающей среды; почвенно-климатические условия; обеспеченность природными ресурсами и др.);

- рыночные (количество и состав конкурентов на рынке; уровень конкуренции; уровень покупательной способности населения; уровень сложности выхода на рынок; взаимосвязи с государственными органами; взаимоотношения с банковским сектором);

- отраслевые (особенности функционирования отрасли; количество и состав потребителей отраслевой продукции; структура и емкость отраслевого рынка; степень развитости отраслей инфраструктуры; уровень межотраслевого взаимодействия и др.) [10].

По нашему мнению, к числу внешних факторов устойчивого развития агропромышленного комплекса целесообразно также отнести научно-технологические и институционально-информационные факторы, характеризующие уровень развития научной среды, доступность современных технологий и степень интеграции АПК в национальное и глобальное информационное пространство. К ним относятся уровень государственной и частной поддержки научных исследований и разработок в аграрной сфере, степень распространения цифровых технологий и платформенных решений, доступность отраслевой информации, развитие системы аграрного консалтинга и трансфера технологий, а также участие АПК в международном научно-технологическом сотрудничестве. Включение данной группы факторов обусловлено тем, что в условиях ускоренного научно-технологического прогресса и цифровизации именно внешняя научно-информационная среда во многом определяет возможности внедрения инноваций, повышения эффективности производства и обеспечения долгосрочной устойчивости и конкурентоспособности агропромышленного комплекса.

В научной литературе выделяют несколько отраслевых особенностей экономического развития сельскохозяйственных организаций. Как правило, их связывают с природно-климатическими условиями, ценовой эластичностью спроса, со сроком хранения продукции, а также с влиянием на продовольственное обеспечение [8].

Считаем, что данный перечень не является исчерпывающим и требует дополнения. Мы предлагаем в состав отраслевых особенностей экономической стабильности сельскохозяйственных предприятий включить высокую зависимость результатов деятельности от сезонности производства и биологических циклов, повышенную капиталоемкость и длительный период окупаемости инвестиций, ограниченную мобильность производственных ресурсов, значительную чувствительность к государственному регулированию и мерам поддержки, а также повышенный уровень производственных и рыночных рисков, обусловленных колебаниями урожайности, цен на ресурсы и агропродовольственную продукцию. Учет данных особенностей позволяет более полно раскрыть специфику формирования экономической устойчивости сельскохозяйственных предприятий и обосновать необходимость применения адаптированных механизмов управления и государственного регулирования в аграрной сфере.

Изучение показывает, что основными принципами устойчивого развития любой отрасли, в том числе и агропромышленного комплекса, являются:

- целеориентированность, предопределяющая достижение такого соотношения между соответствующими элементами, при котором у предприятия будут сохраняться долгосрочные стимулы устойчивого развития;

- адаптивность, ориентированная на возможность приспосабливаться к изменениям во внешней среде для того, чтобы продолжить устойчивое развитие на долгосрочную перспективу. Внешнее окружение является источником проблемных ситуаций в деятельности предприятия, которые следует своевременно выявлять и принимать адекватные решения;

- целостность, которая достигается на основе единства следующих функций: способности обновления (воспроизводства), дополнения недостающих элементов и преобразования себя в качественно новую систему, сохранения финансового равновесия. Принцип целостности является фактором, определяющим результативность деятельности предприятия и его финансовую устойчивость, а также свидетельствующим о сбалансированности и пропорциональности элементов его деятельности (операционной, инвестиционной и финансовой);

- динамичность, отражающая, что изменения в одном из параметров деятельности предприятия, как правило, приводят к изменениям в других. При этом в каждый момент времени предприятие характеризуется определенным набором показателей, которые отражают эффективность его производственно-финансовой деятельности. Вектор устойчивого развития предприятия дает возможность в конкретный момент времени определить его состояние;

– гибкость, которая базируется на исследовании параметров изменения ресурсного потенциала и прогнозировании внешних и внутренних источников саморазвития.

Одной из составляющих устойчивого экономического развития сельского хозяйства является его способность к продовольственному обеспечению на региональном уровне. Ряд авторов для оценки уровня развития АПК предлагают использовать три группы индикаторов, это [9]:

- совпадающие;
- запаздывающие;
- опережающие.

В научных исследованиях установлено, что совпадающие индикаторы отражают текущее состояние и фактический уровень развития агропромышленного комплекса и продовольственного обеспечения региона. К их особенностям относится непосредственная связь с результатами производственно-хозяйственной деятельности сельскохозяйственных организаций, поскольку данные показатели фиксируют происходящие в данный момент экономические процессы и позволяют оценить степень соответствия объемов производства агропродовольственной продукции текущим потребностям регионального рынка.

Также исследования показывают, что запаздывающие индикаторы характеризуют последствия ранее принятых управленческих решений и сложившихся условий функционирования АПК. Их особенностью является проявление изменений с временным лагом, что делает данные показатели менее чувствительными к краткосрочным колебаниям, но значимыми для оценки устойчивости экономического развития сельского хозяйства в средне- и долгосрочной перспективе, включая уровень продовольственной обеспеченности и социально-экономические результаты отрасли.

В то же время установлено, что опережающие индикаторы отражают потенциальные и прогнозируемые изменения в развитии агропромышленного комплекса и продовольственного обеспечения региона. Их особенностью является способность сигнализировать о возможных тенденциях и рисках еще до их фактического проявления, что позволяет использовать данные показатели в качестве инструмента раннего предупреждения и обоснования стратегических управленческих решений, направленных на обеспечение устойчивого экономического развития сельского хозяйства.

Для оценки устойчивого экономического развития предприятия, в том числе и сельскохозяйственного, предлагается некоторыми авторами предлагается использование нескольких подходов [4]:

- индикаторный подход;
- ресурсно-функциональный подход;
- комплексный подход;
- подход на основе теории экономических рисков.

В научной литературе отмечается, что индикаторный подход к оценке устойчивого экономического развития предприятия основан на использовании системы количественных показателей, отражающих различные аспекты его деятельности. Исследования показывают, что особенностью данного подхода является возможность объективной оценки текущего состояния предприятия и динамики его развития на основе сопоставления фактических значений индикаторов с нормативными или пороговыми уровнями, что позволяет выявлять отклонения и потенциальные угрозы устойчивости.

Также установлено, что ресурсно-функциональный подход ориентирован на анализ обеспеченности предприятия ресурсами и эффективности их использования в процессе выполнения основных производственных и управленческих функций. Его особенностью является акцент на взаимосвязи между ресурсным потенциалом предприятия и результатами хозяйственной деятельности, что позволяет оценить способность организации поддерживать устойчивое развитие за счет внутреннего потенциала.

Исследования показывают, что комплексный подход предполагает одновременный учет экономических, финансовых, социальных, экологических и организационных факторов устойчивого развития. Особенностью данного подхода является системный характер оценки, обеспечивающий целостное представление об уровне устойчивости предприятия и позволяющий учитывать многоаспектность его функционирования, особенно актуальную для сельскохозяйственных организаций.

В свою очередь, в рамках подхода на основе теории экономических рисков устойчивое экономическое развитие предприятия рассматривается через призму вероятности наступления неблагоприятных событий и степени их воздействия на результаты деятельности. Установлено, что особенностью данного подхода является ориентация на идентификацию, оценку и управление рисками, что позволяет повысить адаптивность предприятия к неопределенности внешней среды и обеспечить устойчивость его развития в долгосрочной перспективе.

Таким образом, проведенное исследование позволило обобщить и систематизировать научные подходы к пониманию устойчивого развития аграрной сферы и агропромышленного комплекса в целом. Установлено, что устойчивое развитие АПК представляет собой многоаспектную и динамичную категорию, формирующуюся под воздействием совокупности внутренних и внешних факторов, а также отраслевых особенностей сельского хозяйства. Особая роль в обеспечении устойчивости отводится сельскохозяйственным организациям, поскольку именно их экономическая стабильность определяет уровень продовольственного обеспечения и продовольственной безопасности региона и страны в целом. В ходе исследования уточнены группы внутренних и внешних факторов устойчивого развития АПК, дополненные инновационно-кадровыми, а также научно-технологическими и институционально-информационными составляющими. Обосновано, что учет отраслевых особенностей сельского хозяйства, связанных с сезонностью, биологическими циклами, высокой капиталоемкостью и рисковостью производства, является необходимым условием формирования эффективных механизмов управления устойчивым развитием. Рассмотренные группы индикаторов и подходы к оценке устойчивого экономического развития позволяют комплексно оценивать текущее состояние, выявлять потенциальные угрозы и формировать обоснованные управленческие решения, направленные на долгосрочное устойчивое развитие аграрной сферы.

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МАКСИМИЗАЦИЯ НАКОПЛЕНИЯ СОЛНЕЧНОЙ ЭНЕРГИИ СЕЛЬСКОХОЗЯЙСТВЕННЫМИ РАСТЕНИЯМИ

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Abstract. Maximization of the sun energy accumulation by agricultural plants is a way to provide growing human population with food and soil with organic matter. It can be achieved through decreasing the entropy- reduction of the share of the biospheric, anthropic and anthropogenic energies used in farming which do not take part in sun energy capture, and increasing their negentropy – with smaller energy inputs to produce more organic matter.

Key words: farming, entropy, negentropy, crop rotation, crop energy productivity

Сельскохозяйственная деятельность человека призвана максимизировать собирание солнечной энергии с помощью растений и тем самым удовлетворить потребность растущего населения в продовольствии и почву в органическом веществе. В природных условиях генетически обусловленную максимизацию аккумуляирования солнечной энергии осуществляет естественный отбор (12), а достижение ее предельного сбора земной поверхностью обеспечивается постоянной фенотипической эволюцией экониш (11), явлением которое можно было бы назвать естественный подбор.

В сельскохозяйственном способе собирания солнечной энергии задействованы три энергии -биосферная неразумная, биосферная разумная(антропоная) и антропогенная. При этом, фотосинтетическая деятельность растений относится к негэнтропийным процессам, тогда как функционирование отмеченных энергий к энтропийным.

Селекция растений представляет собой эволюцию механизмов осуществляющие сбор солнечной энергии. С потребительской точки зрения она состоит в максимизации накопления энергии не вообще, а той которая находится в зерне, в волокнах хлопка, овощах, фруктах и т.д. Для этого селекционеры избавляются от энтропийных генов ответственных за признаки не оказывающие положительный вклад в урожай и проводят накопление негэнтропийных генов

работающих на производимую продукцию и при меньшем потреблении жизненных ресурсов аккумулирующие большее количество солнечной энергии.

Технологии выращивания с/х растений призваны создавать условия для реализации энергетического потенциала продуктивности сортов. Их элементы делятся на 5 групп взаимосвязанных друг с другом законом оптимальности. Первую группу составляют агротехнические приемы осуществляющие внесение питания для растений, а вторую полив и сохранение влаги в почве. Кроме этого, они нацелены на минимизацию энтропии-уменьшению физических потерь отмеченных ресурсов.

Третью группу образуют элементы технологии снижающие потери урожая по причине их поражения вредителями и болезнями, которые поедая органическое вещество растений осуществляют эрозию накопленной энергии. В четвертую группу входят элементы технологии осуществляющие борьбу с сорной растительностью, которая потребляя часть жизненных факторов снижает энергетическую урожайность посева. По отмеченной причине ее виды относятся к энтропийным системам, в то время как с/х культуры являются неэнтропийными организмами. Последнюю, пятую группу формируют агротехнические приемы обеспечивающие сохранение и увеличение энергии в почве, которая по способу жизнедеятельности является энтропийной системой с полным(минерализация) и неполным(гумификация) трофическими цепями и поэтому нуждающаяся в постоянном поступлении органического вещества.

Строительство энергетически высокопродуктивных агрофитоценозов осуществляется на двух принципах- комплементарности и минимальной конкуренции. Комплементарность означает, что за счет морфологической и биологической взаимодополняемости культур происходит более полное потребление жизненных ресурсов, в результате чего снижается их физические потери и возрастает продуктивность посева. Конкуренция возникает вследствие отсутствия у растений комплементарности при сохранении прежнего уровня жизненных ресурсов, что ведет к снижению урожайности культур.

В гомозиготных сортах, родительских линиях, гибридах первого поколения перекрестноопыляемых культур и сортах размножающихся вегетативно растения генетически одинаковы. В сортах популяций растения в высокой степени генетически родственны. Согласно теории естественного отбора наибольшая конкуренция возникает между генетически близкими особями, то есть именно между растениями упомянутых селекционных конструкций. Более того, по причине генетической одинаковости их растений между ними невозможна морфологическая и биологическая комплементарность. Однако при определенной густоте растений генетическая конкуренция переходит в фенотипическую комплементарность. Так например, в отделе подсолнечника НИИПК "Селекция" среднеспелые гибриды подсолнечника изучались при густоте стояний растений 30, 40, 50, 60 и 70 тыс.га. и их равномерном распределении в ряду. Исследования показали, что по мере уменьшения конкуренции путем снижения числа растений, а также увеличения конкуренции за счет высева большего их количества происходило снижение продуктивности товарных семян. Корреляционно-регрессионным анализом установлено, что наибольшая урожайность достигается при наличии на одном гектаре 55 тыс. растений, которая и является густотой максимального перехода генетической конкуренции в фенотипическую комплементарность и была обусловлена оптимальным заполнением почвы и пространства над ней растениями подсолнечника в результате чего посев за единицу времени поглощал наибольший объем питательных веществ и влаги, и аккумулировал максимальное количество солнечной энергии.

К генетически обусловленной пространственной комплементарности также относятся взаимодополняемость возникающая между растениями компонентов межвидовых посевов. Эта комплементарность означает, что продуктивность совместного посева выше, чем отдельные посевы его компонентов. В то же время, в них иногда отсутствует антропогенная комплементарность - одинаковая полезность их технологий возделывания для всех компонентов. Например, невозможно внести гербициды раздельного действия если один

компонент злаковая культура, а другой бобовая, поскольку защищая один вид от сорной растительности можно повредить другой, или компоненты совместного посева поражаются разными вредителями и болезнями и в разные сроки, и защищая каждую культуру в угрожающий ее период, можно увеличить пестицидную нагрузку на посев.

Общим для всех посевов с/х культур является присутствие в них конкуренции в пространстве обусловленной экологическими факторами. Она состоит в том, что некоторые растения получают преимущество в росте и развитии благодаря возникновению лучших условий произрастания по причине биологических свойств растений и несовершенства с/х техники. Например, из-за неполной полевой всхожести семян некоторые растения приобретают большую площадь питания, а неравномерное покрытие поверхности почвы гербицидом ведет к тому, что растения рядом с которыми не произрастают сорняки растут лучше, чем те которые соседствуют с сорной растительностью и т.д. Проблема экологической конкуренции состоит в том, что растения произрастающие в лучших экологических условиях формируют большую урожайность, но она не компенсирует потери урожайности растений которые росли в худших условиях.

Максимизация накопления солнечной энергии во времени достигается применением трех принципов, которые составляют основу севооборотов. Первый заключается в обеспечении чередования культур исходя из их морфологической и биологической комплементарности друг другу, что позволяет им поглощать из почвы элементы питания и влагу не использованные предшественниками, и тем самым снизить их энтропию – покинуть почву без осуществления работы по аккумулярованию энергии солнца. Второй состоит в снижении, вплоть до полного исключения конкуренции. Наибольшая конкуренция во времени возникает между посевами одной или родственными культурами, для ослабления которой увеличиваются сроки их возврата на прежнее поле. Промежуточные культуры на зеленое удобрение также могут создать конкуренцию основной культуре за жизненные факторы. В этом случае производитель выбирает в пользу какого посева решить эту проблему. Третий принцип говорит, что культуры чередующиеся во времени не должны быть комплементарными друг другу как источники пищи для вредных организмов. Это положение является обратным действием закона Вавилова Н. И. о гомологических рядах наследственной изменчивости и применительно к севооборотам гласит, что, чем с/х культуры генетически близки, тем больше у них общих патогенов и вредителей, и тем дальше их следует размещать друг от друга в пространстве и времени. Вместе с тем, этот принцип не уменьшает количество инфекционного начала патогенов широкой специализации и если они переносятся воздушными потоками. Например, площадь посева подсолнечника в нашей стране в среднем за 2021-2024 годах оставила 412 тыс. га, что превышает рекомендованные нормы более двух раз, хотя и продуктивность товарных семян в этот период была достаточно высокой (18,5 ц/га). Кроме того, увеличилась площадь посева технических культур и составила 34-35% от пахотных земель при допустимой 25%, что произошло наряду с подсолнечником также благодаря рапсу и сое. Все три культуры поражаются белой гнилью инфицирующая более 350 видов растений из различных семейств и фомопсисом, аскоспоры которого разносятся ветром на большие расстояния. В итоге, отмеченные обстоятельства создали условия для интенсивного накопления и поддержания на высоком уровне поражающее начало этих болезней в природе и резко повысили эпифитотийные ожидания по ним.

Иногда полученный рост продуктивности в исследованиях объясняется прямым вкладом факторов жизни и их взаимодействием т.е. синергизмом (1). В основе этого явления находится утверждение древнегреческого философа Аристотеля о том, что целое больше, чем сумма его частей, известное как синергия. Однако, во -первых, все факторы жизни растений - элементы минерального питания и газообмена, вода и согласно формуле А. Эйнштейна $E = mc^2$ лучистая энергия солнца имеют массу. Поэтому растения не могут создать ни прямым вкладом, ни взаимодействием факторов большую или меньшую массу, чем сумма масс, которые они поглотили. Во - вторых, синергия Аристотеля относится к понятию

эмерджентность – появлению у системы свойств, не присущие ее компонентам. Поэтому если образуется прибавка урожайности, но у растений не появляются новые свойства то, это не является синергией. В исследованиях с севооборотах отмеченная прибавка продуктивности известна как эффект севооборота и обусловлена потреблением из почвы не использованных питательных веществ и влаги во времени, а также снижением урона оказываемого вредными организмами. Однако когда нет механизма в виде морфологической и биологической взаимодопоняемости растений, то и прибавка урожайности как результат взаимодействия факторов отсутствует. Подобный эффект наблюдался в наших исследованиях при установлении влияния сорта, нормы высева и срока скашивания травостоя на сбор сырого протеина люцерны. Изученные факторы не имели внешних источников и механизмов усиления или ослабления и как результат прибавка продуктивности от их взаимодействия составил всего несколько процентов и был обусловлен ошибкой опыта (2).

Севооборот как чередование культур не имеет самостоятельного физического проявления, массу и пространственные размеры, то есть он не материален, и как следствие ничего материального в почву не привносит, ничего материального не создает. Севооборот не фактор жизни, а только порядок посева культур во времени. Хотя эффект севооборота является материальным и создается с/х культурами при соблюдении закона возмездия. На каждом поле возделывается свой набор культур исходя из их спроса в рынке, свойств почвы и рельефа местности, и в каждом из них образуется свой эффект севооборота во времени, однако, поскольку он является процессом, а не состоянием, то он имеет временный характер и нуждается в постоянном поддержании.

В тоже время, пространственного эффекта севооборота не существует. Соседние поля связаны друг с другом только необходимостью ослабления потери урожая, которая может возникнуть вследствие перемещения поражающего начала вредных организмов как неуправляемого фактора, что достигается высевом на них культур некомплементарных друг другу как источники пищи для негативного биотического фактора. Однако пространственные севообороты как организационные структуры объединяющие рядом расположенные поля с целью более эффективного использования с/х техники и рабочей силы существуют. В советское время также практиковался межхозяйственный севооборот, в рамках которого хозяйства согласовывали посев культур на соседних полях, особенно при размножении семян перекрестноопыляемых культур. При соблюдении внутри- и межхозяйственных севооборотов вся территория республики выглядела бы как один научно-обоснованный севооборот.

В экспериментах с севооборотах часто встречаются ряд методических недостатков, в том числе проистекающие из предмета самих исследований. Значение севооборота в выращивании с/х культур известно более 2 тыс. лет поэтому нет необходимости доказывать, что культуры обеспечивают большую продуктивность при возделывании в севообороте, чем в монокультуре. Кроме этого, давно экспериментально установлены лучшие, терпимые и худшие предшественники для каждой культуры. Цель современных исследований с севооборотах состоит в получении больших эффектов севооборота в виде прибавки урожая по сравнению с существующими. В связи с отмеченным, применение монокультуры в качестве контроля в этих экспериментах не является корректным поскольку, во-первых, она не имеет механизм в виде разнообразия культур(поликультуры), который обеспечивает эффект севооборота, во-вторых, монокультура как система земледелия, в нашей стране не практикуется, а только встречаются повторные посевы ряда культур, в третьих, получаемые сверхприбавки продуктивности на поликультурных вариантах по сравнению с монокультурами, создают очень благоприятное впечатление об успешном научном решении несуществующей проблемы.

Одна из сложных проблем в исследованиях с севооборотах состоит в соблюдении принципа единственного различия. Например, в следующем теоретическом 5- польном севообороте состоящий из 1) гороха, 2) озимой пшеницы, 3) подсолнечника, 4) кукурузы на силос и 5) озимой пшеницы, в котором изучается наилучшее, случайное и наихудшее

чередование культур, он соблюдается так как варианты отличаются между собой только порядком посева культур во времени при равенстве других факторов. Однако принцип единственного различия невозможно соблюсти при сравнении севооборотов разной длины, например состоящие из 5 и 7 полей, или севооборотов одинаковой длины, но отличающиеся разным насыщением культур так как увеличение доли одной культуры осуществляется за счет исключения другой, в результате чего изменяются сразу два параметра.

Исследования с севооборотами представляют собой строительство эффекта севооборота в пределах каждого варианта как отдельного агрофитоценоза, поэтому с методической точки зрения важным является сохранение получаемых изменений в пределах делянки максимально ограничив движение живого и неживого вещества между ними. В действительности же фон вредных организмов специфический для каждого варианта, а также растительные остатки и почва свободно перемещаются по опыту ветром и с/х техникой, а при размещении этих экспериментов на склоновых землях то почва, растительные остатки, влага и элементы питания, особенно азот, двигаются с верхних делянок на нижние и далее снижая достоверность получаемых данных.

Разработка систем земледелия состоит в повышении эффективности использования биосферной неразумной, биосферной разумной и антропогенной энергий посредством снижения их энтропийности – уменьшения доли, которая не участвует в фотосинтетической фиксации энергии и повышения негэнтропийности – аккумуляирования большего количества солнечной энергии с меньшими затратами.

За свою историю человечество изобрело много систем земледелия. Американский профессор King F. H. в своей книге изданной в 1911 году (10) описал методы земледелия позволившие фермерам Китая, Кореи и Японии сохранить продуктивность их почв в течении 4 тыс. лет. Основными принципами этого земледелия является следующее. Все органическое вещество до внесения в почву подвергалось компостированию; отходы полученные в результате потребления выращенной продукции в виде жизнедеятельности животных и человека, топлива и тканей возвращались назад в поле; выращивался разнообразный набор культур; бобовые травы использовались как сидерат для улучшения почвы; трава с земель не с/х назначения в качестве зеленого удобрения, навоза животных и компонента компостирования, а также канальная грязь (в Китае длина каналов в то время составляла около 200 000 миль, которые использовались для заполнения рисовых чек водой), зола древесины и угля использовались как внешние источники органического вещества и минерального питания; для быстрого разложения органического вещества в почве применялась вспашка; на полях постоянно произрастали с/х культуры; на одном поле одновременно могли выращиваться сразу три культуры находящиеся на разных стадиях развития - одна созревания, вторая роста и третья появления всходов; практиковалось мульчирование почвы канальной грязью в садах, а на полях после дождей в виде разрушения капилляров верхнего слоя почвы; применялся огромный физический труд человека.

Биодинамическое земледелие разработал и изложил в своих публичных лекциях в 1924 году австрийский философ Рудольф Штайнер, основатель антропософии (мудрости человека). По мнению некоторых исследователей фраза о том, что надо кормить почву, а не растения принадлежит именно ему. Цель этого способа хозяйствования состоит не в том, чтобы все оставить все на волю природы, а в том, что бы помогая ей получить более плодородную и богатую жизнью землю. Динамизм в его названии означает, что всё живое находится в постоянной трансформации.

Основным принципом биодинамического земледелия является холистический метод интегрирующий в хозяйство как в живой организм выращивание местных видов растений, севооборот, мульчирование, сидераты, животноводство, навоз и органические отходы, компостирование, отказ от синтетических химикатов, влияние астрологических циклов небесных тел на рост и развитие растений и животных, гомеопатические растворы.

Он предполагает применение двух групп гомеопатических препаратов. Препараты BD 500, BD 501 и BD 508 предназначены для полевого использования и BD 502–BD 507 для применения в компостировании. Например препарат из первой группы BD 500 изготавливается следующим образом. Коровьи рога заполняются свежим коровьим навозом и помещаются в яму на расстоянии 2,5 см друг от друга, основанием вниз, на 50% засыпав их компостом и почвой. Затем яма засыпается влажной почвой и оставляется на 4-6 месяцев для ферментации. Препарат применяется в дозе 100 г на гектар путем опрыскивания поздно днем или вечером 4 раза в год, который предварительно растворяется в 25-50 л теплой воды в течение 1 часа, размешивая ее попеременно по часовой и против часовой стрелки создавая вихревой поток. Используется он для стимуляции роста растений, образования гумуса, улучшения прорастания семян, формирования и развития корней.

Для изготовления препарата BD 503, относящийся ко второй группе, невымытые кишки коровы или быка разрезают на куски длиной 15 см, один их конец завязывают хлопчатобумажной нитью, а с другой стороны они заполняются сухими цветками ромашки. Затем пучок наполненных “колбасок” помещают в глиняные горшки с плодородной почвой. Пучки закапывают в землю в октябре и оставляют там до февраля-марта. Препарат помогает в процессах связанных с кальцием и азотом.

Использование космических сил биодинамическим земледелием состоит состоит в осуществлении посева, пересадки растений, культивации, сбора урожая и использования гомеопатических препаратов с учетом астрологических циклов и ритмов луны, планет и звезд. Хотя нет научного подтверждения влияния гомеопатических препаратов и космических тел на физиологию растений и животных, а многие исследователи прямо называют биодинамическое земледелие псевдонаукой, тем не менее оно практикуется в мире на 15 тыс. га (4).

Природное земледелие или зеленая философия. Автором этой концепции является японский фермер и философ Masanobu Fukuoka. Оно строится на полном отказе от обработки земли, применения удобрений в том числе органических в виде компоста, пестицидов и гербицидов, прополки сорняков, обрезки деревьев и механизированной техники, и направлено на использовании минимального физического труда.

Основные положения зелёной философии заключаются в следующем. Природное земледелие это буддийский способ ведения сельского хозяйства оставляющий почву, растения и насекомых в покое. Оно берет начало в философии «Му», или небытия, и возвращается к природе “ничегонеделания”. Природное земледелие является истинной и изначальной формой сельского хозяйства, это бесцельный метод природы, неизменный путь Бодхидхармы (просветления). Хотя оно кажется хрупким и уязвимым, оно могущественно, ибо приносит победу без борьбы. Главным врагом природы являются человеческие знания, которые служат инструментом расчленения и анализа, хаоса и разрушения. Особую опасность представляет попытка восстановить природу посредством знаний. Мир знаний это мир относительностей и противоречий, в котором сильные питаются слабыми. Мир природы это мир гармонии. Самовосстановление природы и возврат человека к богу начинается с отказа от человеческих знаний (7).

Традиционное или индустриальное земледелие характеризуется вкладом больших инвестиций в с/х производство. Оно включает применение всех форм обработки почвы и орошения, внесение органических удобрений, использование синтетических удобрений, средств защиты и стимуляторов роста, механизацию работ, возделывание высокопродуктивных сортов и гибридов, а в странах где позволяет законодательство и возделывание генетически модифицированных сортов. По оценкам Всемирного Банка за последние 50 лет благодаря этой форме хозяйствования продуктивность с/х культур повысилась от 70 до 90 процентов. В то же время традиционное земледелие является причиной ветровой и водной эрозии, потери органического вещества и снижения биологической

активности почвы, загрязнения грунтовых вод удобрениями, пестицидами и гербицидами, и т.д. (6).

Монокультурное земледелие состоит в возделывании одной с/х культуры на всей площади хозяйства, которое особенно широкое распространение получило в выращивании риса и кукурузы. Высокая продуктивность и экономичность монокультурного земледелия достигается за счет сосредоточения внимания фермеров на выращивании и приобретении с/х техники для возделывания только одной культуры, применения повышенных доз удобрений, пестицидов и гербицидов, и получения эффекта масштаба когда рост фермы ведет к снижению себестоимости продукции. В то же время, монокультурное земледелие ведет к снижению биоразнообразия, разрушению органического вещества и повышению кислотности почвы, а также значительному загрязнению экосистемы синтетическими веществами(14).

Экологическое земледелие состоит в включении в традиционное земледелие экологического принципа, что означает признание каждого поля отдельной экосистемой, осуществление мер по поддержанию ее экосистемных функций и использование полученных экологических эффектов в повышении продуктивности с/х растений. Для этого уменьшается количество и применяются разнообразные формы обработки почвы, возделывается широкий набор культур, используется севооборот, навоз и внешние источники органического вещества, уменьшаются объемы внесения синтетических удобрений, сокращается пестицидная и гербицидная нагрузка на посев посредством осуществления контроля вредных организмов биологическими методами и препаратами растительного происхождения. В идеале экологическое земледелие обеспечивает высокую продуктивность, но без ряда негативных эффектов традиционного земледелия (13).

Интегрированная система земледелия представляет собой получение дополнительного роста производительности за счет интеграции отраслей многоотраслевого хозяйства. Так, интеграция растениеводства и животноводства ведет к выращиванию кормовых культур, которые оставляют большое количество органического вещества почвы, а также на поля вывозится навоз; растениеводства, садоводства и овощеводства с пчеловодством повышает продуктивность энтомофильноопыляемых культур; аквакультуры с овощеводством обеспечивает поливом овощные культуры и получается дополнительный доход за счет рыбной продукции и т.д. (3).

Органическое или биологическое земледелие состоит в полном исключении применения синтезированных химических средств и гмо сортов на полях, и антибиотиков на животных, навоз которых будет вноситься на этих землях. В качестве источников питания для растений выращиваемых в органическом земледелии используется компост, навоз, зеленое удобрение и костная мука. Кроме этого, применяется севооборот, совместные посевы разных с/х культур, биологические и механические способы контроля вредных организмов, вспашка для заделки в почву внесенного органического вещества (8).

Консервативное земледелие направлено на уменьшение эрозии почвы и сохранении ее органического вещества, и строится на трех принципах: 1) на полном исключении любого рыхления и обработки почвы кроме как при осуществлении прямого высева семян и внесения жидких удобрений, 2) на постоянном покрытии не менее 30 процентов площади почвы органическим веществом в виде растительных остатков и/или сидеральных культур и 3) диверсификации с/х видов, возделывание минимум трех культур и их чередование во времени на научной основе (16).

Следующие три системы земледелия стремятся повысить продуктивность культур используя аналогичные методы заимствованные из других систем земледелия, но отличаются второй целью. Так, регенеративное земледелие также направлено на восстановление плодородия почвы (17), углеродное земледелие на накопление(секвестрацию) углерода в почве в виде органического вещества и тем самым его снижении в атмосфере (15) и климатически оптимизированное земледелие на адаптацию выращивания растений к изменяющемуся климату (5).

Кроме приведенных систем земледелия разработаны точное, клеточное, ландшафтное, урбанистическое, гумусное, холистическое, устойчивое, альтернативное, сбалансированных почв и фертильное земледелие, земледелие с низкими энергозатратами и высокой энергетической отдачей и др.

Таким образом, системы земледелия в зависимости от используемых энергий можно объединить в три группы. Биосферное земледелие это когда биосферная бессознательная энергия сама, без участия человека выращивает продукты необходимые ему. Антропоное земледелие состоит в возделывании земли человеком с целью получения большего урожая, чем может обеспечить биосферное земледелие. Для этого тратится биосферная неразумная и антропоная энергии и энергия домашних животных. Антропогенное земледелие заключается в максимизации урожайности с/х культур путем использования биосферной неразумной, антропоной и антропогенной энергий.

В 70-80 годах прошлого столетия земледелие Республики Молдова находилась в пике своего развития. Продуктивность с/х культур в то время достигла наибольших значений, благодаря развитому животноводству на все поля периодически вносился навоз, площади посева культур по годам были достаточно стабильными, люцерна занимала 200-220 тыс. га и таким образом реализовалась идея академика М.Ф. Лупашку о необходимости выращивания этой культуры на каждом поле один раз в 10 лет с целью улучшения почв. В хозяйствах функционировали отрасли растениеводства, садоводства, овощеводства, животноводства, в степной зоне страны также виноградарства. В целом системы земледелия Республики Молдова того периода можно назвать традиционно-интегрированными, что означает, что в них вкладывались значительные инвестиции и они были многоотраслевыми. В тоже время с/х производство характеризовалась низкой энергетической эффективностью. Некоторые отрасли животноводства и многие хозяйства типа совхозов были убыточными и сохраняли свою жизнеспособность только благодаря дотациям государства. В затратах на производство с/х продукции очень большую долю занимала антропоная энергия (человеческий труд). В республике до 55 % населения занимались с/х деятельностью для сравнения в странах с рыночной экономикой эта цифра была почти в 10 раз меньше. Труд в социалистическом способе производства отличался низкой мотивированностью и производительностью, что вело к необоснованным тратам энергии. В итоге, когда остановились поступления дотаций государства многие хозяйства не смогли выжить.

Современное с/х производство нашей страны находятся на стадии энергоматричного становления. Хозяйства разрабатывают свои системы земледелия на основе выращивания рентабельных культур и адаптации технологий их возделывания к изменяющимся климатическим условиям, приобретения с/х техники и строительства соответствующей производственной инфраструктуры. Говоря языком энергий происходит перераспределение и повышение эффективности антропоной, антропогенной и биосферной энергий нацеленные на рост конкурентоспособности производимой продукции.

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ПРИМЕНЕНИЕ АДАПТИВНЫХ ПОДВОЕВ КОСТОЧКОВЫХ КУЛЬТУР КАК ВЕКТОР РАЗВИТИЯ УСТОЙЧИВОГО ПЛОДОВОДСТВА В РЕСПУБЛИКЕ МОЛДОВА

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Abstract. Over the past few years, fruit growing in the Republic of Moldova has faced difficulties in selecting rootstocks for stone fruit crops due to the influence of unfavorable abiotic factors. The solution to the problem may be the introduction of adaptive rootstocks into production that are resistant to drought and high temperatures. In this regard, a method for accelerated propagation of the clonal rootstocks Kuban 86 and VC-13, which possess a number of valuable economic traits, was developed. Application of this method will allow for rapid and large-scale cloning, as well as their widespread implementation in the production process. Based on the research conducted, methods for obtaining aseptic cultures for the studied rootstocks were described. Nutrient media for in vitro culture initiation and mass micropropagation were optimized. The reproduction rate per passage ranged from 3.7 to 4.5 new shoots. 95 – 98 % rooting of micro plants was achieved on MS and QL media. Methods for the effective rooting of microplants have been proposed. In a greenhouse, rooted plants were successfully adapted to natural habitats. This allows us to recommend the developed method as reliable, effective, and suitable for reproduction.

Keywords: fruit growing, planting material, climatic factors, rootstocks, stone fruit crops, explant, nutrient media, in vitro propagation, rhizogenesis.

Введение

Негативное влияние климатических изменений на продуктивность плодового хозяйства в Республике Молдова приводит к снижению урожайности, деградации почв, дефициту водных ресурсов и вынуждает к поиску новых подходов, обеспечивающих стабильность отрасли. Освоение новых адаптивных подвоев, устойчивых к засухам и повышенным температурам, является основой для развития современного плодового хозяйства в долгосрочной перспективе [1, р.13-18].

Проблема выбора подвоев для косточковых пород в условиях Республики Молдова является весьма острой. В большинстве случаев в качестве основы для прививки используют

сильнорослые семенные подвой, однако это ограничивает создание насаждений современного типа. Кроме того, у таких сорто-подвойных комбинаций часто проявляется несовместимость подвоя с привоем [9, р.373-388]. Необходимость широкого применения перспективных подвоев, обладающих ценными адаптационными признаками очевидна, однако сдерживается отсутствием достаточного количества посадочного материала на национальном уровне. Импорт клоновых подвоев не всегда способен решить эту проблему. В зарубежном ассортименте многие вегетативные подвой неустойчивы к почвенно - климатическим условиям нашего региона, что сужает перспективы их использования.

На протяжении многих лет лаборатория Вирусологии и Фитосанитарного контроля Национального Института Прикладных Исследований в Сельском Хозяйстве и Ветеринарной Медицине (НИПИСХВМ) (Молдова, г. Кишинёв) проводит научные исследования и развивает стратегии, которые ложатся в основу развития современного устойчивого плодоводства страны [7, р.266-279]. Одной из основных задач является получение и поддержание растений, свободных от вирусов, а также размножение районированных и перспективных для Молдовы клоновых подвоев [2, р.355-358], [3, р.48].

Особое внимание уделяется методам ускоренного размножения с целью изучения и внедрения перспективных клонов в производственный процесс [10, р.10-11], а также расширения перечня клоновых подвоев с высокой адаптационной способностью в условиях климатических изменений, с которыми сталкивается Молдова в последнее десятилетие.

С учётом этого, особый интерес представляют некоторые клоновые подвой косточковых культур, созданные на Крымской опытно- селекционной станции им. Н. И. Вавилова, среди которых Кубань 86 и ВЦ-13. Они представляют собой биотипы, высоко устойчивые к биотическим и абиотическим стрессам, что наделяет их способностью приспосабливаться к экстремальным погодным явлениям. Подвой устойчивы к засухе, к плотным переувлажнённым почвам, к почвоутомлению, что особенно важно для персика [9, р.373-388]. Имеют хорошую совместимость с большинством сортов персика, сливы, вишни и черешни. Прививка на эти клоновые подвой приводит к раннему вступлению в плодоношение и высокой продуктивности.

Эти особенности привлекли наше внимание, в результате чего был разработан метод ускоренного размножения перспективных клоновых подвоев ВЦ-13 и Кубань 86 в условиях *in vitro*. Применение этого метода позволит быстро и массово клонировать биотипы для получения безвирусного посадочного материала и ускорит их внедрение в производство.

Материалы и методы

Исследования проводились в лаборатории Вирусологии и Фитосанитарного контроля плодовых культур НИПИСХВМ. Объектом исследований стали:

- клоновый подвой универсального типа Кубань 86 (АП-1) - гибрид от переопыления алычи и персика (*P. Cerasifera Erhr* × *Persica Vulgaris Mill*). Хорошо совместим со всеми сортами персика, миндаля, алычи, с большинством сортов сливы домашней и многими сортами абрикоса.
- клоновый подвой для вишни и черешни ВЦ-13. Выведен скрещиванием вишни Владимирской (*Cerasus vulgaris*) с церападусом Мичурина (*Cerasus vulgaris* × *Cerasus maacki*).

На этапе инициации в качестве исходного материала использовали верхушки побегов размером 4 - 8 мм, отобранные с вегетирующих растений в стадии активного роста (апрель - май). Стерилизацию растительного материала проводили с помощью перекиси водорода. Испытаны три концентрации - 10, 15, 20 % при экспозиции 5 - 8 минут. Проводили испытания 4 видов питательных сред - среда Murashige and Skoog (MS) (6), Lloyd and McCown (WPM) (5), Quoirin and Lepoivre (QL) (8), Driver and Kuniyuki (DKW) (4). Среды были обогащены аскорбиновой кислотой, витаминами B1, B6, PP, глицином, мезоинозитолом, сахарозой, регуляторами роста - 6-бензиламинопурином (БАП) и индолил-3-масляной кислотой (ИМК).

Растения содержали в культуральной комнате при температуре воздуха +22+24°C, освещении 3-4 тыс. люкс, световом периоде 16 часов и относительной влажности воздуха 60 - 70 %.

Результаты исследований

При введении эксплантов подвоев Кубань - 86 и ВЦ - 13 использовали стандартные методы инициации в культуру *in vitro*. Изолированные ткани этих биотипов не склонны к окислению. Растительный материал стерилизовали с помощью перекиси водорода. Исходя из наших исследований, установлено, что для подвоя ВЦ-13 оптимально применение 15 % раствора перекиси водорода, а для Кубань 86 – 20 % в течение 8 минут. Такие схемы стерилизации позволили получить сильные, жизнеспособные, стерильные экспланты, потенциально способные к активному размножению. Сокращение времени обработки значительно повышало долю материала, заражённого грибами и бактериями.

За развитием первичных эксплантов наблюдали на двух питательных средах - MS и WPM. Питательная среда по MS лучше подходила для культивирования изолированных эксплантов изучаемых биотипов. Около 70 % из них достигли хорошего уровня развития, в то время как на среде WPM это показатель был в два раза меньше. Формирование первых дополнительных побегов на изолированных эксплантах зафиксировано со второго пассажа.

Нами было изучено влияние минерального состава питательной среды на микроразмножение подвоев. Следует отметить, что у подвоя Кубань 86 несбалансированность макро- и микроэлементов проявлялась нарушением физиологических процессов и замедлением роста и развития побегов (рис.1).



Рис. 1. Микроклональное размножение подвоя Кубань 86 на питательных средах с разным минеральным составом

Источник: архив лаборатории вирусологии НИПИСХВМ

Из испытанных питательных составов оптимальные условия для регенерации подвоя обеспечивали питательные среды с повышенной концентрацией азота – MS и QL. На них побеги активно пролиферировали, отличались развитыми, ярко окрашенными листьями, что является индикатором хорошего фотосинтеза и сбалансированного питания растений. Средняя высота микропобегов составляла около 1,5 см; средний максимум – 3,4 см. Побеги, полученные на питательной среде QL, развивались однородно, в то время как на среде MS часто доминировало несколько лидеров, которые на 1/3 превышали высоту основной массы микропобегов.

На питательных составах с набором макро- микроэлементов по WPM и DKW регенерация у микрорастений Кубань 86 протекала замедленно, наблюдали пожелтение и опадение листьев, что указывает на несоответствие баланса компонентов в питательной среде физиологическим потребностям биотипа.

Для поддержания интенсивного роста и полноценного развития подвоя ВЦ – 13 в условиях *in vitro* оптимальным оказался минеральный состав по MS.

Установлены оптимальные концентрации БАП в питательной среде которые варьируют от 0,8 до 1 мг/л. Повышенные концентрации цитокинина при микроразмножении подвоев не были целесообразны, особенно для Кубань 86. Культивирование этого подвоя на средах с БАП 1,2 - 1,5 мг/л приводило к необратимым морфологическим изменениям в структуре тканей и клеток. У таких растений снижалась регенерация, часть побегов со временем погибала.

Пик побегообразовательной способности подвоев был достигнут после 4 - 5 субкультивирований. В этом промежутке коэффициент размножения у растений Кубань 86 достигал 3,3 – 3,7 дополнительных побега на среде QL (рис.2), а у подвоя ВЦ – 13 приблизился к 4,3 - 4,5 дополнительных побега на среде MS (рис.3).

Основное количество микрорастений Кубань 86 и ВЦ -13, полученных в культуре *in vitro*, достигало высоты, рекомендуемой для начала этапа укоренения, поэтому стимуляции с целью удлинения и улучшения качества побегов не требовалось. Для укоренения было использовано не менее 70 % от объема размноженных микропобегов.

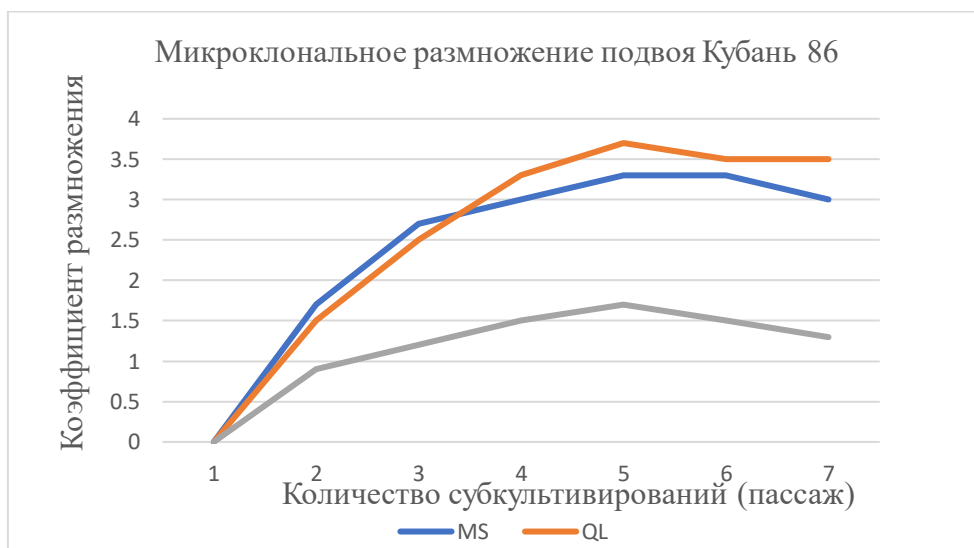


Рисунок 2. Динамика размножения микрорастений подвоев Кубань 86 в зависимости от минерального состава питательных сред

Источник: визуализировано авторами публикации

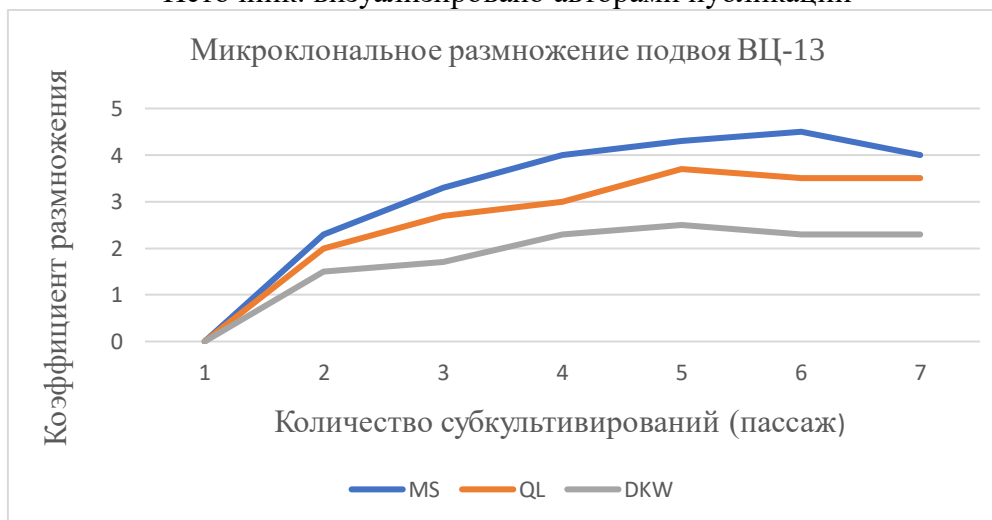


Рисунок 3. Динамика размножения микрорастений подвоев ВЦ-13 в зависимости от минерального состава питательных сред

Источник: визуализировано авторами публикации

Для активации ризогенеза в питательной среде были понижены концентрации минеральных компонентов и сахарозы, а также полностью исключён цитокинин. Изучаемые подвой быстро и активно укоренялись на всех испытанных вариантах (таб.1). Начало корнеобразовательного процесса отмечалось через 11 - 14 дней после посадки.

Таблица 1. Укоренение подвоев для косточковых культур в условиях *in vitro*

Питательная среда		Укоренилось побегов, %	
концентрация	ИМК, мг/л	Кубань 86	ВЦ- 13
MS, 1/2	0.5	66	75
MS, 1/2	1	90	98
MS, 1/2	1.5	90	96
QL, 1/2	0.5	71	80
QL, 1/2	1	85	90
QL, 1/2	1.5	95	86

Источник: данные авторов публикации

У подвоя Кубань 86 высокий процент укоренения (95%) был достигнут на питательной среде QL в присутствии ИМК 1,5 мг/л. 98 % побегов подвоя ВЦ – 13 сформировали корни на среде MS при ИМК 1 мг/л. В рамках эксперимента во всех вариантах доля укоренившихся побегов составила большинство - от 66 до 90% у Кубань 86 и от 75 до 96% у подвоя ВЦ- 13. Это указывает на высокую корнеобразовательную способность изученных биотипов.

Адаптацию растений к естественным условиям проводили в остеклённой теплице. Для посадки использовали субстраты из торфа и перлита обработанные дезинфицирующим раствором. Первые три недели растения содержались в условиях повышенной влажности. Своевременное проведение всех необходимых мероприятий по уходу за растениями, полученными из культуры *in vitro*, позволило адаптировать более 80 % высаженного материала.

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SECTION IV. LAW AND POLITICAL SCIENCES
SEKŦİYA IV. HUKUK VE SİYASİ BİLİMLER
SECȚIUNEA IV. DREPT ȘI ȘTIINȚE POLITICE
СЕКЦИЯ IV. ПРАВО И ПОЛИТИЧЕСКИЕ НАУКИ

CZU 327.2

OBIECTIVE DE SECURITATE UMANĂ ÎN CONTEXTUL SCHIMBĂRILOR
GEOPOLITICE CONTEMPORANE

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Abstract:

Contemporary geopolitical changes that prove to be extreme challenges for human society generate new guidelines, tendencies and trends towards new objectives in order to ensure human security and personal safety. In this context, circular culture embodies the human and societal side of the transition of society based on uncalculated consumption, and on an erroneous assessment and estimation of the potential of society and its access to natural resources, towards a circular economy and a security-resilient society. A fundamental objective of human security is the desire to improve the security culture of both the individual, society, and the state, through its institutions. It is an important goal to achieve that in the future human society is able to raise the level of its self-organization so that the geopolitical environment admits security circularity as a plausible dimension in the equation of improving international relations, and circular culture becomes a reference objective for ensuring the security of the person and communities.

Keywords: Human security, geopolitics, security culture, personal safety, circularity culture insecurity, security menaces, risk, circularity

Promovarea valorilor specifice unei societăți civilizate, bazate pe o cultură profundă și o interiorizare clară de către categorii largi ale societății, în corelație cu principiile securității umane, în condiții de dezechilibru securitar și o insecuritate geopolitică, în contextul accelerării provocărilor globale pentru societățile umane contemporane, este direct legată de necesitatea dezvoltării și impunerii unui nou model și abordare a fenomenului siguranței umane, mai cu seamă în contextul amplificării instabilității geopolitice și securitare, a amplificării insecurității și incertitudinii la nivel personal, național și internațional [1, p. 130].

Această nouă abordare constructivă și generalizatoare a evoluției situației geopolitice formată după pandemia de COVID-19 din anii 2020-2022, dar și în perioada războiul din Ucraina, declanșat pe 24 februarie 2022 de Federația Rusă prin invazia militară și hibridă, este pe deplin concordantă cu perspectivele de schimbare a accentului plasat pe conceptele de securitate statală și națională, securitate umană și siguranță personală [2, p. 269]. Societatea umană conține un set de valori și

modele privind contracararea pericolelor și riscurilor bazate pe respectul pentru demnitatea umană, pe necesitatea asigurării siguranței personale [3, p. 64]. Astfel, siguranța personală ocupă un loc primordial în spectrul larg de preocupări în domeniul securității [4, p. 45]. În contextul procesului de globalizare, se pune problema necesității amplificării culturii circularității în plan securitar, precum și a culturii securității, mai ales că societatea contemporană este una a riscurilor dublate de o serie de pericole și amenințări la adresa securității și siguranței persoanei [5, p. 171]. Conceptul de siguranță umană, care pune accentul pe dimensiunile economice, pe puterea soft și dimensiunile non-militare ale securității, implică și promovarea protecției drepturilor și libertăților fundamentale ale omului, prin consolidarea capacității cetățenilor de autoprotecție și a culturii securității lor [6, p. 39].

Un obiectiv fundamental al securității umane reprezintă dezideratul de îmbunătățire a culturii securității, atât a persoanei, a societății, cât și a statului, prin instituțiile sale [7, p. 79]. Dar cultura securitară este sortită să realizeze un salt calitativ pentru a deveni mai aplicativă și mai utilă societății viitorului, tot mai mult expusă riscurilor de securitate, care necesită pentru soluționarea problemelor de securitate, resurse tot mai mari și implicarea a tot mai multor categorii sociale [8, p. 192]. Astfel, cultura circulară, uneori denumită cultura economiei circulare căci este inspirată de la acest concept înpvtor, evidențiază valorile culturale, mentalitățile și practicile necesare pentru a permite circularitatea în societate pentru bunăstarea persoanei și siguranța statului în egală măsură [9, p. 48]. Această categorie specifică studiilor de securitate, provenită din concepțiile inovatoare ale teoriei economice - cultura securitară, postulează că trecerea la o economie circulară nu este doar o acțiune tehnică sau comercială, ci și o transformare culturală cu o legătură puternică cu siguranța umană [10, p. 87].

O „cultură circulară” implică participarea plenară a întregii societăți care apreciază înalt, nu doar longevitatea produselor, nu doar îmbrățișează reutilizarea deșeurilor și partajarea produselor din materiale reciclate în locul consumului de noi resurse și consideră deșeurile ca pe o resursă importantă și de viitor pentru o societate rezilientă [11, p. 312]. Dar, de asemenea, conceptul emergent de securitate circulară leagă principiile economiei circulare descrise mai sus cu chestiuni de securitate a resurselor, inclusiv al celor energetice și epuizabile care constituie obiectul unor dispute acerbe pe plan geopolitic [12, p. 128]. De altfel, o „cultură circulară” implică și stabilitate socială și a mediului înconjurător, dar și stabilitate geopolitică, echilibru de putere, la fel și cu siguranța și securitatea umană, care împreună pot forma un anturaj propice pentru progresul social și o condiție a dezvoltării sociale pe termen lung [13, p. 43]. Acest termen - „cultură circulară”, reflectă ideea că încetarea risipei de resurse și reducerea dependenței societății umane de materialele noi din natură pot spori reziliența economică și securitatea națională, dar și securitatea umană ca premise pentru un salt conceptual în mentalitatea societății umane a viitorului [14, p. 96].

Tranziția către o un stadiu circular al evoluției societății umane în plan geopolitic nu este o provocare pur tehnică sau politică, ci implică o schimbare fundamentală de cultură, precum și o nouă abordare asupra obiectivelor, dar și a metodelor și căilor optime care să asigure siguranța umană și securitatea persoanei [15, p. 208]. Cultura circulară se referă la normele culturale, valorile și comportamentele colective care se aliniază cu economia circulară și o susțin, dar și cu circularitatea securitară, când toți actorii sociali importanți participă activ la asumarea responsabilității și asigurarea securității comune [16, p. 74]. Este vorba despre promovarea unei mentalități în societate care nu doar încurajează consumul responsabil, spre deosebire de cultura utilizării unice a resurselor ca fundament pentru paradigma liniară [17, p. 35]. Dar, de asemenea, mentalitatea edificată vine să justifice plasarea securității societății și siguranța individului în vârful piramidei valorilor sociale, pentru care se pot utiliza cele mai valoroase resurse, deoarece securitatea devine garanția și sursa altor valori sociale, precum bunăstarea comună, sănătatea individuală, perspectivele de viitor sau chiar progresul imediat [18, p. 228]. Într-o cultură circulară, to așa cum produsele nu sunt văzute ca

simboluri cu statut de unică folosință, ci ca active valoroase care trebuie întreținute, partajate și reutilizate, unde risipa este descurajată social, iar creativitatea este aplicată pentru a găsi o a doua și a treia viață materialelor, și implicarea fiecărui membru al societății în asigurarea securității comune devine la fel de valoroasă prin diversitatea abordării și prin asumarea rezultatelor acestor eforturi [19, p. 169]. Astfel, excuderea socială sau convingerea insuficientă de a fi atrași în procesele sociale ample de asigurare a siguranței fiecăruia și a celei comune, devine o risipă intolerabilă și inacceptabilă [20, p. 48]. Acest concept al culturii circulare ca o condiție pentru circularitatea securitară este evidențiat în atitudinile împărtășite de liderii și strategii societăților contemporane, care urmează cu precădere implementarea unui model democratic de organizare socială, care recunosc că, fără o cultură de susținere și de sprijinire largă de către populație, politicile circulare pot eșua, afectând grav siguranța și securitatea umană din regiune, nu doar nivelul de dezvoltare socio-economică a societăților contemporane [21, p. 150].

Totodată, promovarea unei culturi circulare nu înseamnă inventarea de idei noi, ci revitalizarea și învățarea din cultura tradițională. Popoarele indigene și comunitățile locale din întreaga lume au gestionat resursele timp de secole în mod circular și inteligent, ghidate de asemenea valori culturale universale cu ar fi: reciprocitatea, administrarea cu rezervă și previzibilitate, dar și cu respect și admirație pentru natură și pentru ciclurile sale de reînnoire și regenerare [22, p. 178]. Aceste practici tradiționale includ, de exemplu, agricultura prin rotație, utilizarea fără resturi a fiecărui animal vânat, astfel încât nicio substanță sau material să nu se irosească, transmiterea hainelor și uneltelor din generație în generație și alte ritualuri care impun recoltarea sustenabilă [23, p. 72].

De fapt, abordarea specifică concepției Culturii Circulare care poate deveni un obiectiv pentru o societate rezilientă într-un context geopolitic neprietenos și plin de provocări, este construită pe patru piloni ai armoniei: armonia cu natura, armonia cu trecutul, armonia reciprocă dintre persoane și civilizații, societăți și state, și armonia cu nevoia permanentă de schimbare și adaptare. Această perspectivă extinsă depășește obiceiurile de reciclare, implică respectarea limitelor ecologice (natura), învățarea din moștenire și înțelepciunea tradițională (trecut), consolidarea participării comunitare și democratice (reciproce) și îmbrățișarea inovației și a echității în fața schimbării și adaptării [24, p. 82]. Un astfel de cadru cultural pregătește și educă cetățenii să sprijine inițiativele circulare securitare, geopolitice și economice, de la agricultura urbană la un proces politic tot mai incluziv și transparent, deoarece acestea rezonază cu valorile tradiționale și istoria locală [25, p. 48]. Într-un sens mai larg edificarea și propagarea unei culturi circulare înseamnă insuflarea de noi norme sociale, bazate pe responsabilitate și implicare și, treptat, câștigă acceptul și aprobarea comunității și cetățeanului asemenea activități precum cultivarea toleranței, gratitudinii pentru implicarea și efortul altuia cu scop general-util; repararea obiectelor stricate devine „cool” (sau chiar un motiv de mândrie) mai degrabă decât un semn al sărăciei și imposibilității de a-și permite lucruri noi; afacerile se mândresc cu designurile circulare; modelele de politică și economie colaborativă, cum ar fi cluburile de dezbateri pe teme geopolitice și de administrare locală, dar și bibliotecile de unelte sau schimburile de haine. În context corporativ, unele societăți occidentale, mai avansate în promovarea culturii circularității, manifestă necesitatea de formare și construire a unei mentalități și conștiințe circulare în cadrul organizațiilor și comunităților locale, astfel încât angajații sau membrii de la toate nivelurile să încorporeze gândirea circulară. De exemplu, designerii care evidențiază modularitatea sau specialiștii în marketing care inovează cu diverse scheme de abonament și loializare [26, p. 271].

O cultură circulară implică inevitabil dimensiuni securitare individuale și comune cum ar fi identitatea și aspirațiile cetățenilor care se ajustează la nevoile și procesele psiho-emoționale ale acestora [27, p. 234]. Astel, succesul nu este măsurat prin simpla acumulare de putere, resurse, bunuri sau potențial, ci poate fi înțeles și ca un gest de voință socială sau personală de a lăsa o amprentă redusă de deșeuri sau prin utilizarea unor trucuri creative de reutilizare a lor, de a inventa noi

modalități de diversificare a proceselor decizionale ineficiente [28, p. 68]. Această dimensiune culturală a securizării este din ce în ce mai recunoscută ca fiind esențială de către societatea umană supusă unor provocări extreme [29, p. 53].

În acest context, atitudinile culturale, responsabilizarea, implicarea și dispersarea sarcinilor, conștientizarea riscurilor și a rezultatelor nocive, dar și obiceiurile și tradițiile pot constitui bariere sau factori care facilitează schimbarea și adaptarea societății umane în perspectiva supraviețuirii sale [30, p. 41].

În concluzie, constatăm că schimbările geopolitice contemporane care se dovedesc a fi provocări extreme pentru societatea umană generează noi orietari, tendințe și trenduri către noi obiective în vederea asigurării securității umane și siguranței persoanei. În acest context, cultura circulară întruchipează latura umană și societală a tranziției societății bazată pe consum necalculat, și pe o evaluare și estimare eronată a potențialului societății și a accesului ei la resursele naturale, către economia circulară și o societate rezilientă securitar.

Evoluția tradițiilor seculare, a credințelor și practicilor comune pentru societățile arhaice care stau la baza unui mod de viață circular și precaut, promovând siguranța și securitatea umană la nivel comunitar, constituie premisele și baza pentru o conștiință și mentalitate circulară a societății viitorului, capabilă să formuleze un răspuns ferm și decisiv la provocările momentului.

Vom constata că în epoca contemporană a poat-adevărului, comunicarea, mass-media și rețelele sociale joacă un rol tot mai impotant în influențarea culturii sociale și individuale, iar în ultimii ani aceste mijloace au adus în discuția publică noi concepte de circularitate, atât în discursul public, cât și în viața cotidiană prin apariția unor noi soluții tehnologice. Știrile, producția media, documentarele și operele artistice care expun dezavantajele modelului liniar al abordării riscurilor și amenințărilor la siguranța persoanei, cum ar fi criza poluării cu plastic din oceane sau depozitarea deșeurilor electronice, a celor de la centralele atomo-electrice etc., au crescut gradul de conștientizare și alertă a publicului cu privire la motivul pentru care „business as usual” este nesustenabil și nu mai poate fi tolerat, mai cu seamă în societățile unde mecanismele democratice rămân funcționale. Totodată, media, arta și societatea civilă se operează mai des cu povești de succes ale inovației circulare, de exemplu, o companie care folosește plastic oceanic recuperat în noi produse sau o localitate care reușește să se autoorganizeze și să atingă rate ridicate de reciclare a deșeurilor, tratând circularitatea ca pe o narațiune în contextul unor soluții la provocările contemporane.

În contextul dat, rămâne un deziderat important de atins ca pe viitor societatea umană să fie capabilă să ridice nivelul autoorganizării sale pentru ca mediul geopolitic să admită circularitatea securitară ca o dimensiune plauzibilă în ecuația ameliorării relațiilor internaționale, iar cultura circulară să devină un obiectiv de referință pentru asigurarea securității persoanei și a comunităților.

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CZU 327.2

PROVOCĂRI LA ADRESA SECURITĂȚII NAȚIONALE A REPUBLICII MOLDOVA CA BAZA PENTRU EVOLUȚIA RELAȚIILOR SALE INTERNAȚIONALE

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Abstract:

The international relations of the Republic of Moldova are directly proportionally determined by its national interests, and the challenges to national security cause important changes in the dominant approaches of the rulers towards the priorities of the Republic of Moldova in its international relations. Thus, we find that the hybrid efforts of the Russian Federation to destabilize the Republic of Moldova in recent years, intensified after the Kremlin administration launched the occupation war in Ukraine, had the effect of a significant change in the preferences of the electorate and the consolidation of pro-European forces in government. The challenges from the Russian Federation to the national security of the Republic of Moldova, the unprecedented support of Romania and the EU for the Republic of Moldova, but especially the continuation and escalation of the war in Ukraine after February 2022, have significantly diminished the electoral support for pro-Russian forces which, thus, have become irrelevant and peripheral for the configuration of the foreign policy of the Republic of Moldova. The European vector, thus, becomes a dominant trend for the electorate of the Republic of Moldova, and rapprochement with Romania becomes a widely discussed option

in society and political circles in the government, especially in the context in which other options for securing the territory and citizens of the Republic of Moldova are not realistic given the persistence of plans to expand the war in Ukraine to the Republic of Moldova.

Keywords: Human security, war in Ukraine, hybrid war, national security, security risk, European Union

Securitatea, atât cea a persoanei, cât și cea a comunităților umane, statelor, regiunilor și securitatea mondială conțin elemente care sunt înțelese în mod obiectiv, la nivelul unor parametri care pot fi evaluați științific independent de percepțiile, senzațiile și impresiile cercetătorului, cât și subiectiv, ca rezultat al unui demers irațional individual, în urma unor impresii formate ca rezultat al contactului cu o realitate percepută și asumată personal [1, p. 599]. În sens subiectiv, securitatea se află într-o corelație strânsă cu sentimentul de confort și cu starea generală de bine a persoanei. Iar în sens obiectiv, securitatea devine un concept complex care are capacitatea să se extindă în timp și spațiu și poate fi dovedită prin aplicarea unor metodologii științifice, poate fi verificată și instrumentalizată în perspectiva generării unor beneficii clare și evidente de ordin material sau spiritual pentru subiectul protejat și securizat [2, p. 171].

În general, securitatea poate fi amplificată prin conceptul de beneficiu, care conferă procesului de asigurare a securității un sens aplicativ, o perspectivă dinamică de punere în valoare a celor mai puternice părți, calități sau aspecte [3, p. 109].

Beneficiul care este obținut în urma asigurării prelungite în timp a securității subiectului diferă esențial de avantajele care pot pune într-o nouă lumină subiectul securizat [4, p. 201]. De regulă avantajele obținute în rezultatul asigurării securității demarcă o îmbunătățire a stării anterioare, a situației subiectului vizat prin efortul de securizare, o ameliorare a stării, fără să o schimbe structural sau calitativ [5, p. 516]. Iar beneficiul, în acest context, denotă o stare calitativ nouă, o achiziție și un salt valoric important pe care-l înregistrează subiectul respectiv [6, p. 42].

Beneficiul securitar, prin urmare, devine un obiectiv important pentru eforturile de securizare, prin atingerea căruia starea de securitate se amplifică, transformându-se într-o stare calitativ avansată [7, p. 191]. Dar, odată cum securitatea nu poate fi doar îmbunătățită pentru toți participanții la procesele sociale, cele politice, geopolitice și globale, beneficiile obținute de un subiect protejat, sunt invers proporționale cu un nivel degradat de protecție a securității pe care trebuie să-l accepte subiecții aflați în concurență cu cel ce înregistrează beneficii securitare [8, p. 18].

Pe de altă parte, dezavantajele pe care le experimentează unii subiecți ai ecuației de securitate ca rezultat al înrăutățirii stării acestora de securitate sau a dificultăților de securitate întâmpinate, sunt corelate invers proporțional cu avantajele nou înregistrate ale altor subiecți ai ecuației securitare, aflați pe un trend ascendent în optimizarea proceselor securitate în care sunt implicați [9, p. 36].

Problematika dificultății de identificare, evaluare și soluționare a problemelor de securitate nu ține exclusiv de aspecte metodologice, ci și de contextul în care se activează, de paradigmele dominante în comunitatea științifică și în societate, dar și de capacitățile disponibile, atât umane, tehnologico-tehnice, dar și comunicaționale. Un important impact asupra capacității de identificare a problemelor de securitate îl are abilitatea de a conceptualiza în ansamblu starea de securitate. Fără îndoială că aspectele metodologice țin de esența procesului de identificare și evaluare.

Generalizând, impedimentele menționate pot fi grupate în două mari categorii: 1. dificultăți obiective, care sunt determinate de limite metodologice, teoretico-conceptuale, și 2. dificultăți subiective, determinate de opinii și limite umane și sociale, care sunt bazate pe impresii, percepții și sentimente, care nu pot fi evaluate cu precizie, care sunt o exponentă a calității umane [10, p. 221].

Pentru a contracara atacurile hibride din partea Federației Ruse, este imperativ de necesar ca intruziunea hibridă rusă în sistemele sociale, economice și politice din Vest (Europa Occidentală, statele UE, statele - foste republici unionale ale URSS și Statele unite ale Americii etc.) să devină un obiect de studiu, o preocupare importantă pentru a înțelege mai bine specificul influenței, amploarea, metodele preferate la care se recurge cel mai des, cauzele succesului de intruziune și de presiune asupra factorilor de decizie, dar mai ales breșele posibile din sistemul edificat, punctele vulnerabile

și slabe ale sistemului de intervenție hibridă, informațională construit și folosit de FR pentru a interveni și a influența procesul decizional, mentalitatea socială în statele pe care FR le consideră inamice, rivale sau concurente, mai ales cele din Vest [11, p. 272].

Principiul prioritizării din perspectivă conceptual-metodologică ca metodă științifică și neștiințifică de cunoaștere [12, p. 548]. În domeniul asigurării investigării și cercetării securității principiul respectiv este utilizat des și la ascară largă, cu toate că acest principiu este unul general-științific, dar și un principiu ce aparține activității practice. Prioritizarea în perspectiva evidențierii celor mai importante și mai oportune componente este inerentă procesului de optimizare și ajustare metodologică a studiului științific [13, p. 58]. În plan aplicativ, prioritizarea este necesară pentru a eficientiza demersul practic, activitatea și acțiunea nemijlocită, în concordanță cu resursele disponibile, obiectivele trasate inițial și ajustate pe parcursul procesului [14, p. 170].

În domeniul relațiilor internaționale și a domeniului securității, prioritizarea devine strict conectată de componenta intereselor, atât a celor naționale, cât și a celor corporative, a intereselor personale, a grupurilor de state, a unor formațiuni instituționale internaționale regionale sau modiale [15, p. 68]. Interesele determină formarea și cristalizarea ierarhiei priorităților, a ordinii de promovare a acelor interese. De altfel, în cel mai general sens posibil prioritizarea poate însemna stabilirea unei succesiuni de acțiuni, conform diverselor principii, criterii și motivații. Prioritizarea în domeniul securității se realizează logicii asigurării stării de securitate, de obținere a beneficiilor securitare, de edificare a unui sistem eficient care să promoveze securizarea subiectului protejat și securizat [16, p. 301].

Principiul prioritizării are o aplicabilitate deosebită în corelație cu scopul identificării problemelor de securitate, deoarece clasificarea riscurilor, pericolelor și amenințărilor de securitate se realizează conform criteriului stringenței acestora, în corelație cu evaluarea actualității lor, cu gradul probabilității acestora de a se realiza și a pune în pericol starea de securitate a subiectului protejat și securizat [17, p. 150]. Prin urmare, principiul prioritizării poate căpăta valențe totalmente speciale și deosebite în funcție de domeniul în care este aplicat. În același timp, prioritizarea pare a fi o etapă obligatorie a unui proces de realizare a scopurilor, a unei activități supuse unei logici și unui algoritm raționalizat de acțiuni, preconceptualizat, bine calculat [18, p. 37].

Sinergetica securitară se cristalizează ca o concepție științifică care presupune aplicarea postulatelor teoriei sinergetice în context securitar, în probleme de securitate. În linii generale, teoria sinergetică se transformă și se adaptează problemelor de securitate cu care se confruntă societatea, ajutând la îmbogățirea palitrei metodologice și abordărilor conceptuale cu scopul soluționării practice în condiții de maximă eficiență, rapiditate și costuri minime a provocărilor securitare cu care se confruntă societatea umană la scară universală, dar și comunitățile umane la scară regională și locală, precum și provocările securitare pe care le întâmpină persoana la nivelul său individual [19, p. 93]. Sinergetica securitară se prezintă ca o concepție științifică a autoorganizării în cadrul sistemelor responsabile de gestionarea sectorului securității. Interacțiunea componentelor și părților din sistemul de asigurare a securității, componente care tind către o autoorganizare, constituie obiectul de interes al sinergeticii securitare [20, p. 81].

Principiile universale de evoluție a sistemelor dezechilibrate de securitate și generarea în cadrul acestora de structuri noi, la fel se înscriu în obiectul de studiu al acestei discipline care este sinergetica securitară. Sistemele de asigurare a securității pot activa cel puțin în două feluri, formând astfel două categorii distincte: sisteme deschise de asigurare a securității, sau sisteme dezechilibrate, și sisteme de tip închis, în cadrul cărora evoluția poate avea loc previzibil, în mod rectiliniu și direct, fără devieri și perturbări a traiectoriei planificate la etapa inițială [21, p. 48].

Interconexiunea componentelor sistemului securitar devine un fundament forte pentru a înțelege mai adecvat procesele și cauzele acestora care se produc în cadrul sistemelor securitare, și care determină comportamentul și manifestarea acestor sisteme într-un context mai larg, în care acestea interacționează cu alte sisteme securitare, dar și cu alte entități, în cadrul proceselor obiective în care sunt incluse sau atrase [22, p. 44].

Prin urmare, prisma prin care sinergetica securitară abordează procesele ce țin de domeniul securității, se referă prioritar la dinamica acestor sisteme securitare, la dezvoltarea domeniului securității, în ansamblu.

Problematica aliniarității proceselor securitare se bazează pe principiul ireversibilității și pe cel al polivariabilității, ceea ce determină caracterul aliniar, adică haotic, dezordonat al manifestării sistemelor securitare. Astfel, problemele de securitate, fiind aliniare, pot avea o gamă largă de soluții care corespund multitudinii căilor și variantelor de dezvoltare și evoluție a sistemului securitar respectiv [23, p. 193]. În acest sens, un sistem securitar reprezintă totalitatea de elemente, aspecte și variabile, inclusiv de context, care interacționează reciproc, formând conexiuni organice care se transformă în structuri ale sistemului.

Interconexiunea haosului și ordinii, sau a întâmplării și necesității, la fel, determină o mai profundă înțelegere a mecanismului de funcționare a sistemelor securitare în spiritul autoorganizării acestora [24, p. 88].

Procesul de identificare, evaluare și apreciere a ierarhiei pericolelor de securitate este important, în măsura în care de acesta depinde nivelul de atenție atras, alocarea volumului resurselor din totalul celor disponibile, dar și perioada când se vor elabora și implementa soluțiile de contracarare a consecințelor acelor probleme de securitate [25, p. 171].

Conform ultimelor elaborări în materie de metodologie a evaluării nivelului securității se utilizează simultan o multitudine de perspective și abordări, pentru a permite elaborarea unei imagini cât mai detaliate și mai exacte a situației.

În procesul de evaluare și analiză a stării de securitate este crucial de important și mediul, contextul și conjunctura în care se produce un anumit proces social al cărei stare de securitate este evaluată, pe lângă elementele deja tradiționale pentru ultimele trei decenii care desemnează cele trei direcții de bază în evaluarea și analiza nivelului asigurării securității:

- amenințări de securitate, care se referă mai cu seamă la aspectul extern sistemului al cărui stare de securitate este evaluat.
- riscuri de securitate - vizează cu precădere starea internă a sistemului preconizat a fi protejat prin identificarea și soluționarea potențialelor probleme de securitate.
- vulnerabilități de securitate - include în principal impedimentele sau obstacolele și părțile slabe ale sistemului al cărui securitate se preconizează a fi protejată.

Pentru Republica Moldova, la începutul lui 2026, se prefigurează următoarea evaluare, conform criteriilor de mai sus:

- principalele amenințări de securitate converg către regimul de la Kremlin care a dus dintotdeauna contra Republicii Moldova o politică ostilă de diminuare a securității sale cu intenția explicită de aș extinde autoritatea sa formală și/sau informală asupra întregului teritoriu actual al Republicii Moldova, nu doar asupra părții transnistrene, controlată de forțe ostile încă de la declararea independenței statului Republica Moldova, și de a transforma populația din Republica Moldova, prin deznaționalizare, rusificare, pauperizare, înspăimântare și terorizare, indiferent de apartenența etnică, lingvistică sau socială, în carne de tun în următoarele campanii de ofensivă ale regimului de la Moscova contra vestului. Această politică a fost promovată neînterupt în ultimele trei decenii prin numeroase luări de poziție și atitudini ale oficialităților ruse față de problemele prioritare de securitate ale Republicii Moldova, prin exemplele de relații ale statului rus cu Ucraina în ultimii ani, prin aplicarea unui tratament inuman față de populația din Ucraina, a unui tratament înjositor la adresa suveranității și statalității Ucrainei, relații caracterizate și prin atrocitățile și genocidul ucrainenilor în teritoriile ocupate ale Ucrainei de după 2014 și, mai ales, după 2022. În calitate de amenințare securitară pentru Republica Moldova, sub forma sa militară sau hibridă, Moscova a utilizat și, cel mai probabil va regurge și pe viitor la implicarea regimului separatist de la Tiraspol, aflat sub controlul său total, care nu se distanțează deloc de politica ostilă a Moscovei față de securitatea statului Republica Moldova, dar și față de siguranța cetățenilor și securitatea societății în ansamblu, de pe ambele maluri ale Nistrului [26, p. 70].

- principalele riscuri de securitate pentru societatea din Republica Moldova, pentru cetățeni și pentru securitatea națională, constituie deturnarea cursului și trendului de modernizare, de dezvoltare a acestei societăți prin împrumutarea și implementarea standardelor Uniunii Europene în toate domeniile vieții, proces instabil, anevoios și extrem de lent de modernizare socială care coincide, la această etapă, cu procesul de integrare prin aderare, din 2022, a RM în structurile UE. La fel, unul dintre riscurile majore de securitate pentru Republica Moldova și cetățenii ei, coroborată cu principalele amenințări externe menționate mai sus, constituie riscul declanșării unor operațiuni militare ale Federației Ruse prin și/sau cu participarea trupelor militare din Transnistria separatistă, și/sau intensificarea atacurilor hibride de instigare la conflicte interne prin exploatarea celor mai importante clivaje sociale din Republica Moldova, aplicându-se o gamă variată de metode de manipulare, de influență informațională, știri false și isterizarea populației, iar prin aceasta se poate ajunge la pierderea stării de pace și previzibilitate a evoluției vieții sociale, dar și la o degradare bruscă a calității vieții în Republica Moldova [27, p. 172].

- din gama variată de vulnerabilități securitare ce caracterizează Republica Moldova și societatea ei, care se referă în principal la impedimentele, obstacolele și părțile slabe ale sistemului de asigurare a securității, vom scoate în evidență rolul nociv al întregii clase politice din Republica Moldova, care se dovedește a rămâne prizonier, în mare parte, unor interese meschine, contrare interesului general al societății, ale unor interese personale ale politicienilor, ale unor orgolii și îngâmări - semne ale lipsei de maturitate nu doar politică, ci și psiho-emoțională, lipsă cronică de realism și responsabilitate în comparație cu statutul funcției publice ocupate [28, p. 115]. Această vulnerabilitate a sistemului de securitate semnifică faptul că clasa politică, în general, nu e capabilă (în cel mai fericit caz), dar uneori se dă dovadă și de rea intenție și premeditare, de a asana domeniul securității, de a reacționa adecvat și responsabil la cele mai stringente probleme de securitate (energetică, economică, militară, societală și politică), de a elabora și implementa un cadru normativ și instituțional eficient în domeniul securității, de a identifica, de a argumenta și a izola, proporțional cu pericolele generate, elementele ostile securității naționale, organizatorii și executanții unor acțiuni de provocare la adresa securității naționale și la adresa siguranței persoanei.

După cum se menționa mai sus, în procesul de evaluare și analiză a stării de securitate sunt crucial de importante și asemenea componente precum mediul, contextul și conjunctura în care se produce un anumit proces social al cărei stare de securitate este evaluată, deoarece acestea: mediul, contextul și conjunctura, au un impact fundamental de lungă durată asupra evoluției situației, asupra șanselor de remediere și soluționare a situației de criză securitară [29, p. 178].

În concluzie, relațiile internaționale ale Republicii Moldova sunt direct proporțional determinate de interesele sale naționale, iar provocările la adresa securității naționale cauzează importante schimbări în ceea ce privește abordările dominante ale guvernanților față de prioritățile Republicii Moldova în relațiile sale internaționale. Astfel, constatăm că eforturile hibride ale Federației Ruse de destabilizare a Republicii Moldova în ultimii ani, intensificate după declanșarea de către administrația de la Kremlin a războiului de ocupație din Ucraina, a avut ca efect o schimbare importantă a preferințelor electoratului și de consolidare la guvernare a forțelor pro-europene. Provocările din partea Federației Ruse la adresa securității naționale a Republicii Moldova, sprijinul fără precedent a României și a UE pentru Republica Moldova, dar mai ales continuarea și escaladarea războiului din Ucraina după februarie 2022, au diminuat semnificativ sprijinul electoral pentru forțele pro-ruse care, astfel, au devenit irelevante și periferice pentru configurarea politicii externe a Republicii Moldova. Vectorul european, astfel, devine un trend dominant pentru electoratul Republicii Moldova, iar apropierea de România devine o opțiune larg discutată în societate și cercurile politice de la guvernare, mai cu seamă în contextul în care alte opțiuni de securizare a teritoriului și cetățenilor Republicii Moldova nu sunt realiste în condițiile persistenței planurilor de extindere și în Republica Moldova a războiului din Ucraina.

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ГАРАНТИРОВАННОСТЬ ТРУДОВЫХ ПРАВ РАБОТНИКОВ В УСЛОВИЯХ ЦИФРОВОЙ ТРАНСФОРМАЦИИ

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Аннотация: В статье анализируются особенности гарантированности трудовых прав работников в условиях цифровой трансформации экономики и рынка труда. Рассматривается влияние цифровых технологий, платформенной занятости, автоматизации и дистанционных

форм работы на содержание и реализацию трудовых прав. Особое внимание уделяется проблемам правового регулирования цифровых трудовых отношений, обеспечению социальных и трудовых гарантий работников, а также необходимости адаптации трудового законодательства к новым условиям. Делается вывод о значении совершенствования правовых механизмов защиты трудовых прав в цифровой среде.

Ключевые слова: трудовые права, цифровая трансформация, цифровизация труда, дистанционная работа, платформенная занятость, трудовое законодательство, правовые гарантии, защита работников

GUARANTEES OF WORKERS' LABOR RIGHTS UNDER DIGITAL TRANSFORMATION

Abstract: The article examines the guarantees of workers' labor rights in the context of digital transformation of the economy and the labor market the impact of digital technologies, platform employment, automation, and remote forms of work on the content and implementation of labor rights is analyzed. Special attention is paid to the issues of legal regulation of digital labor relations, ensuring social and labor guarantees for workers, and the need to adapt labor legislation to new conditions. The article concludes that improving legal mechanisms for the protection of labor rights in the digital environment is of key importance.

Keywords: labor rights, digital transformation, digitalization of labor, remote work, platform employment, labor legislation, legal guarantees, workers' protection

В условиях цифровой трансформации экономики и активного внедрения технологий искусственного интеллекта в сферу труда проблема обеспечения гарантий трудовых прав работников приобретает особую актуальность. Цифровизация производственных процессов и управленческих решений сопровождается изменением традиционных моделей занятости, усилением роли алгоритмического управления и расширением использования автоматизированных систем мониторинга и принятия решений. В этих условиях, наряду с повышением гибкости рынка труда, появлением новых «нестандартных» форм занятости, увеличивается риск снижения уровня правовой защиты работника.

Как нами было отмечено, «цифровой» и «зелёный» переходы, влекущие внедрение новых, экологически ориентированных подходов к организации производственных процессов трансформируют рынок труда и социальную сферу. Рассмотрение данных процессов сквозь призму конституционных гарантий и системы прав человека в целом позволяет определить перспективы правового регулирования формирующихся общественных отношений с учётом как социальных, так и экологических аспектов. [17, С. 631; 4, С. 72]

Цифровизация рынка труда, развитие цифровых трудовых правоотношений требуют пересмотра подходов к регулированию взаимоотношений работников и работодателей. При этом определяющим является правовая регламентация и определение понятий работника и работодателя, кто выступает в качестве участников отношений, связанных с применением труда. В научной литературе и международных документах цифровые платформы рассматриваются как цифровые инфраструктуры или компании-посредники [3, С. 30], или как «компании, которые используют Интернет для облегчения экономически выгодного взаимодействия между двумя и более независимыми группами пользователей» [5, С. 8]. Аналогичный подход применяется ОЭСР, МОТ и Евростатом в совместной публикации *Handbook on Measuring Digital Platform Employment and Work* [11, С. 40], где цифровые платформы определяются как цифровые интерфейсы или компании-операторы, связывающие поставщиков услуг и их заказчиков. Именно данное понимание цифровых платформ используется МОТ в материалах, посвященных рассмотрению вопросов труда в платформенной экономике [10, С. 18].

Современные цифровые трудовые платформы, функционирующие с применением технологий искусственного интеллекта, условно подразделяются на два основных вида. К первому относятся платформы, основанные на геолокации, в рамках которых работники

самостоятельно выполняют задания в конкретных физических пространствах (например, услуги такси, курьерская доставка и иные подобные виды деятельности). Ко второму виду относятся платформы, использующие веб-технологии, где выполнение заданий осуществляется дистанционно, включая такие виды работ, как графический дизайн, создание текстов, перевод и другие формы удалённой занятости. [16, С. 114] И.А. Филипова и К.Л. Томашевский, подчеркивают, что «Новые сущности в силу их интеллектуальной составляющей фактически расширяют субъектный состав трудового отношения, чем вызывают потребность в изменении правового регулирования для адаптации законодательства к новым вводным данным. Таковым будет включение понятия цифрового трудового правоотношения вначале в доктрину, а позднее — и в материю трудового права с определением круга субъектов подобного правоотношения, особенностей его объекта, а также характерных именно для него субъективных прав и юридических обязанностей участников этого правоотношения.» [16. С. 128]

В Республике Молдова принята **Программа цифровой трансформации малых и средних предприятий** [12], целью которой является развитие цифровой трансформации бизнеса, в котором даются определения ключевых понятий, таких как «цифровая трансформация» и «цифровые технологии», а также формулируется цель Программы цифровой трансформации малых и средних предприятий. В частности, цифровая трансформация рассматривается как интеграция цифровых технологий во все бизнес-процессы, коренным образом изменяющая способы ведения предпринимательской деятельности и создающая значительные преимущества для клиентов, а цифровые технологии определяются как электронные инструменты, системы и ресурсы, ориентированные прежде всего на развитие интеллектуальных процессов (п. 4 главы I). [12] Цель Программы заключается в восстановлении и увеличении их экономического потенциала путем интеграции цифровых технологий, создания новых бизнес-моделей, основанных на повышении связанности и освоении инновационного потенциала (п.1 Главы 10). [12] Вместе с тем анализ содержания данного документа показывает, что в нём фактически не затрагиваются вопросы рынка труда, трудовых ресурсов и кадрового обеспечения цифровой трансформации. Такая лакуна представляется существенной, поскольку в условиях развития бизнеса и активного продвижения цифровых технологий особую роль приобретает человеческий капитал. Игнорирование кадровой составляющей, в том числе, вопросов подготовки работников для новых условий цифровой занятости, адаптации трудовых навыков, переподготовки и социальной защиты занятых, снижает эффективность цифровых преобразований и не позволяет в полной мере реализовать их потенциал.

В этой связи представляется необходимым рассматривать цифровую трансформацию не только как технологический и экономический процесс, но и как комплексное явление, требующее учёта трудовых и социальных аспектов, в том числе на уровне стратегических и программных документов.

Важным этапом формирования правовых гарантий в данной сфере может стать обязательство Республики Молдова транспонировать Директиву ЕС 2024/2831 об улучшении условий труда на цифровых платформах [2] в национальное законодательство к декабрю 2026 года. Директива вводит правовую презумпцию наличия трудовых отношений, а также устанавливает строгие требования к использованию алгоритмов и защите персональных данных работников [1], формируя первые в истории нормы, регулирующие алгоритмическое управление на рабочем месте. Это имеет принципиальное значение для правопорядка Республики Молдова в контексте сближения с правом ЕС и укрепления гарантий трудовых прав в условиях цифровизации.

В соответствии с Законом Республики Молдова № LP315/2022 утверждена Национальная стратегия развития «Европейская Молдова 2030», в которой цифровая трансформация также указывается в качестве одного из факторов устойчивого социально-экономического развития, модернизации экономики и сближения с правовыми стандартами

Европейского союза [6]. Однако, представляется целесообразным комплексное осмысление социально-трудовых процессов, включая трансформацию занятости, развитие трудовых ресурсов и защиту трудовых прав работников с учетом реальных изменений в сфере труда.

Принцип приоритета трудового правоотношения рассматривается Международной организацией труда также в качестве приоритетного при рассмотрении вопросов цифровой занятости. Наличие трудового правоотношения должно устанавливаться прежде всего на основании фактических обстоятельств, свидетельствующих о выполнении работником трудовой функции и получении им вознаграждения, независимо от формального наименования или правовой квалификации отношений в иных договорах или соглашениях, заключённых между сторонами [8]. Применение указанного принципа имеет важное значение и при правовом анализе отношений, возникающих между исполнителем работ и субъектом, организующим труд, в условиях занятости с использованием цифровых платформ. В таких случаях формальное оформление взаимодействия в виде гражданско-правовых договоров не должно препятствовать признанию фактически сложившихся трудовых правоотношений.

Цифровые платформы, используемые для организации труда, в соответствии с положениями Директивы 2024/2831 [2], отличаются от иных онлайн-платформ тем, что в своей деятельности опираются на автоматизированные системы мониторинга и автоматизированные системы принятия решений, посредством которых осуществляется управление работой, выполняемой физическими лицами по запросу получателя услуги — как на разовой, так и на регулярной основе. Как прямо закреплено в Директиве, такие системы обрабатывают персональные данные лиц, выполняющих работу на платформе, и принимают либо поддерживают решения, оказывающие влияние, в том числе, на условия труда.

Указанные характеристики, обуславливают особую правовую природу цифровых платформ для организации труда как специфической формы предоставления услуг профессионалами, отличающейся от традиционных моделей, таких как классические службы вызова такси или системы диспетчеризации транспортных услуг. Кроме того, обращается внимание на возрастающую сложность организационной структуры цифровых трудовых платформ, которая сочетается с их быстрой эволюцией и приводит к формированию гибких, изменяющихся моделей организации работы. В отдельных случаях цифровые платформы могут предоставлять услуги, получателем которых выступает сама платформа либо иной хозяйствующий субъект в рамках одной группы предприятий, либо выстраивать организацию труда таким образом, что размываются традиционные, ранее легко идентифицируемые модели предоставления услуг (п. 19 Директивы) [2].

Аналогичный подход применяется и к платформам микроработы и краудворка, относящимся к онлайн-платформам цифрового труда и предоставляющим предприятиям и иным заказчикам доступ к широкой и гибкой рабочей силе для выполнения небольших задач, осуществляемых дистанционно с использованием компьютера и подключения к сети Интернет [9].

Цифровая трансформация, неизбежно изменяющая рынок труда и взаимоотношения основных участников трудовых правоотношений, вызывает потребность в осмыслении существующих механизмов защиты прав работников, которые в условиях платформенной занятости не приобретают дополнительных гарантий обеспечения своих трудовых прав.

Использование цифровых технологий в процессе труда, внедрение искусственного интеллекта на различных этапах управления трудом, также свидетельствует о необходимости нормативного закрепления базовых трудовые гарантии для работников. Например, представляет интерес предложение об установлении на законодательном уровне ограничений в действиях работодателей по отношению к работникам, в частности в целях предотвращения необоснованных увольнений, связанных с внедрением систем искусственного интеллекта [13]. Однако подобные ограничения не могут носить декларативный характер и требуют четкого правового содержания. С учетом принципа взаимности прав и обязанностей сторон трудового договора представляется целесообразным исходить из уже закрепленных гарантий трудовых

прав, предусмотренных действующим трудовым законодательством Республики Молдова, в частности в статьях 9 и 10 Трудового кодекса Республики Молдова [7], которые устанавливают фундаментальные права работников и корреспондирующие обязанности работодателей.

Стандарт защиты прав работников при внедрении искусственного интеллекта на предприятиях, предложенный в качестве модельного акта Республиканским объединением профсоюзов «Федерация профсоюзов Республики Казахстан» содержит следующее положение относительно механизма защиты нарушенных прав работника: «Любое лицо, считающее, что его права были нарушены в результате разработки, внедрения или использования систем искусственного интеллекта государственными или частными субъектами, должно иметь доступ к эффективному средству правовой защиты на национальном уровне. Работник должен обладать правом на пересмотр автоматизированных решений с обязательным участием человека, особенно в случаях, затрагивающих увольнение, понижение в должности или существенное сокращение дохода. Такая процедура должна быть независимой, объективной и обеспечивать реальный учет позиции работника» (п.3.4 Стандарта) [15].

Комиссаром Совета Европы по правам человека при рассмотрении вопросов защиты прав человека в условиях взаимодействия с элементами искусственного интеллекта, также особое внимание обращено на способы защиты нарушенных прав. Отмечается, что лицо, считающее, что его права были нарушены в результате разработки, внедрения либо применения систем искусственного интеллекта государственными или частными субъектами, должно быть обеспечено доступом к эффективным средствам правовой защиты на национальном уровне. При этом государства-члены обязаны гарантировать такие средства защиты и лицам, которые обоснованно полагают, что без их ведома и в условиях непрозрачных процедур в отношении них было принято решение, полностью или в значительной степени основанное на результатах функционирования системы искусственного интеллекта. [14]

Цифровая трансформация экономики, внедрение информационных технологий, включая системы искусственного интеллекта и цифровые трудовые платформы, неизбежно изменяют традиционные подходы к пониманию трудовых правоотношений, их содержания. В этих условиях обеспечение гарантированности трудовых прав работников приобретает особую актуальность и требует системного подхода в совершенствовании правового регулирования.

Для Республики Молдова данная задача имеет особое значение в условиях европейской интеграции. В связи с этим представляется необходимым внести изменения и дополнения в национальное трудовое законодательство, прежде всего в Трудовой кодекс Республики Молдова, с целью учета новых форм занятости и цифровых моделей организации труда. Перспективным видится нормативное закрепление специальных норм, регулирующих трудовые отношения, возникающие с использованием цифровых платформ и автоматизированных систем управления трудом. Принципиально важным вопросом становится определение сторон трудового договора, в связи с чем, требует конкретизации определение понятий «работник» и «работодатель». Положения, гарантирующие право работника на то, чтобы решения, существенно затрагивающие его трудовые права и условия труда, не принимались исключительно в автоматическом режиме, также повысило бы уровень обеспечения гарантий трудовых прав.

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КОНЦЕПЦИЯ ОБЕСПЕЧЕНИЯ ИНФОРМАЦИОННОЙ БЕЗОПАСНОСТИ В КОНТЕКСТЕ СОВРЕМЕННЫХ ГИБРИДНЫХ ВОЙН

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The article discusses the basic concepts of the terms "hybrid war" and "information war". The article describes the main challenges, threats, and risks of information and psychological influence on individuals and society in the context of information and hybrid wars.

It is proposed to ensure the threats of information warfare using the term homeostasis, which is the ability of an open system to maintain a constant internal state. This is achieved through coordinated actions aimed at maintaining a dynamic balance in society and the state in the face of information and psychological influence, by strengthening the object (society or individual) to the point where it is no longer susceptible to destructive information and psychological influence.

Keywords: information, information security, strategy, protection, technical means, psychology, influence, society, values

На данный момент не существует единого, признанного всеми определения понятия «гибридная война».

Один из создателей этого понятия, бывший сотрудник Министерства обороны США Натан Фрейер определил гибридную войну на основе четырех типов борьбы: традиционные стычки регулярных войск, партизанская война, «катастрофический терроризм» и истребительные техники, подрывающие военное превосходство регулярных войск [12].

Кроме того, анализ, проведенный нами, теоретических тенденций политического дискурса относительно гибридных войн, позволяет выделить следующие ее концептуальные направления определяемая нами как: «четырёхблочная война» (Дж. Мэттис и Ф. Хоффман), в которой авторы определили четыре разновидности вызовов, «метяжевойна» (Е. Месснер), «сетецентричная война» (Артур Себровски, Джон Гарстка и Джей Джонсон) и теория информационных войн (И. Панарин). Каждая из этих концепций нацелена на идею подрыва политической и общественной стабильности противника изнутри, что является одной из основной задач гибридной войны. Можно выделить две особенности гибридной войны:

- отсутствие четкой разграничительной линии между «войной и миром»;
- проблемность установления ответственности.

В концепции Дж. Мэттис и Ф. Хоффман война трансформируется из традиционной войны в войну, в которой угрозы не носят видимый характер. На основании этого выделяются четыре разновидности вызовов [9]:

1) традиционные вызовы, представляют собой угрозы от государств, обладающих военным потенциалом, силами и средствами для военного противостояния в традиционных (классических) военных конфликтах;

2) нетрадиционные вызовы, исходят от тех, кто использует «нетрадиционные» (необычные) методы противодействия традиционным преимуществам более сильных соперников;

3) катастрофические вызовы, исходящие от сил, имеющие оружие массового уничтожения или обладающие такими методами, применение которых может дать эффект, сопоставимый с использованием ОМУ;

4) разрушительные вызовы, которые исходят от противника, обладающих «прорывными» технологиями.

Этот беспрецедентный синтез вызовов Дж. Мэттисс и Ф. Хоффман назвали «гибридной войной», выиграть которую опираясь, по их мнению, исключительно на военную силу невозможно. Поэтому предпочтение отдается *психологическим и информационным методам* воздействия, то есть методам, которые нарушают внутреннюю стабильность противоборствующего государства.

Е. Месснер ввел понятие «*метяжевойна*». Суть которой заключается в том, что, по его мнению, в современной войне «главной силой становятся не только и не столько войска, сколько народные движения <...>, а в нынешнюю эпоху всенародных войск и народных воюющих движений психологические факторы становятся доминирующими» [4]. Изменяются и цели войны – «на первый план выходят цели психологического, нежели военного или экономического характера» [4].

«Сетецентричная война» (Артур Себровски, Джон Гарстка Джей Джонсон – авторы книги «Сетецентричная война: развитие и использование информационного превосходства») – это новая теория войны в информационную эпоху, которая состоит в «создание мощной и всеобъемлющей информационной сети», которая обеспечивает «широкий доступ к информации своих через сетевые механизмы и инструменты обратной связи, надежно защитив их от внедрения противника» [13].

Профессор И. Панарин: «информационная война — это прежде всего управление, явное или тайное, информационными потоками в своих целях, для достижения определенных результатов» [6]. Направлена она на разрушение у противоборствующей стороны : во-первых, культурных ценностей, во-вторых, духовных, в-третьих, материальных ценностей. Все это является главной целью гибридной войны.

В документах НАТО говорится, что «гибридные конфликты включают в себя многоуровневые усилия, направленные на дестабилизацию функционирующего государства и поляризацию его общества» [10].

Таким образом, анализ показывает, что несмотря на большой разброс мнений и понятий относительно термина «гибридная война», общим является то, что новейшие гибридные войны – это современные войны, которые ведутся с использованием всевозможных доступных тактик борьбы, как регулярных или нерегулярных войск, так и кибернетически-информационных возможностей применения информационных, психологических и пропагандистских методов с использованием информационных и медийных технологий. Информационно-психологическими методами в сочетании с экономическими, научно-технологическими, а в некоторых ситуациях и военно-политическими методами происходит нанесение ущерба конкурирующим странам в борьбе при реализации геополитических интересов. Внедрение информационных методов, военно-политических, экономических и других средств в геополитическую практику без явного военного вторжения – это качественно новое в подходах к организации борьбы за региональное и глобальное доминирование, которое получило название «гибридная война».

В современной гибридной войне важным ее элементом (составляющей) является *информационная война*, которая, приобретая различные оттенки и используя различные методы, так же стала одним из современных, а зачастую и основным средством мировой политики.

Гарольд Дуайт Лассуэлл, выдающийся американский политолог, выделил четыре основные функции средств массовой информации: наблюдение за миром (сбор и распространение информации); «редактирование» (отбор и комментирование информации); формирование общественного мнения; распространение культуры [6, с. 14].

В настоящее время двадцатью странами мира официально признано существование кибервойск [11]. Эти войска нацелены на создание другого информационного нарратива, другой картины мира, другого представления о мире и о миропорядке.

Среди факторов, оказывающих влияние на характер международной политической системы, национальной и международной безопасности, всех сфер общественной жизни все более растущее значение в информационной войне приобрели информационно-телекоммуникационные технологии. Это не только способствует стремительному расширению и качественному изменению транснациональных связей, но и открывает людям иные формы видения мира, другие стили жизни, дало возможность через *информационное воздействие* формировать новые формы и стереотипы *поведения людей*.

Рассмотрим одну из сторон гибридной войны – *информационно-психологическое воздействие* на личность и общество. Данное воздействие образует, по мнению французского социолога С. Московичи, новое явление, которое он назвал «глобализацией масс». «Разрыв социальных связей, быстрота передачи информации, непрерывная миграция населения, ускоренный и раздражающий ритм городской жизни, – писал Московичи, – создают и разрушают человеческие сообщества. Будучи разрозненными, они воссоздаются в форме непостоянных и разрастающихся толп» [5, с. 21].

Благодаря новым информационным технологиям произошла смена логики социального поведения, люди заимели возможность получать информацию не только от национальных и глобальных элит, но и из других источников. В связи с этим «...риски и уязвимости информационной безопасности для личности, общества и государства становятся все более серьезными» [7, с. 184–198]. Несомненно, это затрагивает национальные ценности и исторические обычаи, углубляет эрозию национальной идентичности и приверженность к национальным историческим и культурным истокам.

Появилась реальная возможность через информационно-коммуникационные связи интернета информационно влиять на политические предпочтения, социальную сплоченность, осведомленность и вовлеченность в общественную жизнь граждан. Власти, со своей стороны, получают новые возможности для усиления контроля над населением благодаря мощным информационным системам слежки и возможности контролировать цифровую инфраструктуру. Многие государства, в первую очередь ведущие страны мира, стали использовать возможности социальных сетей в геополитической и внутривнутриполитической борьбе.

И наконец, с помощью современных информационно-коммуникационных технологий стало легко манипулировать людьми, по мнению бывшего разработчика дизайна Google Тристан Харриса производить «взлом мозгов» [3], которое происходит в рамках информационной войны, перешедшей в современный период в другое качество воздействия на личность с использованием социальных и информационных сетей.

Как правило в *информационной войне* информационные атаки для «взлома мозгов» идут по следующим направлениям:

- насильственное вторжение в национальное информационное пространство, добиваясь обеспечения информационного преимущества в политической, идеологической, культурной и других сферах, нанесение ущерба культурному достоянию и системе национальной безопасности;

- организация психологических операций, направленных на осуществление манипулятивного целенаправленного воздействия на сознательные и подсознательные психические процессы населения определенной страны, на его эмоции, чувства, волевые

импульсы, ценностные ориентации и жизненные стратегии, с целью изменить их в желаемом для инициаторов информационных атак направлении [1, с. 164];

– управление поступками людей через психологическое воздействие на подсознание. Главная отличительная особенность современных информационных психотехнологий – они действуют на психику, минуя сознание. Из-за этого человек лишается возможности принимать взвешенные, логически обоснованные решения, а значит, теряет свободу воли. Как известно, «в личном духе человеческом при его единстве есть три силы: разум, воля и чувство, из которых каждая представляет собою нечто особое и отдельное, но в то же время все они составляют единую духовную сущность» [1, с. 164]. Теряя одно из человеческих качеств человек теряет свою духовную сущность и человеческую цельность. В результате вся жизнь человека, включая поведение, желания, эмоции и даже здоровье, оказывается под чужим контролем [8, с. 6];

– в нанесении населению определенной страны тяжелой культурной травмы. Это насильственное, неожиданное, репрессивное внедрение ценностей, остро противоречащих традиционным обычаям и ценностным шкалам», что приводит к разрушению культурного времени-пространства, а значит, и тех духовных основ, на которых держится любое общество;

– насаждение определенных идей, чуждых историческим традициям народов, чем разрушается национальное самосознание целого народа;

– распространение дезинформации, то есть недостоверной и/или умышленно искаженной информации, направленной на разрушение общественного согласия, на дискредитацию действующей в стране системы власти и политических институтов, разжигание социальной розни, национальной и религиозной вражды, предоставление сопернику ложной информации о собственных целях, намерениях и силах [1, с. 164–165];

– изменение мотивов и ценностных ориентиров людей. Ослабляется связь личности с определенной социальной средой, которая поддерживает и сохраняет установленную систему ценностей, стандартов поведения. Все это приводит к распаду ранее существовавших норм, ценностей, служивших человеку жизненными ориентирами;

– обеспечение кризиса идентичности: подмена памяти об историческом прошлом, выражающейся в своего рода манкуртизме, отрицание национальных символов, утрате веры в национальный идеал или миссию национального государства, жажда разрушения традиций, обесценение ценностей и все более разрастающаяся детабуизация, т.е. отказ от веками выработанных норм морали и правил поведения, делегитимация существующей государственной власти и др.

Причем, в информационной войне не всегда происходит прямое внешнее давление на национальные правительства и на граждан определенного государства. Зачастую внешние силы вступают в сговор с национальной элитой и выступают единым фронтом против собственного народа, подавляя национальное самосознание, волю к сопротивлению и насаждают волю тех или иных внешних сил, которые стремятся доминировать в данном регионе или в мире в целом. Особенно это ярко проявляется во многих постсоветских странах.

Таким образом, *стратегия современной гибридной и информационной войн* – в корне изменить восприятие внутреннего мира человека и его социально-общественное поведение, установить контроль над важными национально-государственными процессами – политическими, экономическими, социальными, духовно-культурными и т. д. Это реализуется за счет подмены и разрушения национальных духовных ценностей: одни из них искусственно принижаются, а роль других, наоборот, преувеличивается. Цель подобных действий одна – манипулирование людьми, заставляя их действовать вопреки собственным национальным интересам. В арсенал информационной войны входят такие методы, как низвержение общественных идеалов, носителей культуры и морали, а также внушение чуждых интересов посредством различных психоаналитических технологий. В следствии чего, культурная составляющая общества размывается, ставя под вопрос духовные ценности, на которых и существует общество.

Как правило, *информационная война* имеет политические цели с их маскировкой в привлекательные лозунги, навязывание своему противнику правил и условий игры, чуждых его национальным интересам. Причем, информационная война, как правило, проводится противоборствующей стороной на протяжении длительного времени, путем упорного и последовательного навязывания различных идей, чуждых национальным традиционным историческим ценностям, размывая идентичность народа, противодействуя осуществлению национальной политики по обеспечению национальных интересов. Главным форматом современных информационных войн является манипулятивные действия по дезинформации общественного мнения. Манипулирование личным сознанием проводится с использованием общественной психологии, методов внушения, приведение больших социальных групп в определенное психическое состояние.

Разрушения, которые наносят информационные войны общественному сознанию и психологическому поведению личности по масштабам и по значению вполне соизмеримы, а порой и превышают последствия вооруженных войн.

Вместе с тем, несмотря на серьезные, абсолютно новые вызовы и угрозы гибридных, информационных и психологических войн в науке обеспечение информационной безопасности по противодействию информационным вызовам и угрозам излагается в традиционном алгоритме «...выявления угроз безопасности с целью их блокирования и предотвращения неприемлемых негативных последствий в дальнейшем...» [2]. Что в условиях прозрачности глобального информационного пространства практически невозможно.

Это показывает и государственная практика по обеспечению информационной безопасности. Национальные правительства большинства стран мира не нашли ничего другого как стать на путь перехода от открытого интернета к такому интернету, который все больше становится объектом государственного контроля, запрета различных средств массовой информации, телевидения радио, интернет-контента [7]. Но эти подходы посредством авторитарного контроля (не только авторитарных, но в последнее время и демократических стран Запада) напоминают попытки заткнуть «пальцем дыру» в информационной «дамбе». Тотальный запрет и закрытие национального информационного пространства от информационного воздействия других стран – это не тот путь, который можно реализовать в условиях информационной глобализации и до конца данный подход проблему информационной безопасности не решает.

Данную проблему можно решать *по методу гомеостаза* в классическом его понимании Уолтера Кэннона, – способностью открытой системы сохранять постоянство внутреннего состояния с помощью скоординированных направленных действий на поддержку динамического равновесия общественной системы. Данное состояние достигается с помощью скоординированных действий общества и государства, направленных на поддержку динамического общественного равновесия в условиях *гибридного, информационно-психологического воздействия* путем укрепления объекта (общества, личности) до его способности не воспринимать деструктивное информационно-психологическое воздействие. Все это возможно на основе сохранения и развития национальной культуры, традиций, обычаев, сохранения национальной идентичности.

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IMPLICAREA SINDICATELOR ÎN SOLUȚIONAREA PROBLEMELOR PRIVIND STOPAREA VIOLENȚEI ȘI HĂRȚUIRII LA LOCUL DE MUNCĂ ÎN CONFORMITATE CU LEGISLAȚIA INTERNAȚIONALĂ

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Rezumat. Articolul examinează rolul organizațiilor sindicale în prevenirea și combaterea violenței și hărțuirii în lumea muncii, în contextul consolidării standardelor internaționale după adoptarea Convenției Organizației Internaționale a Muncii nr. 190. Pornind de la realități sociale și juridice din Republica Moldova, sunt analizate dificultățile de aplicare a normelor privind motivele de prejudecată în cazurile de violență împotriva femeilor, fenomenul subraportării hărțuirii sexuale, precum și instrumentele concrete de intervenție sindicală: dialogul social, negocierea colectivă, politicile interne anti-hărțuire, mecanismele de raportare confidențială și protecția împotriva represaliilor. Articolul valorifică exemple relevante din spațiul public și din practica socială, subliniind necesitatea unei abordări integrate care să conecteze prevenirea violenței bazate pe gen cu securitatea și sănătatea în muncă.

Cuvinte-cheie: sindicate, dialog social, colectivul de muncă, loc de muncă, violență, hărțuire, securitatea, sănătatea în muncă.

Summary. The article examines the role of trade union organizations in preventing and combating violence and harassment in the world of work, in the context of the strengthening of international standards following the adoption of the International Labour Organization Violence and Harassment Convention (No. 190). Building on social and legal realities in the Republic of Moldova, it analyzes the difficulties in applying provisions on bias motives in cases of violence against women,

the phenomenon of underreporting of sexual harassment, as well as concrete trade union intervention tools: social dialogue, collective bargaining, internal anti-harassment policies, confidential reporting mechanisms, and protection against retaliation. The article draws on relevant examples from the public sphere and social practice, emphasizing the need for an integrated approach that links the prevention of gender-based violence with occupational safety and health.

Keywords: trade unions, social dialogue, labor collective, place of work, violence, harassment, occupational safety and health.

Introducere. Transformările recente ale pieței muncii au amplificat necesitatea extinderii protecției lucrătorilor dincolo de paradigma clasică, concentrată exclusiv pe riscuri fizice, accidente de muncă și condiții materiale de lucru. În prezent, conceptul de muncă decentă presupune, în mod inevitabil, protejarea demnității, a integrității psihologice și a egalității de tratament în cadrul raporturilor de muncă. În această logică, violența și hărțuirea nu pot fi tratate ca „incidente izolate”, ci ca fenomene care afectează securitatea profesională, coeziunea colectivelor, sănătatea mintală, productivitatea și climatul organizațional [9, p. 189-194].

În iunie 2019, adoptarea Convenției OIM nr. 190 [1] privind eliminarea violenței și hărțurii în lumea muncii a constituit un pas major în consolidarea cadrului normativ internațional, prin definirea integrată a fenomenului și prin plasarea sa la intersecția dintre drepturile omului, dreptul muncii și politicile de egalitate. Convenția accentuează ideea că violența și hărțuirea sunt alimentate de dezechilibre structurale și de raporturi asimetrice de putere, inclusiv de stereotipuri de gen, ceea ce impune răspunsuri instituționale complexe și coerente.

În Republica Moldova, discuțiile privind Convenția nr. 190 [1] au fost asumate în mod constant de partenerii sociali, în special de organizațiile sindicale, care au subliniat rolul lor de promotor și garant al respectării standardelor internaționale în spațiul profesional. În mod particular, dezbaterile purtate după adoptarea Convenției au pus accent pe necesitatea instituirii unei politici reale de „toleranță zero” față de violență și hărțuire, pe rolul dialogului social și pe integrarea unor măsuri preventive în contractele colective și în politicile interne ale întreprinderilor.

Expunerea materialului de bază. Convenția OIM nr. 190 și responsabilizarea partenerilor sociali. Convenția OIM nr. 190 [1] impune o abordare sistemică asupra violenței și hărțurii, stabilind că statele trebuie să creeze un cadru normativ și instituțional care să prevină, să sancționeze și să remedieze asemenea fapte. În același timp, Convenția recunoaște explicit rolul partenerilor sociali și, implicit, rolul sindicatelor în proiectarea și implementarea mecanismelor eficiente de protecție. Acest lucru este esențial, deoarece realitățile din lumea muncii indică frecvent că victimele nu dispun de resurse individuale suficiente pentru a se proteja, iar raportul de putere dintre salariat și angajator (sau dintre salariat și superiorul ierarhic) poate produce tăcere, frică, conformism și retraumatizare.

După adoptarea Convenției, organizațiile sindicale din Republica Moldova au analizat în mod constant conținutul acesteia și modalitățile de integrare în practici naționale. Discuțiile au fost purtate atât în cadrul dialogului social național, inclusiv în Comisia Națională pentru Consultări și Negocieri Colective, cât și la nivel de ramură, unde convențiile colective pot deveni instrumente juridice concrete pentru prevenirea hărțurii și pentru protecția efectivă a victimelor.

În acest cadru, rolul CNSM și al altor structuri sindicale a fost orientat spre: (i) promovarea ratificării și implementării Convenției; (ii) instruirea și sensibilizarea actorilor implicați; (iii) dezvoltarea unor politici anti-hărțuire; (iv) integrarea măsurilor preventive în convenții colective; (v) susținerea principiului confidențialității și a protecției împotriva represaliilor, în special în cazurile de hărțuire sexuală.

Dificultăți de aplicare a cadrului național. „Motivul de prejudecată” și violența bazată pe gen. Deși legislația Republicii Moldova prevede, începând cu 2022, posibilitatea calificării faptelor comise „din motive de prejudecată” drept circumstanță agravantă, aplicarea acestei norme în cazurile de violență împotriva femeilor rămâne incertă și, în practică, restrânsă. Cauzele identificate în discursul public și în analiza instituțională includ: instruirea insuficientă a polițiștilor, procurorilor și judecătorilor; confuzia conceptuală dintre „motivul de prejudecată” și alte noțiuni juridice; reticența

în recunoașterea urii bazate pe gen ca element juridic relevant; precum și tendința de a minimaliza dimensiunea structurală a violenței împotriva femeilor.

Această dificultate de aplicare nu reprezintă o simplă problemă tehnică, ci are consecințe directe: o aplicare limitată a agravantei conduce la pedepse mai blânde și reduce efectul preventiv al normei. În plus, transmite în societate un mesaj de tolerare implicită a violenței bazate pe gen, ceea ce afectează încrederea victimelor în instituțiile statului și contribuie la subraportare.

În acest context, actorii sociali – inclusiv sindicatele – pot avea un rol semnificativ în promovarea instruirilor tematice și în susținerea unei interpretări coerente a normelor, atât în sfera muncii, cât și în sfera conexasă a protecției victimelor violenței domestice, întrucât Convenția OIM nr. 190 [1] recunoaște impactul violenței domestice asupra vieții profesionale și necesitatea măsurilor de protecție.

Cazuri publice și reacții sociale: presiunea asupra victimelor și mecanismele psihologice ale negării. Un exemplu relevant, menționat în spațiul public, privește un incident din aprilie 2025, când un deputat a fost implicat într-un caz de violență în familie. Un copil a apelat serviciul 112, semnalând că „mama este agresată de tata”. Poliția a intervenit, iar imaginile video au surprins faptul că agresorul o ținea imobilizată pe soția sa, care plângea, fără a se opri nici după sosirea forțelor de ordine. În urma incidentului, autoritățile au emis un ordin de restricție de urgență pentru 10 zile, interzicând agresorului să se apropie de soție și copii. Ulterior, soția a negat public că ar fi fost victima violenței, susținând că apelul copilului a fost o „greșeală” și că nu a solicitat protecție. Cazul a generat reacții intense în societate și dezbateri privind violența împotriva femeilor, inclusiv asupra presiunilor exercitate asupra victimelor pentru a nega agresiunile.

Interpretarea specialiștilor în domeniu a evidențiat faptul că un asemenea comportament al victimei poate reflecta mecanisme de supraviețuire psihologică și un model de „control coercitiv”, în care victima caută aparent stabilitate și protecție pentru copii chiar în condiții abuzive. Într-o relatare publicată de presă, directoarea executivă a Centrului de Drept al Femeilor, Angelina Zaporozjan-Pîrgari, a subliniat că astfel de situații indică lipsa sentimentului de siguranță și existența unei relații abuzive, cu elemente de control, violență psihologică și fizică (Ziarul de Gardă, nr. 20, 29 mai 2025) [6].

Aceste observații sunt importante pentru lumea muncii, deoarece violența domestică, în formele sale psihologice și economice, se răsfrânge adesea asupra capacității femeilor de a lucra, de a-și păstra locul de muncă și de a raporta abuzuri, inclusiv hărțuire în mediul profesional. Prin urmare, prevenirea violenței și hărțuirii la locul de muncă nu poate ignora contextul social și familial, iar integrarea acestui fenomen în politicile de securitate și sănătate în muncă devine o necesitate.

Date statistice și dimensiunea structurală a violenței împotriva femeilor. O dimensiune deosebit de relevantă pentru fundamentarea politicilor publice este reflectată în datele și rapoartele specializate. Raportul de letalitate elaborat de Centrul de Drept al Femeilor împreună cu Ministerul Afacerilor Interne [8], pe baza datelor comisiei care examinează cazurile de violență în familie soldate cu deces sau leziuni grave, relevă anual aproximativ 86 de cazuri cu consecințe extrem de grave, majoritatea victimelor fiind femei. Reprezentanții centrului au calificat acest nivel drept ridicat în raport cu media europeană, subliniind că violența împotriva femeilor reflectă dezechilibre de putere și persistența stereotipurilor de gen într-o societate patriarhală.

În planul relațiilor de muncă, această realitate produce cel puțin două efecte: (i) crește vulnerabilitatea femeilor în mediul profesional, inclusiv vulnerabilitatea față de hărțuire sexuală și abuz; (ii) determină o reticență majoră de raportare a abuzurilor, din cauza fricii, rușinii, dependenței economice și a lipsei de încredere în mecanismele de protecție. Tocmai din acest motiv, Convenția OIM nr. 190 [1] impune o abordare integrată, iar sindicatele devin actori cheie în promovarea instrumentelor preventive și în protejarea victimelor.

Experiențe individuale și disfuncționalități instituționale: cazul „Natalița”. În analiza fenomenului, relatările individuale nu au doar valoare narativă, ci și valoare explicativă pentru disfuncționalitățile sistemice. Un exemplu îl constituie cazul unei victime (denumită „Natalița”), care a suportat ani de zile umilințe și abuzuri în concubinaj. Abuzul a inclus control economic (lipsa

banilor), interdicția de a munci, izolarea și impunerea unor roluri domestice degradante, deși victima avea inițiată o afacere. Ulterior, abuzul a vizat inclusiv copilul. Victima a revenit în Republica Moldova, însă agresorul a venit sub pretextul dorinței de a vedea copilul, având ca scop răpirea acestuia. În cadrul procedurilor judiciare, victima a prezentat acte privind condamnarea agresorului în Marea Britanie pentru viol, însă instanța ar fi ignorat aceste probe pe motiv că după pedeapsă acesta „posibil s-a corectat”, deși argumentele victimei au fost prezentate. În relatare se indică faptul că judecătoria ar fi putut să nu fie suficient instruită în aplicarea legislației.

Acest tip de situație are relevanță directă pentru subiectul articolului: lipsa instruirii și sensibilizării actorilor instituționali poate produce ignorarea semnalelor de risc și, implicit, o protecție insuficientă a victimelor, inclusiv în mediul profesional. Pentru sindicate, asemenea realități justifică intensificarea eforturilor de instruire și cooperare interinstituțională, inclusiv prin dialog social, pentru a conecta prevenirea violenței bazate pe gen cu politicile de muncă decentă.

Sindicatele și cadrul juridic al muncii: de la definiții la obligații concrete ale angajatorului. În plan normativ, Codul muncii al Republicii Moldova include definirea hărțuirii sexuale ca formă de comportament fizic, verbal sau nonverbal de natură sexuală care lezează demnitatea persoanei ori creează o atmosferă neplăcută, ostilă, degradantă, umilitoare sau insultătoare [3]. Totodată, Codul muncii stabilește obligația angajatorului de a întreprinde măsuri de prevenire a hărțuirii sexuale și măsuri de prevenire a persecutării pentru depunerea plângerilor privind discriminarea și hărțuirea (art. 10 alin. (2) lit. f³). Prevederi relevante există și în legislația privind asigurarea egalității de șanse între femei și bărbați.

Cu toate acestea, existența normelor nu garantează automat eficiența lor. În practică, fenomenul hărțuirii sexuale rămâne un „tabu” în colective, fiind conștientizat cu dificultate, iar majoritatea cazurilor rămân necunoscute și fără adresări la organele competente. Femeile se tem să reclame, fie din cauza rușinii, fie din cauza fricii de consecințe profesionale, fie din cauza faptului că agresorul este superior ierarhic. În plus, unele victime nu recunosc juridic fenomenul, neînțelegând că ceea ce li se întâmplă este hărțuire și neștiind ce instrumente legale pot utiliza.

Acest tablou explică de ce sindicatele trebuie să acționeze nu doar reactiv (după ce un caz a fost produs), ci mai ales preventiv: prin informare, politici interne, proceduri confidențiale, instruire și negociere colectivă.

Prevenirea ca pivot al politicilor anti-hărțuire. Politici interne, confidențialitate, anti-represalii. În logica Convenției OIM nr. 190 [1] și a practicilor recomandate, prevenirea hărțuirii sexuale trebuie să includă mecanisme care permit raportarea incidentelor fără frică de consecințe, existența unor coduri și regulamente scrise, precum și o politică internă clară împotriva hărțuirii. Angajatorul are obligația de a dezvolta asemenea politici, însă adoptarea lor trebuie să fie rezultatul consultării sau negocierii cu organizațiile sindicale.

Politica anti-hărțuire trebuie să includă, în mod esențial: definirea hărțuirii sexuale; un angajament explicit pentru eradicare și prevenire; sancțiuni disciplinare pentru hărțuitor; procedura de depunere și examinare a plângerilor; garanții de confidențialitate; și, mai ales, o politică anti-represalii care să protejeze reclamantul, martorii și orice persoană implicată în procedură.

În practică, rolul conducerii, al managerului de resurse umane și al reprezentantului organizației sindicale primare este determinant: aceste persoane pot crea condițiile de prevenire, pot identifica rapid riscurile și pot interveni pentru încetarea imediată a comportamentelor abuzive. Reprezentantul organizației sindicale primare, în particular, poate fi primul punct de contact al victimei, asigurând suport inițial, orientare și intervenție în relația cu angajatorul.

Negocierea colectivă după ratificare: protecție universală, recunoașterea dimensiunii de gen, integrarea în SSM. După ratificare, prevederile Convenției OIM nr. 190 [1] devin obiect al negocierilor colective pentru a fi reflectate în contractele colective la nivel de unitate, în convențiile ramurale și în convenția la nivel național. Această abordare este justificată de nevoia de protecție universală a lucrătorilor, indiferent de statut (inclusiv în economia informală, pentru voluntari, stagiați, ucenici), precum și de nevoia de a scoate în evidență violența bazată pe gen, având în vedere vulnerabilitatea disproporționată a femeilor față de hărțuirea sexuală.

În același timp, cadrul european a oferit repere conceptuale relevante. Recomandarea Comisiei Europene 92/131/CEE [4] a definit hărțuirea sexuală ca un comportament abuziv de natură sexuală care lezează persoana, iar acceptarea sau refuzul unei asemenea conduite poate influența decizii privind drepturile în raporturile de muncă. Într-o interpretare modernă, noțiunea include și orice comportament care creează un climat de intimidare, ostilitate sau umilință.

O direcție deosebit de importantă este integrarea violenței și hărțuirii bazate pe gen, inclusiv a violenței în familie, în programele de securitate și sănătate în muncă. În cadrul dialogului social la nivel de unitate economică, acest lucru presupune dezvoltarea de politici, proceduri și instrumente care să prevină violența și hărțuirea, să reducă riscurile psihosociale și să asigure mecanisme de intervenție rapidă.

Activitatea Confederației Naționale a Sindicatelor din Moldova (CNSM) și mobilizarea socială: instruire, campanii, sensibilizare și riscul derivelor discursive. În plan instituțional, CNSM și alte structuri sindicale și-au exprimat constant intoleranța față de violență și hărțuire, susținând ratificarea Convenției OIM nr. 190 [1]. În decembrie 2022, CNSM a organizat o masă rotundă dedicată promovării ratificării Convenției, cu participarea reprezentanților sindicatelor, a autorităților, a partenerilor internaționali și a actorilor relevanți. În cadrul discuțiilor, s-a subliniat că Convenția definește integral violența și hărțuirea, incluzând nu doar abuzul fizic și verbal, ci și riscurile psihosociale și practicile abuzive în mediul de muncă.

Totodată, materialul semnalează o problemă importantă: calitatea discursului public și riscul interpretărilor simplificatoare sau exagerate. În unele dezbateri, s-au exprimat opinii care confundă prevenirea hărțuirii cu negarea interacțiunilor sociale firești (ex. „complimente”), riscând să producă reacții adverse și polarizare. În mod justificat, se subliniază necesitatea unei soluționări echilibrate, corelate cu obiectivele educaționale, cu transformări în mentalitatea educatorilor și cu o abordare care să distingă clar între comportamente respectuoase și comportamente abuzive.

În plus, sindicatele au participat la campanii de solidaritate și la inițiative internaționale, precum „Șase zile de activism împotriva violenței bazate pe gen”, orientate spre amplificarea vocilor supraviețuitoarelor și spre crearea de modele de soluții pentru ruperea ciclului violenței. Promovarea egalității de gen în sindicate și în societate este prezentată ca obiectiv permanent, inclusiv prin campanii naționale de sensibilizare precum „Fii vocea echității la locul de muncă”, în legătură cu standardele privind egalitatea de tratament, inclusiv cele reflectate în Convenția OIM nr. 156 [5] privind lucrătorii cu responsabilități familiale.

Concluzii. Analiza demonstrează că rolul sindicatelor în prevenirea și combaterea violenței și hărțuirii la locul de muncă este unul structural, nu secundar. Adoptarea Convenției OIM nr. 190 [1] a oferit un cadru internațional robust care obligă la politici integrate și la implicarea reală a partenerilor sociali. În Republica Moldova, există un cadru legal relevant (inclusiv în Codul muncii), însă persistă dificultăți de aplicare, în special în zona violenței bazate pe gen și a motivelor de prejudecată, precum și în zona subraportării hărțuirii sexuale.

Pentru a asigura eficiență, accentul trebuie pus pe prevenire: politici interne negociate cu sindicatele, proceduri de raportare confidențiale, garanții de confidențialitate, mecanisme anti-represalii și integrarea riscurilor psihosociale în SSM. Complementar, instruirea actorilor instituționali și dezvoltarea unei culturi organizaționale bazate pe respect și egalitate rămân condiții decisive. În această arhitectură, sindicatele pot funcționa ca mecanisme de proximitate socială, capabile să identifice rapid riscurile, să sprijine victimele și să transforme standardele internaționale în protecții efective la nivelul fiecărui colectiv de muncă.

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МЕЖДУНАРОДНОЕ ГУМАНИТАРНОЕ ПРАВО В УСЛОВИЯХ ГЛОБАЛЬНОЙ НЕСТАБИЛЬНОСТИ

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Аннотация: Статья анализирует международное гуманитарное право в условиях нарастающей глобальной нестабильности, характеризующейся трансформацией системы международных отношений, усложнением структуры вооружённых конфликтов и ослаблением универсальных правовых механизмов их регулирования. В работе рассматриваются ключевые концептуальные проблемы международного гуманитарного права, включая сложности квалификации конфликтов, соотношение МГП и международного права прав человека, процессы фрагментации международного права и кризис его универсальности. Отдельное внимание уделяется значению МГП как правового и гуманитарного регулятора

вооружённых конфликтов, а также перспективам его дальнейшего развития в контексте технологических изменений, усиления международных механизмов ответственности и конвергенции гуманитарных и правозащитных режимов.

Ключевые слова: международное гуманитарное право, вооружённые конфликты, глобальная нестабильность, права человека, фрагментация международного права

В условиях стремительно меняющегося глобального порядка международное гуманитарное право приобретает особое значение как универсальный механизм ограничения страданий, причиняемых вооружёнными конфликтами. Глубокие трансформации мировой политики, технологические революции и рост транснациональных угроз создают новые формы насилия, размывают традиционные границы между государственными и негосударственными субъектами конфликта и ставят под сомнение эффективность классических правовых инструментов. На этом фоне международное гуманитарное право выступает не только как система правил ведения войны, но и как индикатор устойчивости международного правопорядка, способный обеспечивать баланс между интересами государств, безопасностью гражданского населения и соблюдением прав человека. Его актуальность сегодня определяется необходимостью адаптации к новым вызовам, интеграции с нормами международного права прав человека и созданием механизмов ответственности, способных поддерживать легитимность и авторитет гуманитарного регулирования в условиях глобальной нестабильности [2, с. 35].

Одной из ключевых характеристик современной международной обстановки, определяющей актуальность международного гуманитарного права, является устойчивый рост числа вооружённых конфликтов и одновременное усложнение их структуры, участников и форм ведения. После окончания холодной войны в конце XX века в международном сообществе утвердились ожидания постепенного снижения уровня глобального насилия и формирования нового мирового порядка, основанного на верховенстве международного права, коллективной безопасности и координирующей роли Организации Объединённых Наций. Распад биполярной системы, символически завершившийся распадом Советского Союза в 1991 году, воспринимался как исторический шанс для консолидации либерального международного консенсуса и укрепления правовых механизмов предотвращения войн.

Особым рубежом в эволюции современных конфликтов стали события 11 сентября 2001 года и последовавшая за ними «глобальная война с терроризмом». Террористические акты в Нью-Йорке, Мадриде, Лондоне, Париже и других городах привели к коренной трансформации международных представлений о безопасности и допустимых формах применения силы. Военные операции в Афганистане и Ираке, начавшиеся как межгосударственные интервенции, быстро переросли в длительные асимметричные конфликты с участием повстанческих движений, нерегулярных вооружённых формирований и транснациональных террористических сетей. Эти конфликты по своей логике всё больше напоминали войны национального освобождения XX века, но при этом отличались существенно более размытыми правовыми рамками и неопределённым статусом участников.

Рост числа вооружённых конфликтов в XXI веке сопровождается не столько их количественным увеличением, сколько качественным усложнением. Современные конфликты всё реже укладываются в классические модели, предусмотренные Женевскими конвенциями середины XX века. Они характеризуются смешением внутренних и международных элементов, участием транснациональных негосударственных акторов, активным использованием новых технологий и размыванием границ между военными и гражданскими объектами. В совокупности эти процессы формируют принципиально новую реальность, в которой международное гуманитарное право сталкивается с необходимостью адаптации к условиям глобальной нестабильности и нарастающей конфликтной фрагментации.

Традиционно международные вооружённые конфликты (international armed conflicts далее по тексту – IACs) понимались как любые вооружённые столкновения между двумя или

более государствами, тогда как немеждународные вооружённые конфликты (non-international armed conflicts, далее по тексту – NIAC) охватывали вооружённое противостояние между правительственными силами и организованными негосударственными вооружёнными группами либо между такими группами внутри одного государства. Это разграничение имело не только классификационное, но и нормативное значение: к IAC применялся полный комплекс Женевских конвенций, тогда как для NIAC действовали существенно более ограниченные стандарты, закреплённые в общей статье 3 и Дополнительном протоколе II. Однако современная конфликтная реальность всё чаще демонстрирует ситуации, которые не укладываются в эту бинарную схему [5].

Ключевым фактором размывания границ между IAC и NIAC является интернационализация внутригосударственных конфликтов. Современные гражданские войны нередко сопровождаются прямым или опосредованным вмешательством иностранных государств — в форме военной помощи, участия регулярных войск, авиаударов, поставок вооружений или разведывательной поддержки. Возникает вопрос: следует ли рассматривать такие конфликты как немеждународные с иностранным участием или как совокупность нескольких параллельных международных и немеждународных конфликтов? В доктрине и практике международного права до сих пор отсутствует единый подход к этой проблеме, что порождает правовую неопределённость в вопросах применимого режима защиты и ответственности сторон.

Особую сложность представляет ситуация, когда государство применяет вооружённую силу на территории другого государства против негосударственной вооружённой группы без согласия последнего. В таких случаях одновременно присутствуют элементы международного вооружённого конфликта (взаимодействие между двумя государствами) и немеждународного (борьба государства с негосударственным актором). От того, какая квалификация будет признана приоритетной, напрямую зависит, применяются ли, например, нормы о статусе военнопленных, о правомерности интернирования, о допустимых средствах и методах ведения войны. Современные правовые рамки не дают однозначного ответа на этот вопрос, что усиливает фрагментацию правоприменительной практики.

Дополнительное измерение проблемы связано с экстерриториальными военными операциями, включая удары беспилотных летательных аппаратов и специальные операции за пределами национальных границ. Такие действия нередко обосновываются правом на самооборону против негосударственных акторов, однако с точки зрения международного гуманитарного права остаётся неясным, влечёт ли подобное применение силы автоматическое возникновение международного вооружённого конфликта между государством-оператором и территориальным государством, либо речь идёт исключительно о немеждународном конфликте между государством и вооружённой группой. Эта неопределённость подрывает предсказуемость правового регулирования и создаёт риск произвольного выбора более «удобного» правового режима [1, с. 10-11].

Размывание границ между IAC и NIAC усугубляется и тем, что современные негосударственные вооружённые группы всё чаще обладают характеристиками, ранее присущими исключительно государствам. Они устанавливают контроль над территориями, создают параллельные административные структуры, собирают налоги, формируют регулярные вооружённые подразделения и ведут длительные боевые действия высокой интенсивности. Это объективно сближает их с классическими субъектами вооружённых конфликтов, но при этом они не обладают международной правосубъектностью и не связаны теми же объёмами правовых обязательств, что и государства. В результате возникает асимметричная правовая конструкция, в которой фактическое равенство сторон по военному потенциалу не сопровождается равенством их юридического статуса.

Существенные трудности вызывает и вопрос статуса лиц, принимающих участие в боевых действиях в рамках гибридных конфликтов. В классическом международном вооружённом конфликте комбатанты пользуются привилегией законного участия в боевых

действиях и, в случае пленения, статусом военнопленных. В немеждународных конфликтах такого статуса не существует: участники вооружённых групп могут преследоваться по уголовному праву государства за сам факт участия в боевых действиях. В условиях гибридных конфликтов эта разница приводит к правовым парадоксам, когда лица, выполняющие сопоставимые боевые функции, подпадают под радикально разные правовые режимы в зависимости от формальной квалификации конфликта.

Отдельного внимания заслуживает проблема применения норм о задержании и интернировании. В международных вооружённых конфликтах правовые основания и процедуры лишения свободы подробно регламентированы Третьей и Четвёртой Женевскими конвенциями. В немеждународных конфликтах такие нормы либо отсутствуют, либо носят фрагментарный характер. В результате в гибридных конфликтах государства нередко удерживают лиц в правовом вакууме, обосновывая свои действия либо нормами МГП, либо соображениями национальной безопасности, что ставит под угрозу базовые гарантии защиты прав человека.

В совокупности все эти процессы свидетельствуют о том, что классическая бинарная модель вооружённых конфликтов утрачивает свою объяснительную и нормативную адекватность. Современные конфликты всё чаще представляют собой сложные, многослойные образования, в которых переплетаются элементы международного и немеждународного противостояния, государственные и негосударственные акторы, физическое и цифровое насилие. Это не просто усложняет юридическую квалификацию отдельных ситуаций, но и подрывает системную целостность международного гуманитарного права, поскольку разные правовые режимы начинают применяться к сходным по своей сути формам вооружённого насилия.

Размывание границ между международными и немеждународными вооружёнными конфликтами следует рассматривать не как частную техническую проблему квалификации, а как структурный кризис одной из базовых категорий международного гуманитарного права. Он требует либо радикального переосмысления самой дихотомии IAC/NIAC, либо выработки универсального минимального стандарта защиты, применимого ко всем формам организованного вооружённого насилия независимо от их формальной классификации. Без такого пересмотра МГП рискует всё в большей степени утрачивать свою регулятивную эффективность в условиях нарастающей глобальной нестабильности.

Параллельно с размыванием границ между типами вооружённых конфликтов развивается более широкий и системный процесс — кризис универсальности международного права как такового. После окончания холодной войны в международном сообществе сложилось устойчивое представление о формировании либерального международного порядка, основанного на универсальных нормах, многосторонних институтах и принципах коллективной безопасности. Казалось, что эпоха идеологического противостояния уступает место консенсусу вокруг верховенства международного права, а применение силы в международных отношениях будет подчинено жёстким юридическим ограничениям.

В совокупности все эти процессы свидетельствуют о том, что современный международно-правовой порядок переживает глубокий структурный кризис. Универсальность, которая долгое время рассматривалась как ключевое достоинство международного права, постепенно утрачивает своё нормативное содержание, уступая место фрагментации, политизации и селективному применению норм. Для международного гуманитарного права это означает не просто усложнение условий его применения, но и подрыв его легитимности как нейтрального и общепризнанного регулятора вооружённых конфликтов.

В этих условиях особую значимость приобретает вопрос о том, сохраняет ли международное гуманитарное право способность выполнять свою регулятивную функцию в обстановке нарастающей фрагментации и политизации международных норм. С одной стороны, МГП не может быть полностью изолировано от общего кризиса международно-правового порядка и также сталкивается с проблемами избирательного применения, эрозии

доверия и конкуренции правовых режимов. С другой стороны, именно его относительно автономный характер, опора на императивные гуманитарные принципы и универсалистская направленность позволяют рассматривать МГП как один из немногих оставшихся элементов международного права, претендующих на сохранение минимального консенсуса между конфликтующими сторонами. Это противоречивое положение МГП — между уязвимостью перед общим кризисом правопорядка и одновременной нормативной устойчивостью — делает необходимым более детальный анализ его сущности, целей и регулятивного потенциала.

Ключевой предпосылкой актуализации проблематики международного гуманитарного права в XXI веке является глубокая трансформация самого характера вооружённых конфликтов. Если в классическом международно-правовом дискурсе, сложившемся после Второй мировой войны, преобладала модель межгосударственного вооружённого противостояния, то в настоящее время доминирующее положение заняли конфликты иного типа — внутренние, транснациональные, гибридные и асимметричные. Данная эволюция конфликтности радикально изменяет как фактические условия ведения боевых действий, так и юридические рамки их регулирования, ставя под вопрос адекватность традиционных конструкций международного гуманитарного права [6].

Современные вооружённые конфликты в значительной степени утратили симметричный характер, присущий классическим войнам между сопоставимыми по военной и институциональной мощи государствами. Вместо этого всё чаще наблюдаются асимметричные формы противоборства, при которых одна из сторон обладает существенно превосходящими ресурсами, а другая компенсирует этот дисбаланс за счёт нестандартных тактик, скрытности, мобильности и использования гражданской инфраструктуры в военных целях. Подобные конфликты не вписываются в традиционные сценарии фронтовых боевых действий, что приводит к стиранию границ между зоной боевых операций и тылом, а также между комбатантами и гражданским населением. Это, в свою очередь, резко повышает риски для гражданских лиц и усложняет практическую реализацию базовых принципов МГП — различения, пропорциональности и военной необходимости.

Не менее значимой характеристикой современных конфликтов является их гибридность. Под гибридными конфликтами понимаются такие формы противоборства, в которых сочетаются элементы классических военных операций, партизанской войны, террористической деятельности, кибератак, информационно-психологического воздействия и экономического давления [8]. В этих условиях вооружённое насилие всё чаще дополняется немилитарными средствами воздействия, размывающими само понятие «вооружённого конфликта» в его традиционном юридическом смысле. Использование киберопераций, дезинформационных кампаний и экономических санкций в тесной связке с военными действиями создаёт ситуацию нормативной неопределённости, поскольку действующие нормы МГП были разработаны преимущественно для регулирования кинетических форм насилия и не всегда приспособлены к оценке правомерности гибридных методов ведения войны.

Особое внимание в контексте трансформации конфликтов заслуживает проблема размывания границ между международными и немеждународными вооружёнными конфликтами. Классическая дихотомия, лежащая в основе Женевских конвенций 1949 года, предполагала чёткое различие между войнами между государствами и внутренними конфликтами, происходящими в пределах одной страны. Однако в современной практике всё чаще встречаются ситуации, в которых внутренние конфликты интернационализируются за счёт вмешательства иностранных государств, трансграничной деятельности вооружённых группировок или использования внешней военной и финансовой поддержки. В результате возникают так называемые «смешанные» или «гибридные» конфликты, правовая квалификация которых вызывает серьёзные затруднения.

Такая неопределённость имеет далеко идущие правовые последствия. От отнесения конфликта к международному или немеждународному типу напрямую зависит объём

применимых норм МГП, статус участников боевых действий, допустимые методы ведения войны и характер ответственности за нарушения гуманитарного права. В условиях размытых границ между типами конфликтов возрастает риск селективного толкования правовых норм сторонами конфликта в собственных интересах, что подрывает предсказуемость и универсальность правового регулирования. Более того, государства нередко стремятся квалифицировать происходящее как «внутренний конфликт» или «антитеррористическую операцию» с целью минимизировать объем международных обязательств.

Одной из наиболее острых проблем является квалификация вооружённых конфликтов, от которой напрямую зависит объем применимых норм, статус участников боевых действий и характер международной ответственности. Классическая дихотомия между международными и немеждународными вооружёнными конфликтами, на которой строится система МГП, всё чаще оказывается недостаточной для описания гибридных и транснациональных форм насилия [7, с. 78-81]. Интернационализация внутренних конфликтов, вмешательство третьих государств, трансграничная деятельность негосударственных вооружённых групп и использование прокси-формирований создают ситуации, в которых формально внутренний конфликт приобретает признаки международного, а межгосударственное противостояние разворачивается в форме скрытых или опосредованных действий. В результате правовая квалификация конфликта превращается не только в технический, но и в политический вопрос, поскольку от неё зависит, какие нормы будут признаны обязательными и какие механизмы международного контроля могут быть задействованы. Эта неопределённость подрывает предсказуемость правового регулирования и создаёт пространство для селективного толкования гуманитарных норм в интересах сторон конфликта.

Не менее значимой концептуальной проблемой является соотношение международного гуманитарного права и международного права прав человека. Оба правовых режима направлены на защиту человеческого достоинства и ограничение произвола власти, однако они формировались в разных исторических и нормативных контекстах. Международное гуманитарное право изначально ориентировано на регулирование поведения сторон в условиях вооружённого конфликта и допускает определённые исключения из обычных стандартов защиты личности, исходя из логики военной необходимости. Международное право прав человека, напротив, претендует на универсальность и непрерывность действия, включая периоды вооружённых конфликтов. В условиях глобализации и усиления международных механизмов мониторинга прав человека происходит всё более активное наложение этих двух режимов, что порождает как возможности взаимного обогащения, так и серьёзные нормативные коллизии. Возникает вопрос о том, какие стандарты должны иметь приоритет в ситуации конфликта: специальные нормы МГП как *lex specialis* или универсальные требования прав человека, особенно в таких чувствительных сферах, как право на жизнь, запрет пыток и произвольных задержаний. Отсутствие единого подхода к решению этой дилеммы усиливает правовую неопределённость и затрудняет формирование устойчивой практики правоприменения.

Традиционные механизмы разработки международного права, основанные на многосторонних переговорах и заключении универсальных конвенций, демонстрируют всё меньшую эффективность в условиях геополитической поляризации и кризиса многосторонности. В отличие от второй половины XX века, современная международная система характеризуется ростом числа «ревизионистских» акторов, не заинтересованных в укреплении существующего нормативного порядка. Это обстоятельство делает маловероятным скорое появление новых универсальных договоров, регулирующих, например, правовой режим кибервойн или автономных боевых систем. В этих условиях на первый план выходит неформальное развитие норм через практику государств, экспертные руководства и постепенное формирование обычных норм, что предполагает переход от классической модели к более «эволюционной» логике правотворчества.

Одним из ключевых направлений такого развития выступает адаптация МГП к новым технологиям на основе так называемого «нормативного предпринимательства», при котором отдельные государства или коалиции государств берут на себя инициативу по формированию новых стандартов поведения, даже если они ещё не получили всеобщего признания. Суть этого подхода заключается в том, что государство добровольно принимает на себя более жёсткие ограничения, чем это формально требуется действующим международным правом, и последовательно демонстрирует их практическую осуществимость и гуманитарную целесообразность. Со временем такие стандарты могут приобрести статус общепризнанных норм в силу их функциональной эффективности и репутационного давления на другие государства. В контексте гуманитарного права подобная стратегия может быть применена, в частности, к регулированию целеуказания при дистанционных ударах, использованию алгоритмических систем принятия решений в военной сфере и обеспечению принципа соразмерности при высокотехнологичных операциях.

Особое значение в этой связи приобретает вопрос о разработке более строгих процедур оценки целей и рисков при применении беспилотных и иных дистанционных средств поражения. Практика последних десятилетий показывает, что даже при наличии формальных правил и многоуровневых механизмов контроля ошибки в выборе целей приводят к гибели гражданского населения и подрывают легитимность военных операций в глазах международного сообщества. Если ведущие военные державы смогут не только усовершенствовать внутренние стандарты принятия решений, но и публично закрепить их в виде обязательств, выходящих за рамки действующих норм, это может создать прецедент для постепенного формирования новых гуманитарных стандартов, применимых к нетрадиционным формам конфликта.

Не менее важным направлением развития МГП является формирование «правил дорожного движения» в киберпространстве. Хотя кибероперации уже оказывают значительное влияние на инфраструктуру, экономику и безопасность государств, их правовой режим остаётся фрагментарным и неопределённым. В отличие от классических средств ведения войны, кибератаки могут осуществляться негосударственными акторами, частными структурами или полугосударственными сетями, действующими с молчаливого согласия или при пассивной терпимости государств. Это обстоятельство ставит вопрос о разработке стандартов должной осмотрительности, обязывающих государства предотвращать вредоносные кибердействия, исходящие с их территории или осуществляемые их гражданами [3, с. 56]. В долгосрочной перспективе подобные стандарты могут стать частью более широкой системы международной ответственности в цифровой сфере и способствовать интеграции киберопераций в рамки гуманитарного регулирования.

Усиление международных механизмов ответственности является ещё одной ключевой перспективой развития МГП. В условиях, когда традиционные инструменты межгосударственной ответственности всё чаще оказываются политически заблокированными, возрастает значение индивидуальной уголовной ответственности, а также гибридных форм подотчётности, включающих национальные суды, международные трибуналы и универсальную юрисдикцию. Расширение практики привлечения к ответственности за военные преступления, совершённые с использованием новых технологий, может сыграть двойную роль: с одной стороны, оно будет выполнять превентивную функцию, а с другой — способствовать постепенному уточнению содержания гуманитарных норм применительно к новым формам насилия. При этом особое значение приобретает вопрос доказательств и атрибуции в условиях киберопераций и дистанционных ударов, что требует развития специальных процессуальных стандартов и международного сотрудничества в сфере цифровой экспертизы [4, с. 25-29].

Существенным элементом будущей эволюции МГП становится расширение роли негосударственных акторов в его соблюдении и развитии. В условиях, когда значительная часть вооружённых конфликтов носит немеждународный характер, а ключевыми участниками

боевых действий выступают негосударственные вооружённые группы, классическая модель гуманитарного права, ориентированная преимущественно на государства, теряет часть своей практической эффективности. В этой связи возрастает значение мягких механизмов вовлечения негосударственных акторов в гуманитарное регулирование, включая односторонние декларации о приверженности МГП, специальные соглашения с гуманитарными организациями и разработку кодексов поведения. Хотя такие инструменты не обладают формальной юридической обязательностью, они могут выполнять важную социально-нормативную функцию, формируя у негосударственных субъектов представление о гуманитарных стандартах как об элементе легитимного поведения в конфликте.

Особую роль в этом процессе играют международные и неправительственные организации, прежде всего Международный комитет Красного Креста, которые способны выступать в качестве посредников между государствами и негосударственными акторами, а также как источники экспертных интерпретаций гуманитарных норм. Их деятельность способствует не только распространению гуманитарных стандартов, но и постепенной социализации новых участников конфликтов в логике гуманитарного права. В долгосрочной перспективе это может привести к формированию более инклюзивной модели МГП, учитывающей реальное разнообразие субъектов современного насилия.

Наконец, важнейшей тенденцией развития международного гуманитарного права является его постепенная конвергенция с международным правом прав человека. В условиях, когда вооружённые конфликты всё чаще носят затяжной характер и размывают границы между войной и миром, становится всё менее убедительным жёсткое разграничение сфер действия этих двух правовых режимов. Практика международных судов и договорных органов по правам человека свидетельствует о возрастающем признании применимости стандартов прав человека в условиях вооружённого конфликта, по крайней мере в тех аспектах, которые не противоречат специальным нормам МГП. Эта тенденция усиливает гуманитарную направленность правового регулирования и способствует формированию более целостной системы защиты личности в условиях насилия.

В перспективе такая конвергенция может привести к переосмыслению принципа *lex specialis*, на котором традиционно основывались отношения между МГП и правами человека. Вместо иерархической модели, предполагающей автоматическое преимущество гуманитарных норм в условиях конфликта, может утвердиться более гибкий, контекстуальный подход, ориентированный на максимизацию защиты человеческого достоинства. Это, в свою очередь, усилит нормативную легитимность МГП и расширит его социальную базу поддержки в условиях глобального кризиса доверия к международному праву.

В условиях технологической революции и политической нестабильности именно такая модель представляется наиболее реалистичным способом сохранения регулятивного потенциала МГП и его адаптации к реалиям современного вооружённого насилия.

Международное гуманитарное право сегодня сталкивается с беспрецедентными вызовами: изменяется характер конфликтов, усложняется состав участников, размываются классические правовые категории и универсальные принципы. Несмотря на эти трудности, МГП сохраняет свою критическую роль как минимальный стандарт защиты человеческой жизни и достоинства, обеспечивая правовые ориентиры даже в условиях растущей нестабильности. Его дальнейшая эффективность будет зависеть от способности международного сообщества адаптировать нормы к современным реалиям, обеспечивая баланс между гуманностью, военной необходимостью и правовой определённой, что остаётся ключевым фактором поддержания международного порядка в XXI веке.

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ГОСУДАРСТВЕННОЕ УСТРОЙСТВО И ПРАВОВЫЕ ИНСТИТУТЫ В ДАКИИ

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Abstract: The article analyzes the administrative organization of the Roman province of Dacia after its incorporation into the Roman Empire in 106 AD. It focuses on the main territorial-administrative reforms implemented under Emperors Trajan and Hadrian, which resulted in the division of the province into several administrative units. The study examines the powers of the provincial governor and the role of the Council of the Three Dacias in provincial governance. Particular attention is given to local administrative structures, including municipal and colonial authorities, their composition and social requirements. The article also highlights the processes of urbanization and Romanization, as well as the spread of the Latin language in administration, justice, and everyday life in Roman Dacia.

Key words: Roman Dacia; provincial administration; territorial reforms; governor; municipal government; Romanization; urbanization; Latin language.

Введение: Имперской провинцией Дакия была провозглашена после 106 года. При правлении императора Трояна, Дакия находилась под руководством губернатора – *legatus Augusti propraetore* [3, p. 97]. По прошествии времени, в 119 году при правлении Адриана, провинция Дакия была раздроблена на несколько частей: *Dacia Superior* (Северная Дакия) и *Dacia Inferior* (Южная Дакия). Спустя короткий период, в 113 году при правлении того же императора, провинция была разделена на три части, из которых, первая часть – *Dacia Superior*, вторая часть – *Dacia Inferior u Dacia Porolissensis*. Уже спустя два десятка лет, в 167 году при дислокации V легиона *Macedonica*, была проведена последняя реорганизация, при которой вместо *Dacia Inferior u Dacia Superior* уже *Dacia Apulensis u Dacia Malvensis* [4, p. 56]. После императора управлял провинцией губернатор, наделенный правом издания законов, в руках которого были сосредоточены все виды власти, в том числе и административная и судебная власть.

Кроме губернатора в управлении провинцией Дакией принимал участие и *Совет трех Дакий*, в компетенцию которого входило ходатайство перед императором по различным вопросам и сбор денежных средств на сооружение различных памятников деятелям искусства, науки, политики.

Касательно местных органов управления в Дакии, то они делились в соответствии с административно-территориальным делением, а именно: на *городские и сельские*, где городские поселения включали *муниципии и колонии*. Насчитывалось 5 привилегированных колоний, где проживали римские граждане. Как в городах, так и в колониях управление вели *магистры*, которые ежегодно переизбирались, совместно с *городским советом*, члены которого назывались *декурионами*. Отбор которых велся по имущественному цензу. Основными требованиями, для избрания в совет, была личная свобода и значительное состояние. Попасть в городской совет считалось большой привелегией [6, p. 77]. Даже известны были случаи уплаты денег за место в городском совете. Горожане, которые входили в состав институтов власти, избирались сроком на 5 лет и несли ответственность за управление городом. Правители города имели в подчинении большое количество чиновников, которые получали жалование из городского бюджета.

На протяжении римского господства в Дакии возникли 12 новых городов и значительное число сельских поселений. Вся власть находилась в руках римских колонистов, говоривших на латинском языке, живших по римским обычаям, будучи активными носителями римской культуры среди гето-даков.

Города становились административными центрами больших сельских территорий. Как в администрации, в суде, так и в повседневной жизни использовался латинский язык. Для продажи продукции земледелия в городах, местные жители должны были знать латинский язык [8, p. 44].

Финансовое и военное устройство в Дакии

Если говорить о *финансовом устройстве* в римской провинции Дакия, то оно ничем не отличалось от устройства других провинций. В провинции была установлена система налогообложения в виде: прямого и косвенного налога. Прямые налоги подразделялись на земельный налог и персональный налог. Персональный налог выплачивали жители римской провинции Дакия, а вот купцы были обязаны выплачивать специальный налог, согласно изданному приказу Александра Севера, в противном случае, налог изымался принудительно. Что касается косвенных налогов, то на них налагались разные проценты от 1% до 5%, а именно: таможенные пошлины – 1-5%, налог на освобождение из рабства 5%, налог от заключения договоров – 1% и т.д. Контроль за взимание налогов и неукоснительная их оплата возлагались на прокуратуру, которая опирались на работу чиновников.

Военное устройство в римской провинции Дакия включало могущественную армию, так как провинция Дакия соседствовала с варварским миром, грозящим опасностью в любой момент. На территории Дакии были размещены легионы I: XIII легион *Gemina* и V легион *Macedonica*, I *Italica*, VII *Claudia*, XI *Claudia*, X *Gemina*, XXII *Primigenis* и вспомогательные и наемные войска – отряды пехоты и всадников. Гарнизоны находились в городах: Берзобий, Потаисс, Апулум. Изначально, во главе легиона находился *legatus*, а немного позже, после правления императора *Gallienus*, командование легионами приняли *praefectus legionis*, а в помощниках у них находились *tribune militum*, в функции которых входил контроль за дисциплиной и подготовкой в легионах и также присечение и назначение наказаний за военные проступки. Нельзя не упомянуть и функции *префектов* из военных лагерей, которые отвечали за размещение и снабжение военных лагерей. Так, для защиты от возможных нападений извне в провинции размещалось примерно 40 000 солдат, составлявших десятую часть всей армии Римской империи. Помимо них, в провинции проживали семьи военных. Границы провинции укреплялись крепостями – кастрами, земельными валами. Дороги охранялись полицией, совместно со специальными отрядами, отвечавшими за общественный порядок как за пределами провинции, так и в ее окрестностях [7, p. 152].

Во время дако-римских войн, а также после покорения Дакии римлянами, гето-даки понесли существенные потери. Большое количество гето-даков было пленено и превращено в рабов. Присутствие даков в Трансильвании доказывается многочисленными и разнообразными археологическими материалами, а также письменными документами. С окончанием войн начинается массовая колонизация новых провинций. Среди большого числа направленных римлянами колонистов, было много чиновников, следивших за ходом лесных работ, за рудниками по добыче золота, соли и ремесленников, обрабатывавших железо.

С созданием провинций Дакия и Мезия много гето-даков было зачислено в римскую армию. В провинциях местное население было поставлено в такие рамки, что оно вынуждено было воспринимать в полной мере язык, культуру, обычаи колонистов. Так как в повседневной жизни применялся латинский язык, язык даков постепенно вытеснялся. На рудниках и стройках, начиная от надзирателя до простого рабочего, все говорили на латыни, однако в горных областях Дакии и в местах, отдалённых от римских центров, ещё оставались сельские поселения, сохранившие язык и обычаи гето-даков.

Уволенные с военной службы ветераны из числа солдат римской империи оставались на покорённых землях. Как гласили законы того времени, ветераны наделялись участком земли (фермами) там, где завершился срок их военной службы. Лишь на территории Нижней Мезии выявлено свыше 93 римских ферм, а к востоку от Нижнего Дуная более 75 римских ферм и различных других строений. На фермах могли работать люди, которые самостоятельно не имели возможности обрабатывать землю. Хозяева земель способствовали распространению как латинского языка, так и римского образа жизни среди местного населения, но т.к. большинство колонистов не были римлянами и не столь хорошо владели латинским языком, возникла *народная латынь*.

Значимую роль в процессе романизации играло *христианство*. В состав римских легионов, которые располагались в провинциях, входило существенное количество римских граждан из восточных регионов, где данная религия была особо распространена. Многие легионы, которые располагались в Дакии, исповедовали новую религию – христианство.

Начиная с IV в. н.э. к югу от Дуная возросло число христианских общин, что привело к образованию религиозных центров, именуемых *епископатами*. Обнаруженные археологические раскопки доказывают о проникновении христианства и в области, населенные свободными гето-даками. В Будряска и Руджиноаса обнаружены серебряные, бронзовые и костяные крестики. В Нижней Мезии к IV-VI вв. было сооружено множество раннехристианских храмов, именуемых базилик – церковь. Самая ранняя церковь, обнаружена в местности Никулицел в северо-западной части Добруджи. Тут обнаружены останки 6 проповедников христианства (мучеников), принявших смерть за веру. Имена 4 из мучеников



Христианство весьма широко распространяется во время правления Константина Великого, но это продолжалось недолго, т.к. его преемники, находясь на троне, возобновили преследование христианских миссионеров. Уже после запрета императором Феодосием в IV в. языческих культов, на территории Нижнего Дуная появилась первая христианская церковь. Миссионеры распространили христианство на Левобережье Нижнего Дуная. Поскольку христианство распространялось посредством латинского языка, это более усилило романизацию.

Юридический статус граждан Дакии

Римскими гражданами признавались лица, проживающие в Риме и наделенные дополнительными правами, которые отсутствовали у остальных жителей Рима. Граждане Рима пользовались гражданскими и политическими правами:

Ius connubii – право на заключение брака, действительного по гражданскому праву;

Ius militia – право быть солдатом в римских легионах;

Ius suffragii – избирательное право;

Ius honorum – право баллотироваться в местные или государственные органы власти [5, р. 98].

- *praepomen* – имя в собственном смысле слова;

- *poten* – наименование семьи или рода, к которому принадлежит данное лицо;

- указание имени отца в родительном падеже;

- наименование трибы, в составе которой носитель имени голосует в народном

собрании;

- прозвище, которое стало включаться в полное имя гражданина позднее других частей.

Таким образом, полное имя, например, Цицерона было: Marcus (*praenomen*) Tullius (*nomen*) M [*arci*] f [*ilius*] Cornelia (*triba*) Cicero (*coognomen*) [14, p. 106].

Приобретение римского гражданства, возможно, было следующими путями:

- путём рождения от римских граждан;

- в результате усыновления римским гражданином иностранца;

- путем отпущения из рабства;

путём дарования римского гражданства определенным лицам [10, р. 50].

В первом случае ребёнок приобретал римское гражданство, в результате рождения в законном браке, заключённом между римскими гражданами, либо рождения вне брака, но римлянкой. Начиная с I в. н.э. совсем иначе стали подходить к данному вопросу. Было установлено, что, если ребёнок был рождён вне законного брака матерью – римской гражданкой и отцом – не римляном, что не являлось основанием признания его в качестве римского гражданина. Обладателями полной правоспособности признавались свободнорождённые римские граждане. В отличие от них, иностранцы могли приобрести

полную правоспособность и быть приравненными к свободнорождённым в ходе усыновления, осуществлённого полноправными римскими гражданами, проведённого по специально предписанной процедуре. В силу особых предписаний *римское гражданство предоставлялось*:

- определенным лицам за особые заслуги перед римским народом;
- отдельным жителям городов, провинций;
- представителям определённых сословий;

Так, эдиктом императора Каракала в 212 году всем жителям Римской провинции Дакия, завоёванной в 106 году, было предоставлено римское гражданство. До этого романизированные гето-даки имели статус перекринов.

Граждане Рима в силу определённых обстоятельств могли быть лишены правоспособности, а также быть признанными ограниченными в правах. **Лишение правоспособности** римских граждан допускалось в случаях: вследствие смерти гражданина; в результате утраты отдельных статусов, таких как: статус свободы, статус гражданства, семейный статус лица [11, р. 18].

Гражданство утрачивалось: в случае потери свободы; в случае принятия гражданства другого государства; в случае применения наказания в виде ссылки.

Римские граждане *cetățeni romani*, жили в городах, колониях, муниципиях. Владели следующими правами:

- право избирать и быть избранным;
- право заключать законный брак;
- право заключать сделки;
- право проживать в легионах.

Правовое положение латинов. Изначально *латинами* именовались жители Лациума, а совместно с ними и их потомство. Они пользовались также частью гражданских прав, предоставленных римским гражданам, соответственно, *ius conubii* – правом заключать брак, действительный согласно римскому праву, *ius commercii* – правом заключать правовые акты в целях торговли [15, р. 163].

Правовое содержание *latini* определялось их принадлежностью к 1 из 3 категорий: *latini veteres*, *latini coloniarii*, а также *latini Iuniani*. Для категории латинов *latini Iuniani* особых исключений и привилегий не отводилось, так как умирали они на правах рабов, например, имущество лица, относящегося к *latini Iuniani* после смерти передавалось его прежнему господину, который ранее освободил его из рабства. Все споры, касательно имущества латинов, как и споры римлян были разрешаемы в судах, с соблюдением тех же порядков, что и для римских граждан. Латинам также, как и римским гражданам было дозволено вступать в брак, образуя семью, и при этом, наделялись правом выступать субъектом во всех имущественных отношениях.

Латинам не позволено служить в римских легионах, а также избираться в магистраты. Однако, находясь в Риме, им не запрещалось голосовать на народных собраниях. Именно это право в публичной сфере, которым могли пользоваться латины из всех 3 категорий. К тому же римское гражданство получали „древние латины”, переселившиеся на постоянное место жительства в Рим. Так как это могло привести к серьёзным проблемам, а именно к сокращению населения города Лациума, стало соблюдаться условие, об оставлении своего потомства на прежнем месте. Также получить римское гражданство можно было за заслуги перед государством. Несмотря на своё положение латины не соглашались с политическим неравноправием в сравнении с римскими гражданами, что вылилось в Союзническую войну (90–89 гг. до н. э.). Результатом войны стало наделение правами римского гражданства все население.

Правовое положение перекринов. Границы римского государства заметно увеличились за счет подчинения территорий других государств. Население подчиненных территорий

Римом не пользовалось политическими и экономическими правами, присущими римским гражданам. Население это называлось *перегринами*. Они являлись обладателями прав лишь в пределах своей национальной правовой системы. Перегрины могли являться субъектами экономического оборота, однако, что касается форм и обязательств, существенно отличались от граждан Рима. Брак римских граждан с перегринами создавал особый случай правового регулирования и вытекающих из этого союза обязанностей, нежели типичные для римлян формы правоустановленного брака. Перегрины не обладали правоспособностью гражданского права в собственном смысле. Однако в рамках *jus gentium* они обладали частными правами считались субъектами хозяйственного оборота в тех формах и в тех обязательствах, которые не полагались присущими только римским гражданам могли заключать договоры купли-продажи, товарищества и так далее, но не могли оформлять сделки посредством манципации [12, р. 37].

Приобретение римского гражданства перегринами возможно было в двух случаях:

- в силу закона, а именно, путём присвоения в результате заслуг, представленных римскому государству;

- в силу особых актов государственной власти, позволяющих присвоение перегринам римского гражданства. Такого рода решения были приняты с учётом особых соображений, например, за счёт жителей провинций формировались римские легионы, а ведь нести военную службу в Риме имели право только те лица, кто имел римское гражданство. Напомним, что вступление в силу закона, принятого императором Каракаллой в 212 г. н. э. преобразовалось правовое положение перегринов Римской провинции Дакия. Начиная с этой даты, все свободное население получило римское гражданство и перегринами уже признавались лишь иностранцы. Теперь частноправовой статус римских граждан и иностранцев являлся практически равным [16, р. 52].

Существовали две категории перегринов: обычные и дедитичи (*deditici*). В 212 г. император Каракала издаёт эдикт, согласно которому, все жители провинции имели право получать римское гражданство, исключение составляли перегрины дедитичи, сражавшиеся против римского оккупирования Дакии.

Брак и семья в Дакии

Институт гражданского права, институт брака и семьи регламентировался исходя из римского права. Если заключался брак между римским гражданином и женщиной из категории перегринов, то их дети приобретали статус римских граждан. Те военные, которые не были римскими гражданами и при этом заключали брак с местными женщинами, оставались навсегда в Дакии. Действовали и специфические нормы, распространявшиеся на таких граждан, когда при отчуждении недвижимого приданого, муж был обязан просить разрешение у жены, как в Риме в отношении италийского имущества [13, р. 14].

Ввиду того, что перегрины не обладали правом *jus connubii*, они не имели возможность заключить брак по римскому праву, а лишь согласно законодательству для римских граждан, а касательно перегринов-дедитичей применялось право народностей. Что касается рабов, то они не могли заключать брак. *Contubernium* – союз рабов – не имел статус семьи – *matrimonium*. Упоминается о существовании союзов между рабами, имеющими своё имущество (*peculium*) и свободной женщиной (перегриной) или освобождённой из рабства. Известно о наличии институтов опекунов и усыновления, которые применялись у римских граждан, исходя из римских законов, касательно перегринов – согласно *jus gentium* [17, р. 31].

Собственность и обязательства в Дакии

В римской провинции Дакия институт собственности имел свои особенности, отражающие как общие принципы римского права, т.к. регламентировался римскими законами, за одним исключением: римские граждане не могли владеть имуществом, если колония не имела статуса “римской земли” так и местные особенности и изменения: Римское право признавало принцип частной собственности (*dominium*), основанный на праве

собственности (*ius utendi, fruendi, abutendi*). Это означало, что владелец имел право пользоваться и распоряжаться своей собственностью.

В Дакии, как и в других провинциях Римской империи, могли существовать местные традиции и обычаи, влияющие на вопросы собственности. Например, римские власти могли учитывать местные формы землевладения и практики при адаптации римского права к местным условиям. Римские граждане имели право (*possessio vel usufructus*). В Дакии была осуществлена римская колонизация, что влияло на установление римских законов и форм собственности. Римские колонисты могли получать земли на условиях, определённых римским правом, что отличалось от прав местного населения.

Римская империя могла также осуществлять государственную собственность (*res publica*), например, в виде земель, принадлежащих империи и использовавшихся для различных целей, включая военные и экономические нужды.

Собственность в Дакии и других провинциях не всегда была чисто частной. Римская империя могла вмешиваться в вопросы собственности, чтобы обеспечить свои интересы в области экономики, обороны и управления провинциями [18, p. 43].

Институт собственности в римской провинции Дакия отражал сложное взаимодействие между общими принципами римского права и местными особенностями, а также интересами самой Римской империи.

Институт обязательств в римской провинции Дакия

В начале XIX столетия в золотых рудниках были обнаружены 25 восковых таблиц, из которых всего лишь 14 содержали тексты договоров:

- 3 договора найма – *locatio conductio*;
- 3 договора займа – *cautio crediti*;
- 1 договор товарищества – *societas*;
- 1 договор хранения – *depositum*;
- 4 договора купли-продажи – *emptio-venditio*
- 2 договора – разные.

Институт обязательств в римском праве включал в себя следующие основные элементы: - **соглашения (*contractus*)**: добровольные соглашения между сторонами, которые порождали юридические обязательства. Примерами могут быть купля-продажа, дарение, аренда и т.д. Первый договор купли-продажи был заключён посредством манципации в марте 139 года, где предметом договора была рабыня 6-ти лет, **деликты (*delicta*)**: действия, противоречащие общественному порядку или причиняющие ущерб другим лицам. Примеры деликтов включали причинение вреда имуществу или личной неприкосновенности, **обязательства из неосновательного обогащения (*quasi-contractus*)**: Эти обязательства возникали не из соглашения сторон, а из фактического обогащения одной стороны за счёт другой без законного основания.

Виды обязательств

В римской провинции Дакия существовали различные виды обязательств, которые в основном соответствовали тем, что были характерны для римского права в целом. Обязательственное право представляет собой базисную основу римского гражданского права, регулирующее различного рода имущественные отношения, как в сфере производства, так и в сфере гражданского оборота. Некоторые исследователи утверждали, что истоки обязательств, следует искать в обычаях первобытных народов, когда люди дарили друг другу подарки во время церемоний. Постепенно привычка дарить подарки превратилась в обязанность, и, если человек что-то получал и ничего не давал взамен, возникало чувство несправедливости [2, p. 84]. В классическую эпоху торговля в Римской провинции получила широкое распространение. Для развития торговли необходимо было практиковать ссуду под проценты, что требовало значительного распространения ростовщических отношений в Риме. Все эти операции, используемые купцами - это и есть *институт обязательств* [1, p. 66].

Обязательство представляет собой оковы правового характера, заставляющие что-либо исполнить в соответствии с принятыми и действующими законами государства [16, р. 58].

Обязательства из соглашений (*contractus*): обязательства из купли-продажи, аренды, займа и других договоров, заключённых между сторонами. **Обязательства из деликтов (*delicta*):** возникали из противоправных действий, таких как повреждение имущества или личности другого лица. **Обязательства из неосновательного обогащения (*quasi-contractus*):** возникали в случае, когда одна сторона незаконно обогатилась за счет другой стороны, и закон предоставлял возможность восстановления справедливости. **Обязательства из иных источников (*obligationes ex alio*):** возникающие из различных других источников, таких как юридические факты (например, утрата вещи) или решения суда.

В Дакии, как и в других провинциях Римской империи, могли существовать местные особенности, влияющие на конкретные аспекты обязательственного права. Это могло касаться как местных обычаев, так и специфических законодательных актов, принятых для учёта местных потребностей и условий.

Исчезновение юридических структур и миграция племён

Исчезновение юридических структур и миграция племён в IV-X столетиях представляют собой сложный процесс, который оказал значительное влияние на развитие Европы в этот период.

В IV веке Римская империя столкнулась с серьёзными внутренними и внешними угрозами, что привело к её постепенному распаду. Падение западной части империи (476 год) ознаменовало начало перехода от римской государственности к более децентрализованным формам управления. Распад империи и уход центральной власти означали, что ранее установленные юридические структуры, основанные на римском праве и регулировании, перестали эффективно функционировать. Миграции варварских племён (гуннов, вандалов, вестготов, франков и др.) привели к военным конфликтам и территориальным изменениям, что также способствовало разрушению юридических структур. В ходе упадка центральной власти и усиления роли местных феодальных владык формировалась система феодальных отношений, где юридические нормы и права могли различаться в зависимости от местных обычаев и договоренностей.

В IV-X веках варварские народы начали мигрировать на запад, на территории Римской империи. Это движение было вызвано различными факторами, включая климатические изменения, внутренние конфликты и поиск новых земель. Миграции привели к созданию новых политических образований и государственных структур на территориях бывшей Римской империи, таких как королевства, княжества и герцогства. Варвары, постепенно обосновавшись на новых территориях, начали интегрироваться в существовавшие культуры и обычаи, что также отразилось на развитии юридических норм и структур. Миграции племён привели к изменениям в экономической структуре общества, переходу к более самообеспечивающим системам и уменьшению обмена и контактов между регионами.

Исчезновение юридических структур и миграция племен в IV-X столетиях Европы являются ключевыми переходными моментами, оказавшими глубокое влияние как на политическую, социальную, так и на юридическую структуру континента.

Выводы: Институт собственности в римской провинции Дакия формировался на основе общих принципов римского частного права, прежде всего признания частной собственности (*dominium*), однако его практическая реализация была адаптирована к провинциальным условиям и местным обычаям. Существенное влияние на правовой режим собственности оказывал статус земель и колоний, а также различие в правовом положении римских граждан и местного населения. Правовое регулирование имущественных отношений в Дакии характеризовалось сочетанием частной, государственной и ограниченной форм собственности. Активное вмешательство имперской власти в сферу собственности было обусловлено экономическими, военными и административными интересами Римской империи, что ограничивало абсолютный характер частного владения в провинции. Институт обязательств в

Дакии в целом соответствовал классическим нормам римского обязательственного права и охватывал обязательства из договоров, деликтов, неосновательного обогащения и иных юридических фактов. Обнаруженные восковые таблицы подтверждают широкое применение договорных форм в хозяйственной и торговой практике провинции. Наиболее распространёнными видами обязательств в Дакии являлись договоры купли-продажи, займа, найма и хранения, что свидетельствует о развитии товарно-денежных отношений и активной экономической жизни, особенно в период римской колонизации и эксплуатации природных ресурсов. Несмотря на доминирование римского права, в обязательственных отношениях могли сохраняться отдельные местные правовые элементы, что отражало гибкость римской правовой системы и её способность адаптироваться к региональным особенностям провинциального управления. Упадок Римской империи в IV–V веках и массовые миграции варварских племён привели к разрушению устойчивых юридических структур, основанных на римском праве. Ослабление центральной власти и переход к феодальным формам организации общества способствовали утрате единообразия правового регулирования и усилению роли местных обычаев. Таким образом, правовая система римской провинции Дакия представляет собой пример сложного взаимодействия классического римского права, провинциальной практики и последующих трансформаций, вызванных политическими, социальными и этнокультурными изменениями в позднеримский и постримский периоды.

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ФОРМИРОВАНИЕ РУМЫНСКОГО ГОСУДАРСТВЕННОГО УСТРОЙСТВА И ПЕРВЫХ ФЕОДАЛЬНЫХ ПРАВОВЫХ НОРМ

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Abstract: The article explores the formation of the Romanian state structure and the emergence of the first feudal legal norms through the development of the Țări—regional principalities that constituted the earliest political entities on the territory of present-day Romania. Particular attention is given to the establishment of Wallachia, Moldavia, and Transylvania, their administrative organization, and the role of rural communities in local governance. The study analyzes the origins of feudal legal relations, shaped by interactions between local customary law and external influences from Roman, Slavic, and Byzantine legal traditions. Special emphasis is placed on the Wallachian Law (Carta Valachorum) as an early written legal act, examining its structure, content, and significance in regulating political authority, land ownership, taxation, judicial organization, and civil and criminal relations. The article demonstrates that the development of early Romanian legal institutions was the result of adapting indigenous traditions to evolving political and legal frameworks in the medieval period.

Key words: Romanian principalities; Țări; feudal law; Wallachian Law; Carta Valachorum; state formation; medieval legal norms; customary law; Wallachia; Moldavia; Transylvania.

Введение: Формирование румынского государственного устройства и первых феодальных правовых норм связано с процессом создания и развития Țări, что в переводе означает "страны" или "земли" — региональных княжеств, ставшие первыми политическими образованиями на территории современной Румынии. В IV-VI веках на территории нынешней Румынии сформировались различные княжества, такие как Валахия (Wallachia), Молдова (Moldavia), и впоследствии, Трансильвания (Transylvania). Эти княжества возникли как результат миграций народов, включая римлян и славянские племена. *Княжество* — государственно-правовое формирование, где управление сосредоточено в руках феодального класса, во главе с князем. Власти в этих княжествах начали формировать централизованное управление, хотя оно было скорее феодальным [12, р. 16]. *Воеводство* — несколько княжеств под руководством воеводы. На низком уровне население сплачивалось в *сельские общины* — социально-экономические формирования, совмещающие коллективную и частную собственность. Управление в сельской общине осуществлялось общим собранием и советом старейшин (*sfatul*) [13, р. 17]. Таким образом, на данной территории формировались следующие княжества (Țări):

1. **Влахия (Wallachia):** Одно из трех основных княжеств.
2. **Молдова (Moldavia):** Второе княжество.

3. Трансильвания (Transylvania): Третье княжество.

Эти княжества играли ключевую роль в формировании румынской идентичности и в историческом развитии региона. Каждое из них имело своего князя (властителя), который управлял княжеством и формировал его политические и правовые структуры в средневековье и позднее [3, p. 73].

Первые феодальные правовые нормы

В раннем средневековье на территории Румынии начали формироваться феодальные отношения, основанные на взаимных обязательствах между князем и вассалами, которые владели землями в обмен на военную службу или другие услуги. Хотя ранние румынские князья искали образцы для своих законодательных инициатив в римском праве и праве византийской империи, они также создавали собственные нормы, отражающие местные обычаи и потребности. Эти нормы часто регулировали вопросы владения землёй, налогообложения, права собственности и уголовного права [11, p. 66].

Формирование румынского государственного устройства и первых феодальных правовых норм связано с развитием Țării как княжеств, которые находились на стыке культурных и правовых влияний римлян, славян и византийцев. Процесс создания этих княжеств и их юридических основ показывает адаптацию местных обычаев и потребностей к растущей политической и юридической организации румынского общества в средневековье [1, p. 143].

Валашский Закон -структура

"Валашский закон" (Carta Valachorum), также известный как "Хартия Влашко-Молдавская" (Carta Valachorum et Moldavorum), представляет собой один из ранних письменных правовых актов, который содержал юридические нормы и положения, регулирующие общественные и правовые отношения в княжествах Валахии и Молдовы.

Структура Валашского закона. Введение, которое обычно содержит указание на цели и основания создания Хартии, а также может содержать упоминание о правовом статусе княжеств и их князей [5, p. 26]

Основные юридические нормы: *Права и обязанности князя:* устанавливались полномочия князя, его обязательства перед народом, права на владение и управление землёй. *Права знати и бояр:* регулировались права и обязанности знати и бояр, в том числе вопросы владения и управления земельными участками. *Налоговая система:* описывались налоговые обязательства населения, порядок сбора налогов и иные финансовые обязательства перед княжескими властями. *Уголовные нормы:* включались правила и санкции для установления порядка и общественной безопасности, в том числе уголовные наказания за преступления. *Гражданские нормы:* регулировались вопросы гражданского права, включая сделки, наследство, семейное право и другие области.

Содержание Валашского закона. Содержание Хартии включало в себя конкретные правовые нормы, разработанные для регулирования общественной жизни в княжествах: определение прав на землю, правила передачи и управления земельными участками, правила наследования и передачи имущества: установление порядка наследования, правила распоряжения имуществом и соблюдение семейных обязательств, определение видов налогов, методов и сроков их сбора, обязанности населения перед княжеской властью, организация судебной системы, роль и полномочия административных органов, в том числе роль князя и его совета [8, p. 35].

Валашский закон - важный юридический документ в истории румынского права, который стал основой для развития правовой системы княжеств Валахии и Молдовы, отражавший основные аспекты общественной жизни, правовые нормы и нормы управления, которые регулировали отношения между князем, знатью и населением.

Характеристика гражданско-правовых и уголовно-правовых институтов по Валашскому Закону

Валашский Закон представлял собой комплексный правовой документ, который регулировал как гражданские, так и уголовные правоотношения в княжествах Валахии и Молдовы, включавший разнообразные нормы, устанавливающие основные принципы права, которые регулировали жизнь и деятельность населения, а также обеспечивали справедливость и порядок в обществе. Рассмотрим подробную характеристику гражданско-правовых и уголовно-правовых институтов, которые содержались в этом законе:

Право собственности и владения землёй: определялись правила владения и права собственности на землю, устанавливались условия передачи земельных участков и правила наследования земельного имущества, регулировалось использование земель для сельского хозяйства, животноводства и других нужд [2, р. 17].

Гражданские сделки и договоры: определялись виды гражданских сделок, таких как купля-продажа, дарение, аренда и займ, устанавливались правила для заключения, исполнения и прекращения договоров. Главными условиями в договоре признавались:

1. Свобода выражения воли сторон;
2. Добросовестность сторон;
3. Договорённость о форме заключения договора;
4. Проведение специальных ритуалов.

Регулировалась ответственность сторон за неисполнение обязательств по договору. Обязательства устанавливались согласно проведённым церемониям (крещение, венчание). Примером общинной взаимопомощи явилась **клака (claca)** – добровольная помощь, оказываемая крестьянами при срочных работах [7, р. 65].

Семейное право: Семья характеризуется патрилокальной и патрилинейной. Расторжение и заключение брака – компетенция церкви. Предшествовала заключению брака помолвка. Заключался брак венчанием в церкви в присутствии свидетелей. Включало правила о брачных отношениях, брачном имуществе и обязательствах супругов. Необходимыми условиями для заключения брака признавались: 1. согласие будущих супругов и их родителей; 2. единая религия; 3. отсутствие родства до 4-го колена; 4. минимальный возраст жениха 13-14 лет, невесты 12-13 лет. Определялись условия и процедуры развода. Церковь допускала расторжение брака по законным мотивам: 1. неизлечимая болезнь супруга; 2. отсутствие жены дома – сутку мужа- 5 лет; 3. уход в монастырь. Регулировались права и обязанности родителей по отношению к детям.

Наследственное право: устанавливались правила наследования имущества, включая долю наследства, которая могла быть передана наследникам. Так как наследование делилось на два вида: наследование по закону и наследование по завещанию, соответственно наследниками по закону признавались: 1. сыновья; 2. братья; 3. родители; 4. племянники от братьев. Определялись правила распределения наследства между наследниками и другими лицами, имеющими право на наследство. При отсутствии первой и второй категории наследников прибегали к побратимству. Дочери наделялись приданным.

Уголовно-правовые институты. Определялись виды преступлений и их квалификации. Существовали 3 категории преступлений: 1. Преступления против личности; 2. преступления против семьи нравственности церкви; 3. преступления против имущества. Устанавливались виды наказаний и меры пресечения: 1. изгнание из общины; 2. штраф; 3. коленопреклонение; 4. позорящие наказания. Регулировались процедуры судебного разбирательства и права обвиняемых и потерпевших. Судила вся община, во главе **judex**. Помогал **совет старейшин – 12 добрых и мудрых людей** [4, р. 57].

Процедура судебного разбирательства: включала правила о процессуальных гарантиях, таких как право на защиту, сроки предъявления обвинения и т.д. Определялись процедуры судопроизводства, включая состав суда, рассмотрение доказательств и вынесение приговора. На судебных процессах присутствовала **толпа** – жители общины. Процесс был публичный,

носящий состязательный характер. Стороны равны в споре. Принимались во внимание следующие доказательства: 1. *ордали* – испытание раскаленным железом; 2. присяга на кресте и Библии; 3. доказательства свидетелей – очевидцев; 4. вещественные доказательства [6, p. 43].

Выводы: Формирование румынского государственного устройства в раннем средневековье было непосредственно связано с процессом возникновения и развития *Țări* — региональных княжеств, которые стали первыми устойчивыми политико-правовыми образованиями на территории современной Румынии. Образование княжеств Валахии, Молдовы и Трансильвании происходило в условиях активных миграционных процессов и взаимодействия различных этнокультурных групп, что оказало существенное влияние на характер политической организации и правового развития данных территорий. Государственная власть в ранних румынских княжествах носила преимущественно феодальный характер и была сосредоточена в руках князя и феодальной знати, при этом элементы централизованного управления сочетались с автономией местных структур, прежде всего сельских общин. Сельские общины играли важную роль в социально-экономической и правовой жизни, объединяя коллективные и частные формы собственности и обеспечивая самоуправление через общее собрание и совет старейшин (*sfatul*), что свидетельствует о сохранении сильных традиций обычного права. Первые феодальные правовые нормы формировались на основе взаимных обязательств между князем и вассалами и регулировали ключевые сферы общественных отношений, включая землевладение, налогообложение, имущественные и уголовные отношения. Существенное влияние на становление румынского права оказали римская, византийская и славянская правовые традиции, однако их заимствование сопровождалось адаптацией к местным условиям, обычаям и потребностям общества. «Валахский закон» (*Carta Valachorum*) стал одним из важнейших ранних письменных источников румынского права, закрепив основы государственного управления, социально-правового статуса князя и знати, налоговой системы, а также гражданских и уголовных норм. Значение Валахского закона заключается в том, что он заложил фундамент дальнейшего развития правовой системы княжеств Валахии и Молдовы, отразив процесс институционализации феодальных отношений и переход от обычного права к более формализованному правовому регулированию.

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**АНТИКОРРУПЦИОННЫЕ МЕХАНИЗМЫ В РЕСПУБЛИКЕ МОЛДОВА:
ПРАВОВАЯ БАЗА И МЕЖДУНАРОДНОЕ СОТРУДНИЧЕСТВО****Георгий СУЛТ,**

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Abstract. The article examines the anti-corruption mechanisms in the Republic of Moldova, including legislative initiatives, institutions responsible for combating corruption, and international cooperation in this field. Key legal acts regulating anti-corruption policy and the country's participation in international initiatives are analyzed.

Keywords: corruption, Moldova, anti-corruption mechanisms, legal framework, legislation, National Anti-Corruption Center, international cooperation, law enforcement, transparency, accountability.

Борьба с коррупцией является одним из приоритетных направлений государственной политики Республики Молдова. В последние десятилетия страна предприняла значительные шаги по созданию эффективной системы противодействия коррупционным проявлениям. Были приняты важные законодательные акты, направленные на предупреждение, выявление и пресечение коррупционных правонарушений.

Основой антикоррупционной политики Республики Молдова является национальное законодательство, которое постоянно совершенствуется и приводится в соответствие с международными стандартами и обязательствами страны перед международными организациями, такими как Совет Европы и Организация Объединенных Наций.

Важную роль в формировании антикоррупционной политики играют международные договоры, ратифицированные Республикой Молдова, в том числе Конвенция ООН против коррупции. Эти документы устанавливают общие принципы и стандарты борьбы с коррупцией, а также предусматривают механизмы международного сотрудничества в этой области.

Республика Молдова активно сотрудничает с международными организациями в сфере борьбы с коррупцией, такими как Группа государств против коррупции (ГРЕКО) и Программа развития ООН (ПРООН). Это сотрудничество способствует обмену опытом и лучшими практиками, а также получению экспертной и финансовой помощи для реализации антикоррупционных инициатив.

Несмотря на достигнутые успехи, борьба с коррупцией в Республике Молдова остается сложной и многогранной задачей. Коррупционные проявления по-прежнему встречаются в различных сферах общественной жизни, что требует дальнейшего совершенствования антикоррупционных механизмов и усиления ответственности за коррупционные правонарушения.

Законодательная база антикоррупционной политики в Республике Молдова представляет собой сложную и многоуровневую систему, включающую в себя различные нормативные акты, направленные на борьбу с коррупцией.

Основным нормативным актом, регулирующим борьбу с коррупцией в стране, является Закон Республики Молдова №82 от 25 мая 2017 года «О неподкупности» [2].

Данный закон устанавливает комплекс мер по предупреждению коррупции, включая декларирование имущества и интересов, а также механизмы контроля за соблюдением антикоррупционных норм.

Закон Республики Молдова «О неподкупности» является ключевым элементом антикоррупционной политики Республики Молдова и направлен на создание прозрачной и подотчетной системы государственной власти.

Важным элементом антикоррупционной политики также является Уголовный кодекс Республики Молдова, который предусматривает наказания за коррупционные преступления. Уголовный кодекс устанавливает ответственность за такие виды коррупционных правонарушений, как взяточничество, злоупотребление служебным положением, превышение должностных полномочий и другие.

Закон Республики Молдова №325 от 23 декабря 2013 года «Об оценке институциональной неподкупности» направлен на предотвращение конфликта интересов среди государственных служащих. Данный закон устанавливает правила поведения для государственных служащих, включая ограничения на получение подарков, участие в коммерческой деятельности и другие меры, направленные на предотвращение возникновения ситуаций, в которых личные интересы могут противоречить общественным [4].

Закон Республики Молдова №165 от 22 июня 2022 года «Об осведомителях о нарушениях неподкупности» обеспечивает правовую защиту лиц, сообщающих о коррупционных правонарушениях. Данный закон гарантирует конфиденциальность информации, предоставленной осведомителями, а также защиту от преследования со стороны лиц, в отношении которых было сделано сообщение о коррупции [3].

В целом, законодательная база антикоррупционной политики Республики Молдова включает в себя широкий спектр нормативных актов, направленных на предупреждение, выявление и пресечение коррупционных правонарушений. Данная система постоянно совершенствуется и приводится в соответствие с международными стандартами и обязательствами страны перед международными организациями.

В Республике Молдова действует целая система органов, ответственных за борьбу с коррупцией. Каждый из них играет свою роль в этом важном деле.

Национальный центр по борьбе с коррупцией (CNA) является ключевым учреждением в этой области. Именно он занимается расследованием коррупционных преступлений и разработкой различных антикоррупционных инициатив. CNA играет важную роль в выявлении и пресечении коррупции на всех уровнях власти [5].

Национальная комиссия по неподкупности контролирует декларации о доходах и имуществе государственных служащих. Это помогает обеспечить прозрачность доходов чиновников и предотвратить случаи незаконного обогащения.

Антикоррупционная прокуратура, в свою очередь, является подразделением Генеральной прокуратуры, специализирующимся на расследовании коррупционных преступлений, совершенных высокопоставленными должностными лицами.

Важно отметить, что эффективность борьбы с коррупцией зависит от слаженной работы всех этих органов, а также от активного участия гражданского общества.

Республика Молдова придает большое значение международному сотрудничеству в борьбе с коррупцией, поскольку эта проблема носит глобальный характер и требует совместных усилий международного сообщества.

Республика Молдова активно участвует в различных международных инициативах и сотрудничает с авторитетными организациями для достижения прогресса в этой области.

Одним из важных направлений международного сотрудничества является участие Молдовы в работе Группы государств против коррупции (ГРЕКО) [7].

ГРЕКО – это мониторинговый орган Совета Европы, который оценивает усилия стран-участниц по выполнению антикоррупционных рекомендаций. Участие в работе ГРЕКО позволяет Молдове получать экспертную оценку своей антикоррупционной политики и

совершенствовать национальное законодательство в соответствии с европейскими стандартами.

Республика Молдова также является участницей Конвенции ООН против коррупции (UNCAC) [8], которая была ратифицирована ею в 2007 году. UNCAC обязывает страны-участницы принимать меры по предотвращению коррупции и содействовать международному сотрудничеству в этой области.

Важным аспектом международного сотрудничества для Республики Молдова является также ее взаимодействие с Европейским Союзом. Соглашение об ассоциации между Республикой Молдова и ЕС включает положения о верховенстве закона и борьбе с коррупцией, что является важным аспектом европейской интеграции страны [6].

Международное сотрудничество играет важную роль в укреплении антикоррупционной системы Республики Молдова. Оно способствует обмену опытом и лучшими практиками, а также получению экспертной и финансовой помощи для реализации антикоррупционных инициатив.

Несмотря на значительные усилия, Республика Молдова продолжает сталкиваться с серьезными вызовами в борьбе с коррупцией.

Одной из ключевых проблем является недостаточная эффективность исполнения антикоррупционных законов. Несмотря на наличие развитого законодательства, на практике коррупционные схемы продолжают существовать и приносить вред обществу.

Серьезной проблемой остается и политическое влияние на правоохранительные органы. Это может приводить к тому, что коррупционные дела не расследуются должным образом или же, наоборот, используются для политического давления на оппонентов.

Проблемы в судебной системе также препятствуют эффективному расследованию коррупционных дел. Недостаточное финансирование, коррупция среди судей и другие проблемы могут приводить к тому, что виновные в коррупции остаются безнаказанными.

Негативно сказывается на борьбе с коррупцией и низкий уровень доверия населения к антикоррупционным институтам. Для улучшения ситуации необходимы дальнейшие реформы, направленные на усиление независимости антикоррупционных органов, повышение прозрачности государственного управления и развитие механизмов общественного контроля. Важно также повышать уровень правовой грамотности населения и вовлекать граждан в борьбу с коррупцией.

Антикоррупционные механизмы Республики Молдова представляют собой сложную и развивающуюся систему, включающую в себя законодательные нормы, специализированные институты и активное международное сотрудничество. Законодательная база, включающая такие законы, как Закон Республики Молдова «О неподкупности» [2], Закон Республики Молдова «Об оценке институциональной неподкупности» [4] и Закон Республики Молдова «Об осведомителях о нарушениях неподкупности» [3], создает основу для борьбы с коррупцией.

Ключевые институты, такие как Национальный центр по борьбе с коррупцией (CNA), Национальная комиссия по неподкупности и Антикоррупционная прокуратура, играют важную роль в выявлении, расследовании и пресечении коррупционных правонарушений.

Международное сотрудничество с такими организациями, как ГРЕКО и ООН, а также участие в Конвенции ООН против коррупции, способствуют обмену опытом и лучшими практиками, а также получению экспертной и финансовой помощи для реализации антикоррупционных инициатив.

Несмотря на достигнутые успехи, эффективность антикоррупционных механизмов в Молдове требует дальнейшего совершенствования. Необходимо усилить механизмы контроля за деятельностью государственных служащих, сократить коррупционные риски в различных сферах государственного управления [1] и обеспечить независимость антикоррупционных институтов.



Успешная борьба с коррупцией зависит не только от законодательных изменений и институциональных реформ, но и от политической воли руководства страны, а также от активного участия гражданского общества. Важно повышать уровень правовой грамотности населения, вовлекать граждан в процесс контроля за деятельностью органов власти и создавать атмосферу нетерпимости к коррупционным проявлениям.

Только комплексный подход, сочетающий в себе законодательные, институциональные и общественные меры, позволит Республике Молдова достичь прогресса в борьбе с коррупцией и создать условия для устойчивого развития страны.

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ОБЩИЕ ПОЛНОМОЧИЯ ОРГАНОВ МЕСТНОГО ПУБЛИЧНОГО В ОБЕСПЕЧЕНИИ ПРАВ ЧЕЛОВЕКА

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Аннотация: в статье рассматриваются основные полномочия органов местного публичного в обеспечении прав человека. Разработана классификация полномочий в области обеспечения прав человека.

Abstract: The article examines the main powers of local public authorities in ensuring human rights. A classification of powers in the area of human rights is developed.

Keywords: local authorities, human rights, taking into account human interests.

Ключевые слова: местные органы власти, права человека учет интересов человека.

В Конституции Республики Молдова, как в высшем нормативном акте государства, закреплена следующая фундаментальная идея: «Республика Молдова - демократическое

правовое государство, в котором достоинство человека, его права и свободы ... являются высшими ценностями и гарантируются»³.

Для достижения этой конституционной цели Республика Молдова ратифицировала множество международных договоров, направленных на обеспечение прав человека. Конечно, основные обязательства устанавливаются для органов центральной власти государств, ставших стороной договора, однако часть обязательств также относится к местной власти, к органам местного публичного управления.

Несомненно, права и свободы человека реализуются, прежде всего, на местном уровне, то есть там, где человек живет и работает. Из этого можно сделать вывод, что реализация прав в значительной степени зависит от деятельности органов местного самоуправления. Однако действующее законодательство в области организации и функционирования органов местного самоуправления прямо не закрепляет «уважение и защиту прав и свобод человека» в качестве задачи этих органов. В этом контексте стоит отметить, что в специализированной литературе даже предлагается признать это как отдельную функцию соответствующих органов (полным названием – «функция обеспечения законности, верховенства права и прав и свобод человека и гражданина») ⁴. Деятельность органов местного самоуправления в сфере соблюдения и защиты прав человека достаточно всеобъемлюща, поскольку касается всего населения страны, сгруппированного в местные сообщества, и практически охватывает все права и свободы граждан. Говоря непосредственно о вкладе органов местного самоуправления в реализацию прав и свобод человека и граждан, необходимо подчеркнуть, что это связано, прежде всего, с обеспечением политических прав. По мнению исследователей, это является необходимым условием самого существования местной власти. С этой точки зрения, местное самоуправление рассматривается как определенная форма самоорганизации, которую можно охарактеризовать как административную систему, в которой управляемый субъект (население) имеет возможность существенно влиять на организацию и функционирование административной системы (органов местного самоуправления) и корректировать ее деятельность посредством таких механизмов, как местные выборы, местные референдумы, общественные консультации, подача петиций в местные органы власти и местным выборным должностным лицам и т. д.

Среди международных договоров, ратифицированных республикой, стоит акцентировать внимание на Европейскую Хартию Местного Самоуправления от 15 октября 1985 года, которая устанавливает основные принципы, и стандарты в области местного самоуправления⁵.

Хартия является важным инструментом для укрепления демократии на местном уровне. Она способствует децентрализации власти и повышению эффективности управления, служит ориентиром для стран, стремящихся развивать местное самоуправление в соответствии с европейскими стандартами.

Республика Молдова взяла на себя обязательства по исполнению положений Хартии в 1997 году⁶, тем самым подчеркивая, что реализация публичных полномочий, в первую очередь, относится к обязанностям, тех органов власти, которые находятся ближе всего к гражданам.

Безусловно, права и свободы человека реализуются, прежде всего, на местном уровне, так как это наиболее близкий к индивидууму уровень власти, где принимаются решения, напрямую влияющие на повседневную жизнь. Кроме того, на местном уровне человек может

³ Конституция Республики Молдова от 29 июля 1994. Monitorul Oficial al Republicii Moldova № 1 от 12. 08. 1994

⁴ ⁴ **Vitalie Mazur**. Rolul administrației publice locale în asigurarea și protecția drepturilor omului. In: *Protecția drepturilor omului: mecanisme naționale și internaționale*, 11 decembrie 2013, Chișinău. Chișinău, Republica Moldova: 2014, pp. 410-418. URL https://ibn.idsi.md/sites/default/files/imag_file/410-418.pdf

⁵ European Charter of Local Self-Government Strasbourg, 15.X.1985

⁶ Постановление Правительства № 1253 «О ратификации Европейской хартии местного самоуправления» от 16.07.1997 г. Опубликовано: 24.07.1997 в Monitorul Oficial № 48 статья № 423

активно участвовать в управлении, используя свои политические права, например, голосовать на выборах, участвовать в публичных консультациях или инициативах. Это способствует более эффективному учёту интересов населения и укреплению демократии.

Местные органы власти имеют доступ к актуальным потребностям и проблемам граждан, живущих на определённой территории, и способны быстрее реагировать на их запросы. Отсюда видно, что реализация прав существенно зависит от деятельности местных органов публичной власти. Несмотря на это, действующее законодательство, в компетенциях и полномочиях органов местного публичного управления не закрепляет прямой формулировки защиты прав и свобод человека как основную задачу данных органов власти⁷. При этом, анализируя их закреплённые полномочия можно утверждать, что все они основываются на прямой защите прав и свобод человека.

Органами местного публичного управления, посредством которых осуществляется местная автономия в селах/коммунах, городах/муниципиях, являются местные советы, как правомочные органы власти и примары как исполнительная власть.

Таким образом, говоря об обеспечении прав человека органами местного публичного управления необходимо рассмотреть полномочия примара и местных советов, которые направлены на реализацию и защиту прав человека в рамках их территориальной компетенции.

Исходя из положения законов РМ: № 435 «Об административной децентрализации» от 28.12.2006 года⁸ и № 436 «О местном публичном управлении» от 28.12.2006 года⁹ общие полномочия ОМПУ в области прав человека можно рассматривать в следующем виде:

1. *Административные полномочия* сводятся к обеспечению исполнения законодательства о правах человека на местном уровне, организации и обеспечению доступности государственных услуг для всех категории, а также принятие и контроль за исполнение решений советов, направленных на защиту и реализацию прав человека.

2. *Социальные полномочия* включают разработку и реализацию социальных программ, направленных на защиту уязвимых групп населения, а также предоставлении определенных субсидий или льгот для определенных категорий граждан. Обеспечение доступа к услугам здравоохранения, образования и социального обеспечения, а также принятие мер по соблюдению принципов недискриминации и равенства возможностей для всех граждан равным способом относят к категории социальных полномочий ОМПУ.

3. *Экономические полномочия* выражены в: создание условий для реализации права граждан на труд, включая поддержку предпринимательской деятельности; управление местным бюджетом и ресурсами в целях обеспечения реализации социально-экономических прав граждан; принятие мер для снижения уровня бедности и улучшения уровня жизни населения.

4. *Полномочия в сфере защиты прав и свобод человека.* Выделяются такие аспекты как: мониторинг соблюдения прав и свобод человека на территории административно-территориальной единицы, реагирование на жалобы и обращения граждан в случаях предполагаемых нарушений их прав, содействие работе национальных правозащитных институтов и взаимодействие с международными организациями.

5. *Полномочия в сфере участия общественности в управлении* сводятся к: обеспечению участия граждан и организаций гражданского общества в процессе принятия решений на местном уровне (в частности, местные выборы и референдум), проведение общественных

⁷ Vitalie Mazur. Rolul administrației publice locale în asigurarea și protecția drepturilor omului. In: *Protecția drepturilor omului: mecanisme naționale și internaționale*, 11 decembrie 2013, Chișinău. Chișinău, Republica Moldova: 2014, pp. 410-418. URL: https://ibn.idsi.md/vizualizare_articol/96044 (data обращения: 14.11.2025).

⁸ Закон № 435 «Об административной децентрализации» от 28.12.2006 г. Опубликовано: 02.03.2007 г. в Monitorul Oficial № 29-31 статья № 91

⁹ Закон РМ № 436 «О местном публичном управлении» от 28.12.2006 г. Опубликовано: 09.03.2007 г. в Monitorul Oficial № 32-35 статья № 116

слушаний, встреч с гражданами для учета их мнений при разработке местных планов, разработка механизмов, способствующих активному участию населения в местном самоуправлении¹⁰.

5. *Информационно-просветительские полномочия* предполагают обеспечение доступа населения к информации о правах человека, правах и обязанностях граждан, организацию мероприятий по правовому просвещению и обучению населения, распространение информации о возможностях участия граждан в управлении местными делами. Не мало важное значение также играет прозрачность принятия решений, а именно регулярное информирование населения о планах, бюджете и результатах деятельности через веб-сайты, публикации и местные собрания.

Таким образом, местный уровень является ключевым и связующим звеном между государством и гражданами в реализации прав человека, так как именно ОМПУ обеспечивают практическую реализацию социальных, экономических, культурных и политических прав человека.

Кроме этого, деятельность местных органов власти в направлении обеспечения прав человека направлена на следующие сферы:

Социальные услуги: Обеспечение доступа к социальной помощи, уход за пожилыми людьми, детьми, людьми с ограниченными возможностями, управление социальными пособиями.

Образование и культура: Поддержка школ, детских садов, библиотек, культурных мероприятий для продвижения права на образование и культуру.

Здравоохранение: Управление местными медицинскими службами (диспансеры, скорая помощь), пропаганда здорового образа жизни и профилактика заболеваний.

Жилищное строительство и градостроительство: Обеспечение социального жилья, инклюзивное городское планирование, доступ к зеленым насаждениям и инфраструктуре.

Общественный порядок и безопасность: Сотрудничество с местной полицией, обеспечение безопасности граждан, предотвращение преступлений.

Окружающая среда и ресурсы: Охрана окружающей среды, управление водными ресурсами, санитария, содействие праву на здоровую окружающую среду.

Участие и прозрачность: Содействие вовлечению граждан (общественные консультации, местные советы) и обеспечение прозрачности принятия решений.

Дискриминация и равенство: Борьба с дискриминацией на местном уровне, содействие гендерному равенству, защита меньшинств.

Естественно, разные контексты требуют разных решений. При рассмотрении обязанностей местных и региональных властей в области прав человека не существует единого правильного подхода к решению проблемы, так же как нет универсального порога для осуществления права. Местные власти лучше всего знают потребности своих граждан, проблемы, с которыми они сталкиваются, и наиболее эффективные подходы к их решению. Подход, основанный на правах человека, предполагает понимание правозащитного аспекта работы и долгосрочного воздействия политики, подчеркивающей уважение этих прав, не только на непосредственных бенефициаров, но и на население села/города/региона в целом. Обеспечение уважения прав человека не обязательно предполагает дорогостоящие политические меры или реформы: организация однодневного мероприятия, поддержка местной ассоциации или просто четкое изложение позиции в прессе могут иметь огромное значение.

Итак, подводя итоги, можно говорить о том, что права и свободы человека являются основополагающими аспектами правового государства и демократии. Они представляют собой совокупность естественных и неотчуждаемых прав, приобретенных при рождении и

¹⁰ Закон РМ № 436 «О местном публичном управлении» от 28.12.2006 г. Опубликовано: 09.03.2007 г. в Monitorul Oficial № 32-35 статья № 116



обеспечивающих возможность каждому человеку реализовывать свои интересы, потребности и стремления в рамках сообщества, а также, в случае необходимости, получать правовую защиту от государства.

Обязательства правительств в соответствии с международным правом в области прав человека распространяются на все уровни и ветви власти. Хотя национальные и региональные органы власти играют важную роль в поощрении и защите прав человека, именно местные органы власти поддерживают самые непосредственные контакты с населением. Они получают требования, иски и жалобы от жителей, разрабатывая и вводя в действие политику, которая непосредственно влияет на жизнь людей.

Глобальная тенденция к децентрализации только еще больше подчеркивает роль местных органов власти в оценке потребностей населения и обеспечении соблюдения прав человека.

Местные органы власти, являясь ключевым и связующим звеном между государством и гражданами в реализации прав человека, обеспечивают практическую реализацию социальных, экономических, культурных и политических прав человека.

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ПРОБЛЕМЫ ОСУЩЕСТВЛЕНИЯ ПРАВ ЖЕНЩИН В АТО ГАГАУЗИИ

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Аннотация: в статье рассматриваются основные проблемы по продвижению гендерного равенства на территории АТО Гагаузии. The article discusses the main problems in promoting gender equality in the territory of the ATU Gagauzia.

Keywords: gender equality, methods of promoting human rights, rights protection issues.

Ключевые слова: гендерное равенство, методы продвижения прав человека, проблемы защиты прав.

Несмотря на то, что в последнее время на территории Республики Молдова приняты нормативные рамки по обеспечению гендерного равенства, отмечаются и многочисленные проблемы в практическом их применении. В АТО Гагаузии по состоянию на 01.01.2024 года зарегистрировано 157845 человек, из которых – 82047 женщин и 75798 мужчин.

Сфера трудоустройства.

АТО Гагаузия по уровню средней заработной платы существенно отстает в темпах роста по сравнению со всей Республикой Молдова. Недостаточная профессиональная ориентация, существование половых стереотипов препятствуют избранию некоторых профессий из отдельных отраслей, которые являются преимущественно мужскими. Низкая заработная плата – это основное объяснение низкой привлекательности рынка труда в Молдове. В сфере трудоустройства существует разрыв в оплате труда мужчин и женщин. Согласно официальной статистики, опубликованной Департаментом статистики Республики Молдова 15 октября 2023 года, на сто женщин приходится 93 мужчины. Это соотношение меняется в зависимости от возраста. Например, на сто женщин старше 35 лет приходится 90 мужчин. А на сто женщин старше 65 — 61 мужчина. Женщины вступают в брак раньше, чем представители сильного пола. Обычно они выходят замуж в 25 лет, а мужчины заводят семью в 28. Высшее образование есть у 23% женщин. У мужчин этот показатель на 5% ниже. Кроме того, работающих женщин больше, чем мужчин. Зачастую они выбирают работу в сфере торговли, образования, здравоохранения и гостинично-ресторанном бизнесе. Меньше — в сельском хозяйстве, промышленности и строительстве. Однако их зарплаты на 14% ниже, чем у мужчин [1].

Разница в заработной плате женщин и мужчин объясняется многими факторами. Основными факторами, определяющими разницу в оплате труда мужчин и женщин, являются горизонтальная и вертикальная сегрегация. Таким образом, около половины женщин из сельской местности трудоустроены в сельскохозяйственном секторе и сфере услуг, где они выполняют самую малоквалифицированную работу и, соответственно, получают более низкую заработную плату, чем мужчины, занимающиеся наиболее квалифицированной работой. Другим фактором различий между заработной платой женщин и мужчин является наличие областей, в которых преобладают женщины, – “женские” виды деятельности (воспитание, здравоохранение), в которых заработные платы ниже, чем в секторах, где доля мужчин выше (строительство, транспорт). Кроме того, женщины недостаточно представлены наверху профессиональной пирамиды. Количество женщин превышает количество мужчин в категории государственных служащих низкого ранга.

На сегодняшний день не существует четких статистических данных, показывающих уровень миграции женщин и мужчин в АТО Гагаузии. Имеющиеся данные Национального Бюро статистики показывают лишь общую для всей Республики Молдова картину. Согласно проведенного социологического опроса среди жителей АТО Гагаузии 68 процентов мужчин и 49 процентов женщин хотя бы раз выезжали на заработки за рубеж (причем среди женщин старше 38 лет этот процент намного выше - 67%).

Женщины чаще жалуются на дискриминацию при трудоустройстве. Так, в приеме на работу отказывают молодым женщинам (возможность забеременеть), женщинам с маленькими детьми (возможность частых больничных), а также пожилым женщинам. Кроме того, женщине труднее заняться предпринимательской деятельностью из-за недостатка свободных финансовых средств и отсутствия необходимых знаний в области экономики. Доступ к существующим программам обучения в бизнес-сфере часто проблематичен из-за отсутствия или ненадлежащего информирования об этих программах. Также данные обучающие программы для женщин в сфере предпринимательства не распространяют своё действие на всю территорию АТО Гагаузии, а только на крупные населенные пункты.

Сфера участия в публичном и политическом процессе принятия решений

В регионе продолжает оставаться достаточно сильным стереотип о невозможности участия женщины в процессе управления, либо о слабых управленческих способностях

женщины. При все этом, В АТО Гагаузия наблюдается положительная динамика в области вовлечения женщин в процесс принятия публичных и политических решений. Так, в 2015 году пост Башкана АТО Гагаузии впервые заняла женщина. Эта тенденция сохранилась и в 2023 году. На данный момент Башканом АТО Гагаузии также является женщина Гуцул Евгения. С 1 депутата- женщины в 5 созыве Народного Собрания АТО Гагаузии 2012-2016 года до 4-5 женщин –депутатов настоящего созыва. До 40 процентов возросло количество женщин – членов Исполнительного Комитета АТО Гагаузии. Среди примарского корпуса АТО Гагаузии появились две женщины (из 26 примэрий). В то же время женщины по-прежнему недостаточно участвуют как в избирательном, так и в политическом процессе и процессе принятия решений, хотя среди служащих избирательной сферы насчитывается до 95 процентов служащих-женщин. Важно то, чтобы тенденции роста числа женщин, участвующих в политической деятельности, будут удержаны и усилены. Основными факторами положительных изменений в данной области являются: изменение и гармонизация законодательства; соблюдение международных обязательств; применение политик и программ, воздействующих на менталитет населения относительно гендерных ролей женщин и мужчин в обществе и семье; устранение гендерных стереотипов и структурных барьеров (таких, как недостаточность услуг, направленных на уход за детьми дошкольного возраста, инвалидами /престарелыми людьми; негибкие графики работы женщин и мужчин). Женщины Молдовы в отличие от мужчин продолжают сталкиваться с дискриминацией в политической и публичной областях, определенной в большой мере существующими стереотипами и сексизмом.

При всём этом, установлены, что те женщины, которые рискнули выдвинуть свои кандидатуры на выборах, как правило, и побеждают. Исходя из этого, можно сделать вывод, что необходимо активизировать процесс выдвижения женщин для занятия государственных должностей.

Сфера социальной защиты и семьи

Система социальной помощи в своей классической форме и в нынешней структуре основывается на патриархальной модели общества, где именно женщины осуществляют неоплачиваемый уход за престарелыми лицами, детьми и больными людьми, а также на более активном вовлечении их в социальную и коммунитарную деятельность. Эта модель, основанная на идее, что в семье имеется доход, полученный как от оплачиваемой работы, так и от неоплачиваемой работы по уходу, существенно ограничивает социальное, политическое и экономическое участие женщин, которые преимущественно оказывают услуги по неоплачиваемому уходу, а также снижает роль мужчин в частной сфере.

В целом, отмечается рост предоставления некоторых социальных услуг, в частности если персональных ассистентов до 2018 году было 47, то уже в 2023 году – 223 человека, однако, реально нуждающихся в несколько раз больше. Действующее законодательство в области государственного социального страхования не содержит никакой дискриминации по отношению к плательщикам и бенефициарам социальных услуг (пенсия, пособия) по половому признаку. Однако, именно в силу слабого развития предоставления социальных услуг (персональный ассистент, мобильная бригада, служба «Респиро») социальной помощью может воспользоваться ограниченное количество бенефициаров.

В АТО Гагаузии открыт один центр временного размещения граждан, находящихся в ситуации риска. Есть настоятельная необходимость открыть социальное учреждение для агрессоров, т.к. им также необходимо предоставлять реабилитационные услуги.

В АТО Гагаузии отсутствует система организации досуга для семей с детьми, для пенсионеров. С учетом обстоятельства, что на данный период женщины выходят на пенсию в 61 год, а мужчины в 63, все они еще остаются достаточно активными, обладающими широкими знаниями и умениями. Ресурс пенсионеров можно использовать при организации различных мероприятий по типу привлечения к волонтерской деятельности. Также, необходимо продумать систему занятости для родителей с детьми, где можно было бы

организовать совместный отдых мам и пап с детьми (дети смотрят мультик, а родители за чашкой чая беседуют и узнают о новых способах общения с детьми). Кроме этого, среди работников культуры практически все работники пенсионного возраста и скоро работать некому будет.

В АТО Гагаузии действует ограниченное количество поставщиков социальных услуг. Среди них необходимо назвать организации «Конкордия» (Конгаз), центр Святого Пантелеймона (Чадыр-Лунга), столовая «Матронушка» (Чадыр-Лунга), общественная столовая «Надежда» (Вулканешты), семья Иванчевых, которая открыла детский дом семейного типа и центр помощи жертвам насилия. Иванчевы действуют по собственной инициативе.

Для оказания помощи детям в ситуации риска действуют Чадыр-Лунгский интернат для детей-сирот, и всего три патронатные семьи. Отмечается тенденция усиления противодействия работе этих учебных учреждений и так называемой оптимизации. В последние годы для обустройства ребенка в эти учреждения необходимо получить направление Министерств Республики Молдова. В итоге уходит драгоценное время для помощи детям. Эти же учебные учреждения можно было бы переориентировать на оказание большого количества социальных услуг населению.

Кроме этого, необходимо увеличивать количество патронатных семей.

В АТО Гагаузии отсутствует единая база данных о поставщиках социальных услуг. Большая часть НПО, оказывающих социальные услуги, действуют временно, пока находятся на поддержке тех или иных доноров. Предполагается, что создание единой базы данных поставщиков социальных услуг сможет полнее учитывать как имеющиеся ресурсы, так и развивать социальный сектор помощи.

Сфера здравоохранения

Несмотря на конкретные меры, предпринимаемые в последние годы для улучшения состояния здоровья женщин и мужчин, по-прежнему существует ряд экономических и медико-социальных проблем, которые влияют на здоровье населения. Таким образом, женщины в сельской местности имеют более ограниченный доступ к качественным услугам в области здравоохранения и воспроизводства, что увеличивает количество проблем со здоровьем. Одной из медико-социальных проблем, которые сильно влияют на здоровье матерей, является частое прерывание беременности, часть которых осуществляется устаревшими методами и в небезопасных условиях. В регионе отмечается недостаток профильных врачей-специалистов. Увеличивается промежуток времени для получения той или иной медицинской услуги по причине больших очередей и малого количества предоставляемых медицинских услуг. Необходимо отметить также, что большая часть людей трудоспособного возраста не имеет медицинский полис по причине неофициального трудоустройства.

Из социологического опроса населения ясно, что только 22% женщин и 31% мужчин оценили своё здоровье как хорошее. Каждый десятый женщина и мужчина оценили своё здоровье как неудовлетворительное.

Исходя из изложенного выше, следует обеспечить разработку и ориентирование политики в области здравоохранения на нужды женщин и мужчин, обусловленные как биологическими, так и социально-экономическими и культурными аспектами.

Сфера насилия и торговли людьми

На нынешнем этапе в сфере насилия и торговли людьми в АТО Гагаузии была проведена определенная работа. Так, была создана комиссия по предотвращению торговли людьми, которую возглавила заместитель Башкана по социальным вопросам. Были созданы и другие институциональные структуры, обладающие особыми полномочиями: региональная комиссия в области насилия в семье. Начинает развиваться сеть услуг для жертв торговли и насилия, проводится работа по формированию интегрированной автоматизированной системы случаев насилия в семье. Профилактика правонарушений на семейно-бытовой почве одно из



приоритетных направлений национальной политики по защите семьи, которая включает в себя соблюдение фундаментальных принципов, регламентирующих семейных отношений по соблюдению прав членов семьи на жизнь без насилия.

Согласно указаниям Генерального Инспектора Полиции МВД РМ Управлением Полиции АТО Гагаузия был разработан план действий по проведению профилактических мероприятий и в целом недопущения правонарушений в семейных отношениях. Во все подчиненные подразделения УП Гагаузии были направлены соответствующие указания. На данный период состоит на учёте: - 101 семейный дебошир (Комрат- 54, Чадыр-Лунга-24, Вулканешты-23).

Также, необходимо отметить функциональные изменения в работе полиции. Сейчас полиция осталась единственным актором защиты жертв насилия. Социальные службы и примары не имеют достаточных средств для оказания помощи жертвам насилия.

Одновременно отмечается недостаточный уровень осознания обществом проблемы насилия в семье как нарушения прав человека; низкий уровень подготовки специалистов в различных областях по установлению, регистрации и соотнесению случаев насилия в семье; недостаточность квалифицированных людских ресурсов и финансовых ресурсов для оказания помощи жертвам насилия в семье и работы с семейными агрессорами; отсутствие механизмов установления, обработки и разрешения феномена сексуального домогательства; недостаточность служб по оказанию помощи и защите жертв; отсутствие услуг по ресоциализации семейных агрессоров; несовершенство механизма мониторинга и оценки в области насилия и торговли людьми.

Закон N 436-XVI от 28.12.2006 в пункте г) ст. 29 устанавливает полномочия примаров в сфере предотвращения насилия в семье, но на данный момент полиция выявляет проблему, но работать с агрессорами некому. Предлагается ввести специальные обязательные курсы для агрессоров. Кроме этого, при ежегодном отчете примар должен отдельной строкой отчитаться о том, что именно сделано в данной административно-территориальной единице по предотвращению насилия в семье и алкоголизации населения.

В области насилия в семье также отмечается наличие стереотипов, которые проявляются в поговорке: бьёт, значит любит. В регионе наметилась тенденция по усилению роли полиции в разрешении семейных споров и оказании помощи жертвам насилия в семье, при недостаточной активности и оснащённости социальных ассистентов.

Следовательно, при данных проблемах, необходима более слаженная работа местных и региональных органов власти по продвижению гендерного равенства в регионе.

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DIALOGUL SOCIAL CA ELEMENT CONSTITUȚIONAL AL PROMOVĂRII SECURITĂȚII ȘI SĂNĂTĂȚII ÎN MUNCĂ ÎN CONTEXTUL ALINIERII LA STANDARDELE UNIUNII EUROPENE

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Rezumat. Securitatea și sănătatea în muncă reprezintă un domeniu prioritar al politicilor sociale contemporane, plasat la intersecția dintre drepturile fundamentale ale salariaților, funcționarea statului social de drept și competitivitatea economică. Articolul analizează rolul dialogului social și al Confederației Naționale a Sindicatelor din Moldova în promovarea și implementarea standardelor de Securitate și sănătate în muncă în Republica Moldova, în contextul integrării europene și al armonizării cu acquis-ul Uniunii Europene. Sunt examinate fundamentele teoretice ale dialogului social, cadrul normativ național (Constituție, Codul muncii, Legea nr. 186/2008), mecanismele instituționale tripartite și relevanța negocierii colective pentru prevenirea riscurilor profesionale. Studiul evidențiază provocările persistente (implementare formală, cultură preventivă redusă, resurse limitate) și formulează direcții de dezvoltare: consolidarea capacității instituționale, întărirea mecanismelor de participare, transferul de bune practici europene și integrarea evaluării performanței în securitatea și sănătatea în muncă.

Cuvinte-cheie: constituțional, drepturi fundamentale, armonizare juridică, stat social, sindicate, protecție, dialog social.

Summary. Occupational safety and health is a priority area of contemporary social policy, situated at the intersection of employees' fundamental rights, the functioning of the social rule-of-law state, and economic competitiveness. This article analyzes the role of social dialogue and the National Confederation of Trade Unions of Moldova in promoting and implementing Occupational safety and health standards in the Republic of Moldova, in the context of European integration and harmonization with the European Union acquis. It examines the theoretical foundations of social dialogue, the national legal framework (the Constitution, the Labour Code, Law No. 186/2008), tripartite institutional mechanisms, and the relevance of collective bargaining for the prevention of occupational risks. The study highlights persistent challenges (formal implementation, a weak prevention culture, limited resources) and outlines development directions: strengthening institutional capacity, reinforcing participation mechanisms, transferring European best practices, and integrating performance assessment into occupational safety and health.

Keywords: constitutional, fundamental rights, legal harmonization, trade unions, social state, protection, social dialogue.

Introducere. Securitatea și sănătatea în muncă constituie un domeniu central al politicilor sociale moderne, fiind strâns legată de protecția drepturilor fundamentale ale salariaților și de realizarea principiilor statului social de drept. Nivelul de protecție al securității și sănătății în muncă (SSM) nu reflectă doar calitatea normelor juridice, ci și gradul de funcționare a mecanismelor instituționale,

maturitatea relațiilor de muncă și capacitatea societății de a preveni riscurile profesionale prin participare și responsabilitate partajată.

În contextul integrării europene a Republicii Moldova, dialogul social și alinierea la standardele Uniunii Europene în domeniul securității și sănătății în muncă capătă o importanță sporită. Armonizarea legislativă și instituțională cu acquis-ul comunitar nu poate fi redusă la transpunere formală; dimpotrivă, fără un dialog social funcțional, normele europene riscă să rămână declarative, fără efecte reale asupra condițiilor de muncă și fără reducerea accidentelor și bolilor profesionale.

Relevanța științifică a temei decurge din necesitatea analizării rolului partenerilor sociali – în special al Confederației Naționale a Sindicatelor din Moldova (CNSM) – în procesul de armonizare cu modelul social european, unde participarea partenerilor sociali este considerată un mecanism de guvernanta socială. În această logică, scopul articolului este analiza rolului dialogului social și al Confederației Naționale a Sindicatelor din Moldova în promovarea securității și sănătății în muncă în Republica Moldova, raportat la standardele Uniunii Europene și la cadrul internațional relevant.

Actualitatea și relevanța temei. Dialogul social și SSM: fundamente teoretice și semnificație juridico-socială. Dialogul social reprezintă una dintre instituțiile fundamentale ale dreptului muncii contemporan. În accepțiune doctrinară, acesta desemnează ansamblul proceselor de consultare, negociere și cooperare dintre partenerii sociali – salariați, angajatori și autorități publice – orientate spre armonizarea intereselor socio-economice și prevenirea conflictelor de muncă. În plan istoric, dialogul social a apărut ca răspuns la dezechilibrele industrializării, când raporturile de muncă erau marcate de inegalitate structurală, fiind ulterior consacrat la nivel internațional prin instrumentele Organizației Internaționale a Muncii, care a promovat dialogul social ca pilon al justiției sociale și al muncii decente [4,5].

În doctrina modernă, dialogul social nu se limitează la salarizare sau timp de muncă, ci acoperă domenii precum protecția socială, egalitatea de șanse și, esențial, securitatea și sănătatea în muncă. SSM este definită ca un ansamblu de măsuri juridice, tehnice, organizatorice și medicale destinate prevenirii accidentelor de muncă și bolilor profesionale și asigurării unui mediu de lucru sigur și sănătos. Această instituție are o dublă dimensiune: juridică (obligații ale statului și angajatorului) și socială (impact asupra calității vieții, productivității și coeziunii sociale) [4].

În raport cu securitatea și sănătatea în muncă, dialogul social are valoare instrumentală: el transformă normele imperative în practici aplicabile și adaptate realităților sectoriale, prin implicarea directă a lucrătorilor și a reprezentanților acestora în identificarea riscurilor, evaluarea măsurilor preventive și monitorizarea implementării.

Metodologia cercetării. Cercetarea utilizează: (1) analiza doctrinară asupra dialogului social și a conceptului de muncă decentă; (2) analiza normativă a cadrului național securității și sănătății în muncă; (3) metoda comparativă pentru raportarea soluțiilor naționale la Directiva-cadru 89/391/CEE; (4) metoda logică pentru identificarea relației dintre dialogul social, negociere colectivă și eficiența prevenirii riscurilor. Abordarea este una juridico-instituțională, cu accent pe rolul actorilor colectivi în operaționalizarea normelor.

Reperul internațional și european: rolul Organizației Internaționale a Muncii și modelul social european. Organizația Internațională a Muncii a consacrat dialogul social drept unul dintre pilonii conceptului de muncă decentă, iar standardele internaționale promovează consultarea partenerilor sociali în elaborarea și implementarea politicilor securității și sănătății în muncă [4,5]. În Europa, dialogul social este un element definitoriu al modelului social european și un mecanism recunoscut pentru guvernanta relațiilor de muncă.

În domeniul securității și sănătății în muncă, Directiva-cadru 89/391/CEE reprezintă actul fundamental al Uniunii Europene, consacrand principiul prevenirii riscurilor, obligația evaluării riscurilor profesionale și rolul informării, instruirii și consultării lucrătorilor [7]. Alinierea Republicii Moldova la acest standard nu implică doar preluarea dispozițiilor, ci și funcționarea efectivă a mecanismelor de participare: comitete SSM, consultări reale, negociere colectivă, control și monitorizare.

Cadrul normativ național SSM și rolul dialogului social în aplicarea sa. Reglementarea securității și sănătății în muncă în Republica Moldova este realizată printr-un ansamblu de norme constituționale, legislative și subordonate legii, reflectând obligația statului de a asigura protecția vieții și sănătății lucrătorilor. Constituția oferă fundamentul suprem, consacrand dreptul la muncă și obligația statului de a crea condiții pentru desfășurarea activității în siguranță și cu respectarea demnității umane.

Codul muncii nr. 154/2003 are rol de act normativ central în reglementarea raporturilor de muncă și include obligații ale angajatorului de a asigura condiții de muncă care să nu pună în pericol viața și sănătatea salariaților, precum și drepturi ale lucrătorilor la informare și instruire [8]. Un element important îl constituie recunoașterea rolului sindicatelor: participare la elaborarea măsurilor de protecție, exercitarea controlului sindical asupra respectării legislației și apărarea drepturilor lucrătorilor în caz de încălcări.

Legea securității și sănătății în muncă nr. 186/2008 dezvoltă cadrul general al prevenției, consacrand principii precum evaluarea riscurilor, combaterea riscurilor la sursă, adaptarea muncii la persoană și consultarea lucrătorilor, în consonanță cu Directiva 89/391/CEE [9]. Aplicarea eficientă a legii depinde însă de dialogul social: fără consultare, normele rămân adesea „proceduri pe hârtie”.

Confederația Națională a Sindicatelor din Moldova ca actor strategic: negociere colectivă, control social și cultură preventivă. Confederația Națională a Sindicatelor din Moldova este un actor central al dialogului social instituționalizat, asigurând reprezentarea intereselor salariaților în structurile tripartite și în consultările privind politicile publice SSM. În cadrul Comisiei naționale pentru consultări și negocieri colective, participarea sindicatelor conferă legitimitate socială deciziilor și oferă posibilitatea de a ajusta politicile la realitățile din unități și sectoare.

Negocierea colectivă este unul dintre cele mai eficiente instrumente de concretizare a securității și sănătății în muncă. Prin contractele colective, partenerii sociali pot stabili standarde suplimentare față de minimele legale: reguli privind instruirea periodică, dotarea cu echipamente, proceduri de investigare a accidentelor, evaluări de risc, mecanisme de raportare și măsuri de protecție adaptate activității. În unitățile unde există structuri funcționale de participare (comitete SSM) și unde sindicatele monitorizează implementarea, efectul preventiv este, în practică, mai puternic: riscurile sunt identificate mai devreme, iar conformarea angajatorilor crește.

În plus, Confederația Națională a Sindicatelor din Moldova contribuie la formarea culturii securității și sănătății în muncă prin instruiți și activități de informare pentru lideri sindicali și membri de sindicat, ceea ce permite trecerea de la o abordare reactivă (după incident) la una preventivă (înainte de incident). O asemenea orientare este coerentă cu standardele Uniunii Europene și cu viziunea Organizației Internaționale a Muncii privind prevenția.

Provocări persistente: de ce rămâne implementarea adesea formală. În pofida cadrului normativ relativ dezvoltat, persistă dificultăți sistemice. În practică, accidentele de muncă și bolile profesionale sunt alimentate de câteva cauze recurente: instruire insuficientă sau formală; nerespectarea normelor și control insuficient; resurse limitate pentru echipamente și măsuri preventive (mai ales în sectoarele cu risc ridicat); cultură organizațională slabă a prevenției și deficit de comunicare internă. Aceste cauze confirmă că legislația, de una singură, nu este suficientă; eficiența depinde de mecanisme de participare, control și responsabilitate comună.

Un alt risc important este transpunerea „procedurală” a standardelor europene: existența documentelor (planuri, fișe, instrucțiuni) fără aplicare reală. În această zonă, dialogul social are rol de „verificare socială” a implementării, iar sindicatele pot corecta tendința formalistă prin monitorizare, negociere și sesizarea disfuncționalităților.

Direcții de dezvoltare: de la armonizare juridică la eficiență instituțională. Pentru a atinge un nivel european de protecție în SSM, Republica Moldova are nevoie de acțiuni coerente, dintre care câteva sunt prioritare: elaborarea unei strategii naționale SSM care să coordoneze intervențiile; consolidarea capacității instituționale (inspectori, specialiști SSM, lideri sindicali); integrarea indicatorilor de performanță și evaluări periodice; întărirea mecanismelor tripartite și extinderea



dialogului în sectoarele cu risc ridicat; transferul de bune practici europene prin cooperare cu parteneri din Uniunea Europeană [6,7].

În toate aceste direcții, rolul Confederației Naționale a Sindicatelor din Moldova este strategic: confederația poate facilita trecerea de la adoptarea normelor la interiorizarea lor în cultura organizațională, prin negociere colectivă, instruire și implicarea directă a lucrătorilor în identificarea riscurilor.

Concluzii. Securitatea și sănătatea în muncă este nu doar o obligație legală, ci și un indicator al maturității sociale și economice a statului. Analiza confirmă că dialogul social constituie mecanismul central pentru implementarea efectivă a normelor securității și sănătății în muncă, iar implicarea sindicatelor – în special a Confederației Naționale a Sindicatelor din Moldova – poate transforma cadrul formal într-un sistem funcțional de prevenție. Prin participarea la structurile tripartite, prin negociere colectivă, monitorizare și instruire, Confederația Națională a Sindicatelor din Moldova contribuie la armonizarea practicilor naționale cu standardele Uniunii Europene (în special cu Directiva-cadru 89/391/CEE) și cu reperele Organizației Internaționale a Muncii.

Provocările persistente (implementare formală, resurse limitate, cultură preventivă redusă) indică faptul că progresul depinde de consolidarea instituțională și de participarea efectivă a partenerilor sociali. În perspectivă, transferul de bune practici europene, întărirea mecanismelor de evaluare și dezvoltarea unei culturi organizaționale orientate spre prevenție sunt condiții-cheie pentru reducerea riscurilor profesionale și creșterea calității vieții salariaților.

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STATUTUL JURIDIC AL ȘOMERILOR ÎN REPUBLICA MOLDOVA ABORDĂRI COMPARATIVE CU UNIUNEA EUROPEANĂ

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Articolul analizează statutul juridic al șomerilor în Republica Moldova în raport cu cadrul juridic și politicile Uniunii Europene. Sunt examinate condițiile de dobândire a statutului de șomer, drepturile și obligațiile aferente, precum și rolul măsurilor active de ocupare. Analiza comparativă evidențiază o convergență la nivel de principii, în special privind activarea șomerilor și obligațiile reciproce. Totodată, sunt identificate diferențe legate de mobilitatea transfrontalieră și de implementarea politicilor de ocupare. Concluziile subliniază necesitatea armonizării progresive a legislației naționale cu standardele europene.

Cuvinte-cheie: șomaj, statut juridic al șomerului, politici de ocupare, activare, protecție socială.

Abstract

The article examines the legal status of unemployed persons in the Republic of Moldova in relation to the European Union's legal framework and employment policies. It analyses the conditions for acquiring unemployed status, the related rights and obligations, and the role of active labour market measures. The comparative approach reveals convergence at the level of principles, particularly regarding activation and mutual obligations. At the same time, differences persist concerning cross-border mobility and policy implementation. The study highlights the need for further harmonisation with European standards.

Keywords: unemployment, legal status of the unemployed, employment policies, activation, social protection.

Șomajul reprezintă unul dintre cele mai sensibile fenomene sociale și economice ale societății contemporane, având implicații directe asupra nivelului de trai al populației, stabilității economice și

coeziunii sociale. Lipsa unui loc de muncă nu determină doar pierderea veniturilor, ci afectează în mod semnificativ demnitatea persoanei, accesul la servicii sociale și capacitatea de integrare socială și profesională. Din această perspectivă, protecția juridică a șomerilor constituie o componentă esențială a statului social și un indicator relevant al maturității politicilor publice în domeniul muncii [11, p. 45-48].

Statutul juridic al șomerului reprezintă instrumentul prin care statul definește condițiile de recunoaștere a unei persoane ca șomer, stabilește drepturile și obligațiile aferente acestei calități și instituie mecanismele de sprijin destinate reintegrării pe piața muncii. În Republica Moldova, acest statut este reglementat într-un cadru normativ distinct, care reflectă o orientare progresivă spre politici active de ocupare, în concordanță atât cu tendințele europene, cât și cu angajamentele asumate în procesul de integrare europeană.

Uniunea Europeană nu dispune de o reglementare unitară a statutului juridic al șomerului, însă promovează un ansamblu coerent de principii, instrumente și mecanisme de coordonare care influențează profund legislațiile naționale ale statelor membre, precum și ale statelor aflate în proces de apropiere de Uniunea Europeană, inclusiv Republica Moldova. În acest context, analiza comparativă dintre reglementările naționale și cadrul european prezintă relevanță atât din perspectiva armonizării legislative, cât și din cea a eficienței protecției sociale și a politicilor de ocupare [4, p. 6].

Actualitatea temei de cercetare este determinată de transformările profunde ale pieței muncii și de creșterea importanței protecției sociale a persoanelor aflate în șomaj, într-un context marcat de instabilitate economică, migrație a forței de muncă, digitalizare și schimbări structurale ale ocupării. Pentru Republica Moldova, problematica statutului juridic al șomerilor capătă o relevanță sporită în contextul parcursului european și al angajamentelor asumate prin Acordul de Asociere cu Uniunea Europeană, care impun apropierea cadrului normativ național de standardele europene în domeniul muncii și protecției sociale. În aceste condiții, statutul juridic al șomerului nu mai poate fi analizat exclusiv ca un mecanism de protecție pasivă, ci ca un instrument activ de integrare profesională și de adaptare a forței de muncă la cerințele economiei moderne.

Scopul prezentului articol constă în examinarea statutului juridic al șomerilor în Republica Moldova prin raportare la cadrul juridic și politicile Uniunii Europene, cu accent pe noțiunea de șomer, drepturile și obligațiile asociate acestei calități, măsurile active de ocupare și rezultatele obținute în practică. Articolul urmărește evidențierea gradului de convergență dintre cele două sisteme, identificarea lacunelor existente și formularea unor direcții de perfecționare a cadrului juridic național, menite să răspundă mai eficient provocărilor actuale ale pieței muncii și nevoilor reale ale persoanelor aflate în căutarea unui loc de muncă.

Cercetarea este realizată prin aplicarea preponderentă a metodelor juridice, având în vedere caracterul normativ al subiectului analizat. *Metoda juridico-dogmatică* este utilizată pentru analiza actelor normative care reglementează statutul juridic al șomerilor în Republica Moldova, în special Legea privind promovarea ocupării forței de muncă și asigurarea de șomaj, precum și alte acte normative din domeniul muncii și protecției sociale. *Metoda logică* este aplicată pentru formularea concluziilor prin corelarea normelor juridice cu datele statistice oficiale și cu realitățile pieței muncii, permițând evaluarea eficienței aplicării statutului juridic al șomerului. Totodată, *metoda comparativă* este utilizată pentru raportarea reglementărilor naționale la cadrul juridic și politicile Uniunii Europene, inclusiv Regulamentul (CE) nr. 883/2004 privind coordonarea sistemelor de securitate socială, Pilonul european al drepturilor sociale și orientările Strategiei europene pentru ocuparea forței de muncă. Cercetarea este completată de analiza statistică descriptivă a datelor furnizate de Agenția Națională pentru Ocuparea Forței de Muncă pentru anul 2025, care oferă o perspectivă practică asupra aplicării statutului juridic al șomerilor și eficienței măsurilor active de ocupare [2, p. 23-26].

În Republica Moldova, statutul juridic al șomerului este definit expres și dobândit în baza unor condiții legale clare, stabilite de Legea nr. 105/2018. Persoana este recunoscută ca șomer doar dacă este aptă de muncă, nu are un loc de muncă, se află în căutarea activă a unui loc de muncă și este înregistrată la Agenția Națională pentru Ocuparea Forței de Muncă. Această abordare conferă

statutului juridic al șomerului un caracter administrativ și condiționat, orientat spre activare și reintegrare profesională [7].

În cadrul Uniunii Europene, deși nu există o definiție juridică unică a șomerului, accentul este pus pe disponibilitatea pentru muncă și pe căutarea activă a unui loc de muncă, elemente regăsite inclusiv în definiția statistică a șomajului elaborată de Biroul Internațional al Muncii [3, p. 28]. Se poate observa astfel o convergență conceptuală între legislația Republicii Moldova și standardele europene, chiar dacă mecanismele juridice și instituționale diferă.

Diferența esențială constă în faptul că, în Uniunea Europeană, statutul șomerului este reglementat indirect, prin mecanisme de coordonare și mobilitate. Regulamentul (CE) nr. 883/2004 nu stabilește condiții uniforme de acces la indemnizația de șomaj, dar creează un cadru de coordonare a sistemelor naționale, permițând totalizarea perioadelor de asigurare și exportul prestațiilor. În schimb, legislația Republicii Moldova concentrează aceste elemente într-un singur act normativ, oferind o reglementare mai compactă, dar mai puțin flexibilă din perspectiva mobilității transfrontaliere [12, p. 4]. Astfel, stagiul de cotizare realizat în alte state nu este luat în considerare la stabilirea dreptului la indemnizația de șomaj, ceea ce limitează accesul persoanelor cu experiență de muncă transnațională la protecția socială în caz de pierdere a locului de muncă.

Statutul juridic al șomerului în Republica Moldova este construit pe un echilibru între drepturi și obligații. Pe de o parte, șomerul beneficiază de servicii de informare, consiliere profesională, mediere a muncii și, în condițiile prevăzute de lege, de indemnizație de șomaj. Pe de altă parte, acesta are obligația de a căuta activ un loc de muncă și de a participa la măsurile propuse de serviciul public de ocupare [10, p. 17]. Nerespectarea acestor obligații atrage consecințe juridice directe, constând în pierderea statutului de șomer și, implicit, încetarea dreptului la indemnizația de șomaj. Această abordare reflectă caracterul condiționat al protecției sociale în domeniul ocupării forței de muncă, în care acordarea prestațiilor este strâns legată de comportamentul activ al beneficiarului pe piața muncii și de cooperarea acestuia cu autoritățile competente.

În Uniunea Europeană, acest echilibru este consacrat prin principiul „*activării*”, promovat constant în cadrul Strategiei europene pentru ocuparea forței de muncă și consolidat prin Pilonul european al drepturilor sociale. Potrivit acestui principiu, protecția socială acordată șomerilor nu are un caracter pasiv, ci este strâns corelată cu implicarea activă a acestora în măsuri menite să faciliteze reintegrarea pe piața muncii, precum formarea profesională continuă, recalificarea, consilierea individualizată sau participarea la programe de ocupare. Astfel, indemnizația de șomaj este concepută nu doar ca un instrument de sprijin financiar temporar, ci și ca un mijloc de stimulare a responsabilității individuale și a adaptabilității profesionale. În acest context, principiul obligațiilor reciproce — drepturi sociale corelate cu îndatoriri concrete ale beneficiarului — reprezintă un element comun atât sistemelor statelor membre ale Uniunii Europene, cât și legislației Republicii Moldova, chiar dacă mecanismele de aplicare și gradul de flexibilitate diferă [10, p. 3].

Republica Moldova a preluat orientarea europeană spre măsuri active de ocupare, fapt reflectat atât în legislație, cât și în practica instituțională. Datele Agenției Naționale pentru Ocuparea Forței de Muncă pentru anul 2025 arată că 20.733 de persoane au fost angajate cu sprijinul ANOFM, cu 24% mai mult față de anul 2024 [2, p. 18]. Dintre acestea, 6.641 au fost șomeri, iar 14.092 persoane aflate în căutarea unui loc de muncă. Totodată, 1.217 șomeri au beneficiat de măsuri active, inclusiv 557 persoane care au primit vouchere de formare profesională. Prin intermediul echipelor mobile, au fost identificate 2.045 persoane inactive, dintre care 481 tineri NEET, iar 848 persoane au fost ulterior încadrate în câmpul muncii.

Aceste rezultate sunt comparabile cu tendințele promovate la nivelul Uniunii Europene, unde politicile de ocupare sunt orientate prioritar spre formare profesională, recalificare și activarea persoanelor inactive. Analiza comparativă evidențiază o apropiere progresivă a Republicii Moldova de modelul european, deși persistă diferențe semnificative în ceea ce privește resursele financiare și capacitatea instituțională [8, p. 32].

Legea nr. 105 din 14 iunie 2018 a constituit un pas esențial în modernizarea politicilor naționale de ocupare și în apropierea acestora de standardele europene. Adoptarea acestei legi se

înscrie în angajamentele asumate de Republica Moldova prin Acordul de Asociere cu Uniunea Europeană, în special în domeniul politicilor sociale și al ocupării forței de muncă [1].

Această lege este strâns corelată cu Strategia de dezvoltare „Moldova Europeană 2030”, care urmărește consolidarea pieței muncii, creșterea gradului de ocupare și îmbunătățirea condițiilor de muncă. Reforma pieței muncii contribuie la stimularea angajării categoriilor vulnerabile, reducerea șomajului, dezvoltarea formării profesionale continue și creșterea atractivității pieței muncii naționale [14].

Analiza comparativă a statutului juridic al șomerilor în Republica Moldova și în Uniunea Europeană demonstrează că, în ultimii ani, au fost realizate progrese semnificative la nivel de principii și orientări de politică publică, în special în ceea ce privește activarea șomerilor și corelarea protecției sociale cu participarea activă pe piața muncii. Cu toate acestea, diferențele continuă să persiste la nivel de implementare practică, diversitate a instrumentelor și capacitate instituțională, ceea ce indică faptul că procesul de apropiere de standardele europene este unul în desfășurare. În acest context, este necesar să fie atrasă o atenție sporită asupra consolidării și perfecționării cadrului juridic și instituțional existent, astfel încât statutul juridic al șomerilor să răspundă mai eficient realităților pieței muncii și nevoilor reale ale persoanelor aflate în căutarea unui loc de muncă.

În vederea perfecționării statutului juridic al șomerilor în Republica Moldova, devine necesară continuarea și aprofundarea reformelor inițiate, prin consolidarea și diversificarea măsurilor active de ocupare, astfel încât acestea să răspundă mai eficient realităților dinamice ale pieței muncii. O importanță deosebită trebuie acordată extinderii formării profesionale bazate pe competențe relevante și adaptabile, capabile să faciliteze reintegrarea durabilă a șomerilor în câmpul muncii. Totodată, dezvoltarea mecanismelor de profilare individualizată și de intervenție timpurie poate contribui la creșterea eficienței serviciilor de ocupare și la reducerea duratei șomajului. În același timp, intensificarea cooperării dintre Agenția Națională pentru Ocuparea Forței de Muncă, instituțiile de învățământ și angajatori este esențială pentru corelarea ofertelor de formare cu cerințele reale ale economiei. Nu în ultimul rând, armonizarea progresivă a legislației naționale cu principiile Pilonului european al drepturilor sociale reprezintă o condiție indispensabilă pentru consolidarea unui sistem modern, eficient și incluziv de protecție socială, capabil să asigure nu doar sprijin financiar temporar, ci și integrarea profesională sustenabilă a persoanelor afectate de șomaj.

În acest context, se impune și consolidarea mecanismelor de monitorizare și evaluare a politicilor de ocupare, prin utilizarea indicatorilor de performanță și a datelor statistice relevante, astfel încât măsurile aplicate să fie permanent ajustate în funcție de impactul lor real asupra beneficiarilor. Abordarea statutului juridic al șomerului trebuie să depășească dimensiunea formal-normativă și să fie orientată spre rezultate concrete, cu accent pe incluziune socială, prevenirea excluziunii de pe piața muncii și creșterea rezilienței profesionale a persoanelor aflate în căutarea unui loc de muncă.

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CRIMINALISTIC CONCEPT OF MEDICAL CRIMES

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Abstract. This paper reveals the criminalistic concept of medical crimes as an explanatory and normative model for proving harm caused in the course of medical activity. It shows that an unfavorable outcome is not synonymous with illegality: medicine operates in conditions of acceptable risk, probabilistic prognosis, and the inevitability of some complications. The concept differs from the criminalistic characterization in that it sets the framework for verifying versions and interpreting evidence along the chain of „clinical solution – documentation – expert reconstruction – legal assessment.” It is proposed to structure the object by identifying the clinical core and peripheral contours of medical illegality. The central tool is the evidence matrix „context – standard – process – documentation – defect – causality – guilt” with mandatory verification of legality filters (extreme necessity and reasonable risk). The role of digital traces and the controlled use of special knowledge is justified.

Keywords: medical crimes; criminalistic concept; defect in medical care; normative corridor; causal link; extreme necessity; reasonable risk.

1. Introduction

Medical activity is one of the socially significant and at the same time socially risky areas in which harm to the life and health of a patient is possible even with the conscientious and professionally correct behavior of medical workers. The use of invasive diagnostic and treatment methods, the use of drugs, and the need to find solutions under conditions of time and information constraints determine the probabilistic nature of clinical outcomes and the inevitability of some adverse outcomes. These features fundamentally distinguish medical practice from most other types of professional activity, where harm is usually a direct consequence of a violation of established rules.

Modern approaches to patient safety emphasize that not all harm in medicine is preventable,

and that professional risk represents an integral part of clinical decision-making [7]. In this regard, formally equating an adverse outcome with illegality and the fault of a healthcare professional is methodologically flawed and dangerous from a law enforcement perspective. At the same time, the state is obliged to ensure effective protection of the life and health of patients, including the identification and investigation of cases of preventable harm caused by defects in medical care or gross violations of professional duties.

This contradiction cannot be resolved solely by means of criminal law or clinical expertise. Criminal law norms establish the limits of liability, but do not provide the tools for reconstructing the medical process and proving causality. Medical science, in turn, focuses on assessing the quality of care rather than establishing legally significant facts and guilt. As a result, there is a lack of methodologically sound tools in law enforcement practice that would allow clinical reality to be translated into evidence.

It is in this context that the need arises to develop a criminalistic concept of medical crimes. This is not about a specific methodology for investigating individual offences, but about an explanatory and normative model capable of organising the process of proving guilt, taking into account the specifics of medical activity. Such a concept should link the mechanism of harm, sources of evidence, normative requirements for medical behavior, and procedural solutions into a single logical system. Without such a concept, the investigation of medical crimes inevitably fluctuates between the unjustified criminalization of clinical risk and the actual unprovability of preventable violations.

The purpose of this paper is to justify the need for and develop a criminalistic concept of medical crimes as an independent branch of criminalistic theory. To achieve this goal, the tasks are set to define the methodological boundaries of the concept, reveal the structure of medical crimes, form an evidence matrix for medical cases, analyze the trace pattern and regulatory corridor of medical activity, and justify the role of legality filters and the controlled use of specialized knowledge.

2. Materials and methods

The study was conducted on the basis of a systemic-structural approach, which allows medical crimes to be considered as an interdisciplinary object in which legally significant features are formed within the clinical process. The formal-legal method was used to interpret norms referring to the „rules/methods” of providing assistance and to analyze institutions of lawful harm. Logical-analytical and logical-reconstructive methods were used to model the clinical chronology and identify „solution points” at which versions of defect and causality are formed. Conceptual modeling was used to construct an evidence matrix of „context – standard – process – documentation – defect – causality – fault”. Comparative analysis made it possible to take into account patient safety ideas about the distinction between preventable and unpreventable harm and the systemic nature of errors [8]. The provisions of the loaded chapter served as the empirical basis.

3. Results and discussion

3.1. Methodological design of the concept: from result to process

The criminalistic concept of medical crimes is understood as an explanatory-normative model that organizes evidence not through a list of „typical signs” but through a sequence of verifiable nodes: clinical solution, regulatory framework, documentation, defect, causality, guilt. Unlike a criminalistic characterization, the concept is not limited to a description of typical information about a person and „traces” but sets out the logic of their selection and legal interpretation in a specific investigation situation. In the medical field, this is fundamental: the actual content of an event is shaped by a professional process and is therefore reflected primarily in documentation and digital data, rather than in the material traces of a traditional crime.

The methodological basis of the concept consists in rejecting the reduction of „medical crime” to the „error-harm” model. The patient safety paradigm distinguishes between preventable and unpreventable harm and links safety to risk management [10]. For criminalistics, this means that an adverse outcome is a reason for investigation, but not proof of a defect. Consequently, competing versions must be formed at the outset: harm as a consequence of a defect in care and harm as a

consequence of acceptable risk, the natural course of the disease, emergency, or other circumstances that exclude illegality. This architecture prevents „blame by outcome” and increases the rigor of evidence.

3.2. Object of the concept: clinical core and periphery

The object of the concept is medical crimes as acts whose criminal unlawfulness is functionally related to medical activity and requires reconstruction of the clinical process. The criterion for classifying an act as falling within the sphere of medical activity in a criminalistic sense is determined not by the departmental affiliation of the institution or the formal context, but by the fact that the evidence is based on medical documentation, clinical solutions, and specialized knowledge. Within this array, a clinical core stands out – cases of harm to life and health in the provision of medical care. This is where the maximum criminalistic complexity manifests itself: it is necessary to establish an applicable standard, identify the defect, prove causality, and assess guilt, taking into account the urgency, lack of resources, and team nature of treatment.

The peripheral contours cover acts in the healthcare field that are not clinical in nature (e.g., illegal practice, drug trafficking, corruption, and official crimes). General criminal investigation techniques are more often applicable to these, but certain modules of the concept are still relevant: documents as evidence, digital chronology, confidentiality, and organizational context. In this way, the concept unfolds „from the core to the periphery”: the most complex structure of the clinical core provides methodological calibration and sets transferable investigation tools [6; 9].

3.3. Evidence matrix: „context – standard – process – documentation – defect – causality – fault”

The subject of proof in medical cases must be expressed in clinical and organizational coordinates, otherwise the investigation will remain at the level of „result” (death/complication) without a restored causal-temporal line. The proposed evidence matrix includes six interconnected blocks. Clinical context: the patient's initial condition, risk profile, urgency, availability of resources and diagnostic capabilities. Regulatory corridor: what rules and methods were applicable at the time of the event (protocols, standards, internal regulations) and what courses of action were considered acceptable. Actual process: sequence of solutions and interventions, including patient transfers between departments and shifts. Documentation as an evidence environment: completeness of records, time stamps, consistency of documents and electronic data. Defect in care as an operational category: clinically and organizationally recorded deviation from the normative corridor without acceptable professional and legal justification. Causality and fault: establishing the impact of the defect on the outcome (counterfactual logic) and assessing the possibility of acting differently.

The matrix ensures the „anti-variant” nature of the evidence: it prevents retrospective moral judgment and requires verification of each node in the system. This forms the transition to the trace pattern and normative corridor as the basic conditions for reconstructing the event.

3.4. Trace picture: documents, digital traces, and communications

The trace picture of the clinical core is characterized by the dominance of documentary and digital sources. Of central importance are the medical history/outpatient card, appointment sheets, operation and anesthesia protocols, test results, monitoring records, and consultation and advisory protocols. These documents record not only „what was done” but also „why” and „when” — that is, the rationale for the solution and the clinical dynamics. Organizational documents (duty schedules, routing, resource availability) make it possible to assess the context of the conditions in which medical workers operated and to correctly consider the question of „could the subject have acted differently”.

In a digital environment, metadata becomes significant: timestamps, change history, audit logs, and comparison of „paper” and „electronic” event lines. Audit logs of electronic medical records are used to reconstruct the sequence of actions and to verify versions of retrospective changes [4]. Communication forms a separate layer of traces: patient transfer between shifts, notification of critical results, and consultation requests. Studies indicate that structured communication practices can reduce the risk of information transfer errors [5]. Therefore, in the forensic model, the communication

circuit is not a „background” but an independent object of verification, linking the clinical process and organizational responsibility.

3.5. Regulatory corridor: three modes of behavior and evaluation criteria

The normative corridor of medical practice is a set of legal and professional regulators that define appropriate and acceptable behavior in a specific clinical situation. It includes legislative requirements, clinical protocols and standards, instructions for the use of drugs and devices, internal protocols of the institution, as well as documentation rules. At the same time, the regulatory corridor in medicine is not rigidly fixed: clinical variability and individual patient characteristics allow for alternative tactics, especially in emergency situations and when resources are limited.

Within the framework of the concept, it is advisable to distinguish between three modes of behavior. The first is compliance with the standard, when actions correspond to the protocol and documentation reflects the implementation of key steps. The second is permissible deviation, when a departure from the standard algorithm is due to clinical necessity, the objective impossibility of a standard step, or the choice of another recognized tactic; here, the justification and recording of the solution become critical. The third is unjustified deviation, when the deviation is not confirmed by clinical grounds, is not documented, and is associated with the risk of harm.

This model makes the assessment of behavior provable: the subject of analysis is not a formal „violation of protocol” but the establishment of a regimen and its rationale. This logically leads to the category of defective care and causality as mechanisms for the transition from a medical incident to a legally significant event.

3.6. Defective medical care as a constructive element of the concept

Medical malpractice is central to the criminalistic concept of medical crimes, since it is through its establishment that the transition from a medical incident to a legally significant assessment of the behavior of a medical professional is made. Within this concept, a defect is not equated with an unfavorable outcome of treatment and is not reduced to any medical error. It is considered a deviation from the normative corridor of medical activity related to a clinical solution, action, or inaction. It has no acceptable professional justification in the specific conditions of care provision.

It is of fundamental importance to distinguish between the medical and legal assessment of a defect. At the medical level, a defect is established by a forensic medical expert or a commission of experts. The expert examines the compliance of the medical professional's actions with clinical recommendations, medical care standards, and rules of diagnosis and treatment that were in force at the time of care. If a deviation from proper medical practice is identified, the expert classifies it as a defect in medical care in the medical sense, indicating its nature (active or passive), form (individual or organizational), and potential clinical significance. At the same time, the expert does not assess guilt, does not establish criminal illegality, and does not draw conclusions about the existence of a crime, since his conclusion is limited to the professional medical sphere.

The legal assessment of the defect is carried out by the court. Based on the expert opinion and other evidence, the court determines whether the identified medical defect has criminal significance. In particular, it assesses whether the deviation from the normative corridor was significant, whether it went beyond the limits of permissible professional discretion, whether it was causally related to the harm that occurred, and whether it was due to circumstances that exclude illegality, such as permissible professional risk or extreme necessity. In this way, not every medical defect is transformed into a legally significant violation, and the final conclusion about the presence of a defect as an element of a medical crime is exclusively within the competence of the court.

3.7. Causal link: counterfactual reconstruction and „solutions”

Establishing causation in medical malpractice cases represents one of the most difficult and fundamental elements of proving a case. This is due to the multifactorial nature of medical harm, in which the adverse outcome is simultaneously influenced by the underlying disease, concomitant pathology, individual characteristics of the patient, timeliness of treatment, organizational conditions for the provision of care, and specific clinical solutions. In such conditions, causality cannot be established using the formula „after means because of” and requires the reconstruction of the clinical

chronology with the identification of key „points of solution”.

The forensic concept is based on a counterfactual approach: at each significant point, it is necessary to answer the question of whether the unfavorable outcome could have been prevented with a reasonable degree of probability if the medical professional had exhibited different and appropriate behavior. Such an analysis makes it possible to distinguish between the natural course of the disease, inevitable complications, acceptable professional risk, and medical malpractice that affected the outcome. Counterfactual reconstruction links causality to real alternatives available to the doctor in specific conditions of time, information, and resources. In terms of evidence, the counterfactual model requires: accurate determination of the timing of solutions, completeness of the data available to the subject, and the reality of alternatives (in terms of resources and time). This increases the importance of safety barriers: checklists, double checks, and structured information transfer. Studies show a link between surgical checklists and a reduction in complications when implemented adequately [1], and between medication safety interventions and a reduction in errors in a number of conditions [2].

At the same time, the cause-and-effect connection in medical malpractice cases is established at two levels: medical and legal. A forensic medical expert determines the medical (factual) cause-and-effect connection by answering specific questions that require professional knowledge. The expert investigates the presence of a defect in medical care, determines whether this defect could have caused harm, contributed to the deterioration of the patient's condition, or accelerated the onset of an adverse outcome, and characterizes the relationship as direct, indirect, probable, or absent. At the same time, the expert does not assess guilt and does not make legal conclusions, limiting himself to the medical sphere.

The final legally significant cause-and-effect connection is established by the court. Assessing the expert's conclusion in conjunction with other evidence, the court solves whether the identified violation was a necessary and essential condition for the harm to occur, whether the chain of cause and effect was interrupted by objective circumstances, and whether the medical professional could have foreseen the consequences and prevented them. Even if there is an expert opinion on a probable or indirect connection, the final solution on the existence of a causal link in the crime is made exclusively by the court, which emphasizes the need for a clear distinction between medical and legal assessments of causality.

3.8. Legality filters and expert outline: completion of the evidentiary model

Even in the presence of a defect and an established link to harm, the concept requires mandatory verification of legality filters—circumstances that exclude illegality or influence the assessment of behavior. This is especially important in medicine, as clinical solutions are often made in situations of immediate danger and uncertainty. Extreme necessity reflects the forced choice of lesser harm to prevent greater harm; in evidentiary terms, these are questions about the reality of danger, the absence of alternatives, and proportionality. Justifiable risk reflects the acceptability of risk for a socially useful purpose, provided that precautions are taken; the goal, exhaustion of alternatives, and safety barriers are verified and documented. The integration of legitimacy filters prevents retrospective „blame by outcome” and is consistent with a systemic understanding of errors and risk in medicine [7; 10].

High dependence on specialized knowledge is compensated for by a manageable expert loop. The expert establishes medical facts (the mechanism of the complication, compliance with standards, medical causality), but does not replace the court in its legal assessment. Complex cases require modularity: clinical expertise in the quality of care, forensic medical assessment, and, if necessary, examination of digital traces (metadata, access logs) [4]. The transparency of the source data and the verifiability of the reasoning ensure that expert knowledge is included in the evidence system without losing procedural control.

4. Conclusion

The study confirms that the investigation of crimes committed in the field of medical practice requires not fragmentary solutions, but a comprehensive forensic model that takes into account the specifics of the clinical process. Medical crimes cannot be adequately investigated and proven solely

by means of criminal law or medical expertise, since their actual content is shaped by professional solutions made in conditions of risk, uncertainty, and limited resources.

The development of a criminalistic concept of medical crimes allows this methodological gap to be filled. The proposed concept focuses the investigation not on the assessment of the adverse outcome as such, but on the reconstruction of the clinical solution, the regulatory conditions for its adoption, and its documentary reflection. The central place in the model is occupied by an evidence matrix that includes the clinical context, the normative corridor, the actual trajectory of the medical process, the defect in medical care, the causal link, and guilt. This structure ensures the consistency and verifiability of evidence and prevents retrospective „accusation based on the result”.

Of fundamental importance is the inclusion in the concept of filters of legality — extreme necessity and reasonable risk. These institutions reflect the reality of medical practice and allow for a criminally correct distinction between legitimate clinical choices, defects in the quality of care, and criminally significant violations. Ignoring them leads either to the unjustified criminalization of medical activity or to the actual inaccessibility of criminal law protection for patients.

Equally important is the justification of a controlled expert framework. Specialized medical knowledge is essential in cases of this category, but without a criminalistic concept, it either replaces legal assessment or is used fragmentarily. The concept ensures that expert conclusions are included in the evidence system while maintaining procedural control and distinguishing between competences.

In this way, the need to develop a criminalistic concept of medical crimes is due to the objective complexity of this array of cases. Such a concept serves as the theoretical and methodological basis for fair law enforcement, ensuring a balance between protecting patient rights and preventing unjustified criminal liability of medical professionals.

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**ACCESUL INDIVIDUAL LA JUSTIȚIA CONSTITUȚIONALĂ
ÎN REPUBLICA MOLDOVA: CARENȚE STRUCTURALE ȘI PERSPECTIVE DE
CONSOLIDARE ÎN LUMINA SECURITĂȚII JURIDICE¹¹**

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Abstract: The study examines individual access to constitutional justice in the Republic of Moldova from the perspective of legal certainty, highlighting its exclusively indirect and mediated nature. In the absence of an autonomous right of individuals to directly refer cases to the Constitutional Court, the exception of unconstitutionality remains the main procedural mechanism through which constitutional review of legal norms applicable in a concrete case may be triggered. However, an analysis of procedural norms, Constitutional Court jurisprudence and legal doctrine reveals significant structural limitations of this mechanism, arising from its dependence on ordinary courts, the lack of explicit constitutional recognition of the courts' power to refer cases to the Constitutional Court, and insufficient procedural guarantees ensuring effective and predictable access to constitutional justice.

The paper further explores the relationship between constitutional review and conventionality control exercised by ordinary courts, emphasizing the need for coherent interaction between these mechanisms. Additionally, it assesses the relevance of introducing an individual constitutional complaint as a complementary remedy for the protection of fundamental rights. The study concludes that strengthening individual access to constitutional justice requires not the abandonment of existing mechanisms, but their refinement and completion within a coherent framework capable of ensuring the effective supremacy of the Constitution and enhanced legal certainty.

Keywords: individual access to constitutional justice; legal certainty; structural deficiencies; constitutional review; conventionality control; fundamental rights; Constitutional Court.

Rezumat: Studiul analizează accesul individual la justiția constituțională în Republica Moldova din perspectiva principiului securității juridice, evidențiind caracterul exclusiv indirect și mediat al acestuia. În lipsa consacrării unui drept autonom de sesizare directă a Curții Constituționale, excepția de neconstituționalitate rămâne principalul mecanism prin care persoana poate provoca controlul constituționalității normelor aplicabile într-o cauză concretă. Analiza normelor procedurale, a jurisprudenței Curții Constituționale și a doctrinei relevă însă limite structurale ale acestui mecanism, generate de dependența de instanțele judecătorești, de lipsa unei consacrări constituționale exprese a competenței de sesizare și de absența unor garanții suficiente privind caracterul efectiv și previzibil al accesului la jurisdicția constituțională.

În acest context, studiul examinează rolul controlului de convenționalitate exercitat de instanțele ordinare și necesitatea corelării acestuia cu mecanismele de control constituțional. Totodată, este analizată oportunitatea instituirii plângerii constituționale individuale ca mecanism complementar de protecție a

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drepturilor fundamentale. Concluziile evidențiază necesitatea perfecționării cadrului normativ și instituțional existent, în vederea consolidării accesului efectiv la justiția constituțională și a securității juridice.

Cuvinte-cheie: acces individual la justiția constituțională; securitate juridică; carențe structurale; control de constituționalitate; control de convenționalitate; drepturi fundamentale; Curtea Constituțională.

Introducere.

Accesul individual la justiția constituțională reprezintă una dintre garanțiile esențiale ale statului de drept, întrucât asigură supremația Constituției în aplicarea concretă a normelor juridice și protecția efectivă a drepturilor fundamentale. În ordinea juridică a Republicii Moldova, acest acces nu este consacrat ca un drept autonom, ci se realizează exclusiv în mod indirect, prin intermediul unor mecanisme procedurale limitate, a căror eficiență și previzibilitate ridică probleme serioase din perspectiva securității juridice.

În prezent, singurul instrument prin care un justițiabil poate provoca controlul de constituționalitate al normelor aplicabile într-o cauză concretă este *excepția de neconstituționalitate*. Reglementată în Codul de procedură civilă și întemeiată pe competența exclusivă a Curții Constituționale, această instituție are o importanță structurală majoră, întrucât permite eliminarea normelor neconstituționale din ordinea juridică și previne consolidarea unor raporturi juridice întemeiate pe dispoziții contrare Constituției. Cu toate acestea, caracterul său mediat, dependența de intervenția instanței de judecată și insuficiența garanțiilor procedurale privind sesizarea efectivă a Curții Constituționale afectează previzibilitatea și uniformitatea aplicării mecanismului.

În paralel, ordinea juridică națională nu recunoaște *plângerea constituțională individuală* ca mecanism autonom de acces direct la justiția constituțională. Această absență nu constituie, în sine, o deficiență normativă, însă devine problematică în măsura în care mecanismul existent – excepția de neconstituționalitate – nu oferă garanții suficiente pentru realizarea unui control efectiv și previzibil al constituționalității normelor aplicabile cauzelor individuale. Din această perspectivă, examinarea oportunității introducerii plângerii constituționale individuale apare ca o consecință logică a limitelor structurale ale mecanismului actual, și nu ca o opțiune teoretică abstractă.

Principiul securității juridice constituie standardul central prin prisma căruia sunt analizate aceste două dimensiuni ale accesului individual la justiția constituțională. Acesta presupune nu doar stabilitatea și claritatea normelor, ci și existența unor mecanisme procedurale previzibile și efective, apte să permită corectarea aplicării normelor neconstituționale în cauze concrete. În lipsa unor asemenea garanții, supremația Constituției riscă să rămână una declarativă, iar protecția drepturilor fundamentale să fie afectată de incertitudinea privind accesul la controlul constituțional.

Pornind de la aceste premise, studiul își propune să analizeze, pe de o parte, rolul și importanța *excepției de neconstituționalitate* ca principal instrument de acces individual la justiția constituțională, precum și carențele de garantare ale acestuia, iar, pe de altă parte, să examineze necesitatea introducerii *plângerii constituționale individuale* ca mecanism complementar, evaluat din perspectiva consolidării securității juridice. Analiza se întemeiază pe interpretarea sistematică a normelor constituționale și procedurale, pe jurisprudența relevantă a Curții Constituționale și pe exigențele statului de drept, având ca obiectiv formularea unor concluzii fundamentate cu privire la eficiența actualului cadru de acces la justiția constituțională.

Rezultate obținute și discuții.

1. Accesul la justiția constituțională ca garanție a supremației Constituției

Spre deosebire de justiția de drept comun, orientată prioritar spre garantarea supremației legii, justiția constituțională funcționează la un nivel normativ superior, având ca finalitate asigurarea supremației Constituției în întregul sistem juridic. Această distincție funcțională este constant subliniată în doctrină, unde se arată că „drepturile constituționale ale omului pot fi protejate în maniera cea mai eficientă doar prin intermediul justiției constituționale” [1, p. 40]. Prin urmare, jurisdicția constituțională nu reprezintă doar o componentă instituțională a statului de drept, ci un mecanism indispensabil pentru garantarea caracterului efectiv al drepturilor și libertăților fundamentale.

În logica statului de drept, accesul la justiție nu poate fi conceput într-o manieră fragmentară, ci trebuie să includă și accesul la justiția constituțională, întrucât „normele juridice sunt edictate pentru binele individului, acesta fiind atât sursa, cât și finalitatea întregului edificiu normativ” [1, p. 40].

Referitor la accesul cetățenilor la Curtea Constituțională, doctrina observă că, „în dreptul intern, se poate vorbi despre existența unei garanții a dreptului de acces la justiție în fața acestei jurisdicții (denumit și acces liber la justiția constituțională), în măsura în care norma constituțională – în speță art. 20 din *Constituția Republicii Moldova* [2] – nu limitează domeniul de aplicare al garanțiilor sale” [3, p. 62; 4, p. 192]. Cu toate acestea, cadrul normativ actual nu confirmă o asemenea deschidere, întrucât nici Constituția, în dispozițiile sale speciale, nici *Legea cu privire la Curtea Constituțională* [5] nu recunosc persoana fizică drept subiect cu competență de sesizare directă a Curții.

O asemenea interpretare nu poate fi reținută în cadrul constituțional actual. Deși art. 20 din Constituția Republicii Moldova consacră dreptul de acces la justiție într-o formulare generală, acesta nu poate fi interpretat ca instituind o garanție a accesului liber la justiția constituțională. Curtea Constituțională nu este o instanță judecătorească în sensul art. 20, ci o jurisdicție constituțională distinctă, cu un regim propriu de competență și sesizare, reglementat exhaustiv de art. 135 din Constituție.

Accesul la Curtea Constituțională nu este guvernat de principiul general al accesului liber la justiție, ci de un mecanism special, de strictă interpretare, bazat pe enumerarea limitativă a subiecților îndreptățiți să o sesizeze. Extinderea domeniului de aplicare al art. 20 asupra jurisdicției constituționale ar conduce, în mod implicit, la eludarea opțiunii explicite a legiuitorului constituant, care nu a consacrat persoana fizică drept subiect autonom al sesizării Curții Constituționale.

În consecință, art. 20 din Constituție nu consacră și nu poate fi interpretat ca instituind un drept de acces la justiția constituțională, nici direct, nici sub forma unei garanții constituționale implicite. Eventuala instituire a unui asemenea drept poate interveni doar ca rezultat al unei revizuirii constituționale exprese sau al unei opțiuni normative clare a legiuitorului constituant, și nu pe calea unei interpretări extensive a dreptului general de acces la justiție.

În concluzie, deși accesul la justiția constituțională este recunoscut, la nivel doctrinar, ca o garanție esențială a supremației Constituției, cadrul normativ intern nu consacră un drept autonom al persoanei de a sesiza direct Curtea Constituțională. În aceste condiții, realizarea efectivă a acestui acces depinde de mecanismele procedurale indirecte prevăzute de lege, care vor fi analizate în continuare din perspectiva rolului lor în asigurarea accesului la justiția constituțională.

2. Excepția de neconstituționalitate ca mecanism central de acces individual indirect la justiția constituțională

În ordinea juridică a Republicii Moldova, *excepția de neconstituționalitate* constituie principalul și, în prezent, singurul mecanism prin intermediul căruia persoana poate declanșa controlul de constituționalitate al normelor aplicabile unei cauze concrete. Doctrina este unanimă în a recunoaște importanța structurală a acestei instituții, calificând-o drept „un mecanism esențial pentru asigurarea accesului indirect al persoanelor la justiția constituțională” [6, p. 50]. Valoarea sa rezidă în faptul că permite examinarea conformității normelor juridice cu Constituția în contextul aplicării lor concrete, prevenind consolidarea unor raporturi juridice întemeiate pe dispoziții neconstituționale.

Literatura de specialitate subliniază că *excepția de neconstituționalitate* privește în mod direct drepturile și libertățile fundamentale ale cetățenilor și constituie, în egală măsură, „o garanție constituțională a apărării intereselor lor” [7, p. 18]. Din această perspectivă, instituția nu are un caracter pur tehnic sau procedural, ci îndeplinește o funcție materială de protecție a drepturilor fundamentale, plasând Curtea Constituțională în poziția de garant efectiv al supremației Constituției.

Potrivit opiniei exprimate în doctrină, „*excepția de neconstituționalitate* reprezintă un procedeu eficient de protecție a drepturilor și libertăților publice, fiind un mecanism defensiv prin care persoana așteaptă aplicarea legii pentru a-i putea contesta constituționalitatea” [8, p. 86]. Această caracteristică evidențiază natura reactivă a mecanismului, accesul la jurisdicția constituțională fiind condiționat de existența unui litigiu pendent și de aplicabilitatea normei contestate în cauza respectivă.

Într-o altă abordare doctrinară, s-a arătat că, „prin natura sa, *excepția de neconstituționalitate* funcționează ca o garanție constituțională a drepturilor și libertăților conferite cetățenilor, oferind mijloace de apărare împotriva eventualelor ingerințe ale legiuitorului prin adoptarea unor norme neconstituționale” [6, p. 50]. În consecință, „prin intermediul acestui mecanism, Curtea Constituțională, exercitându-și rolul de garant al supremației Constituției, devine implicit și garantul protecției efective a drepturilor și libertăților fundamentale, asigurând accesul cetățenilor la justiția constituțională în scopul apărării acestora” [9, p. 142].

În plan practic, *excepția de neconstituționalitate* intervine în cadrul unui proces judiciar pendinte, în care partea interesată contestă constituționalitatea dispoziției legale ce urmează a fi aplicată la soluționarea cauzei. Procedura de invocare și soluționare a excepției este reglementată de legislația procesuală, în special de art. 12¹ din Codul de procedură civilă [10], fiind pusă la dispoziția justițiabililor ca instrument de protecție juridică [8, p. 86]. Astfel, mecanismul se integrează în logica controlului concret de constituționalitate, exercitat incidental, ca abatere de la regula generală a controlului abstract.

Curtea Constituțională a Republicii Moldova a interpretat noțiunea de *excepție de neconstituționalitate* ca exprimând „o legătură organică între problema de constituționalitate ridicată și fondul litigiului principal”, subliniind că aceasta reprezintă „o procedură prin care instanța de drept comun, la inițiativa părților sau din oficiu, sesizează jurisdicția constituțională cu privire la conformitatea normei aplicabile cauzei. Denumirea de *excepție* reflectă caracterul său derivat și incidental, în opoziție cu controlul abstract exercitat la sesizarea autorităților publice abilitate” [11].

Totodată, Curtea a statuat în jurisprudența sa că *excepția de neconstituționalitate* constituie un mijloc de acces indirect al persoanelor la jurisdicția constituțională, realizat prin intermediul instanței de judecată, și că acest control concret reprezintă singurul instrument care permite cetățeanului să se apere împotriva legiuitorului în situația în care normele edictate aduc atingere drepturilor sale constituționale. În acest sens, dreptul de a accesa Curtea Constituțională prin intermediul excepției de neconstituționalitate este calificat ca o componentă a dreptului la un proces echitabil, mecanismul respectiv oferind Curții posibilitatea de a-și exercita rolul constituțional de garant al supremației Constituției.

Rezultatul analizei doctrinare și jurisprudențiale confirmă că *excepția de neconstituționalitate* reprezintă un pilon central al accesului individual la justiția constituțională în Republica Moldova. Totuși, caracterul său exclusiv mediat și dependent de intervenția instanțelor de judecată conturează limitele structurale ale mecanismului, aspect care impune o evaluare distinctă din perspectiva securității juridice și a efectivității protecției drepturilor fundamentale.

3. Rolul instanțelor judecătorești în mecanismul de acces la justiția constituțională: între jurisprudență și lipsa consacării constituționale

Procedura ridicării *excepției de neconstituționalitate* este reglementată expres de art. 12¹ din Codul de procedură civilă al Republicii Moldova, care stabilește că, „în cazul existenței incertitudinii privind constituționalitatea normelor ce urmează a fi aplicate la soluționarea unei cauze, instanța de judecată, din oficiu sau la cererea unui participant la proces, sesizează Curtea Constituțională. Instanța de drept comun nu este în drept să se pronunțe asupra temeiniciei sesizării sau asupra conformității normei cu Constituția, limitându-se la verificarea condițiilor formale de admisibilitate”.

Această reglementare reflectă concepția potrivit căreia instanța ordinară îndeplinește rolul unui intermediar procedural între justițiabil și jurisdicția constituțională, fără a exercita un control propriu-zis de constituționalitate, care rămâne apanajul exclusiv al Curții Constituționale.

Relevantă deosebită prezintă evoluția acestui mecanism sub aspect instituțional. Astfel, până în anul 2016, dreptul de a sesiza Curtea Constituțională cu excepția de neconstituționalitate aparținea doar Curții Supreme de Justiție. Prin Hotărârea nr. 2 din 9 februarie 2016 [11], Curtea Constituțională a operat o remaniere esențială a acestui cadru, statuând că dreptul de sesizare revine tuturor instanțelor judecătorești. Totodată, Curtea a precizat că „judecătorul ordinar nu se pronunță asupra temeiniciei sesizării sau asupra conformității normelor contestate cu Constituția, limitându-se exclusiv la verificarea întrunirii următoarelor condiții: (1) obiectul excepției să se încadreze în categoria actelor

prevăzute la art. 135 alin. (1) lit. a) din Constituție; (2) excepția să fie ridicată de una dintre părți sau reprezentantul acesteia ori din oficiu de către instanța de judecată; (3) prevederile contestate să fie aplicabile cauzei pendinte; (4) să nu existe o hotărâre anterioară a Curții având ca obiect aceleași prevederi”.

Prin această jurisprudență, Curtea Constituțională a consolidat substanțial garanțiile accesului indirect al persoanei la justiția constituțională, soluție anticipată și susținută de doctrină cu mult timp înainte [12, p. 121; 13, p. 148; 14, p. 30].

Ulterior, în anul 2018, art. 12¹ din Codul de procedură civilă a fost modificat în strictă conformitate cu această hotărâre, consacrând expres competența instanțelor judecătorești de a sesiza direct jurisdicția constituțională.

Cu toate acestea, se impune a sublinia că, nici până în prezent, Constituția Republicii Moldova nu a fost revizuită în sensul consacrării explicite a competenței instanțelor judecătorești de drept comun de a sesiza Curtea Constituțională, textul constituțional menținând referirea expresă la Curtea Supremă de Justiție. În aceste condiții, extinderea competenței de sesizare se întemeiază pe o soluție jurisprudențială consolidată și ulterior transpusă în legislația procesuală, însă lipsită de o consacrare constituțională expresă.

Această evoluție a condus, în fapt, la o extindere a rolului tradițional al Curții Constituționale de „legiuitor negativ” și la asumarea unor atribuții cu caracter normativ accentuat, impunând respectarea hotărârilor sale interpretative în absența unor modificări corespunzătoare ale Constituției. Așa cum s-a remarcat în doctrină, „interpretarea Constituției, deși indispensabilă pentru garantarea supremației acesteia, poate genera riscuri pentru securitatea juridică atunci când ajunge să substituie intervenția legiuitorului constituant, în lipsa unor limite normative clare” [15, p. 53-74].

Prin urmare, deși *excepția de neconstituționalitate* rămâne un instrument esențial de acces indirect al persoanei la justiția constituțională, funcționarea sa este marcată de limite structurale care decurg din caracterul mediat al accesului, din dependența de instanțele judecătorești și din lipsa unei consacrări constituționale explicite a acestui mecanism. Aceste limite justifică, din perspectiva securității juridice, examinarea necesității unor mecanisme complementare de protecție constituțională a drepturilor fundamentale.

În acest sens, doctrina a subliniat că, deși *excepția de neconstituționalitate* reprezintă un instrument valoros de protecție a cetățeanului, ea rămâne, în același timp, insuficientă [16, p. 68], întrucât accesul efectiv la justiția constituțională depinde de filtrul obligatoriu exercitat de instanțele judecătorești.

4. Excepția de neconstituționalitate și controlul de convenționalitate

În completarea analizei limitelor structurale ale accesului individual la justiția constituțională prin intermediul *excepției de neconstituționalitate*, se impune examinarea raportului dintre controlul de constituționalitate și controlul de convenționalitate, în special din perspectiva competențelor instanțelor judecătorești de drept comun. Această analiză urmărește delimitarea domeniilor în care instanțele ordinare pot asigura protecția drepturilor fundamentale prin aplicarea directă a Constituției și a Convenției Europene a Drepturilor Omului [18], fără sesizarea Curții Constituționale, precum și identificarea limitelor acestei competențe, în care *excepția de neconstituționalitate* rămâne mecanismul indispensabil de acces la jurisdicția constituțională.

Potrivit doctrinei [17, p. 357], „atunci când o lege sau o hotărâre de guvern conține asemenea limitări, situația juridică diferă în funcție de faptul dacă procedura respectivă intră sau nu sub incidența art. 6 din Convenția Europeană a Drepturilor Omului, pe lângă garanțiile constituționale interne”. Această distincție este esențială, întrucât verificarea compatibilității unei norme juridice cu Constituția Republicii Moldova aparține competenței exclusive a Curții Constituționale, în timp ce verificarea compatibilității unei norme interne cu Convenția Europeană a Drepturilor Omului poate fi realizată de orice instanță din sistemul judiciar.

În temeiul art. 4 din Constituție, normele internaționale referitoare la drepturile fundamentale ale omului se aplică cu prioritate față de normele interne. Această prioritate nu are însă un caracter general și nelimitat, ci se manifestă în cadrul competențelor conferite instanțelor judecătorești de drept

comun. Din această perspectivă, controlul de convenționalitate nu echivalează cu un control difuz al constituționalității, ci reprezintă un mecanism distinct, circumscris aplicării Convenției și jurisprudenței Curții Europene a Drepturilor Omului.

Această delimitare este consolidată expres la nivelul legislației procesuale civile. Astfel, potrivit art. 2 alin. (1) din Codul de procedură civilă al Republicii Moldova, *procedura de judecare a cauzelor civile* este stabilită, inter alia, de Constituție, de hotărârile și deciziile Curții Europene a Drepturilor Omului și de hotărârile Curții Constituționale. În același timp, alin. (2) al aceluiași articol consacră prioritatea Constituției în caz de coliziune cu normele Codului de procedură civilă, precum și aplicarea normei ulterioare în caz de discordanță între normele codului și cele ale unei alte legi organice. Prin urmare, art. 2 CPC consacră integrarea standardelor constituționale și convenționale în ordinea normativă aplicabilă procedurii judiciare, fără a conferi instanțelor ordinare competența de a înlătura aplicarea normelor materiale neconstituționale.

În consecință, controlul de convenționalitate exercitat de instanțele judecătorești permite înlăturarea aplicării normelor procesuale contrare art. 6 din Convenția Europeană a Drepturilor Omului, precum și a acelor norme materiale care, prin efectele lor, afectează direct dreptul de acces la justiție sau garanțiile procesului echitabil [17, p. 357]. În aceste situații, instanța este în drept să asigure protecția drepturilor fundamentale fără a recurge la mecanismul excepției de neconstituționalitate, însă exclusiv sub aspectul compatibilității normelor procesuale cu Constituția și cu Convenția.

Prin contrast, în cazul normelor materiale de fond care reglementează drepturi, obligații sau statute juridice și care sunt incompatibile cu Constituția, instanțele judecătorești nu dispun de competența de a înlătura aplicarea acestora. În asemenea situații, *excepția de neconstituționalitate* rămâne mecanismul indispensabil și exclusiv de acces la jurisdicția constituțională, singurul capabil să determine eliminarea normei neconstituționale din ordinea juridică.

Prin urmare, deși controlul de convenționalitate exercitat de instanțele ordinare nu constituie o formă de acces la justiția constituțională în sens strict, acesta funcționează ca un mecanism autonom de protecție a drepturilor fundamentale, limitat la normele procedurale și la normele materiale cu impact procedural. Această limitare confirmă caracterul indispensabil al excepției de neconstituționalitate pentru controlul constituționalității normelor materiale de fond și evidențiază, totodată, necesitatea unor mecanisme complementare de acces la justiția constituțională, capabile să asigure coerența și efectivitatea protecției drepturilor fundamentale.

5. *Plângerea constituțională individuală ca mecanism complementar de acces la justiția constituțională*

Analiza limitelor structurale ale *excepției de neconstituționalitate*, inclusiv caracterul său exclusiv mediat, dependența de instanțele judecătorești și delimitările rezultate din raportul cu controlul de convenționalitate, conduce, în mod firesc, la examinarea instituției *plângerii constituționale individuale* ca posibil mecanism complementar de acces la justiția constituțională. În ordinea juridică a Republicii Moldova, un asemenea mecanism nu este consacrat, deși problematica introducerii sale a fost abordată atât în doctrină, cât și în cadrul unor inițiative legislative încă din anul 2004 [19, p. 92].

Plângerea constituțională individuală, denumită și *recurs constituțional individual*, reprezintă o cale distinctă de acces direct al persoanei la jurisdicția constituțională, având ca obiect contestarea actelor autorităților publice care încalcă sau restrâng drepturile și libertățile fundamentale garantate de Constituție. În sens doctrinar, această instituție este concepută ca un instrument de protecție subsidiară, care intervine după epuizarea căilor ordinare de atac și care permite Curții Constituționale să examineze nu doar norme juridice abstracte, ci și efectele concrete ale aplicării acestora asupra situației juridice a persoanei.

La nivel european și internațional, existența unor mecanisme interne efective de protecție a drepturilor fundamentale este încurajată, Curtea Europeană a Drepturilor Omului subliniind necesitatea ca statele să asigure remedii interne reale și eficiente anterior sesizării sale [20, p. 86]. Din această perspectivă, *plângerea constituțională individuală* apare ca un instrument apt să consolideze protecția

drepturilor fundamentale la nivel național și să reducă dependența excesivă de mecanismele jurisdicționale internaționale.

În dreptul intern, opiniile doctrinare cu privire la oportunitatea instituirii *plângerii constituționale individuale* nu sunt unitare. O parte a doctrinei consideră că introducerea unui asemenea mecanism ar fi inoportună, întrucât cetățenii dispun deja de multiple mijloace de protecție a drepturilor și libertăților fundamentale, inclusiv prin intermediul instanțelor judecătorești, al avocaților parlamentari, al procuraturii, al organizațiilor neguvernamentale și al Curții Europene a Drepturilor Omului. În această optică, accesul direct al persoanei la Curtea Constituțională ar putea conduce la suprasolicitarea jurisdicției constituționale și la afectarea capacității acesteia de a-și exercita rolul constituțional [21, p. 61-62; 22, p. 41; 23, p. 297].

De asemenea, s-a susținut că hotărârile Curții Constituționale sunt definitive și irevocabile, iar sesizarea directă a acesteia de către persoană ar putea limita în mod ireversibil posibilitatea valorificării drepturilor sale în alte proceduri jurisdicționale, ridicând probleme suplimentare de protecție efectivă a drepturilor fundamentale. Totodată, s-a atras atenția asupra riscului ca *plângerea constituțională individuală* să fie calificată ca remediu inefficient de către Curtea Europeană a Drepturilor Omului, în lipsa unor garanții procedurale adecvate [22, p. 41].

În opoziție cu aceste opinii critice, o parte semnificativă a doctrinei autohtone susține implementarea *plângerii constituționale individuale* ca instrument valoros de garantare a drepturilor fundamentale la nivel național [24, p. 163; 25, p. 536; 26, p. 47-52; 27, p. 297-301; 28, p. 41-47; 29, p. 208-220; 30, p. 120-124; 31, p. 116-120; 32, p. 156; 33, p. 53; 34; 35; 36]. Potrivit acestei orientări doctrinare, riscul suprasolicitării Curții Constituționale poate fi prevenit prin instituirea unor filtre procedurale clare de admisibilitate, prin delimitarea strictă a obiectului plângerii și prin reglementarea unor termene și condiții precise de exercitare a acesteia, astfel încât mecanismul să rămână unul subsidiar și excepțional, supus unor filtre stricte de admisibilitate, pentru a evita transformarea Curții Constituționale într-o instanță de control general al legalității.

Un argument central în favoarea *plângerii constituționale individuale* îl constituie posibilitatea exercitării controlului constituționalității asupra actelor puterii judecătorești. În prezent, în Republica Moldova, actele puterii legislative și executive pot fi supuse controlului Curții Constituționale, însă hotărârile definitive și irevocabile ale instanțelor judecătorești care contravin normelor constituționale nu pot fi contestate la nivel național. În aceste condiții, persoana este nevoită să se adreseze direct Curții Europene a Drepturilor Omului, care verifică exclusiv conformitatea actelor naționale cu Convenția, și nu cu Constituția Republicii Moldova [1, p. 40].

Această situație evidențiază o lacună semnificativă în sistemul național de protecție a drepturilor fundamentale, întrucât supremația Constituției presupune ca niciun act al autorităților publice, indiferent de natura sa, să nu fie exclus de la controlul constituționalității. Din această perspectivă, *plângerea constituțională individuală* ar putea funcționa ca un instrument eficient de corectare a eventualelor încălcări constituționale rezultate din acte jurisdicționale definitive și de restabilire a drepturilor fundamentale ale persoanei.

Absența unui asemenea mecanism afectează nu doar completitudinea protecției constituționale, ci și securitatea juridică, în măsura în care persoana nu dispune de un remediu intern capabil să corecteze încălcările constituționale rezultate din acte jurisdicționale definitive.

Generalizând, se poate afirma că introducerea *plângerii constituționale individuale* nu reprezintă o opțiune teoretică abstractă, ci o necesitate obiectivă derivată din limitele structurale ale mecanismului actual de acces la justiția constituțională, din imperativul consolidării securității juridice, precum și al protecției efective a drepturilor și libertăților fundamentale la nivel intern [32, p. 156]. Concepută ca un mecanism subsidiar și complementar *excepției de neconstituționalitate*, iar nu ca un substitut al acesteia, *plângerea constituțională individuală* ar putea contribui la completarea arhitecturii naționale de protecție a drepturilor fundamentale, asigurând un acces real și previzibil al persoanei la justiția constituțională.

6. Carențe și recomandări privind mecanismul accesului individual la justiția constituțională

Analiza cadrului normativ, jurisprudențial și doctrinar privind accesul individual la justiția constituțională în Republica Moldova evidențiază carențe structurale și funcționale care afectează efectivitatea mecanismului, coerența protecției drepturilor fundamentale și previzibilitatea rezultatului juridic din perspectiva principiului securității juridice.

În primul rând, **accesul individual la justiția constituțională are un caracter exclusiv indirect și mediat**, fiind condiționat de existența unui litigiu pendinte și de intervenția instanței judecătorești. Această configurație limitează posibilitatea persoanei de a provoca controlul de constituționalitate în situațiile în care drepturile sale sunt afectate prin acte definitive ale autorităților publice, în special ale puterii judecătorești.

În al doilea rând, **deși art. 12¹ din Codul de procedură civilă consacră**, în mod formal, posibilitatea controlului jurisdicțional asupra refuzului instanței de a ridica excepția de neconstituționalitate, acest control este conceput într-o manieră **tardivă și preponderent formală**, fiind exercitat doar odată cu examinarea fondului cauzei. În consecință, verificarea legalității refuzului intervine, de regulă, după ce norma pretins neconstituțională a fost deja aplicată în soluționarea litigiului, ceea ce diminuează substanțial utilitatea practică a mecanismului și afectează caracterul efectiv al accesului indirect la justiția constituțională.

Această carență este accentuată de faptul că, **deși art. 12¹ alin. (4) CPC enumeră criterii legale** pentru ridicarea sau refuzul ridicării excepției, formularea lor generală și lipsa unor standarde explicite de aplicare și motivare nu permit limitarea efectivă a marjei de apreciere a instanței. În absența unor repere clare și uniforme, mecanismul este aplicat neuniform și imprevizibil, în detrimentul principiului securității juridice.

În al treilea rând, **extinderea competenței instanțelor judecătorești de a sesiza Curtea Constituțională se întemeiază pe o soluție jurisprudențială și legislativă consolidată, însă nu beneficiază de o consacrare constituțională expresă**. Discrepanța dintre textul Constituției și cadrul normativ infraconstituțional afectează securitatea juridică și previzibilitatea mecanismului de acces la justiția constituțională.

În al patrulea rând, delimitarea dintre controlul de constituționalitate și controlul de convenționalitate nu este suficient de clar formulată la nivel normativ și jurisprudențial. Absența unor criterii explicite privind domeniile de aplicare ale fiecărei forme de control favorizează fragmentarea mecanismelor de protecție a drepturilor fundamentale și poate conduce la soluții divergente, în special în situațiile în care instanțele ordinare exercită controlul de convenționalitate și de constituționalitate asupra normelor procesuale.

În al cincilea rând, lipsa unor criterii clare de delimitare între situațiile care impun sesizarea Curții Constituționale și cele în care instanțele judecătorești sunt în drept și obligate să aplice direct Constituția și Convenția Europeană a Drepturilor Omului generează riscul utilizării nejustificate a *excepției de neconstituționalitate*. În asemenea condiții, mecanismul excepției este declanșat inclusiv în cauze ce vizează exclusiv compatibilitatea normelor procesuale sau a normelor materiale cu impact procedural cu standardele constituționale și convenționale, ceea ce poate conduce la suprasolicitarea jurisdicției constituționale și la deturnarea *excepției de neconstituționalitate* de la funcția sa proprie.

În fine, **absența plângerii constituționale individuale ca mecanism autonom de acces direct la jurisdicția constituțională** limitează capacitatea sistemului național de a asigura o protecție completă și coerentă a drepturilor fundamentale. În lipsa unui asemenea instrument, persoana este nevoită, în anumite situații, să recurgă direct la mecanismele internaționale de protecție, ceea ce evidențiază o lacună în arhitectura internă a justiției constituționale și a mecanismului intern de apărare a drepturilor fundamentale.

Analizate cumulativ, aceste carențe demonstrează că mecanismul actual al accesului individual la justiția constituțională, deși funcțional din punct de vedere formal, nu oferă întotdeauna garanții suficiente de efectivitate și previzibilitate, din perspectiva principiului securității juridice.

În lumina carențelor constatate, se impune formularea unor recomandări orientate spre consolidarea efectivității accesului individual la justiția constituțională și întărirea securității juridice, după cum urmează:

În primul rând, se impune consolidarea caracterului efectiv al controlului jurisdicțional prevăzut de art. 12¹ CPC asupra refuzului instanței de a ridica excepția de neconstituționalitate, în special sub aspectul conținutului și intensității acestui control. Deși mecanismul este consacrat normativ, exercitarea sa într-un moment ulterior soluționării fondului cauzei și în absența unor repere clare de evaluare tinde să transforme acest control într-o garanție preponderent formală.

În acest context, este necesară orientarea practicii judiciare spre o verificare reală și efectivă a îndeplinirii criteriilor prevăzute de art. 12¹ alin. (4) CPC, printr-o analiză concretă a pertinentei și relevanței excepției de neconstituționalitate pentru soluționarea cauzei. O asemenea abordare este menită să asigure faptul că accesul indirect la justiția constituțională nu depinde exclusiv de aprecierea larg discreționară a instanței de fond, ci dobândește un grad sporit de previzibilitate și securitate juridică.

Totodată, se impune instituirea, fie pe cale legislativă, fie prin consolidarea practicii judiciare, a unui standard unitar și minim de motivare a refuzului de sesizare a Curții Constituționale, care să permită verificarea efectivă a modului de aplicare a criteriilor legale și să prevină soluțiile arbitrare, lacunare sau stereotipe. O motivare riguroasă a refuzului constituie o garanție indispensabilă a transparenței actului de justiție și a securității juridice.

În fine, este necesară asigurarea unei practici judiciare coerente și previzibile în aplicarea mecanismului excepției de neconstituționalitate, în scopul evitării tratamentului diferențiat al justițiabililor aflați în situații comparabile și al consolidării caracterului efectiv al accesului indirect la justiția constituțională.

În al doilea rând, se impune clarificarea raportului dintre controlul de constituționalitate și controlul de convenționalitate exercitat de instanțele judecătorești. Lipsa unor criterii clare de delimitare favorizează fie substituirea controlului constituțional prin aplicarea exclusivă a Convenției Europene a Drepturilor Omului, fie declanșarea nejustificată a excepției de neconstituționalitate în cauze ce țin exclusiv de compatibilitatea normelor cu standardele convenționale.

În acest sens, este necesară delimitarea explicită a situațiilor în care instanțele judecătorești sunt obligate să aplice direct Constituția și Convenția Europeană a Drepturilor Omului, fără sesizarea Curții Constituționale, precum și a ipotezelor în care sesizarea acesteia este indispensabilă. O asemenea delimitare ar contribui la utilizarea proporțională a excepției de neconstituționalitate și la degrevarea jurisdicției constituționale.

În al treilea rând, se recomandă consacarea constituțională expresă a competenței instanțelor judecătorești de a sesiza Curtea Constituțională cu *excepția de neconstituționalitate*, în vederea eliminării discrepanței existente între textul Constituției, jurisprudența constituțională și legislația procesuală, discrepanță de natură să afecteze securitatea juridică și previzibilitatea mecanismului.

În fine, se poate examina oportunitatea instituirii *plângerii constituționale individuale* ca mecanism complementar de acces la justiția constituțională, conceput ca remediu subsidiar și excepțional. Introducerea unui asemenea mecanism nu decurge dintr-o obligație constituțională direct și nu este impusă de art. 20 din Constituție, însă poate deveni justificată în măsura în care mecanismele indirecte existente se dovedesc insuficiente pentru asigurarea unei protecții constituționale efective și previzibile a drepturilor fundamentale.

Plângerea constituțională individuală ar trebui, în această ipoteză, să fie supusă unor condiții stricte de admisibilitate, pentru a preveni transformarea Curții Constituționale într-o instanță de drept comun și pentru a menține caracterul său de jurisdicție specializată în garantarea supremației Constituției.

În concluzie, consolidarea accesului individual la justiția constituțională în Republica Moldova presupune nu abandonarea mecanismelor existente, ci perfecționarea și completarea lor într-o arhitectură coerentă, capabilă să asigure realizarea efectivă a supremației Constituției și protecția previzibilă a drepturilor fundamentale, în deplină concordanță cu principiul securității juridice.

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RESOCIALIZATION OF CONVICTED PERSONS AS A GOAL OF SENTENCE EXECUTION IN THE CONTEXT OF THE EDUCATIONAL FUNCTION IN THE REPUBLIC OF MOLDOVA

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Abstract. This article analyzes the resocialization of convicted persons as a key goal of the execution of criminal sentences and examines the role of education as one of the main means of achieving this goal in the Republic of Moldova. It is shown that, despite the normative recognition of the right of convicted persons to education, the content of the educational function within the penitentiary system largely remains formal and traditional and does not adequately reflect the conditions of the digital society.

Based on an analysis of criminal enforcement and educational legislation, as well as international standards, the author substantiates the conclusion that the resocialization potential of education is reduced due to the limited use of modern educational forms and technologies. The article argues for the necessity of transforming the educational function of sentence execution, focusing on the development of digital and socially significant competencies as a prerequisite for enhancing the effectiveness of resocialization and the social integration of convicted persons.

Keywords: resocialization of convicted persons, execution of sentences, education, penitentiary system, digital society, Republic of Moldova.

Rezumat. Articolul analizează resocializarea persoanelor condamnate ca scop fundamental al executării pedepselor penale și rolul educației ca unul dintre principalele mijloace de realizare a acestuia în Republica Moldova. Se evidențiază faptul că, deși dreptul persoanelor condamnate la educație este recunoscut la nivel normativ, conținutul funcției educative în cadrul sistemului penitenciar păstrează, în mare măsură, un caracter formal și tradițional, nefiind adaptat în mod adecvat condițiilor societății digitale.

Pe baza analizei legislației execuțional-penale și educaționale, precum și a standardelor internaționale, se argumentează că potențialul resocializator al educației este diminuat ca urmare a utilizării limitate a formelor și tehnologiilor educaționale moderne. Autoarea justifică necesitatea transformării funcției educative a executării pedepselor, orientată spre formarea competențelor digitale și social relevante, ca premisă pentru creșterea eficienței resocializării și integrării sociale a persoanelor condamnate.

Cuvinte-cheie: resocializarea persoanelor condamnate, executarea pedepselor, educație, sistem penitenciar, societate digitală, Republica Moldova.

Resocialization of convicted persons is regarded as one of the key objectives of the execution of criminal penalties in a state governed by the rule of law. Contemporary penitentiary policy is increasingly oriented not toward punitive measures, but toward preparing convicted persons for their

return to society, making the effectiveness of the system of execution of sentences dependent on its capacity to ensure social reintegration.

In this context, the educational function of the execution of sentences acquires particular importance, acting as a crucial instrument for personal development, the formation of responsibility, and the professional readiness of convicted persons. In the Republic of Moldova, the right to education is закреплено at the normative level; however, its practical implementation within the penitentiary system largely retains a traditional character and does not fully respond to contemporary social challenges.

Under conditions of digital transformation, education implies the development of digital, communicative, and professional competences that are essential for successful social and labour integration. The absence of an updated educational content reduces the resocializing potential of education and deepens the gap between declared objectives and the real possibilities of their achievement.

The aim of this article is to analyse the educational function of the execution of sentences in the Republic of Moldova through the prism of the goal of resocialization and to substantiate the necessity of its transformation in light of contemporary social and legal conditions.

This article develops and synthesizes the results of the author's previous research on the education of convicted persons and the use of information technologies in the penitentiary system, shifting the focus from individual aspects of educational practice to a conceptual rethinking of the educational function of sentence enforcement in the context of a digital society.

In contemporary criminal law and criminal enforcement doctrine, the resocialization of convicted persons is regarded as a complex and long-term process aimed at restoring stable social ties between the individual and society. This process is concerned not so much with the formal observance of rules of conduct in places of deprivation of liberty as with the formation of an internal readiness for a law-abiding way of life after release, the acceptance of social norms, and the performance of social roles.

International standards for the treatment of prisoners emphasize that the execution of sentences should not be limited to isolation and control. On the contrary, the penitentiary system is expected to ensure the preparation of convicted persons for their return to society, which allows resocialization to be regarded as a system-forming objective that determines the content and direction of penitentiary activities.

Among the means of resocialization, education occupies a special place. Unlike other forms of influence, it has a long-term and sustainable effect, contributing to the development of critical thinking, responsibility, social adaptation, and professional self-realization among convicted persons. Academic literature justifiably highlights the multidimensional nature of the right of convicted persons to education, which simultaneously serves as a means of correction and as a factor in preventing recidivism.

Thus, A. Racu, in the study *"Individualizarea executării pedepsei penale privative de libertate: realități și perspective"*, identifies three key components of the resocialization process of persons deprived of liberty: education, social upbringing, and behavioral change [13, p. 33]. A similar position is taken by G. Sult, developing this idea in the monograph *"Preparation for Release and the Resocialization of Persons Sentenced to Deprivation of Liberty"* [4, p. 214]. The author emphasizes that the problems of the criminal punishment system cannot be resolved exclusively through repressive measures. In his view, the implementation of criminal policy must take into account the social and personal circumstances of convicted persons, their way of life, individual difficulties, and, most importantly, the challenges they face after release. Such a humanistic approach, focused on considering social factors, is regarded as a necessary condition for achieving the goals of resocialization and enhancing the effectiveness of punishment.

The significance of education in the penitentiary system is also confirmed by contemporary empirical research. Thus, I. K. Shchepkina notes that education is "a leading means contributing to the social resocialization of convicted persons, stabilizing the situation in penal institutions and

exerting a positive influence on the criminogenic situation in society as a whole” [5, p. 239]. Consequently, the state should regard the development of educational programs for convicted persons as a priority area of penitentiary policy.

In practice, staff and specialists of penitentiary institutions recognize the potential of education as a tool for the positive transformation of the convicted person’s personality. Educational programs are aimed at raising the level of knowledge, developing intellectual and social competencies, and involving convicted persons in socially useful activities [11, pp. 94–95]. Such an impact is particularly relevant for individuals released after long terms of imprisonment, who require adaptation to changed social and economic conditions.

At the same time, a significant obstacle to successful resocialization remains the persistently negative public perception of former prisoners, which limits their opportunities for employment and social integration. In this regard, educational initiatives in places of deprivation of liberty should be accompanied by information and awareness-raising measures aimed at fostering public understanding of the value of a “second chance” and the importance of rehabilitative approaches.

The right of convicted persons to education is implemented within the framework of the Education Code of the Republic of Moldova [3], which establishes a unified education system in accordance with the levels and cycles defined by the International Standard Classification of Education. In penitentiary institutions, education is provided at various levels and in different forms, ranging from basic education programs for persons lacking fundamental literacy skills to lower secondary (gymnasium) programs for juvenile offenders. In addition, considerable attention is paid to vocational education, the purpose of which is to develop in-demand job skills among convicted persons and to prepare them for independent life after release.

The normative consolidation of the educational function of sentence enforcement in the Republic of Moldova is carried out within the framework of criminal enforcement and educational legislation. The Enforcement Code of the Republic of Moldova classifies education among the means of correction and resocialization of convicted persons, alongside labor and educational work [2, Art. 1, Art. 167], thus formally incorporating it into the system of objectives of sentence enforcement.

At the same time, the Education Code of the Republic of Moldova guarantees the right to education regardless of a person’s legal status, including persons deprived of liberty, and allows the implementation of educational programs in full-time, part-time, and distance learning formats [3, Art. 6, Art. 10]. This creates a general legal framework for the use of modern educational technologies.

However, an analysis of the legislation shows that criminal enforcement norms are predominantly declarative in nature and do not disclose the substantive content of the educational function in light of contemporary social and technological conditions. The law does not define the goals and priorities of education within the system of correctional measures, minimum standards for educational programs for convicted persons, criteria for their effectiveness from the perspective of resocialization, or mechanisms for adapting education to conditions of isolation.

As a result, in practice educational activities are subordinated to regime requirements and lose their focus on long-term goals of social reintegration. Such an approach does not comply with international standards, according to which education should be regarded as an integral element of correction and preparation for release and should be brought as close as possible to the national education system [7, Rules 28–30; 17, Rules 104–108]. The formal recognition of the right to education without a normative definition of its content and implementation mechanisms cannot be considered a full fulfillment of the state’s international obligations.

The insufficient normative clarity of the educational function of sentence enforcement largely determines its formalized character in the practice of penitentiary institutions in the Republic of Moldova. Educational activities are often reduced to meeting minimal requirements aimed at formally ensuring the right of convicted persons to education, without a clear orientation toward achieving sustainable resocialization outcomes.

Research indicates that traditional forms of education, primarily focused on the acquisition of basic knowledge, continue to prevail in the penitentiary system, while the development of

competencies demanded in contemporary society remains outside systematic attention [15, pp. 92–100]. Under conditions of digital transformation, such an approach reduces the practical value of education and limits its impact on the processes of social adaptation after release.

The formalization of the educational function is also manifested in the absence of an individualized approach to the education of convicted persons. As a rule, educational programs do not take into account the level of prior education, professional experience, or the actual needs of the labor market; as a result, education performs mainly a compensatory rather than a transformative role.

In the doctrine of criminal enforcement law, the multifaceted nature of the right of convicted persons to education is emphasized, as it simultaneously serves as a means of correction, a factor in preventing recidivism, and a key element of social reintegration of the individual [14, p. 48]. However, under a formal approach, this potential remains largely unrealized.

One consequence of this situation is the dominance of a restrictive managerial approach, in which priority is given to regime and security considerations rather than to an assessment of educational measures in light of resocialization goals. Such practice does not always comply with the principle of proportionality in restricting human rights.

Thus, the formalization of educational activities in the penitentiary system of the Republic of Moldova is the result of shortcomings in the normative framework rather than the absence of the very idea of education as a means of resocialization. Overcoming this situation requires a rethinking of the educational function of sentence enforcement and its orientation toward the real social conditions of life that convicted persons face after release.

Contemporary society is undergoing profound digital transformation, encompassing all spheres of social life—from public administration and the economy to education and the labor market. In a digital economy, full social integration increasingly depends not only on the level of formal education but also on the availability of digital competencies, the ability to work with information, and the use of electronic services [9; 16].

In the twenty-first century, education has ceased to be a one-time stage of the life course and has become a process of lifelong learning focused on the development of competencies. International strategic documents emphasize that access to modern educational technologies is a key condition for social inclusion and for preventing the marginalization of vulnerable groups [9; 16].

In this context, the educational function of sentence enforcement requires reconsideration. Preparing convicted persons for life after release presupposes the development not only of basic knowledge but also of practical skills necessary for functioning in a digital society, including digital literacy, the ability for self-directed learning, and the use of electronic public services.

International penitentiary standards proceed from the premise that education in places of deprivation of liberty should be as close as possible to the education system outside penitentiary institutions and should take into account social and technological changes [7, Rule 28]. Otherwise, it loses its resocialization significance.

For the Republic of Moldova, this issue is particularly acute in the context of the active digitalization of public services. The lack of basic digital skills among persons released from places of detention objectively hampers their social and labor integration, increasing the risks of renewed marginalization and recidivism.

The preservation within the penitentiary system of predominantly traditional forms of education, focused on transmitting a minimal amount of knowledge, leads to a gap between the content of the educational function of sentence enforcement and the real needs of contemporary society. In conditions of digital transformation, such forms of education prove insufficient for adequately preparing convicted persons for life after release.

Scholarly research in the fields of criminal enforcement law and penitentiary pedagogy indicates that an exclusive orientation toward traditional educational models reduces their practical value and limits the resocialization potential of education [10, pp. 540–559]. Convicted persons who lack digital skills often face difficulties in accessing employment, education, and social services after release, finding themselves in a situation of secondary social isolation [12, pp. 129–130].

In the Republic of Moldova, this problem is further aggravated by normative restrictions on convicted persons' access to information technologies, including the prohibition on Internet use (Article 208(6) of the Criminal Enforcement Code of the Republic of Moldova) [3], which effectively excludes the use of modern educational tools despite the existence of legal grounds for distance learning in educational legislation.

The limitations of traditional forms of education are also reflected in their weak orientation toward labor market needs. Educational programs that are not aimed at developing relevant professional and digital competencies reduce the competitiveness of convicted persons after release and increase the risk of recidivism [1, pp. 351–356].

Under these conditions, the educational function of sentence enforcement requires substantive renewal based on the transformation of the goals, content, and methods of instruction, taking into account digital and social changes. The use of distance learning formats and digital educational resources, provided that appropriate legal regulation is ensured, may become an effective instrument for implementing the resocialization function of punishment [8, p. 18].

In criminal enforcement law, education is traditionally regarded as one of the key means of rehabilitating convicted persons alongside labor and educational work. However, in a digital society, the formal inclusion of education in the system of sentence enforcement is no longer sufficient. Education as such does not ensure the achievement of resocialization goals if its content is not aligned with the social and technological conditions to which a person returns after release.

Resocialization implies restoring an individual's ability to function fully within the legal, social, and economic environment. In this sense, education must go beyond a compensatory function and assume an adaptive role, forming the skills necessary for life in a modern, institutionally complex society.

International standards emphasize that the education of convicted persons should be future-oriented and as closely aligned as possible with the education system outside places of deprivation of liberty, taking into account changes in the social and economic environment [7, Rule 28].

For the Republic of Moldova, this means the need to abandon a formal approach to the educational function of sentence enforcement and to move toward a model in which education becomes a real instrument of social integration for convicted persons.

The transformation of the educational function of sentence enforcement should be comprehensive and oriented toward the real living conditions that convicted persons face after release. First of all, this involves updating the content of educational programs with a focus on developing digital competencies, including basic digital literacy, skills in using electronic services, and an understanding of how the digital state functions. In the context of the active digitalization of public services, the absence of such skills significantly complicates the process of social reintegration.

An important direction of transformation is the expansion of educational formats through the use of distance and blended learning models adapted to conditions of isolation. International experience confirms that, with appropriate legal regulation and oversight, digital technologies can be effectively used for educational purposes without compromising security requirements [16; 7].

Equally significant is the reconsideration of the role of penitentiary administration, which should ensure not only security and control but also the organizational conditions necessary for implementing educational programs, including through cooperation with educational authorities and educational institutions. At the same time, a key prerequisite remains the normative definition of the goals, principles, and permissible forms of educational activities for convicted persons, which would help overcome fragmented practices and reduce dependence on the discretion of individual institutions.

Education oriented toward contemporary social realities contributes to reducing the social isolation of convicted persons and increases their readiness for law-abiding behavior after release. Research shows that participation in comprehensive educational programs during the period of serving a sentence is associated with lower recidivism rates and a higher level of social adaptation [6, pp. 349–354]. In this context, the transformation of the educational function of sentence enforcement

in the Republic of Moldova represents not only a legal task but also an important social condition for improving the overall effectiveness of the penitentiary system.

The conducted research leads to the conclusion that within the system of sentence enforcement in the Republic of Moldova, the resocialization of convicted persons is formally recognized, at the level of goals and principles, as one of the key objectives of criminal punishment. At the same time, the content of the educational function, which should serve as the main instrument for achieving this goal, largely retains a traditional and, in many respects, outdated character.

An analysis of criminal enforcement and educational legislation shows that the right of convicted persons to education is legally закреплено and formally included in the system of corrective measures. However, the existing legal norms are predominantly general in nature and do not disclose the functional content of education in light of contemporary social and technological conditions. As a result, educational activities in penitentiary institutions are often limited to meeting minimum requirements, ensuring formal compliance with the right to education without fostering the competencies necessary for successful social integration after release.

It has been established that the predominance of traditional forms of education in the context of active digitalization of social processes reduces the resocialization potential of education. The lack of systematic integration of digital and practice-oriented elements deepens the gap between the educational process in places of deprivation of liberty and the real conditions of modern society faced by convicted persons after release.

The study substantiates that the transformation of the educational function of sentence enforcement should be regarded not as an optional measure but as a necessary condition for achieving resocialization goals. Such transformation implies updating the content of educational programs, focusing on the development of digital and socially relevant competencies, expanding forms of learning, and strengthening sustainable interagency cooperation in the field of education.

In conclusion, without a normative and conceptual rethinking of the educational function of sentence enforcement, the penitentiary system risks reproducing formal educational models that do not contribute to the sustainable social reintegration of convicted persons. In this regard, further development of legal regulation should be aimed at establishing a comprehensive approach to education as a key instrument of resocialization in a digital society.

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**ПРАВОВЫЕ МЕХАНИЗМЫ ПРОТИВОДЕЙСТВИЯ ИГРОВОЙ ЗАВИСИМОСТИ
(ГЕЙМИНГ-АДДИКЦИИ) У ПОДРОСТКОВ: СОВРЕМЕННЫЕ ВЫЗОВЫ И ПУТИ
РЕГУЛИРОВАНИЯ**

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Abstract. In the context of total digitalization of the social environment, adolescent gaming addiction is no longer merely a private pedagogical issue but is increasingly becoming a national security concern, requiring the development of a comprehensive system of legal restrictions for developers and protective guarantees for underage users. Within the framework of the humanization of education and the shift toward a learner-centered approach, the importance of analyzing and improving the legal and regulatory framework governing the responsibility of the state, educational institutions, and families for creating a safe and supportive developmental environment is growing.

Keywords: gaming addiction, gaming disorder, minors' rights, International Classification of Diseases, 11th Revision (ICD-11), legal regulation, digital security, child protection.

Введение. Современный этап развития общества характеризуется интенсивным внедрением цифровых технологий во все сферы жизни, включая систему образования и досуговую деятельность детей и подростков. Компьютерные и онлайн-игры стали неотъемлемой частью подростковой субкультуры и значимым каналом социализации. Однако наряду с положительными возможностями цифровой среды всё более отчётливо проявляются её риски, одним из которых является формирование гейминг-зависимости как устойчивой формы аддиктивного поведения.

Гейминг-зависимость (игровая зависимость, интернет-игровое расстройство) — это форма поведенческой аддикции, проявляющаяся в патологически устойчивом и неконтролируемом увлечении компьютерными и онлайн-играми, которое приводит к нарушениям в учебной, социальной, эмоциональной и личностной сферах подростка. В научной литературе данный феномен также обозначается как *игровая аддикция, интернет-зависимость игровой направленности*.

Гейминг-зависимость негативно отражается на психическом здоровье подростков, уровне их учебной мотивации, качестве межличностных отношений и социальной адаптации. В этой связи проблема выходит за рамки исключительно психологической или педагогической и приобретает выраженное социальное и правовое измерение. Речь идёт не только о трудностях воспитания, но и о защите базовых прав ребёнка на здоровье, безопасность и полноценное развитие.

Актуальность данного исследования продиктована критическим разрывом между стремительным совершенствованием технологий психологического вовлечения в игровых индустриях и инертностью нормативно-правовой базы. В современной жизни игровая зависимость перестаёт быть частной педагогической проблемой и переходит в категорию угроз национальной безопасности, требуя создания комплексной системы правовых ограничений для разработчиков и гарантий защиты для несовершеннолетних пользователей. В условиях гуманизации образования и ориентации на личностно-ориентированный подход возрастает значение анализа нормативной базы, регламентирующей ответственность государства, образовательных учреждений и семьи за создание безопасной развивающей среды.

Объектом нашего исследования выступают общественные отношения, складывающиеся в сфере обеспечения цифровой безопасности несовершеннолетних и защиты их психического здоровья от аддиктивного воздействия игрового контента.

Предметом исследования являются нормы международного и национального права, регулирующие деятельность субъектов игровой индустрии, а также правовые коллизии, возникающие при реализации механизмов ответственности разработчиков за использование «манипулятивного дизайна».

Цель работы — теоретическое обоснование и разработка предложений по совершенствованию законодательства, направленного на профилактику гейминг-зависимости через внедрение стандартов обязательного саморегулирования отрасли и усиление контроля за играми.

Методологическую основу исследования составили: *Метод сравнительного правоведения*, который позволил проанализировать эффективность «моделей ограничения» (опыт КНР и Южной Кореи) в сопоставлении с «моделями информирования» (опыт ЕС), а также *Формально-юридический метод*, использованный для анализа текущего состояния нормативной базы (международной и национальной) на предмет соответствия новым технологическим вызовам.

В изложение материала считаем необходимым подчеркнуть, что Международно-правовое признание гейминг-зависимости в *Международных правовых нормативных документах* создает достаточную нормативную базу для обоснования необходимости системной профилактики данного явления.

Ключевым международным нормативным документом является *Международная классификация болезней 11-го пересмотра (МКБ-11)*, утверждённая Всемирной организацией здравоохранения в 2019 году. В МКБ-11 официально закреплёно понятие *gaming disorder*, отнесённое к расстройствам, связанным с аддиктивным поведением [1]. Данное положение имеет важное правовое значение, поскольку закрепляет гейминг-зависимость как проблему общественного здоровья, создаёт нормативное основание для разработки государственных программ профилактики и легитимирует деятельность педагогов, психологов и медицинских специалистов в сфере профилактики и коррекции. Таким образом, признание гейминг-зависимости в МКБ-11 переводит данную проблему из области субъективных оценок в сферу юридически и социально значимых явлений, требующих системного реагирования.

Важную нормативную основу составляет и *Конвенция ООН о правах ребёнка (1989)*, ратифицированная Республикой Молдова [2]. В документе закреплёны положения, которые напрямую связаны с проблемой гейминг-зависимости. Это право ребёнка на охрану здоровья (ст. 24); право на защиту от вредных воздействий (ст. 19); приоритет наилучших интересов ребёнка (ст. 3); право на образование, направленное на развитие личности (ст. 28–29). Если чрезмерное увлечение играми приводит к ухудшению психического состояния детей и подростков, снижению успеваемости и социальной дезадаптации, это объективно означает нарушение прав закреплённых Конвенцией прав ребёнка [2]. Следовательно, государство и образовательные институты несут правовую ответственность за профилактику подобных рисков.

Несмотря на то, что термин «гейминг-зависимость» пока прямо не закреплён в национальном законодательстве, действующие нормативные акты Республики Молдова создают юридическую основу для профилактической работы.

Так *Кодекс об образовании Республики Молдова № 152/2014* закрепляет приоритет охраны здоровья и благополучия обучающихся [3]. В документе подчёркивается необходимость обеспечения безопасной образовательной среды; психолого-педагогического сопровождения учащихся; профилактики рискованного и девиантного поведения; защиты физического и психического здоровья детей. С правовой точки зрения это означает, что образовательное учреждение обязано реагировать на любые формы поведения, угрожающие развитию ребёнка, включая аддиктивные формы, к которым относится и гейминг-зависимость [3].

Не менее значимым является *Закон Республики Молдова «О правах ребёнка» № 338/1994*, который закрепляет право ребёнка на гармоничное развитие личности и защиту от факторов, наносящих вред его физическому, психическому и нравственному развитию [4]. Данный закон позволяет рассматривать игровую зависимость не как частную проблему семьи, а как социально значимый риск, требующий системной профилактики и вмешательства специалистов.

На основе национального законодательства в образовательных учреждениях Республики Молдова внедряются *Политики по защите детей*, регулирующие деятельность школ в сфере профилактики насилия, девиантного и рискованного поведения. Эти документы разрабатываются в соответствии с положениями Кодекса об образовании и национальных стратегий в области защиты детства [3; 5]. В рамках данных политик предусмотрено создание безопасной образовательной среды и профилактика психологических рисков для детей и подростков, применительно к деятельности школьного психолога и работе с семьёй и ребёнком в ситуации риска.

Таким образом, проведённый нами анализ нормативно-правовой базы регулирования игровой зависимости подростков показывает, что международные нормы признают гейминг-

зависимость проблемой общественного здоровья [1], что права ребёнка на здоровье, безопасность и полноценное развитие закреплены в международных документах, а национальное законодательство возлагает на систему образования Республики Молдова ответственность за профилактику факторов риска для развития ребёнка [3; 4]. А школьные политики по защите детей призваны создать практический механизм реализации этих норм [5].

В Республике Молдова целесообразно изучение зарубежного опыта правового регулирования проблемы гейминг - зависимости у подростков. Зарубежный опыт можно разделить на две основные модели: Азиатскую, для которой характерны жесткие технические и временные ограничения и Европейскую, с её регулированием через защиту прав потребителей и запрет «азартных» технологий.

Общеизвестно, что страны Азии первыми столкнулись с массовой зависимостью и внедрили наиболее радикальные меры. Так, Китай применяет самую строгую в мире систему регулирования, вводя лимит времени: несовершеннолетним разрешено играть только 3 часа в неделю (с 20:00 до 21:00 в пятницу, субботу, воскресенье и праздничные дни). В период каникул 2025–2026 гг. лимит расширяется до 15 часов на весь период отпуска. Для борьбы с использованием подростками аккаунтов родителей внедрена система распознавания лиц: если система подозревает, что играет ребенок, она требует сканирование лица в течение 3 минут. Кроме того в Китае запрещена любая игра без привязки к государственному идентификационному номеру потребителя, где необходимо указывать реальные имена вступающих в игру. А вот Южная Корея отказалась от ночного запрета на игры (с 00:00 до 06:00), признав его неэффективным. Там вместо общего запрета введена система «Choice Permit» (2025) и родители сами устанавливают часы доступа для ребенка в каждой конкретной игре. А государство активно финансирует реабилитационные лагеря для геймеров и специализированные клиники.

В Европе акцент делается не на времени игры, а на запрете игровых техник, вызывающих привыкание. Вводится система регулирования лутбоксов, когда «ящики с сюрпризами» приравниваются к азартным играм. К примеру, в Бельгии и Нидерландах продажа случайных виртуальных предметов за реальные деньги без лицензии на игровой бизнес является незаконной. Германия приняла поправки к Закону о защите молодежи и игры с лутбоксами и «темными паттернами» (дизайном, заставляющим играть дольше) получают возрастные ограничения 18+.

Для Молдовы, которая активно гармонизирует свое законодательство с нормами Европейского Союза, наиболее целесообразно внедрение европейской модели регулирования с учетом местной специфики. Прямые запреты (как в Китае) вряд ли будут эффективны и соответствовать демократическим нормам, поэтому акцент стоит сделать на защите прав потребителей, прозрачности технологий и профилактике игровой зависимости.

В завершение обозначим **конкретные шаги в области профилактики геймер зависимости, которые целесообразно внедрить в правовое поле Молдовы.**

✓ В Молдове уже действует строгий запрет на рекламу азартных игр. Логичным продолжением станет признание лутбоксов (платных случайных наград) формой азартных игр. Для этого, на наш взгляд, стоит внести поправку в Закон об организации и проведении азартных игр, обязывающую разработчиков раскрывать шансы выпадения предметов и запрещающую продажу лутбоксов несовершеннолетним.

✓ Законодательно необходимо запретить дизайн игр, который манипулятивно удерживает ребенка в сети (например, уведомления в ночное время или технологии, наказывающие за выход из игры).

✓ Целесообразно, на наш взгляд, внедрение стандартизированной, но конфиденциальной системы учета возраста для доступа к игровому контенту 16+ и 18+. А

также ограничение рекламы внутри игр, т.е. регулирование маркетинга энергетических напитков и внутриигровых покупок, ориентированных на подростков.

✓ Правовое поле должно не только запрещать, но и обеспечивать помощь. Поэтому целесообразно официальное закрепление статуса заболевания «Игровое расстройство» в Молдавском Национальном реестре заболеваний (согласно МКБ-11 ВОЗ), что позволит выделять бюджетные средства на лечение и реабилитацию гейминг - зависимых подростков.

✓ В системе образования в школьные программы необходимо внедрить курс «Цифровой грамотности», обязательные предметы о психологических рисках гейминга и механизмах самоконтроля.

Молдова уже начала работу над аналогом европейской системы правового регулирования в области профилактики гейминг- аддикции и её стоит продолжить. А эффективное решение проблемы возможно при условии комплексного подхода, объединяющего правовые механизмы, психолого-педагогические технологии и активное взаимодействие школы, семьи и общества. Именно такой подход позволяет обеспечить защиту прав подростков, сохранить их психическое здоровье и создать условия для полноценного личностного развития в условиях цифровой среды.

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ОТ ЗАПРЕТА К КОНТРОЛИРУЕМОМУ ДОСТУПУ: ПРАВОВЫЕ МЕХАНИЗМЫ ИСПОЛЬЗОВАНИЯ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ В ОБРАЗОВАНИИ ОСУЖДЁННЫХ В РЕСПУБЛИКЕ МОЛДОВА

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Abstract. The article analyzes the implementation of legal mechanisms for the use of information technologies in the education of convicted persons within the penitentiary system of the Republic of Moldova. It is shown that, despite the formal recognition of the right of convicted persons to education and the development of distance learning within the national education system, penitentiary practice remains predominantly restrictive. Based on an analysis of criminal enforcement and educational legislation, normative gaps and inconsistencies are identified that hinder the use of digital educational tools under conditions of isolation. The expediency of transitioning to a model of limited and controlled access to information technologies is substantiated as a legal mechanism for balancing security requirements with the protection of the rights of convicted persons. Special attention is given to the prospects for the development of legal regulation, the role of penitentiary administration, and interinstitutional cooperation. Proposals de lege ferenda are formulated, aimed at

improving legal mechanisms and strengthening the rehabilitative potential of education in places of deprivation of liberty.

Keywords: penal enforcement system; information technologies; distance learning; penitentiary institutions; legal mechanisms; controlled access; digitalization; convicts' rights; resocialization.

Аннотация. В статье анализируется реализация правовых механизмов использования информационных технологий в образовании осуждённых в системе исполнения наказаний Республики Молдова. Показано, что при формальном признании права осуждённых на образование и развитии дистанционного обучения в национальной системе образования пенитенциарная практика по-прежнему основывается преимущественно на запретительном подходе. На основе анализа уголовно-исполнительного и образовательного законодательства выявляются нормативные пробелы и противоречия, затрудняющие применение цифровых образовательных инструментов в условиях изоляции. Обосновывается целесообразность перехода к модели ограниченного и контролируемого доступа к информационным технологиям как правовому механизму обеспечения баланса между требованиями безопасности и защитой прав осуждённых. Отдельное внимание уделяется перспективам развития правового регулирования, роли администрации пенитенциарных учреждений и межведомственного взаимодействия. Сформулированы предложения *de lege ferenda*, направленные на совершенствование правовых механизмов и укрепление ресоциализационного потенциала образования в местах лишения свободы.

Ключевые слова: система исполнения наказаний; информационные технологии; дистанционное обучение; пенитенциарные учреждения; правовые механизмы; контролируемый доступ; цифровизация; права осуждённых; ресоциализация.

Цифровизация в XXI веке стала одним из определяющих факторов развития публичной власти и системы предоставления государственных услуг. Информационные технологии активно внедряются в сферу образования, здравоохранения, социального обеспечения и правосудия, трансформируя традиционные формы взаимодействия государства и граждан [15]. Вместе с тем система исполнения наказаний продолжает оставаться одной из наиболее консервативных сфер публичного управления, что обусловлено её специфическим назначением — обеспечением режима изоляции, безопасности и контроля. В условиях цифровой трансформации общества всё более отчётливо проявляется противоречие между необходимостью поддержания надлежащего уровня безопасности в пенитенциарных учреждениях и обязанностью государства гарантировать реализацию фундаментальных прав осуждённых. К числу таких прав относятся право на образование, доступ к информации и подготовка к социальной реинтеграции после освобождения [4]. В доктрине уголовно-исполнительного права обоснованно подчёркивается многозначный характер права осуждённых на образование, которое рассматривается не только как элемент исправления, но и как средство предупреждения рецидива, а также как фактор, способствующий социальной реинтеграции личности после освобождения [17, р. 306].

Что касается использования информационных технологий в данном контексте, то отметим, что оно приобретает двойственный характер: с одной стороны, они выступают важным инструментом личностного развития и ресоциализации осуждённых, с другой — воспринимаются как потенциальный источник угроз режиму исполнения наказаний, что обуславливает осторожный и зачастую ограничительный подход к их применению.

Анализируя практику Республики Молдова отметим, что внедрение информационных технологий в пенитенциарной системе осуществляется преимущественно фрагментарно и носит эпизодический характер. Как правило, такие инициативы реализуются в рамках отдельных образовательных проектов и не сопровождаются формированием целостной модели правового регулирования [3, р. 658]. Отсутствие специальных нормативных механизмов приводит к тому, что вопросы доступа осуждённых к цифровым ресурсам

решаются на уровне административного усмотрения, что нередко влечёт за собой применение чрезмерно ограничительных мер и не всегда соответствует принципам соразмерности и необходимости [14, р. 140]. В этих условиях особую актуальность приобретает научный анализ правовых механизмов обеспечения использования информационных технологий в системе исполнения наказаний. Целью настоящей статьи является исследование действующего правового регулирования в данной сфере и обоснование необходимости перехода от модели полного запрета к модели ограниченного и контролируемого доступа, позволяющей обеспечить баланс между требованиями безопасности и защитой прав осуждённых.

Развитие дистанционных образовательных технологий является закономерным этапом цифровизации системы образования и отражает современные тенденции трансформации образовательных процессов [2, р. 14]. Дистанционное обучение как форма организации учебного процесса основывается на использовании информационно-коммуникационных технологий и позволяет преодолевать пространственные и временные ограничения, обеспечивая доступ к образованию для различных категорий обучающихся, в том числе для лиц, находящихся в условиях ограниченной свободы [16, р. 16].

В Республике Молдова дистанционная форма обучения предусмотрена действующим законодательством. Кодекс об образовании Республики Молдова закрепляет возможность реализации образовательных программ в очной, заочной и дистанционной формах [6]. Данная норма как правило формирует общую правовую рамку для использования дистанционных образовательных технологий, однако не содержит специальных механизмов их реализации применительно к условиям пенитенциарной системы, что порождает существенные трудности на практике. Особую актуальность дистанционное обучение приобрело в период пандемии COVID-19, когда образовательные учреждения были вынуждены в кратчайшие сроки перейти на цифровые форматы обучения [7, р. 2]. Полученный в этот период опыт продемонстрировал как высокий потенциал дистанционного образования, так и наличие значительных нормативных и организационных пробелов. Отсутствие чётких законодательных определений дистанционного обучения, единых стандартов его реализации и требований к цифровой инфраструктуре существенно осложнило организацию образовательного процесса, особенно для уязвимых категорий обучающихся.

В 2025 году в Республике Молдова был утверждён подзаконный нормативный акт, «Положение об организации и проведении дистанционного и заочного обучения в рамках лиценциации и магистратуры» регламентирующий дистанционное и заочное обучение в учреждениях высшего образования [8]. Указанный документ официально закрепил возможность реализации программ бакалавриата и магистратуры в дистанционной форме и свидетельствует о поступательном развитии нормативного регулирования дистанционного образования. При этом указанный Регламент [8] ориентирован на условия функционирования учреждений высшего образования в гражданском секторе и не учитывает правовые и режимные особенности пенитенциарных учреждений, в связи с чем его положения не могут быть непосредственно применены к организации дистанционного обучения осуждённых без внесения специальных нормативных адаптаций.

В пенитенциарных учреждениях Республики Молдова реализация дистанционного обучения сталкивается с дополнительными правовыми и практическими барьерами. В соответствии с ч. 6 ст. 208 Исполнительного кодекса Республики Молдова [5] осуждённым запрещён доступ к сети Интернет. Данное ограничение направлено на обеспечение безопасности и предотвращение несанкционированных коммуникаций, однако на практике оно приводит к фактическому исключению возможности использования дистанционных образовательных технологий даже в образовательных целях.

Отсутствие дифференцированного подхода к доступу осуждённых к информационным ресурсам обуславливает применение запретительной модели, при которой информационные технологии рассматриваются преимущественно как источник потенциальных угроз [12].

Такой подход не в полной мере учитывает современные технические возможности обеспечения кибербезопасности, фильтрации контента и контроля доступа к цифровым ресурсам.

В качестве возможного решения обозначенной проблемы представляется целесообразным внедрение модели ограниченного и контролируемого доступа к информационным технологиям. Речь идёт о создании в пенитенциарных учреждениях специализированной цифровой образовательной среды с использованием IP-адресации, фильтрации трафика и «белых списков» разрешённых ресурсов. Подобный подход позволяет обеспечить доступ исключительно к образовательным платформам, электронным библиотекам и академическим базам данных, где будут исключены использования социальных сетей и иных ресурсов, не связанных с образовательным процессом.

Реализация дистанционного обучения в пенитенциарных учреждениях должна сопровождаться рядом обязательных условий: обеспечением осуждённых необходимыми техническими средствами, разработкой адаптированных образовательных программ, подготовкой педагогических кадров, а также внедрением механизмов контроля и мониторинга использования цифровых ресурсов. Существенное значение имеет и проведение обучающих программ по безопасному использованию информационных технологий как для осуждённых, так и для персонала учреждений.

Практика зарубежных государств и международные стандарты, включая Минимальные стандартные правила ООН обращения с заключёнными (Правила Нельсона Манделы) и Европейские пенитенциарные правила, подчёркивают необходимость включения образовательных программ для осуждённых в национальные системы образования и допускают использование дистанционных форм обучения при условии соблюдения требований безопасности [19].

Дистанционное обучение в местах лишения свободы обладает значительным ресоциализационным потенциалом [1, р. 4]. Оно способствует повышению уровня образования и цифровой грамотности осуждённых, снижает риск социальной изоляции и повышает их шансы на успешную интеграцию в общество после освобождения. Исследования показывают, что лица, получившие образование в период отбывания наказания, демонстрируют более низкий уровень рецидивизма и более высокую готовность к легальной трудовой деятельности [10, р. 137].

Таким образом, дистанционное обучение следует рассматривать как легитимный и перспективный инструмент реализации права осуждённых на образование. Вместе с тем его внедрение в пенитенциарной системе Республики Молдова требует дальнейшего совершенствования нормативной базы, в том числе внесения изменений в Исполнительный кодекс Республики Молдова и Правила внутреннего распорядка исправительных учреждений, с целью нормативного закрепления механизмов ограниченного и контролируемого доступа к информационным технологиям.

Так исследование действующего законодательства Республики Молдова показывает, что правовое регулирование использования информационных технологий в системе исполнения наказаний носит фрагментарный и несистемный характер. Несмотря на нормативное признание права осуждённых на образование и развитие дистанционных форм обучения в национальной системе образования, в уголовно-исполнительном законодательстве отсутствуют специальные нормы, обеспечивающие реализацию этих прав с применением цифровых технологий.

Кодекс об образовании Республики Молдова закрепляет дистанционную форму обучения как одну из законных форм организации образовательного процесса [6]. Более того, нормативные изменения последних лет, включая подзаконные акты 2025 года, свидетельствуют о расширении применения дистанционного обучения в высших учебных заведениях Республики Молдова [8]. Однако указанные нормы ориентированы на общий контекст функционирования образовательной системы и не учитывают специфические

условия деятельности пенитенциарных учреждений, связанные с режимом изоляции и повышенными требованиями безопасности.

В то же время Исполнительный кодекс Республики Молдова содержит прямые ограничения, препятствующие использованию информационных технологий осуждёнными. В частности, ч. 6 ст. 208 ИК РМ запрещает доступ осуждённых к сети Интернет [5]. Данная норма сформулирована в категоричной форме и не предусматривает исключений либо дифференцированных режимов доступа в образовательных целях. В результате возникает нормативное противоречие между закреплённым правом на образование и фактической невозможностью его реализации с использованием современных образовательных технологий, что противоречит принципу соразмерности ограничений прав человека [9].

Отсутствие специальных процедур и критериев допустимого использования информационных технологий приводит к тому, что вопросы доступа осуждённых к электронным образовательным ресурсам решаются преимущественно на уровне внутренней административной практики пенитенциарных учреждений. Такой подход формирует состояние правовой неопределённости, поскольку решения о предоставлении либо отказе в доступе к цифровым ресурсам не основаны на чётко закреплённых нормативных стандартах, а зависят от усмотрения администрации конкретного учреждения.

К числу ключевых нормативных пробелов в рассматриваемой сфере следует отнести: отсутствие определения правового режима использования информационных технологий в местах лишения свободы; отсутствие разграничения уровней и целей допустимого доступа к цифровым ресурсам; отсутствие процедур взаимодействия пенитенциарных учреждений с образовательными организациями и цифровыми образовательными платформами; отсутствие нормативно закреплённых гарантий защиты прав осуждённых при принятии решений об ограничении доступа к образовательным ресурсам.

Указанные пробелы обуславливают доминирование запретительной модели регулирования, при которой информационные технологии рассматриваются преимущественно как источник потенциальной угрозы режиму исполнения наказаний. При этом современные технические возможности обеспечения кибербезопасности, фильтрации контента и мониторинга доступа фактически остаются вне сферы правового регулирования и не используются в качестве альтернативы полному запрету [11].

Особую проблему представляет отсутствие нормативного закрепления механизмов реализации дистанционного обучения в пенитенциарных учреждениях. Несмотря на наличие правовых оснований для дистанционного образования в системе общего и высшего образования, уголовно-исполнительное законодательство не содержит положений, позволяющих адаптировать данные формы обучения к условиям изоляции. В результате складывается ситуация, при которой осуждённые формально обладают правом на образование дистанционно, но лишены реальных инструментов для его осуществления. Таким образом, действующая нормативная база Республики Молдова характеризуется разрывом между декларативным признанием права осуждённых на образование и отсутствием правовых механизмов его реализации с применением информационных технологий. Устранение данного разрыва требует перехода от фрагментарного регулирования к формированию комплексной модели правового обеспечения использования информационных технологий в системе исполнения наказаний, основанной на принципах законности, соразмерности и защиты прав человека.

Реализация правовых механизмов использования информационных технологий в системе исполнения наказаний Республики Молдова в значительной степени зависит от деятельности администрации пенитенциарных учреждений. Именно администрация обеспечивает практическое соотнесение требований режима и безопасности с необходимостью реализации прав осуждённых, прежде всего права на образование и доступ к информации [13, р. 47-51]. В условиях отсутствия детализированного правового регулирования роль администрации существенно возрастает. На практике это нередко

приводит к преобладанию запретительного подхода, при котором цифровые технологии воспринимаются преимущественно как источник угроз, а не как инструмент ресоциализации. Подобная практика не всегда соответствует принципу соразмерности и может приводить к необоснованному ограничению прав осуждённых.

В этой связи особое значение приобретает нормативное закрепление полномочий администрации и процедур принятия решений в сфере использования информационных технологий. Администрация должна быть ориентирована не только на контроль, но и на создание условий для целевого и контролируемого использования цифровых ресурсов в образовательных целях [18].

Ключевыми задачами администрации являются организация защищённой цифровой среды, определение перечня разрешённых образовательных ресурсов, взаимодействие с образовательными учреждениями и мониторинг использования цифровых средств. Реализация этих полномочий должна осуществляться в рамках чётких правовых стандартов и находиться под институциональным и судебным контролем, что позволяет ограничить элементы произвольного усмотрения.

Эффективное использование информационных технологий в пенитенциарной системе невозможно без межведомственного взаимодействия с органами управления в сфере образования и образовательными учреждениями. Такое сотрудничество обеспечивает интеграцию обучения осуждённых в национальную систему образования и признание полученных результатов. Следовательно, роль администрации и межведомственного взаимодействия является ключевой для реализации модели ограниченного и контролируемого доступа к информационным технологиям. Без их нормативного определения внедрение цифровых образовательных решений в пенитенциарных учреждениях будет носить фрагментарный характер и зависеть от субъективных управленческих решений, что не соответствует международным стандартам обращения с осуждёнными.

Важно подчеркнуть, что предлагаемая модель использования информационных технологий в пенитенциарных учреждениях Республики Молдова не предполагает предоставление осуждённым свободного доступа к сети Интернет или средствам неконтролируемой цифровой коммуникации. Речь идёт исключительно о создании защищённой образовательной цифровой среды с ограниченным и контролируемым доступом, предназначенной для реализации образовательных программ и профессиональной подготовки. Такая модель может быть реализована с применением технических средств фильтрации контента, «белых списков» разрешённых ресурсов, локальных серверов и постоянного мониторинга со стороны администрации учреждения. Поэтапное внедрение в формате пилотных проектов в отдельных пенитенциарных учреждениях позволяет минимизировать риски для режима и безопасности, оценить эффективность предлагаемых решений и обеспечить их дальнейшую нормативную адаптацию. В этом контексте использование информационных технологий выступает не как фактор дестабилизации, а как управляемый правовой инструмент ресоциализации осуждённых, полностью совместимый с задачами исполнения наказаний.

Проведённое исследование показывает, что использование информационных технологий в системе исполнения наказаний Республики Молдова находится на стадии нормативного формирования. Несмотря на формальное признание права осуждённых на образование и развитие дистанционного обучения в национальной системе образования, в пенитенциарной системе до настоящего времени отсутствует целостная модель правового регулирования применения цифровых технологий.

Уголовно-исполнительное законодательство ориентировано преимущественно на обеспечение режима и безопасности, что обуславливает доминирование запретительного подхода и формирует разрыв между декларативным признанием образовательных прав осуждённых и реальными возможностями их реализации с использованием современных образовательных технологий.

Нормативные изменения 2023–2025 годов, направленные на развитие дистанционного обучения, не учитывают специфику пенитенциарных учреждений и ограничения, связанные с исполнением наказаний, что приводит к устойчивому нормативному пробелу. В этих условиях обоснована целесообразность перехода от модели полного запрета к модели ограниченного и контролируемого доступа к информационным технологиям, соответствующей международным стандартам обращения с осуждёнными.

Реализация данной модели требует комплексного правового подхода, включающего нормативное определение целей и пределов использования информационных технологий, процедур контроля и механизмов защиты прав осуждённых. Ключевая роль в этом процессе принадлежит администрации пенитенциарных учреждений и межведомственному взаимодействию с органами управления в сфере образования.

В связи с этим представляется целесообразным:

1. внести изменения в Исполнительный кодекс Республики Молдова, закрепив возможность использования информационных технологий в образовательных целях в условиях контролируемого доступа;
2. разработать подзаконный акт, регламентирующий порядок предоставления осуждённым доступа к цифровым образовательным ресурсам;
3. нормативно закрепить создание защищённой цифровой образовательной среды в пенитенциарных учреждениях;
4. обеспечить разграничение полномочий администрации и органов управления в сфере образования;
5. внедрить программы повышения квалификации персонала в области цифровых технологий и кибербезопасности;
6. предусмотреть процедуры обжалования решений об ограничении доступа к образовательным ресурсам;
7. реализовать пилотные проекты дистанционного обучения с последующей оценкой их эффективности.

Реализация указанных мер позволит перейти к управляемой и правово обеспеченной цифровизации системы исполнения наказаний, повысить эффективность ресоциализации осуждённых и привести национальное законодательство Республики Молдова в соответствие с международными стандартами в области прав человека.

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ПРАВОВЫЕ МЕХАНИЗМЫ ЗАЩИТЫ ПРАВ ЧЕЛОВЕКА В РЕСПУБЛИКЕ МОЛДОВА

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Abstract. The article analyzes the legal mechanisms for protecting human rights in the Republic of Moldova, including national and international instruments. The role of state bodies such as the Constitutional Court, the Ombudsman, and international organizations is examined. Special attention is paid to the implementation of international standards, the case law of the European Court of Human Rights (ECtHR), and the challenges faced by the country's human rights protection system.

Keywords: human rights, Moldova, Constitutional Court, Ombudsman, rule of law, ECtHR, legal protection, democracy, international standards, judicial practice.

Права человека являются фундаментальной ценностью любого демократического государства. Республика Молдова, как участница международных договоров и соглашений, активно развивает систему правовой защиты прав и свобод граждан. Основные гарантии прав человека закреплены в Конституции Республики Молдова (1994 г.) [1], а также в ряде международных документов, таких как Европейская конвенция о защите прав человека и основных свобод (ЕКПЧ), подписанная и ратифицированная Молдовой.

Конституция Республики Молдова провозглашает права человека высшей ценностью и закрепляет широкий перечень основных прав и свобод, таких как право на жизнь, право на свободу и личную неприкосновенность, право на справедливое судебное разбирательство, право на свободу выражения мнения и другие.

Молдова, присоединившись к Европейской конвенции о защите прав человека и основных свобод, признала юрисдикцию Европейского суда по правам человека (ЕСПЧ). Это означает, что граждане Молдовы, исчерпав все внутренние средства правовой защиты, могут обратиться в ЕСПЧ с жалобой на нарушение своих прав, гарантированных Конвенцией.

В последние годы Республика Молдова предприняла ряд важных шагов по укреплению системы защиты прав человека. Были приняты новые законы, направленные на борьбу с дискриминацией, насилием в семье и другими формами нарушения прав человека.

Несмотря на достигнутые успехи, в сфере защиты прав человека в Молдове остаются нерешенные проблемы. К ним относятся такие явления, как дискриминация по различным признакам, насилие в семье, жестокое обращение со стороны правоохранительных органов, нарушения прав человека в местах лишения свободы и другие.

Целью данной статьи является анализ правовых механизмов защиты прав человека в Республике Молдова, выявление существующих проблем и перспектив развития данной сферы в контексте европейской интеграции. В статье будут рассмотрены как национальные механизмы защиты прав человека, такие как Конституционный суд, Народный адвокат (Омбудсмен), суды общей юрисдикции, так и международные механизмы, такие как ЕСПЧ и другие международные организации, занимающиеся защитой прав человека.

Права человека являются краеугольным камнем любого демократического государства. Республика Молдова, будучи участницей многочисленных международных договоров и соглашений, активно развивает систему правовой защиты прав и свобод своих граждан.

Основные гарантии прав человека закреплены в Конституции Республики Молдова 1994 года, а также в ряде международных документов, таких как Европейская конвенция о защите прав человека и основных свобод (ЕКПЧ), которую Молдова подписала и ратифицировала.

Конституция Республики Молдова провозглашает права человека высшей ценностью и закрепляет широкий перечень основных прав и свобод, таких как право на жизнь, право на свободу и личную неприкосновенность, право на справедливое судебное разбирательство, право на свободу выражения мнения и другие [1].

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Национальные механизмы защиты прав человека в Республике Молдова представляют собой многоуровневую систему, включающую различные институты и правовые механизмы, направленные на обеспечение соблюдения прав и свобод человека.

Конституция Республики Молдова закрепляет широкий перечень основных прав и свобод граждан, включая право на жизнь, защиту частной собственности, свободу выражения мнений, право на справедливое судебное разбирательство и другие. Эти права и свободы гарантируются Конституцией и охраняются законом [1].

Одним из ключевых институтов защиты прав человека является Конституционный суд Республики Молдова. Он рассматривает жалобы граждан на неконституционность законов и других нормативных актов, а также разрешает споры о компетенции между различными ветвями власти.

Конституционный суд играет важную роль в обеспечении верховенства права и защите конституционных прав граждан. Например, в 2019 году Конституционный суд вынес постановление, касающееся соблюдения принципов верховенства права при проведении парламентских выборов (Постановление № 15/2019) [3]. Решение суда способствовало усилению прозрачности избирательного процесса и защите избирательных прав граждан.

Офис Народного адвоката (Омбудсмена) Республики Молдова играет важную роль в обеспечении соблюдения прав человека. Омбудсмен рассматривает обращения граждан, проводит расследования и рекомендует государственным органам меры по исправлению нарушений.

Омбудсмен является независимым и беспристрастным органом, который действует в интересах защиты прав человека. В 2022 году Омбудсмен инициировал расследование условий содержания в пенитенциарных учреждениях, что привело к рекомендациям по улучшению условий для заключенных.

Суды общей юрисдикции обеспечивают защиту прав граждан путем рассмотрения административных и уголовных дел, связанных с нарушением прав человека. Граждане могут обращаться в суд за защитой своих прав и законных интересов.

Важную роль в правозащитной деятельности играют также неправительственные организации (НПО), такие как Центр правозащитных ресурсов и Promo-LEX, активно занимающиеся мониторингом прав человека и предоставлением юридической помощи уязвимым группам населения. НПО играют важную роль в выявлении нарушений прав человека и привлечении внимания общества к этим проблемам.

В целом, национальные механизмы защиты прав человека в Республике Молдова включают различные институты и правовые механизмы, которые обеспечивают защиту прав и свобод граждан. Однако эффективность этих механизмов может быть повышена путем дальнейшего совершенствования законодательства и укрепления независимости судебной власти и других правозащитных институтов.

Международные механизмы защиты прав человека играют важную роль в обеспечении соблюдения прав и свобод человека в Республике Молдова.

Республика Молдова является участницей Европейской конвенции о защите прав человека и основных свобод (ратифицирована в 1997 году), что предоставляет ее гражданам право подавать жалобы в Европейский суд по правам человека (ЕСПЧ) после исчерпания всех национальных средств защиты.

ЕСПЧ является международным судебным органом, который рассматривает жалобы на нарушения прав человека, гарантированных Европейской конвенцией. Граждане Молдовы могут обращаться в ЕСПЧ, если они считают, что их права были нарушены государственными органами или должностными лицами.

Некоторые наиболее значимые дела, рассмотренные ЕСПЧ по жалобам против Молдовы, включают:

- **Pașcu and Others v. Moldova and Russia (2004)** – дело о нарушении прав человека в Приднестровском регионе, связанное с незаконным лишением свободы. Это дело стало важным прецедентом в области защиты прав человека в конфликтных ситуациях [4].
- **Ojog and Others v. Moldova (2021)** – дело о нарушениях прав собственности в результате незаконного изъятия земельных участков. Это дело подчеркнуло проблему защиты права собственности в Молдове и необходимость совершенствования законодательства в этой области [5].

Согласно Годовому отчету ЕСПЧ за 2023 год, Республика Молдова остается одной из стран с наибольшим количеством жалоб на 100 000 жителей среди стран Совета Европы. Это подчеркивает необходимость дальнейшего совершенствования национальной системы защиты прав человека и повышения эффективности судебной системы.

ООН и ее специализированные агентства, такие как Управление Верховного комиссара ООН по правам человека (УВКПЧ), активно взаимодействуют с Молдовой в сфере защиты прав человека.

В рамках Универсального периодического обзора (УПО) 2022 года ООН рекомендовала Молдове принять дополнительные меры для борьбы с дискриминацией и улучшения условий содержания в пенитенциарных учреждениях. УПО является механизмом, в рамках которого Совет по правам человека ООН рассматривает ситуацию с правами человека во всех государствах-членах ООН.

Молдова также сотрудничает с другими международными организациями, такими как Совет Европы и ОБСЕ, в области защиты прав человека.

Международные механизмы защиты прав человека играют важную роль в обеспечении соблюдения прав и свобод человека в Республике Молдова. Они дополняют национальные механизмы защиты и способствуют укреплению демократии и верховенства права в стране.

Несмотря на значительный прогресс, система защиты прав человека в Молдове сталкивается с рядом вызовов.

Одним из основных вызовов является политическое влияние на судебную систему и органы правозащиты. Это может проявляться в давлении на судей и сотрудников правоохранительных органов, в попытках использовать их в политических целях, а также в недостаточной независимости этих органов от других ветвей власти.

Ограниченные ресурсы для реализации правозащитных инициатив также являются серьезной проблемой. Недостаточное финансирование может приводить к тому, что

правозащитные организации и государственные органы, занимающиеся защитой прав человека, не имеют достаточных средств для эффективной работы.

Проблемы с выполнением решений ЕСПЧ также остаются актуальными. Несмотря на то, что Молдова признает юрисдикцию ЕСПЧ, решения этого суда не всегда выполняются в полной мере и своевременно.

Медленная имплементация международных стандартов в национальное законодательство также является проблемой. Молдова принимает участие в различных международных договорах и соглашениях в области прав человека, однако процесс их имплементации в национальное законодательство может быть длительным и сложным.

Перспективы развития защиты прав человека в Молдове связаны с усилением независимости судебной власти, активным участием гражданского общества в мониторинге прав человека, а также с расширением международного сотрудничества, в частности с ЕС и ООН [7].

Усиление независимости судебной власти является ключевым условием для обеспечения эффективной защиты прав человека. Независимые и беспристрастные судьи должны иметь возможность принимать решения, основанные на законе, а не на политическом влиянии.

Активное участие гражданского общества в мониторинге прав человека также играет важную роль. Гражданские организации могут осуществлять общественный контроль за деятельностью государственных органов, выявлять нарушения прав человека и привлекать внимание общества к этим проблемам.

Расширение международного сотрудничества, в частности с ЕС и ООН, может способствовать укреплению системы защиты прав человека в Молдове. Международные организации могут оказывать экспертную и финансовую помощь, а также делиться своим опытом в области защиты прав человека [6].

В целом, система защиты прав человека в Молдове находится в процессе постоянного развития и совершенствования. Несмотря на существующие вызовы, есть основания полагать, что в будущем ситуация в этой области будет улучшаться.

Правовые механизмы защиты прав человека в Республике Молдова представляют собой сложную и многоуровневую систему, включающую как национальные, так и международные инструменты.

Национальные механизмы защиты прав человека включают Конституционный суд, который является высшим органом конституционного контроля и рассматривает жалобы граждан на неконституционность законов и других нормативных актов. Институт Омбудсмана (Народного адвоката) [2] играет важную роль в обеспечении соблюдения прав человека, рассматривая обращения граждан и проводя расследования по фактам нарушений. Судебная система, включая суды общей юрисдикции, обеспечивает защиту прав граждан путем рассмотрения административных и уголовных дел, связанных с нарушением прав человека.

Международные механизмы защиты прав человека, такие как Европейский суд по правам человека (ЕСПЧ), предоставляют гражданам возможность обратиться за защитой своих прав на международном уровне, исчерпав все внутренние средства правовой защиты. Республика Молдова, будучи участницей Европейской конвенции о защите прав человека и основных свобод, признает юрисдикцию ЕСПЧ и обязана исполнять его решения.

Несмотря на наличие разнообразных правовых механизмов защиты прав человека, в Республике Молдова существуют проблемы, связанные с эффективностью их функционирования. Одной из основных проблем является политическое влияние на судебную систему и органы правозащиты, что может приводить к недостаточной независимости и объективности их деятельности. Ограниченные ресурсы, выделяемые на реализацию правозащитных инициатив, также могут препятствовать эффективной защите прав человека. Проблемы с выполнением решений ЕСПЧ и медленная имплементация международных стандартов в национальное законодательство также остаются актуальными вызовами.

Для эффективного функционирования системы защиты прав человека в Республике Молдова необходимо дальнейшее развитие институтов, устранение политического влияния и усиление правоприменительной практики. Важными направлениями развития являются усиление независимости судебной власти, активное участие гражданского общества в мониторинге прав человека, а также расширение международного сотрудничества, в частности с ЕС и ООН [8].

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КРИЗИС В ИРАНЕ (2025–2026) И ЕГО ВЛИЯНИЕ НА НАЦИОНАЛЬНУЮ БЕЗОПАСНОСТЬ АФГАНИСТАНА

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Abstract: This article analyzes the escalation of the crisis in Iran during 2025–2026 and its multifaceted impact on Afghanistan's national security. The study argues that the Iran crisis transcends regional boundaries, posing significant humanitarian, economic, and strategic threats to the fragile Islamic Emirate of Afghanistan. The conflict's evolution from a localized confrontation into a broader proxy war involving key regional and global actors has exacerbated instability in the Middle East and generated spillover effects affecting Afghanistan's migration patterns, economic stability, and security landscape. The article underscores the urgent need for adherence to international legal norms to prevent further regional destabilization.

Keywords: Iran crisis, Afghanistan, national security, Middle East conflict, Palestine, Israel, international law

В октябре 2023 года палестино-израильский конфликт вступил в новую фазу эскалации, последствия которой оказали существенное воздействие на региональную стабильность и вновь актуализировали вопрос об эффективности существующих международно-правовых механизмов его урегулирования. Отправной точкой данного витка насилия стала крупномасштабная военная операция под кодовым названием «Наводнение Аль-Аксы» (*Operation Al-Aqsa Flood*), начатая 7 октября вооружёнными формированиями движения ХАМАС — палестинской организации, осуществляющей фактическое управление сектором Газа [5].

С точки зрения её инициаторов операция представляла собой акт вооружённого сопротивления, направленный на прорыв шестнадцатилетней военно-экономической блокады сектора Газа, пересмотр сложившегося статус-кво и привлечение внимания международного сообщества к проблеме оккупации палестинских территорий [5].

Реакция международного сообщества на данные события с самого начала продемонстрировала раскол по хорошо известным геополитическим линиям. Израиль, Соединённые Штаты Америки, а также ряд их ключевых союзников — включая Европейский союз, Великобританию, Канаду, Австралию и Японию — единодушно осудили действия ХАМАС, квалифицировав их как «террористическое нападение» и «акт неспровоцированной агрессии», мотивированный, согласно доминирующему в данном лагере нарративу, идеологией уничтожения «еврейского государства». Данная интерпретация легла в основу легитимации последующих военных действий Израиля как реализации «неотъемлемого права на самооборону» в соответствии со статьёй 51 Устава ООН [6].

В то же время значительная часть международного сообщества — прежде всего арабские и мусульманские государства, а также многие страны Глобального Юга — предложила принципиально иную интерпретацию данных событий. Не выражая прямой поддержки насильственным методам ХАМАС, представители данного лагеря указывали на то, что структурные причины эскалации коренятся в длительной и системной политике оккупации и поселенческой колонизации палестинских территорий, осуществляемой Израилем. С их точки зрения, подписание Соглашений в Осло (1993 г.) и последовавший односторонний вывод израильских поселений и войск из сектора Газа (2005 г.) не привели к подлинному мирному урегулированию, а были использованы для консолидации израильского контроля над Западным берегом реки Иордан и Восточным Иерусалимом. Политика расширения израильских поселений, квалифицируемая в резолюциях ООН и практике Международного суда ООН как противоречащая международному праву, систематическая дискриминация палестинского населения, а также блокада сектора Газа рассматриваются в рамках данной интерпретации как факторы, подрывающие саму возможность мирного урегулирования и реализации формулы «два государства для двух народов» — консенсусной основы международных усилий по урегулированию палестино-израильского конфликта, предполагающей создание независимого, суверенного и жизнеспособного Государства Палестина в границах 1967 года со столицей в Восточном Иерусалиме [7, 8, 9].

Единственными акторами, открыто одобрявшими операцию «Наводнение Аль-Аксы» с самого начала, стали Исламская Республика Иран и её коалиция прокси-сил, известная как «Ось сопротивления». Этот военно-политический альянс, сформированный Тегераном, представляет собой сложную сетевую структуру негосударственных вооружённых формирований, объединённых идеологией антисионизма, антиамериканизма и шиитского фундаментализма. В ядро данного альянса, помимо самого Ирана, входят ливанская «Хезболла», обладающая значительным ракетным арсеналом; йеменское движение «Ансар Аллах» (хуситы), контролирующее часть территории Йемена и представляющее угрозу судоходству в Красном море; коалиция иракских шиитских ополчений «Исламское сопротивление в Ираке»; а также иностранные бригады, такие как афганские «Фатимийон» и пакистанские «Зайнабион», принимавшие участие в сирийском конфликте на стороне режима Башара Асада. Палестинские движения ХАМАС и «Исламский джихад», несмотря на

конфессиональные различия, долгое время рассматривались как стратегические партнёры и де-факто участники этой оси, получая от Ирана финансовую, военную и идеологическую поддержку [3, 10].

Военная операция ХАМАС, первоначально воспринятая как локальный конфликт, вызвала каскадную эскалацию, которая быстро превратилась в крупнейший военно-политический кризис на Ближнем Востоке за последние десятилетия. Ответ Израиля не ограничился масштабной наземной операцией в секторе Газа: он включал регулярные рейды и аресты на оккупированном Западном берегу, а также перекрёстные удары по территории Ливана и Сирии, направленные против целей, связанных с «Хезболлой» и иранским присутствием. Таким образом, конфликт приобрёл трансграничный характер, постепенно вовлекая новых участников. С одной стороны, активизировались члены «Оси сопротивления»: йеменские хуситы начали атаки на судоходство в Красном море, иракские ополченцы — на объекты США в Ираке и Сирии, а «Хезболла» — регулярные обстрелы северных районов Израиля и оккупированных им Голанских высот. С другой стороны, в конфликт напрямую вмешались внерегиональные державы, прежде всего США и Великобритания, оказавшие Израилю беспрецедентную дипломатическую, военную и разведывательную поддержку, а также предпринявшие собственные военные операции в Йемене под предлогом «защиты свободы судоходства» [3].

Интернационализация конфликта создала для Израиля стратегическое пространство для последовательного повышения уровня эскалации и расширения целей военной кампании. Апогеем данного процесса стала прямая атака Израиля на объекты на территории Ирана в июне 2025 года, мотивированная обвинениями Тегерана в поддержке «терроризма» и стремлении к обладанию ядерным оружием. Последовавшая «12-дневная война» между Израилем и Ираном, в ходе которой Соединённые Штаты нанесли удары по иранской ядерной инфраструктуре, стала беспрецедентным примером прямого военного столкновения двух региональных антагонистов с участием сверхдержавы. Заключённое при посредничестве администрации Дональда Трампа перемирие, несмотря на временное прекращение боевых действий, не разрешило фундаментальных противоречий, оставив обе стороны в состоянии перманентной конфронтации, чреватой новым обострением [3].

Подписанное осенью 2025 года отдельное перемирие между Израилем и ХАМАС оказалось нестабильным и неэффективным. Основным фактором его срыва стал отказ Израиля выполнить ключевые условия, связанные с полным выводом оккупационных войск из сектора Газа и снятием блокады, ограничивающей доступ жизненно необходимой гуманитарной помощи. Продолжающийся военный контроль и ограничения усугубили гуманитарную катастрофу. Согласно данным Управления Верховного комиссара ООН по правам человека (УВКПЧ), Международного комитета Красного Креста (МККК) и ведущих правозащитных организаций, таких как Amnesty International и Human Rights Watch, гражданское население Газы в ходе конфликта систематически сталкивалось с массовыми насильственными перемещениями, разрушением критической инфраструктуры (больниц, водопроводов, школ) и искусственно созданным дефицитом продовольствия и медикаментов, что в совокупности квалифицируется экспертами как условия, ведущие к голоду [2, 4]. Ряд специальных докладчиков ООН и исследователей открыто заявляют о наличии убедительных доказательств для рассмотрения действий Израиля в контексте Конвенции о предупреждении преступления геноцида 1948 года, что нашло отражение в решении Международного суда ООН о применении временных мер к Израилю [1, 8, 9].

В декабре 2025 года конфликт приобрёл новое измерение. Масштабные антиправительственные протесты в Иране, возникшие на фоне тяжелейшего экономического кризиса, были жестко подавлены силовыми структурами, что привело к многочисленным жертвам среди гражданского населения. Иранское руководство возложило ответственность на «внешние силы» — Израиль и Соединённые Штаты Америки, обвинив их в подрыве стабильности страны. Жёсткие заявления президента США Дональда Трампа и израильского

руководства, направленные на «защиту иранского народа» с угрозами военного вмешательства, создали прецедент, при котором внутренний политический кризис мгновенно интернационализировался, превратившись в новый очаг прямой конфронтации. Этот продолжающийся кризис (2025–2026 гг.) представляет собой комплексную угрозу безопасности всего региона, включая соседний Афганистан.

Для Исламского Эмирата Афганистан, который в августе 2021 года вышел из двадцатилетнего периода войны и иностранной оккупации и находится в состоянии хрупкого восстановления, дестабилизация ситуации в Иране представляет собой серьёзные и взаимосвязанные вызовы.

Во-первых, любое военное обострение в приграничных и урбанизированных районах Ирана неизбежно вызовет массовый поток беженцев, направляющихся преимущественно в Афганистан, учитывая закрытость других границ и исторические связи между странами. Такой масштабный миграционный кризис усугубит и без того критическую ситуацию с гуманитарной инфраструктурой страны, которая зависит от международной помощи, и вызовет конкуренцию за ограниченные ресурсы, что может привести к вспышкам болезней и росту социальной напряжённости. Кроме того, лагеря беженцев традиционно становятся очагами повышенного риска — здесь могут активизироваться радикальные группировки, включая ИГИЛ, а также развиваться криминальные сети, что создаст дополнительные угрозы внутренней безопасности.

Во-вторых, экономические последствия конфликта в Иране будут ощутимы и для Афганистана. Иран является важным торговым партнёром и транзитным коридором для товаров и топлива. Военные действия приведут к остановке двусторонней торговли и транзита, вызовут резкий рост цен и дефицит ключевых товаров, в том числе горюче-смазочных материалов, а также спровоцируют падение национальной валюты Афганистана — афгани.

В-третьих, военный конфликт повысит вероятность прямых инцидентов на афгано-иранской границе, включая риск попадания ракет или дронов на территорию Афганистана. Одновременно могут активизироваться проиранские шиитские формирования, такие как «Фатимийюн», что создаст предпосылки для внутренних столкновений и даст повод для внешнего вмешательства. Кроме того, ослабление контроля над границей откроет пути для перемещения боевиков, оружия и наркотиков, усугубляя угрозы безопасности обеих стран.

Наконец, наиболее серьёзной стратегической угрозой для правительства «Талибана» станет возможное появление враждебной военной инфраструктуры у западных границ Афганистана. Падение шиитской теократии в Иране и замена её проамериканским или нестабильным режимом может привести к размещению военных баз США и их союзников, включая Израиль, рядом с афганской территорией. Такое развитие существенно изменит региональный баланс сил, окружит Афганистан потенциально враждебными государствами и ограничит стратегическую автономию талибов. Кроме того, присутствие военных объектов у границ создаст прямую угрозу идеологическому режиму «Талибана», который традиционно занимает жёсткую антиизраильскую и антиамериканскую позицию, что может спровоцировать новый виток конфронтации и усиление милитаризации западных провинций страны. Наконец, усилится угроза «цветной революции» и внутренней дестабилизации, поскольку присутствие враждебных сил будет рассматриваться Кабулом как база для поддержки оппозиции и подрывной деятельности, что приведёт к ужесточению внутренней политики и росту расходов на безопасность в ущерб социально-экономическому восстановлению.

Таким образом, новый кризис вокруг Ирана не может рассматриваться Афганистаном как внешнее событие; он представляет собой непосредственную и многогранную угрозу национальной безопасности, экономической стабильности и социальной сплочённости страны, способную вернуть её к состоянию хаоса и насилия.

Проведённый анализ позволяет заключить, что эскалация, начавшаяся в октябре 2023 года, стала не просто очередным витком палестино-израильского противостояния, а качественным переходом к новой, более опасной фазе системного кризиса на Ближнем Востоке. Этот кризис характеризуется тремя взаимосвязанными признаками, которые имеют далеко идущие последствия для международного права и глобальной безопасности.

Во-первых, конфликт выявил глубокий кризис ключевых институтов и норм международного правопорядка. Принцип запрета приобретения территории силой, закреплённый в Уставе ООН, был фактически девальвирован продолжающейся оккупацией и колонизацией палестинских земель. Право на самооборону (статья 51 Устава ООН), используемое Израилем и его союзниками для легитимации своих действий, применялось непропорционально и без временных ограничений. По оценкам экспертов ООН и Международного суда, это трансформировалось в коллективное наказание и операции, сопряжённые с военными преступлениями и действиями, подпадающими под Конвенцию о предупреждении преступления геноцида [1, 7, 8, 9]. Паралич Совета Безопасности ООН вследствие использования права вето легитимировал возврат к праву сильного как основному регулятору международных отношений в регионе.

Во-вторых, конфликт эволюционировал из локального столкновения между Израилем и палестинскими движениями сопротивления в комплексную гроху-войну. Палестинский вопрос стал катализатором и идеологическим оправданием широкомасштабной конфронтации между двумя блоками: проамериканской коалицией во главе с Израилем и «Осью сопротивления» под патронажем Ирана. Прямое военное столкновение Израиля и Ирана в 2025 году стало прецедентом, разрушающим последние табу на межгосударственную войну в регионе и повышающим риски ядерной эскалации. Эта трансформация отодвинула на второй план саму палестинскую проблему, сделав заложниками гражданского население Газы, продолжающее страдать от последствий неокOLONIALной оккупации и гуманитарной катастрофы, квалифицируемой ведущими правозащитными институтами как рукотворный геноцид [2, 4].

В-третьих, важнейшим выводом исследования является демонстрация того, как кризис в ядре системы — Ближнем Востоке — порождает экзистенциальные угрозы на её периферии. На примере Исламского Эмирата Афганистан наглядно проявляется мультидоменная природа таких вызовов. Потенциальный крах соседней Исламской Республики Иран представляет для Афганистана комплексную угрозу гуманитарно-миграционного, экономического и стратегически-идеологического характера. В частности, речь идёт о рисках массового миграционного кризиса, который способен дестабилизировать внутреннюю устойчивость страны, о вероятности экономической изоляции и коллапса, а также о перспективе размещения военной инфраструктуры США и Израиля у границ, что будет воспринято теократическим режимом Кабула как прямая угроза его существованию.

Таким образом, кризис на Ближнем Востоке становится источником экспортируемой нестабильности, создавая предпосылки для нового витка насилия далеко за пределами своего географического ареала. Итогом является системный отказ от политического урегулирования в пользу силовых методов и умышленное игнорирование норм международного права ради узких политических интересов. Выход из сложившейся ситуации невозможен без возвращения к универсальным правовым принципам: немедленному прекращению оккупации, реализации права палестинского народа на самоопределение и безусловному подчинению всех сторон конфликта — как государств, так и негосударственных акторов — юрисдикции международного правосудия. В противном случае регион и международное сообщество обречены на дальнейшую дестабилизацию с учащающимися и географически расширяющимися циклами насилия.



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ИНСТИТУЦИОНАЛЬНЫЕ БАРЬЕРЫ ПРОЗРАЧНОСТИ В АТО ГАГАУЗИЯ И ПОТЕНЦИАЛ КОМРАТСКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА В ИХ ПРЕОДОЛЕНИИ

INSTITUTIONAL BARRIERS TO TRANSPARENCY IN THE AUTONOMOUS TERRITORIAL UNIT OF GAGAUZIA AND THE POTENTIAL ROLE OF COMRAT STATE UNIVERSITY IN OVERCOMING THEM

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Rezumat: Articolul analizează rolul Universității de Stat din Comrat în consolidarea mecanismelor de consultare publică și participare civică în Unitatea Teritorial-Autonomă Găgăuzia. Studiul examinează cadrul normativ național privind transparența procesului decizional, practicile existente de consultare publică la nivel regional și deficiențele instituționale care limitează participarea reală a societății civile. Autorul argumentează că instituțiile academice pot acționa ca

intermediari neutri între autoritățile publice și comunitate, contribuind la creșterea calității procesului decizional și la consolidarea încrederii publice. Articolul evidențiază potențialul universităților în promovarea culturii participative și a guvernanței deschise în contexte regionale cu capacitate administrativă limitată.

Cuvinte-cheie: consultări publice, guvernanță participativă, Găgăuzia, societate civilă, transparență decizională, universități.

Abstract: The article examines the role of Comrat State University in strengthening public consultation mechanisms and participatory governance in the Autonomous Territorial Unit of Gagauzia. It analyzes the national legal framework on decision-making transparency, existing regional consultation practices, and institutional constraints that hinder meaningful public participation. The author argues that academic institutions can function as neutral intermediaries between public authorities and society, contributing to improved decision-making quality and enhanced public trust. The study highlights the potential of universities to promote participatory culture and open governance in regions with limited administrative capacity.

Key words: civil society, decision-making transparency, Gagauzia, participatory governance, public consultations, universities.

Введение

Автономное территориальное образование Гагаузия (АТО Гагаузия) является уникальным институциональным экспериментом на постсоветском пространстве: это регион с особым правовым статусом, трёхязычной средой и сильной локальной идентичностью. Однако, несмотря на формальные полномочия по самостоятельному нормотворчеству и управлению, на практике Гагаузия демонстрирует один из самых низких уровней прозрачности среди всех административных единиц Республики Молдова. По данным независимого мониторинга, проведённого неправительственной организацией Promo-LEX в 2020 году, ни одно из решений Исполнительного комитета Гагаузии не было внесено в Государственный регистр местных актов, а публичные консультации, предусмотренные Законом о прозрачности процесса принятия решений, проводились формально или вовсе отсутствовали [2 с. 9].

Этот разрыв между нормативными возможностями и реальной практикой создаёт серьёзные институциональные риски, поскольку решения, не опубликованные в Государственном регистре местных актов, нельзя считать юридически вступившими в силу [7 с. 55], а отсутствие синтезов рекомендаций подрывает доверие граждан. В результате прозрачность в Гагаузии остаётся «цифровым фасадом» - сайты Исполкома Гагаузии gagauzia.md [18] и Народного Собрания Гагаузии halktoplushu.md [9] существуют, но не обеспечивают подлинного диалога с обществом.

При слабой институциональной зрелости высшие учебные заведения могут выступать не только как образовательные учреждения, но и как независимые агенты реформы, способные разрабатывать инструменты, проводить мониторинги и выстраивать платформы диалога [14 с. 134]. В этих условиях особую роль приобретает Комратский государственный университет - единственный академический центр в автономии, готовящий специалистов в области публичного управления [1] и обладающий потенциалом стать архитектором доверия между властью и обществом.

Цель данной статьи - проанализировать системные барьеры прозрачности в АТО Гагаузия, обосновать стратегическую роль КГУ в их преодолении и предложить конкретные механизмы, через которые университет может способствовать переходу от имитации открытости к институту подлинного доверия.

В исследовании применялись методы юридического анализа нормативных актов Республики Молдова и АТО Гагаузия; контент-анализ разделов прозрачности на сайтах Исполкома и Народного Собрания Гагаузии; сопоставление фактической практики с данными мониторингов Promo-LEX [2], экспертного отчета, выполненного по заказу Конгресса

местных и региональных органов власти Совета Европы [7] и Отчета Государственной канцелярии об обеспечении прозрачности процесса принятия решений органами государственной администрации в 2024 году [3]; а также аналитико-синтетический подход для интеграции нормативной, эмпирической и сравнительной информации в единый вывод. Такой методологический набор позволил объективно оценить состояние транспарентности и определить роль КГУ как институционального актора, способного компенсировать структурные дефициты открытого управления в Гагаузии.

Правовые основания прозрачности в АТО Гагаузия: между автономией и национальным правом

Правовой статус Автономного территориального образования «Гагаузия» создаёт уникальную правовую конфигурацию, в которой принципы прозрачности формируются на пересечении общереспубликанского законодательства и внутреннего автономного права. Эта двойственность не является противоречием — напротив, она усиливает обязательства органов власти Гагаузии перед гражданами и центральными властями.

Согласно статье 109 Конституции Республики Молдова, органы местного самоуправления действуют на принципах демократии, автономии, подотчётности и гласности [5]. Это конституционное требование распространяется в полной мере и на Гагаузию как особую форму местного самоуправления. Более того, статья 3 Закона о прозрачности в процессе принятия решений» прямо устанавливает, что его действие распространяется на все органы публичной власти, включая автономные, если иное не предусмотрено специальными нормами [13]. Поскольку для Гагаузии таких исключений не существует, Народное Собрание и Исполнительный комитет обязаны соблюдать все процедуры прозрачности: от информирования и публичных консультаций до публикации синтезов рекомендаций и итоговых актов.

Однако ключевая особенность Гагаузии заключается не в подчинении, а в усилении этих обязательств на уровне автономного законодательства. Статья 21 ч. (5) Закона об Исполнительном комитете Гагаузии прямо предписывает: «Исполнительный комитет обеспечивает гласность своей деятельности». Ещё более значима статья 21(3) того же закона, которая обязывает Исполком «принимать и доводить до сведения заинтересованных сторон Внутренние правила организации процедур по обеспечению прозрачности в процессе разработки и принятия решений, разработанные в соответствии с Законом Республики Молдова № 239/2008» [17].

Это положение не является рекомендацией. Оно представляет собой императивную норму, требующую от Исполкома не просто следовать национальному праву, но и институционализировать его через собственные внутренние регламенты. Аналогичные обязательства закреплены и в Регламенте Народного Собрания Гагаузии. Статья 49 требует проведения публичных слушаний и трансляции заседаний на официальном сайте [16].

Таким образом, правовая база прозрачности в Гагаузии не только соответствует, но и превосходит требования, предъявляемые к другим органам местного публичного управления. Автономия получает не просто право на самоуправление, но и повышенную ответственность за его прозрачность и подотчётность.

Именно поэтому систематическое нарушение этих норм приобретает особую тяжесть. По данным мониторинга, проведенного Общественной Ассоциацией Promo-LEX [2], в 2020 году:

- ни одно из шестнадцати заседаний Исполкома Гагаузии не было объявлено одновременно на сайте, стенде и в СМИ, как того требует ст. 13 Закон № 239/2008;
- ни один проект решения не был опубликован на сайте Исполкома несмотря на то, что этого прямо установлено в ст. 10 Закон № 239/2008;
- ни один акт не был внесён в Государственный регистр местных актов, хотя этого требует ст. 101 Закона о местном публичном управлении [12];

- Внутренние правила прозрачности, предусмотренные ст. 21(3) Закона об Исполкоме, так и не были утверждены.

Это свидетельствует не о правовой неопределённости, а о сознательном уклонении от исполнения как общереспубликанских, так и автономных правовых обязательств. Вместо того чтобы использовать свой особый статус как возможность для демонстрации передовой модели открытого управления, органы власти Гагаузии превращают автономию в зону правового вакуума, что подрывает доверие как со стороны населения, так и со стороны центральных властей.

Следовательно, преодоление кризиса прозрачности в Гагаузии начинается не с новых законов, а с реализации уже существующих обязательств, как национальных, так и автономных. Именно в этом заключается основа легитимности особого статуса: не в привилегиях, а в повышенной ответственности и открытости.

Цифровая инфраструктура прозрачности в Гагаузии: между возможностями и реальностью

Наличие правовых обязательств – это необходимое, но недостаточное условие прозрачности. Для их реализации требуется цифровая инфраструктура, способная обеспечить не только публикацию, но и диалог с обществом. В Гагаузии такая инфраструктура формально существует: действуют два официальных сайта - *gagauzia.md* (сайт Исполнительного комитета) и *halktoplushu.md* (сайт Народного Собрания), которые в совокупности охватывают все этапы принятия решений.

Анализ контента сайта *gagauzia.md* показывает, что Исполком публикует повестки заседаний с прилагаемыми материалами, протоколы и видеозаписи заседаний, проекты нормативных актов, действующие постановления, планы закупок, декларации ответственных лиц.

Сайт *halktoplushu.md* содержит два ключевых раздела: «Законотворчество», где содержится перечень законопроектов с номерами инициатив, и «Нормативная база» - с Законом об особом статусе Гагаузии, Регламентом Народного Собрания, местными законами, постановлениями.

На первый взгляд, это соответствует требованиям статьи 15 Закона № 239/2008, которая обязывает публиковать не только итоговые акты, но и проекты, материалы консультаций и синтезы рекомендаций. Однако, при детальном рассмотрении выявляется глубокая фрагментация и отсутствие функциональной интеграции, превращающие цифровые платформы в «информационные острова», изолированные друг от друга и от национальной экосистемы прозрачности.

Во-первых, на обоих сайтах отсутствует обязательный «единый модуль открытого управления», обеспечивающий прямую публикацию проектов в национальный портал *particip.gov.md*, который все органы публичной власти, согласно п. 15. п\п 15) Постановления правительства об официальных веб-сайтах органов публичного управления и публичных учреждений обязаны интегрировать на своих сайтах [10].

Во-вторых, принятые нормативные акты так и не публикуются в Государственном регистре местных актов, хотя, согласно статье 101 Закона о местном публичном управлении, все акты органов местной публичной власти подлежат обязательному внесению в Регистр в течение 5 рабочих дней. Однако, и в 2025 году ни одно решение Исполкома Гагаузии не было внесено в Регистр [4]. Это не техническая ошибка. Это системное игнорирование условия вступления решений в силу.

В-третьих, отсутствуют инструменты участия в процессе принятия решений. На обоих сайтах отсутствуют формы для подачи рекомендаций, контакта ответственных лиц, календари публичных слушаний (раздел «Календарь слушаний» на *halktoplushu.md* пуст), синтезы рекомендаций.

Как подчёркивает Отчет Государственной Канцелярии, только 45% центральных органов публикуют синтезы, а на местном уровне эта цифра стремится к нулю [3 с. 52]. Без

синтеза участие теряет смысл, поскольку гражданин не узнаёт, было ли его мнение учтено, и не может требовать мотивированного объяснения решений.

В-четвёртых, информация не адаптирована под многоязычную специфику Гагаузии. Несмотря на то, что гагаузский и румынский (молдавский) языки имеет официальный статус и признаны в числе официальных языков автономии, все проекты нормативных актов и пояснительные материалы публикуются исключительно на русском языке. Это формально исключает из процесса участия тех граждан, для кого гагаузский или румынский являются единственным или предпочтительным языком общения, особенно в сельской местности и среди старшего поколения.

Таким образом, отсутствие официальной информации на гагаузском и румынском языках нарушает принцип инклюзивности и создаёт барьер для реального участия этнических гагаузов и молдаван в управлении автономией». Это особенно критично в контексте международных стандартов, (в частности, Принципов SIGMA), которые требуют, чтобы информация была доступна на языках, реально используемых населением, а не только на языке административной традиции.

Наконец, документы не соответствуют требованиям открытых данных. В соответствии со ст. 10 ч. (5) Закона о доступе к общественно значимой информации, информация должна быть доступна в машиночитаемом формате и с возможностью скачивания [11]. Однако на сайтах Гагаузии преобладают сканы, изображения и встроенные *iframe*, что делает анализ невозможным и нарушает принцип «открыто по умолчанию».

Таким образом, цифровая инфраструктура в Гагаузии существует формально, но не функционирует фактически. Она создаёт иллюзию прозрачности, но не обеспечивает подлинного диалога. Чтобы преодолеть этот разрыв, требуется не просто обновление сайтов, а институциональное проектирование — интеграция платформ, соблюдение стандартов открытых данных и восстановление связи с национальной системой прозрачности.

Институциональные риски фрагментированной прозрачности: юридическая недействительность, подрыв легитимности и социальная изоляция

Наличие цифровых платформ и нормативных обязательств не гарантирует функционирования системы прозрачности. Как показывает практика Гагаузии, формальное соблюдение отдельных элементов при игнорировании ключевых процедур создаёт фрагментированную модель прозрачности, которая не только не способствует диалогу, но и порождает серьёзные институциональные риски.

Основной и главный риск — это подрыв легитимности автономного статуса. АТО Гагаузия существует не только на основании закона, но и на основе политического договора между центром и регионом. Одним из ключевых условий этого договора является высокий уровень самоуправления и ответственности. Однако, как отмечается в Отчёт о практических аспектах обеспечения прозрачности в процессах принятия решений центральными и местными органами власти, в регионах с низким уровнем прозрачности «граждане теряют доверие к институтам власти и сомневаются в их способности эффективно управлять» [7]. Когда автономия демонстрирует худший уровень прозрачности, чем даже отдельные районные советы, её претензии на «особый путь управления» теряют основания. Вместо «лаборатории демократии» Гагаузия рискует превратиться в зону правового вакуума, что подрывает саму идею автономии.

Кроме того, фрагментация прозрачности ведёт к потере доступа к международным ресурсам. Программы ЕС, такие как «Восточное партнерство» или «Instrument for Pre-Accession Assistance» (IPA), прямо требуют выполнения стандартов открытого управления. Доклад Европейской комиссии о Республике Молдова за 2024 год прямо указывает: «уровень прозрачности и вовлечения заинтересованных сторон в Республике Молдова требует улучшения» [8, с. 71]. Если Гагаузия не сможет продемонстрировать реальные улучшения, её шансы на получение финансирования для развития инфраструктуры, образования или здравоохранения будут серьёзно ограничены.

Таким образом, фрагментированная прозрачность в Гагаузии — это не просто административный недостаток, а стратегическая уязвимость, затрагивающая правовую, политическую, социальную и экономическую сферы.

Стратегия модернизации: от сайта к институту открытого управления

Преодоление кризиса прозрачности в АТО Гагаузия требует не точечных улучшений, а системного институционального проектирования, поскольку эффективная реформа должна быть «не формальной, а целостной, включающей правовые, институциональные и культурные аспекты» [14 с. 134]. Для Гагаузии это означает переход от «цифрового фасада» к созданию института открытого управления, где прозрачность — не внешний ритуал, а внутренний принцип работы.

Первым и обязательным шагом является утверждение Внутренних правил прозрачности, предусмотренных статьёй 21(3) Закона об Исполкоме Гагаузии. Эти правила должны регламентировать порядок проведения публичных консультаций, назначать ответственное лицо за координацию, устанавливать сроки публикации материалов и синтезов рекомендаций, определять порядок многоязычной коммуникации.

Вторым шагом должно стать создание «Регистра нормативных актов Гагаузии» - своего рода регионального зеркала Государственного регистра местных актов. Региональный регистр позволит обеспечить юридическую валидность актов; создать единый, структурированный архив; обеспечить поиск по дате, теме, автору; интегрировать данные в национальную систему через API.

Третий элемент — институционализация публичных консультаций. Сегодня на сайте Народного Собрания отсутствует календарь публичных слушаний, а на сайте Исполкома нет даже формы для подачи рекомендаций. Необходимо ввести обязательный календарь слушаний на 6 месяцев вперёд, разместить на сайте интерактивную форму подачи мнений, публиковать синтезы рекомендаций в течение 10 рабочих дней после завершения консультаций с мотивировкой каждого решения.

Четвёртый элемент — многоязычная доступность. Хотя русский язык выполняет функцию *лингва франка*, гагаузский и румынский (молдавский) языки имеют официальный статус и являются языками идентичности. Поэтому все ключевые документы - законы, бюджет, отчёты - должны сопровождаться кратким резюме на гагаузском и румынском языках.

Пятый элемент — интеграция цифровой инфраструктуры. Сайты *gagauzia.md* и *halktoplushu.md* должны быть объединены в единый портал «Открытая Гагаузия», где проект закона → консультации → синтез → принятый акт → регистрация → отчёт об исполнении - будут представлены как единая цепочка; все документы будут в машиночитаемом формате (XML, JSON), как того требует статья 10 ч. (5) Закона № 148/2023; будет внедрён модуль *particip.gov.md* в соответствии с Постановлением Правительства № 728/2023.

Такая стратегия не требует больших бюджетов, но предполагает политическую волю, институциональную дисциплину и готовность к диалогу. Только в этом случае Гагаузия сможет превратиться из «зоны правового вакуума» в лабораторию открытого управления, демонстрирующую, как автономия может стать ресурсом, а не препятствием для демократии.

Роль Комратского государственного университета как архитектора доверия

На фоне системного кризиса прозрачности в АТО Гагаузия Комратский государственный университет обладает уникальным потенциалом стать не просто образовательным учреждением, а независимым агентом реформы открытого управления. Университет, как единственный вуз в автономии, готовящий специалистов по публичному управлению, обладает всеми необходимыми ресурсами для реализации этой миссии.

Первая функция КГУ — подготовка кадров нового типа. Студенты, обучающиеся по специальности «Публичное управление», в рамках курса «Прозрачность в процессе принятия решений» получают знания относительно функционирования Государственного регистра местных актов, платформы *particip.gov.md*. Они изучают такие понятия, как «синтез рекомендаций» и «оценка регулирующего воздействия». Знакомятся с нормативной базой

Гагаузии. Эти компетенции позволяют им не только соблюдать формальные требования, но и внедрять культуру открытости в будущей профессиональной деятельности, поскольку, как отмечают исследователи, «в органах публичной власти отсутствует понимание процедур прозрачности как инструмента качества, а не формальной обязанности» [7 с. 52]. Выпускники КГУ могут стать теми, кто изменит эту установку.

Вторая функция — независимый мониторинг и аналитика. КГУ может ежегодно публиковать собственный «Отчёт о прозрачности органов власти Гагаузия», дополняя или верифицируя национальные мониторинги. Такой отчёт, основанный на методологии Promo-LEX и стандарты SIGMA [15], мог бы воспроизводить объективную картину соблюдения требований открытого управления: полноту публикаций, наличие внутренних правил прозрачности, использование синтезов рекомендаций, соответствие сроков консультаций и внесения документов в Регистр.

Наличие независимого академического отчёта создало бы конкурентную среду ответственности и стимулировало бы органы власти к улучшению практик.

Третья функция — разработка институциональных инструментов. На основе анализов местных и зарубежных экспертов, а также требований международных актов и национального законодательства, КГУ может разработать проект Внутренних правил прозрачности для Исполкома Гагаузии, шаблон многоязычного синтеза рекомендаций на гагаузском, русском и румынском языках, чек-лист для оценки качества публичных консультаций, прототип Регистра нормативных актов Гагаузии как регионального зеркала Государственного регистра местных актов.

Эти инструменты должны быть не теоретическими, а практически применимыми, с учётом ресурсных ограничений малых органов местной публичной власти.

Четвёртая функция — студенческие проекты как пилотные инициативы. Студенты могут запускать реальные проекты, которые демонстрируют, как может выглядеть открытая Гагаузия: «Открытый бюджет Гагаузии» - инфографика на гагаузском языке с пояснением, куда тратятся средства; «Календарь публичных слушаний» - интерактивная карта с датами и темами обсуждений; «Портал открытой Гагаузии» - прототип единой платформы, объединяющей *gagauzia.md* и *halktoplushu.md*.

Такие проекты, даже если они остаются на уровне курсовых работ, становятся демонстрационными моделями, которые могут быть масштабированы при наличии политической воли.

Пятая функция — платформа диалога. КГУ может инициировать регулярный «Форум открытого управления Гагаузия», где представители власти, НПО, бизнеса и образования будут обсуждать барьеры прозрачности, лучшие практики, предложения по реформе. Такой форум мог бы стать институционализированным механизмом совместного проектирования политик - именно тем, что Совет Европы называет «подлинным диалогом» [6].

Таким образом, КГУ обладает возможностью выйти за рамки традиционной образовательной миссии и стать архитектором доверия в Гагаузии. Успех этой роли зависит не от бюджета, а от профессиональной этики, академической независимости и готовности действовать как соучастник реформы, а не как сторонний наблюдатель.

Заключение

Анализ нормативной архитектуры транспарентности, фактической практики органов власти АТО Гагаузия и национальных требований, закреплённых в законодательстве Республики Молдова, позволяет сделать вывод о глубоком разрыве между формальными обязательствами и реальными административными процедурами. Несмотря на наличие законодательных оснований для обеспечения открытости, механизмы прозрачности в автономии остаются фрагментированными, нерегулярными и несистемными. Публикация проектов решений, синтезов рекомендаций и протоколов заседаний осуществляется выборочно, решения Исполнительного комитета не интегрируются в Государственный

регистр местных актов, а синтез рекомендаций либо отсутствует, либо не соответствует установленным требованиям качества.

На этом фоне особое значение приобретает роль институциональных акторов, способных компенсировать дефицит административной зрелости и инициировать процессы модернизации. Комратский государственный университет выступает именно таким актором, сочетая образовательную, аналитическую и общественную функции, что позволяет ему действовать как независимый центр экспертизы и как носителю культуры открытого управления. Университет способен формировать профессиональные компетенции будущих управленцев, обеспечивать объективный мониторинг прозрачности, разрабатывать прикладные регуляторные инструменты и выступать платформой для конструктивного диалога между властью и обществом.

Таким образом, в условиях системного кризиса прозрачности в автономии университет может стать не только участником, но и архитектором институционального доверия. Его потенциал обусловлен не только академическими ресурсами, но прежде всего независимостью, профессиональной этикой и готовностью брать на себя роль посредника между государственными структурами и гражданским обществом. Совокупность этих факторов позволяет рассматривать Комратский государственный университет как ключевой элемент будущей модели открытого управления в Гагаузии, способной обеспечить устойчивость демократических процессов и повышение качества публичной политики.

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РОЛЬ ЕВРОПЕЙСКОГО СУДА ПО ПРАВАМ ЧЕЛОВЕКА В ЗАЩИТЕ ПРАВ ГРАЖДАН РЕСПУБЛИКИ МОЛДОВА

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Abstract. The European Court of Human Rights (ECHR) plays a crucial role in protecting the rights of Moldovan citizens. This article examines key ECHR rulings related to Moldova, their impact on the national judicial system, and the country's legal framework. The mechanisms for implementing ECHR decisions and their influence on human rights protection in Moldova are analyzed.

Keywords: European Court of Human Rights, Moldova, human rights, legal protection, ECHR, court decisions, justice, legal system, European Convention, law.

Европейский суд по правам человека (ЕСПЧ) играет ключевую роль в защите прав и свобод человека в странах-участницах Совета Европы, включая Республику Молдова.

После ратификации Европейской конвенции о защите прав человека и основных свобод в 1997 году, Республика Молдова активно участвует в системе Европейской конвенции. Несмотря на это, большое количество жалоб от граждан Республики Молдовы в ЕСПЧ указывает на наличие проблем в национальной судебной системе страны.

ЕСПЧ служит важным механизмом, позволяющим гражданам Республики Молдовы обращаться за защитой своих прав, когда национальные средства защиты оказываются неэффективными или недостаточными. Суд рассматривает индивидуальные жалобы на

нарушения прав, гарантированных Конвенцией, и выносит решения, обязательные для исполнения государствами-ответчиками [2].

Деятельность ЕСПЧ не только способствует защите прав человека в Республике Молдове, но и оказывает влияние на развитие национального законодательства и судебной практики. Решения ЕСПЧ часто служат основанием для внесения изменений в законодательство и процедуры с целью обеспечения соответствия стандартам Конвенции.

Важно отметить, что ЕСПЧ является последней инстанцией, к которой могут обратиться граждане Республики Молдовы после исчерпания всех внутренних средств правовой защиты.

Европейский суд по правам человека (ЕСПЧ) играет важную роль в защите прав граждан Молдовы, рассматривая жалобы на нарушения, которые могли быть допущены государственными органами или судебной системой страны. За годы своей деятельности ЕСПЧ вынес ряд значимых решений против Республики Молдова, касающихся нарушений различных прав, гарантированных Европейской конвенцией о защите прав человека и основных свобод.

Одной из наиболее важных сфер, в которых ЕСПЧ защищает права граждан Республики Молдовы, является право на справедливое судебное разбирательство, закрепленное в статье 6 Конвенции. ЕСПЧ неоднократно указывал на недостатки в судебной системе Республики Молдовы, такие как чрезмерная продолжительность судебных разбирательств, отсутствие независимости судей и неисполнение судебных решений.

Другой важной областью, где ЕСПЧ защищает права граждан Республики Молдовы, является право на свободу и личную неприкосновенность, гарантированное статьей 5 Конвенции. ЕСПЧ выносил решения, в которых признавал незаконное задержание и арест граждан Республики Молдовы, а также нарушение их права на свободу передвижения.

Кроме того, ЕСПЧ защищает граждан Республики Молдовы от пыток и бесчеловечного обращения, что гарантируется статьей 3 Конвенции. ЕСПЧ рассматривал жалобы на жестокое обращение со стороны правоохранительных органов и указывал на необходимость принятия мер для предотвращения подобных нарушений.

Одним из примеров важного решения ЕСПЧ, которое оказало влияние на правоприменительную практику в Республике Молдове, является дело "Ilașcu and Others v. Moldova and Russia" (2004). В этом деле ЕСПЧ признал нарушение прав заявителей, которые незаконно удерживались в Приднестровье. Это решение стало важным шагом на пути защиты прав граждан Республики Молдовы, проживающих в этом регионе [3].

Решения ЕСПЧ не только обеспечивают защиту прав конкретных заявителей, но и способствуют улучшению ситуации с правами человека в Республике Молдове в целом. Они оказывают влияние на развитие национального законодательства и судебной практики, а также на формирование правосознания общества.

Исполнение решений Европейского суда по правам человека (ЕСПЧ) является важным показателем эффективности механизмов защиты прав человека в стране.

В Республике Молдова были проведены реформы в судебной системе, направленные на приведение национального законодательства в соответствие с требованиями Европейской конвенции о защите прав человека и основных свобод. Несмотря на это, проблемы с исполнением решений ЕСПЧ остаются актуальными, о чем свидетельствует неоднократная критика со стороны Совета Европы.

Решения ЕСПЧ оказывают значительное влияние на правовую систему Республики Молдовы. Они служат основанием для внесения изменений в законодательство и судебную практику с целью обеспечения соответствия стандартам Конвенции. Однако, как показывает практика, принятие законодательных изменений не всегда приводит к реальному улучшению ситуации с исполнением решений ЕСПЧ.

Одним из примеров является дело "Ojog and Others v. Moldova" (2021), в котором ЕСПЧ установил нарушение права на справедливое судебное разбирательство в связи с длительными сроками рассмотрения дел в национальных судах [4].

В результате этого решения Республика Молдова приняла ряд законодательных изменений, направленных на ускорение судебного разбирательства. Однако, как показывает практика, проблема длительных сроков рассмотрения дел в молдавских судах до сих пор не решена.

Эффективное исполнение решений ЕСПЧ требует не только принятия законодательных изменений, но и изменения правоприменительной практики, а также повышения квалификации судей и других участников судебного процесса.

Кроме того, необходимо обеспечить независимость судебной системы и исключить любое вмешательство в ее деятельность со стороны исполнительной власти или других органов государственной власти.

В целом, несмотря на определенные успехи, Республика Молдова сталкивается с серьезными вызовами в области исполнения решений ЕСПЧ. Решение этой проблемы требует комплексного подхода, включающего в себя не только законодательные изменения, но и реформу судебной системы, а также повышение правовой культуры общества.

Несмотря на положительное влияние Европейского суда по правам человека (ЕСПЧ) на правовую систему Республики Молдова, страна продолжает сталкиваться с серьезными вызовами в области защиты прав человека. Эти вызовы требуют постоянного внимания и принятия мер для улучшения ситуации [5].

Одной из основных проблем остается недостаточная эффективность исполнения решений ЕСПЧ. Несмотря на то, что Республика Молдова принимает законодательные изменения, направленные на приведение национального законодательства в соответствие с требованиями Конвенции, на практике решения ЕСПЧ часто не исполняются в полной мере или исполняются с большими задержками. Это подрывает авторитет ЕСПЧ и создает у граждан ощущение безнаказанности за нарушения прав человека [5].

Другой серьезной проблемой является коррупция в судебной системе. Коррупция препятствует независимому и беспристрастному рассмотрению дел, создает неравенство перед законом и подрывает доверие граждан к судебной системе.

Политическое влияние на суды также остается серьезной проблемой. Независимость судебной власти [1] является одним из ключевых принципов правового государства, и любое вмешательство в ее деятельность со стороны исполнительной власти или других органов государственной власти недопустимо.

Ограниченный доступ граждан к правосудию, особенно для социально уязвимых групп населения, также является серьезной проблемой. Многие граждане не имеют достаточных средств или юридических знаний для того, чтобы обратиться в суд за защитой своих прав.

Для улучшения ситуации в области защиты прав человека в Республике Молдове необходимы дальнейшие реформы, направленные на усиление независимости судебной власти, повышение уровня правовой осведомленности граждан и эффективное исполнение решений ЕСПЧ на национальном уровне.

Важно отметить, что защита прав человека является общей задачей государства и общества. Каждый гражданин должен осознавать свои права и быть готовым защищать их всеми доступными способами.

Европейский суд по правам человека (ЕСПЧ) играет ключевую роль в защите прав граждан Республики Молдова, оказывая значительное влияние на развитие национальной судебной системы и законодательства страны. Благодаря деятельности ЕСПЧ, граждане Республики Молдовы имеют возможность обращаться за защитой своих прав на международном уровне, когда национальные средства защиты оказываются неэффективными или недостаточными.

Решения ЕСПЧ служат важным инструментом для улучшения ситуации с правами человека в Республике Молдове. Они указывают на системные проблемы в правовой системе страны и способствуют принятию мер по их решению. Благодаря решениям ЕСПЧ, в Республике Молдове были проведены реформы в судебной системе, направленные на



приведение национального законодательства в соответствие с требованиями Европейской конвенции о защите прав человека и основных свобод [5].

Однако эффективность работы ЕСПЧ во многом зависит от того, насколько добросовестно национальные органы власти выполняют его решения. Проблемы с исполнением решений ЕСПЧ остаются актуальными для Республики Молдовы, что подтверждается неоднократной критикой со стороны Совета Европы. Для улучшения ситуации необходимо не только принятие законодательных изменений, но и изменение правоприменительной практики, а также повышение квалификации судей и других участников судебного процесса.

Дальнейшее сотрудничество Республики Молдовы с международными институтами правосудия, такими как ЕСПЧ и Совет Европы, может способствовать улучшению ситуации в области защиты прав человека в стране. Важно отметить, что защита прав человека является общей задачей государства и общества. Каждый гражданин должен осознавать свои права и быть готовым защищать их всеми доступными способами.

В заключение можно отметить, что Европейский суд по правам человека играет важную роль в защите прав граждан Республики Молдовы. Несмотря на существующие проблемы, сотрудничество с ЕСПЧ и другими международными институтами является важным фактором на пути к построению правового государства, в котором права человека защищены и уважаются.

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АВТОНОМИЯ В ПРАВОВОЙ ДОКТРИНЕ КАК ИНСТИТУТ КОНСТИТУЦИОННОГО ПРАВА

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Abstract. The subject of this study is a set of theoretical concepts and legal doctrines that define the legal nature, status, and functional purpose of autonomy as a constitutional and legal institution within the framework of the state structure.

The aim of this work is to develop the theoretical foundations of public law through a systematic analysis of the evolution of the concept of “autonomy” and the development of its author's definition, taking into account contemporary trends in decentralization and the need to ensure the stability of the state organism.

The research methodology is based on the basic principles of dialectics of cognition and includes a set of general scientific (analysis, synthesis) and special legal methods. The work uses the historical-doctrinal method to study the genesis of ideas, the comparative-legal method to compare national legal schools, and the systemic-structural and functional methods to determine the characteristics of autonomy as a stable legal institution.

The results of the study may be of interest to constitutional scholars, specialists in the field of public administration, and experts dealing with issues of regional policy and legal regulation of interbudgetary and interethnic relations.

The novelty of the work is expressed in the acquisition of scientific knowledge necessary for the formation of a relevant concept of autonomy capable of adapting a unitary state to the challenges of territorial diversity. This includes the author's definition of the concept of “autonomy,” which synthesizes the classical requirements of state sovereignty and the modern requirements of institutional guarantees of regional identity.

The main conclusions include: (1) the transformation of the perception of autonomy in doctrine from a form of administrative self-government to an understanding of it as a fundamental element of the constitutional order; (2) the need to identify four mandatory characteristics of autonomy (normative stability, division of powers, institutional subjectivity, and preservation of the unity of sovereignty) in order to distinguish it from simple decentralization; (3) the recognition of autonomy as a dynamic tool that allows potential ethno-political conflicts to be transformed into a constructive channel of institutional interaction.

Keywords: autonomy, constitutional law, decentralization, sovereignty.

В современном публичном праве институт автономии представляет собой одну из наиболее сложных и востребованных моделей организации публичной власти. Его природа заключается в поиске устойчивого равновесия между принципом государственного суверенитета и необходимостью обеспечения институциональной самостоятельности территорий, обладающей политической, культурной или этнической спецификой.

Историко-доктринальная эволюция понятия автономии демонстрирует значительную вариативность его восприятия в различных правовых традициях.

Особое внимание в науке уделяется функциональной динамике развития автономий, механизму их нормативной устойчивости и роли в обеспечении стабильности многонационального и многоуровневого государственного механизма.

Автономия, возникшая как ответ на ограниченность классических подходов к децентрализации, в настоящее время рассматривается как конституционно гарантированный режим, обеспечивающий сочетание локального самоуправления с сохранением единства государственного правопорядка.

Фундамент для юридической легитимации автономии был заложен в немецкой школе государственного права конца XIX - начала XX века, где проблема соотношения централизации и децентрализации рассматривалась в рамках общей теории государства.

Выдающийся немецкий правовед, автор «Общего учения о государстве» Георг Еллинек трактовал автономию как «децентрализованное государственное единство», подчеркивая необходимость институционального включения автономных образований в общегосударственную структуру. В его теории понятия «децентрализация» и «автономия» не подрывают структурное единство государства, а представляют собой правомерные формы институционализации его внутренней дифференциации. Предоставление полномочий Г. Еллинек трактовал как акт самоограничения государства [3, С. 492]. Важнейшей и безусловной заслугой ученого является отрицание абсолютной неограниченности государственной власти. Учреждая автономию, признавая ее права, государство таким образом ограничивает пределы своей власти. Вместе с тем, концепция автономии как «дара» суверена, который может быть отозван по воле центра, делает статус автономии юридически уязвимым перед лицом политической воли государства.

Французская доктрина первой трети XX века, представленная ученым Леоном Дюги (1859–1928), фокусировалась на функциональном характере автономии. Являясь основателем школы солидаризма, Дюги понимал её как делегирование публичных функций в условиях сохранения приоритета центральной власти [2, С. 367]. Именно данная модель государства, по мнению ученого, обеспечивает социальную солидарность. Вместе с тем, сводя автономию к «эффективному управлению», Дюги не учитывал её политическую и культурную природу. В такой модели автономия выступает как инструмент административного менеджмента, лишенный гарантий самостоятельности, обеспеченных на высшем законодательном уровне.

Англосаксонская доктрина начала XX века развивалась под сильным влиянием идей выдающегося английского юриста и конституционалиста, профессора Оксфордского университета, автора классического труда «Основы конституционного права Великобритании» А. В. Дэйси. В своих трудах ученый представил модель автономии, функционирующую при сохранении абсолютного суверенитета Парламента Соединенного Королевства. Автономия трактовалась не как разделение суверенитета, а как учреждение подчиненной легислатуры, чья компетенция носит дискреционный характер и юридически полностью зависит от воли центрального законодателя. Дэйси подчеркивал прагматичный характер такого устройства: автономия – это политический инструмент управления, который позволяет разгрузить центральное правительство, сохраняя при этом юридическое единство империи и право «последнего слова» за Вестминстером [1, С. 102, 174].

Жесткий принцип парламентского верховенства в любых вопросах, касающихся территориально-политической организации государства, в начале века приводил к острым политическим конфликтам, так как автономные регионы стремились получить конституционные гарантии самостоятельности, которые английская правовая доктрина того времени трактовала как подрыв основ абсолютного парламентского суверенитета.

В российской конституционно-правовой науке начала XX века, напротив, преобладал более «охранительный» подход. Выдающийся ученый Ф. Ф. Кокошкин (1871–1918) последовательно доказывал, что государство должно сохранять правовое единство, а признание автономий по этническому признаку несет риск формирования «государств в государстве». В его концепции автономия – это интегрированная часть единого правопорядка

под жестким контролем центра [4, С. 258]. По нашему мнению, такой концептуальный подход фактически приравнивает автономию и местное самоуправление, что противоречит цели национальных регионов обрести подлинную политическую субъектность.

Научные исследования Г. Еллинека, Л. Дюги, А. В. Дайси и Ф. Ф. Кокошкина заложили фундаментальную теоретическую основу, без которой было бы невозможно современное осмысление конституционно-правовой природы автономии. Впервые автономия перестала рассматриваться исключительно как политическая уступка или случайный компромисс и обрела статус правовой конструкции и научной категории.

Таким образом, классическая доктрина начала XX века не просто подготовила почву, но и заложила фундамент для формирования современного понимания автономии как конституционно-правового института и инструмента обеспечения демократического согласия и стабильности.

Вместе с тем, новые вызовы, связанные с глобализацией и этнокультурным плюрализмом, потребовали переосмысления исторически сформировавшихся правовых понятий и появлению современного подхода к понятию автономии, основанному не на одностороннем делегировании полномочий, а на принципах конституционного партнерства и взаимного признания.

В современной конституционно-правовой науке произошел фундаментальный переход от упрощенного, статичного восприятия автономии как формального разграничения компетенций между центром и периферией. В настоящее время институт автономии признается как инструмент обеспечения системной устойчивости и легитимности государства в условиях динамично меняющейся социально-политической реальности.

Одной из наиболее авторитетных и научно обоснованных концепций современной юридической науки является теория профессора сравнительного конституционного права Университета Вероны и директора Института сравнительного федерализма (Eurac Research) Франческо Палермо. Доктринальный подход Ф. Палермо базируется на понимании автономии как инструмента институционального структурирования многообразия, который трансформирует потенциальные этнополитические противоречия в упорядоченную систему конституционно-правового взаимодействия [7, С. 118-121]. Согласно точке зрения ученого, в многосоставном государстве автономия выступает не как уступка сепаратизму, а как высшая форма конституционной интеграции. Палермо внес неоценимый вклад в конституционно-правовую науку, доказав, что жизнеспособность автономного образования определяется не столько количественным объемом переданных ему полномочий, сколько качеством правовых гарантий его статуса. В своих новейших работах Ф. Палермо развивает данную концепцию, вводя понятие «права многообразия». Ученый подчеркивает, что ключевым индикатором устойчивости системы выступает «процедурный иммунитет» автономии, выраженный в неспособности центральной власти в одностороннем порядке девальвировать правовые гарантии статуса региона в условиях политической конъюнктуры [8, С. 42-45].

Анализ современной правовой доктрины позволяет констатировать, что смещение акцента на юридические конструкции порождает определенный риск «чрезмерной юридизации» политических процессов. Во взаимоотношениях центральных и автономных органов власти избыточное доверие к формальным процедурам может замедлить живой политический диалог, превращая гибкий механизм согласования интересов в процессуальную ловушку.

Выдающийся британский исследователь, профессор политологии Университета Абердина Майкл Китинг блестяще демонстрирует социально-институциональное измерение автономии. Его фундаментальная концепция «территориальной реструктуризации» государственного пространства знаменует собой парадигмальный сдвиг в понимании природы современной государственности, предлагая научно обоснованный взгляд на эволюцию суверенитета в условиях многоуровневого управления [5, с. 72-75, 112]. Китинг рассматривает автономии не как пассивные административные единицы, а как активные

«институциональные пространства», в которых формируется уникальная политическая легитимность. Согласно его теории современное государство - это динамическая конструкция, где региональная идентичность становится не угрозой, а источником развития. Исследования М. Китинга демонстрируют, как институт автономии способствует адаптации государства к вызовам глобализации. Это достигается путем наделения регионов функциональной субъектностью, позволяющей им эффективно сохранять идентичность и самостоятельно адаптировать социально-экономические стратегии к глобальным вызовам, что подтверждает тезис о переходе от жестких иерархий к сетевым моделям государственного управления [6, С. 18-22].

Представляется, что модель «многоуровневого управления», предложенная Китингом, является доктринальным вызовом классической теории суверенитета. Размывание четких границ ответственности между уровнями власти может затруднять правовую идентификацию «конечной точки» принятия решений, что требует от конституционалистов поиска новых форм разделения компетенций в рамках единого правового порядка.

Особое место в современной доктрине занимает юридико-процедурный подход, развиваемый представителем скандинавской правовой школы, профессором публичного права Университета Або Академи Маркку Сукси [9, С. 65-67, 131]. Являясь ведущим мировым экспертом по статусу Аландских островов, профессор Сукси анализирует технологию правового взаимодействия. Он убедительно доказывает, что устойчивость автономии зиждется не на самом факте закрепления прав, а на наличии постоянных, институционализированных каналов диалога между центром и регионом. В работах Сукси автономия предстает как непрерывный процесс коммуникации, подкрепленный конституционными гарантиями. Ученый доказывает, что в условиях современных политических кризисов именно «институциональная устойчивость» процедур, таких как право «вето» автономии на изменение своего статуса или участие в конституционном правосудии, позволяет рассматривать автономию как систему «взаимного признания», где правовые процедуры исключают возможность одностороннего диктата. Это позволяет дефинировать автономию не как статичную уступку, а как «динамическое равновесие» прав и обязанностей центра и региона [10, С. 14-17].

Следует признать, что модель Сукси является идеалистичным правовым решением. Реализация такой модели требует высокого уровня правовой культуры и взаимного доверия сторон, что делает её прямое масштабирование на государства с переходной демократией или высокой степенью политической поляризации крайне сложной задачей, требующей длительного периода адаптации.

Таким образом, научный вклад Ф. Палермо, М. Китинга и М. Сукси позволил сформировать современное научное понятие автономии. Благодаря исследованиям этих ученых автономия в настоящее время понимается не как статичная форма децентрализации, а как динамический конституционно-правовой институт, способный обеспечить долгосрочную стабильность государства через баланс юридических гарантий, политической идентичности и процедурного диалога. Этот теоретический синтез заложил основу для современного доктринального восприятия автономии как неотъемлемого элемента демократического конституционализма XXI века.

Анализ фундаментальных классических теорий и современных компаративистских исследований позволяет выделить систему существенных признаков, которые конституируют автономию как особый институт и позволяют дифференцировать её от простой административной децентрализации или местного самоуправления.

Первым и определяющим признаком является юридическая легитимация на высшем законодательном уровне. Правовой статус автономии закрепляется не на уровне обычного закона или подзаконного акта, а в Конституции государства или специальном Статуте (органическом законе), имеющем силу конституционного. Это обеспечивает процессуальную стабильность статуса: автономия получает защиту от произвольного, одностороннего

пересмотра или упразднения со стороны центральных властей, поскольку изменение такого статуса, как правило, требует сложной процедуры согласования с самой автономией (принцип взаимного согласия). Такая нормативная конструкция превращает автономию из временного политического компромисса в устойчивый элемент государственного порядка организации публичной власти.

Не менее важным признаком выступает наличие специального, законодательно защищенного объема собственных полномочий. В отличие от административной децентрализации, где органы на местах лишь исполняют волю центра, автономия предполагает право на собственное нормотворчество. Речь идет о широком спектре законодательных, административных и фискальных прерогатив, которые имеют юридический иммунитет от необоснованного вмешательства центральных институтов. Наличие собственной законодательной компетенции является своеобразной демаркационной линией, выделяющей автономию от административно-территориальных единиц.

Наличие собственной системы органов публичной власти, формирующихся на основе демократического волеизъявления населения территории, придает автономному образованию статус устойчивого публично-правового субъекта. Наличие собственного законодательного собрания (парламента) и исполнительного органа власти (правительства) позволяет автономии не просто «управлять», а реализовывать собственную региональную политику, обладая при этом высокой степенью политической ответственности перед местным сообществом.

Концептуально значимым признаком автономии является ее функционирование исключительно в пределах неделимого государственного суверенитета. Эта форма внутреннего самоопределения в рамках единого государства не содержит признаков государственной независимости. Правопорядок автономии является составной частью общенационального правопорядка, а автономные органы встроены в общую систему публичной власти государства, что исключает риск превращения автономии в «государство в государстве».

Таким образом, содержание понятия «автономия» претерпело в юридической доктрине фундаментальную трансформацию от ограниченной формы административного самоуправления к пониманию её как полноценного конституционно-правового института.

Современная правовая доктрина демонстрирует динамику осмысления автономии от узкого позитивистского разграничения сфер ведения к признанию фундаментальной роли в обеспечении системной политической стабильности, демократической легитимности и институциональной интеграции территориального многообразия. Следовательно, в настоящее время статичная юридическая конструкция трансформируется в динамичный инструмент адаптации государственности к сложным социальным, этнокультурным и институциональным вызовам.

Анализ достижений фундаментальной юридической науки, современных правовых идей позволяет нам предложить понятие автономии, включающее в себя признаки нормативной устойчивости и функциональной субъектности:

Автономия - это конституционно или статутно закреплённый правовой режим части территории государства, предусматривающий законодательно защищённый объём самостоятельных компетенций (законодательных, административных, финансовых), наличие собственных институтов самоуправления и устойчивых механизмов правовой защиты, функционирующих в рамках единого государственного суверенитета и общего правового порядка.

Таким образом, автономия представляет собой динамическую, многоуровневую модель организации публичной власти, характеризующуюся высокой степенью адаптивности к специфическим условиям развития конкретной государственно-правовой системы. В данной концепции автономия выступает не как потенциальная угроза унитарности, а как способ



трансформации этнополитических конфликтов в конструктивный диалог институционального взаимодействия.

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СОВРЕМЕННЫЙ МЕЖДУНАРОДНЫЙ ТЕРРОРИЗМ КАК ГЛОБАЛЬНАЯ ПРОБЛЕМА

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Abstract. The article examines modern international terrorism as a global challenge that has transcended national borders and evolved into a supranational phenomenon threatening international security and the global legal order. It analyzes the transformation of terrorism under globalization, technological development, and geopolitical changes, as well as the diversification of its forms and methods.

Keywords: international terrorism; global security; international law; political violence; globalization; counterterrorism; international relations.

Введение. Тема терроризма становится всё более актуальной – ежедневные сводки новостей сообщают о новых терактах, жертвами которых всё чаще становятся гражданские лица. При этом волна террора захлёстывает не отдельно взятые страны, а целые регионы. Понятие терроризм стало наднациональным, вышло за пределы отдельно взятых государств и стало неотъемлемым элементом международной обстановки [6].

Сегодня, терроризм во всех формах и проявлениях и по своим масштабам и интенсивности, по своей бесчеловечности и жестокости превратился в одну из самых острых и злободневных проблем глобальной значимости. Проявление терроризма влекут за собой массовые человеческие жертвы, разрушаются духовные, материальные, культурные ценности, которые невозможно воссоздать веками. Он порождает ненависть и недоверие между социальными и национальными группами.

Масштабные террористические действия во всём мире и сопряженные с этим невосполнимые человеческие жертвы заставляют по-новому взглянуть на проблему международного терроризма, которая сегодня превратилась в реальную и серьёзную угрозу стабильности и безопасности мира и прогресса человечества.

Международный терроризм относится к числу самых опасных и трудно прогнозируемых явлений, он приобретает всё более разнообразные формы и угрожающие масштабы.

Современный международный терроризм как явление многогранен и противоречив, он имеет целый ряд специфических черт и особенностей. Терроризм сегодняшнего дня уже не укладывается в «классические» модели прошлого. За последние годы претерпели изменения и модернизировались организационные структуры террористических организаций, расширилось использование ими высоких технологий, новых вооружений, позволяющих проводить операции, сопоставимые с военными.

Вызовы международного терроризма последних лет обусловили широкий спектр актуальнейших задач, требующих безотлагательного решения. Это не только выработка стратегии противодействия возникающим и распространяющимся новым формам терроризма, поиск профилактических, превентивных антитеррористических мер, но и проблема создания международной системы мер противодействия терроризму и надежного правового обеспечения антитеррористической деятельности. Суть терроризма остаётся прежней – это противоправное деяние, преступление, вследствие чего борьба с ним должна вестись посредством политики, а также в сфере права, как на национальном, так и на международном уровне [12].

Всё вышеперечисленное делает чрезвычайно актуальным научное осмысление сущности, содержания, типологии международного терроризма, выяснение его особенностей, новых форм и разновидностей, вне чего невозможно говорить об эффективности борьбы с ним.

Общая характеристика международного терроризма. Сегодня, терроризм превратился в явление международного масштаба, приобрёл черты глобальной проблемы человеческого общества, так называемой «чумы XX века», теперь уже и XXI века [11].

Международный терроризм имеет большое количество определений, которые предлагаются различными государствами, политическими деятелями и политологами [2]. Определение терроризма представляется непростой задачей. Формы и методы террористической деятельности существенно менялись со временем. Это явление имеет устойчивую негативную оценку, что порождает произвольное толкование. С одной стороны, существует тенденция неоправданно расширенной трактовки, когда некоторые политические силы без достаточных оснований называют террористами своих противников. С другой, – неоправданного сужения. Сами террористы склонны называть себя солдатами, партизанами, диверсантами в тылу противника [7]. Отсюда трудности как юридически-правовых дефиниций, так и общетеоретического осмысления терроризма.

Политолог Дугин А. высказывает свой взгляд на международный террор. Он считает, что произошла «существенная мутация террора: в однополярном, пусть номинально, мире обнаружился симметричный ему фактор влияния, получивший название «международный терроризм» и новую функциональную нагрузку. Отныне этот термин стал обозначать радикальные действия всех противников однополярного глобализма» [5].

Исследователь Золотарев П. выделяет как формообразующие международного терроризма следующие факторы: 1) процессы глобализации; 2) разрушение двухполюсного миропорядка; 3) цивилизационный кризис; 4) наследие «холодной войны» [8].

Определение терроризма в рамках ООН не удалось, так как одни считают его преступлением, а другие – «борьбой за правое дело». Одно из определений, данное госдепартаментом США гласит: терроризм – «заранее обдуманное, политически мотивированное насилие, применяемое против не участвующих в военных действиях лиц субнациональными группами или подпольными государственными агентами» [15].

Терроризм – это общественный феномен, заключающийся в противоправном использовании крайних форм насилия или угрозы насилием для устрашения противников с целью достижения конкретных политических целей.

Международный терроризм, являясь видовой формой терроризма, обладает рядом специфических признаков. К основным следует отнести:

- ✓ Международный правопорядок как специфический объект терроризма, защищаемый Уставом ООН, международными конвенциями и другими общепризнанными актами права;
- ✓ Международный характер ущерба, когда действия террористов затрагивают интересы нескольких государств или международных организаций;
- ✓ Транснациональный характер действий, проявляющийся в подготовке актов в одной стране и их совершении в другой, вовлечении граждан разных государств в качестве террористов или жертв, а также использовании ресурсов и средств из-за рубежа.

Свое определение предложил бывший Генсек ООН Кофи Аннан: «Всякое действие является террористическим, если оно предполагает смерть или причинение тяжкого увечья гражданским лицам и лицам, не участвующих в боевых действиях, с целью запугивания населения или принуждения какого бы то ни было правительства или международной организации к совершению действия или отказу от действия» [14].

Международный терроризм (лат. terror – ужас, страх) – международное преступление, представляющее собой действия отдельных лиц или организаций, направленные на достижение определённых целей путём применения насилия и совершения террористических актов.

Международный терроризм – это совокупность общественно опасных действий международного масштаба, угрожающих безопасности государств, причиняющих человеческие жертвы и нарушающих дипломатические, транспортные и иные международные связи.

Суть терроризма – насилие с целью устрашения.

Субъект террористического насилия – отдельные лица или неправительственные организации и некоторые государства.

Объект насилия – власть в лице отдельных государственных служащих или общество в лице отдельных граждан (в том числе иностранцев, госслужащих), частное и государственное имущество, объекты инфраструктуры, системы жизнеобеспечения.

Цель насилия – добиться желательного для террористов развития событий – революции, дестабилизации общества, развязывания войны с иностранным государством, обретения независимости некоторой территорией, падения престижа власти, политических уступок со стороны власти и т.д.

Международный терроризм представляет особую угрозу для международного правопорядка, межгосударственных отношений, безопасности государств и жизни людей во всём мире.

В современных условиях наблюдается эскалация террористической деятельности экстремистски настроенных лиц, групп и организаций, усложняется её характер, возрастают изощрённость и античеловечность террористических актов.

Озабоченность мирового сообщества ростом террористической активности обусловлена многочисленностью жертв террористов и огромным материальным ущербом, наносимом

террором. Террористическая деятельность в современных условиях характеризуется широким размахом, отсутствием явно выраженных государственных границ, наличием связи и взаимодействием с международными террористическими центрами и организациями.

Терроризм связан с более общим, родовым для него понятием террора. Террор – это способ управления обществом посредством превентивного устрашения.

Социолог Ильинский И., определяет террор как привилегию власти меньшинства над большинством, он осуществляется «сверху вниз». «Международный терроризм» – это ответная реакция «слабых» на международный террор «сильных». Террор и терроризм – «зеркальные» явления; одно определяет другое. Там, где есть террор, неизбежно возникает терроризм. И наоборот [10].

Обязательное условие терроризма – резонанс террористической акции в обществе. Терроризм принципиально декларативен. Широкое распространение информации о теракте, превращение его в наиболее обсуждаемое событие представляет собой ключевой элемент тактики терроризма. Оставшийся незамеченным теракт утрачивает всякий смысл.

Общественный резонанс террористических актов является необходимым условием их эффективности, поскольку они направлены на воздействие на массовое сознание и изменение общественных настроений. Посредством терактов террористические организации демонстрируют свою силу, решимость и готовность к крайним формам насилия, заявляя о непризнании существующего общественно-политического порядка. Международный терроризм выступает одним из наиболее эффективных по соотношению «затраченные ресурсы – достигнутый результат» инструментов политической дестабилизации. В отличие от таких форм дестабилизации, как военная интервенция, гражданская война или массовые беспорядки, террористическая деятельность требует сравнительно ограниченной социальной поддержки и минимальных организационно-технических ресурсов.

Международный терроризм по содержанию и основным формам проявления является сложным социально-политическим явлением, и его общественная опасность на протяжении последних десятилетий неуклонно возрастает.

При всём разнообразии существующих в международно-правовой теории и практике понятий международного терроризма в настоящее время существует общее мнение о том, что рассматриваемое явление представляет собой одну из разновидностей терроризма как социально-политического явления более широкого масштаба. Как часть терроризма, международный терроризм характеризуется присущими ему общими свойствами (применение насилия, использование принуждения и устрашения и др.).

Международный терроризм обладает рядом характерных признаков, отличающих его от других видов терроризма:

Международно-политическая опасность. Акции международного терроризма угрожают международной безопасности, мировому правопорядку и межгосударственным отношениям, так как затрагивают интересы нескольких государств. В зависимости от характера атак, они могут серьёзно осложнять внутривнутриполитическую ситуацию отдельных стран. Например, убийство государственного деятеля за рубежом может одновременно дестабилизировать межгосударственные отношения и внутреннюю политическую обстановку его страны.

Субъекты международного терроризма. Главными субъектами выступают устойчивые террористические группы и организации, использующие методы террора для достижения целей. Они могут действовать самостоятельно или входить в состав экстремистских движений, националистических и религиозно-политических организаций, а также структур организованной преступности. В последние десятилетия значительную роль играют международные террористические организации с развитой инфраструктурой, действующие на территории нескольких государств.

Транснациональное сотрудничество. Террористические группы из разных стран, близкие по идеологической направленности, устанавливают связи для подготовки и

осуществления международных актов терроризма. Эти контакты политические, организационные и финансово-материальные и диктуются совпадением идейно-политических установок и необходимостью внешней поддержки.

Угрозу мировому сообществу в форме международного терроризма определяют следующие факторы: нищета, низкий уровень культуры и угнетение национального сознания, нарастание культурного и информационного империализма [3].

Формы современного международного терроризма: 1) необъявленные войны; 2) политические убийства; 3) взрывы; 4) похищения людей, избиения и издевательства; 5) захват самолетов, кораблей; 6) захват государственных учреждений, посольств; 7) экспорт революций и контрреволюций; 8) ограбления банков, ювелирных салонов и др.

Расширение угроз международного организованного терроризма заставляет мировое сообщество искать различные средства и способы противодействия этой глобальной угрозе. Здесь и юридический аспект (создание международно-правовой базы) и наращивание мощи силовых структур, и использование научно-технических достижений по предотвращению терактов, поиску источников по финансированию и созданию материально-технической базы антитеррористических организаций.

По мнению экспертов, средства поражения атакующих террористов должны быть самыми высокоинтеллектуальными свойствами поиска, идентификации, определения координат, в выборе метода атаки и гарантированного поражения в короткие сроки с минимальным побочным ущербом для окружающих объектов и населения. Среди новых технологий вооружений и методов борьбы с террористами – применение рассредоточенной сети специальных сенсоров способные обнаруживать импровизированные взрывные и др. боевые средства, заминированные объекты, а также отдельных и мелких групп смертников.

Усовершенствованные высокоскоростные системы управляемого ракетного оружия и дальностями стрельбы в сотни километров также должны эффективно использоваться в борьбе с террористами: (управляемая ракета с гиперзвуковыми скоростями способна достигнуть цели в 9-10 раз быстрее, чем крылатая ракета «Томахок») [4].

По некоторым оценкам, стоимость информационного компонента в современных вооружениях и военной технике составляет от 5 до 20% в зависимости от видов вооружений [15]. Для обуздания террористических организаций используется также «искусственная разведка», т.е. математическое моделирование поведения.

Нельзя не отметить, что террористические акции оказывают влияние на власть, на внутреннюю и внешнюю политику отдельных государств. Так, после взрывов на испанских вокзалах вывод испанских воинских подразделений из Ирака [1]. После захвата в Афганистане талибами группы южнокорейских граждан, со смертельным исходом некоторых из них, правительство Южной Кореи вынуждено было заявить в 2007 г. о выводе своего воинского контингента из указанной страны.

В начале 2008 года было объявлено об отмене международного ралли «Дакар», впервые за всю 30-летнюю историю автомобильных гонок. Основное событие, повлиявшее на решение организаторов, произошло в Мавритании, где 24 декабря 2007 года террористами были убиты четверо французских туристов [13].

Новые формы и методы террористической деятельности. Современный международный терроризм превратился в фактор, серьёзно дестабилизирующий обстановку не только в отдельных странах, но и в мире в целом.

Существенным отличием современного этапа терроризма стало широкое использование террористов-смертников. Так за последние годы более 80% исполнителей всех совершённых в мире террористических актов относятся к этой категории.

В арсенале террористических организаций, террористы-смертники относятся к категории так называемого «оружия священного возмездия», так как акции с их использованием приводят к многочисленным жертвам и всегда широко освещаются в средствах массовой информации.

Кроме того, применение террористов-смертников гарантирует, что атака состоится в наиболее подходящий для террористов момент, нет нужды готовить пути отхода для всей группы, а также нет опасений, что преступник попадет в руки правоохранительных органов и выдаст сообщников, организаторов. Расчёт обычно делается на фактор неожиданности, которая достигается исключением шаблонности в тактике проведения акций, применением различных видов взрывных устройств, выбором наиболее подходящего места и времени проведения акции. Применяются эффективные приёмы маскировки. Так, чтобы усыпить бдительность правоохранительных органов и беспрепятственно пройти к цели, женщины-смертницы выдают себя за беременных, привлекаются и подростки. Могут использоваться лица с различными увечьями. По замыслу организаторов террористических акций, явно выраженные физические недостатки заставляют относиться к подобному человеку с сочувствием, а не опаской, что облегчает проникновение к местам совершения преступлений. Террористы-смертники – это конечное звено исполнителей в разветвлённой террористической организации. Для маскировки своих подлинных целей организаторы терактов стремятся представить исполнителей как религиозных фанатиков, национальных экстремистов, мстителей за личные или клановые обиды. Среди террористов-смертников не более 10% действительно демонстрировали черты фанатизма и экстремизма, остальные – либо пошли на акцию не по своей воле, либо вообще не подозревали о своей судьбе.

Пополнению их рядов способствуют неблагоприятные социально-экономические условия (тяжёлые жизненные обстоятельства, отсутствие перспектив, нищета).

Значительную часть смертников составляют женщины, потерявшие мужей, детей, близких родственников, что равносильно их собственной гибели. Оторванные от семьи и привычного круга общения, подвергнутые мощной идеологической и психотропной обработке, они составляют костяк «шахидок». Сравнительно новым стало использование в качестве террористов-смертников людей, подвергнутых серьёзному психопрограммированию «зомбированию». Подобные лица, как правило, не осознают сути программы, их поведение более естественно. В качестве подобных исполнителей выбираются не просто лица определённых этнических групп, но и жители тех населённых пунктов, где планируется проведение террористических актов.

Закключение. Современный международный терроризм характеризуется рядом устойчивых тенденций, определяющих его угрозу для международной безопасности. Ключевыми из них являются: расширение географии терроризма и его интернационализация; усиление влияния социальных, политических и экономических факторов на возникновение и распространение террористической деятельности; повышение уровня организованности террористических структур и создание крупных формирований с развитой инфраструктурой; взаимосвязь терроризма и организованной преступности; рост материально-технического и финансового обеспечения террористических организаций; стремление террористов овладеть средствами массового поражения; использование терроризма как инструмента вмешательства во внутренние дела государств и неправительственных международных организаций; разработка новых форм и методов, направленных на увеличение масштабов и последствий террористических актов. Поэтому борьба с международным терроризмом требует комплексного подхода, объединяющего усилия государственных институтов, международных организаций и всего мирового сообщества, включая политические, правовые и превентивные меры.

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УТРАТА ПРАВА СОБСТВЕННОСТИ НА ОРУЖИЕ ГРАЖДАНСКОГО НАЗНАЧЕНИЯ: АНАЛИЗ СИТУАЦИИ

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Аннотация. В статье исследованы актуальные вопросы, связанные с способом утраты права собственности на оружие гражданского назначения в Республике Молдова. Актуальность исследования данного специфического способа утраты права собственности в молдавском обществе обоснована необходимостью, после 14 декабря 2023 года, когда Республика Молдова получила статус кандидата в ЕС для дальнейшей работы по приведению национального законодательства к европейским стандартам.

В результате исследования приходим к аргументированному выводу, что утрата права собственности на оружие гражданского назначения, вследствие наступления обстоятельств, предусмотренными именно ч. (9) ст. 18 Закона РМ о режиме оружия и боеприпасов гражданского назначения № 130/201 представляет собой особый и специальный случай прекращения права собственности. Это специальное основание прекращения права собственности именно на оружие гражданского назначения и ее не следует отождествлять с таким основанием утраты права собственности, указанное в ст. 359 ГК РМ как утрата права собственности вследствие отчуждения имущества, которое в соответствии с законом (в силу закона) не может принадлежать данному лицу на праве собственности. Статья отражает часть результатов исследования научной подпрограммы «Securitatea națională a Republicii

Moldova în contextul aderării la Uniunea Europeană: abordări juridice, politologice și sociologice» - «Национальная безопасность Республики Молдова в свете присоединения к Европейскому Союзу: юридические, политологические и социологические аспекты» - код: 01.05.01 при Институте юридических, политических и социологических исследований Государственного университета Молдовы, в рамках институционального проекта (2024-2027).

Ключевые слова: оружие гражданского назначения; основания утраты права собственности; мера безопасности; санкция.

Abstract. This article examines current issues related to the method of loss of ownership of civilian weapons in the Republic of Moldova. The relevance of studying this specific method of loss of ownership in Moldovan society is justified by the need, after December 14, 2023, when the Republic of Moldova received EU candidate status for further work on aligning national legislation with European standards. As a result of the study, we come to the reasoned conclusion that the loss of ownership of weapons for civilian purposes, due to the occurrence of circumstances stipulated by Part (9) of Article 18 of the Law of the Republic of Moldova on the regime of weapons and ammunition for civilian purposes No. 130/201, represents a special and specific case of termination of ownership. This is a specific ground for terminating the right of ownership of weapons for civilian purposes and should not be equated with the grounds for loss of ownership specified in Article 359 of the Civil Code of the Republic of Moldova as loss of ownership due to the alienation of property that, in accordance with the law (by virtue of law), cannot belong to the given person by right of ownership. The article reflects part of the research results of the scientific subprogram "Securitatea națională a Republicii Moldova în contextul aderării la Uniunea Europeană: abordări juridice, politologice și sociologice" - "National security of the Republic of Moldova in the light of accession to the European Union: legal, political and sociological aspects" - code: 05/01/2011 at the Institute of Legal, Political and Sociological Research of the State University of Moldova, within the framework of the institutional project (2024-2027).

Keywords: civilian weapons; grounds for loss of ownership; security measure; sanction.

Введение.

Целью настоящей публикации является выяснение сущности способа утраты права собственности на оружие гражданского назначения в Республике Молдова.

В ходе исследования автор использовал общетеоретические положения, изложенные в трудах по общей теории государства и права, конституционному, гражданскому и административному праву. В статье сформулирован ряд новых выводов и положений, практических рекомендаций наиболее значимыми из которых являются предложения *de lege ferenda* на основе которой считаем целесообразным в части (9) ст. 18 Закона РМ о режиме оружия и боеприпасов гражданского назначения № 130/2012, в конце предложения после слов «изымается в принудительном порядке», добавить словосочетание «компетентными органами полиции на безвозмездной основе».

Методология исследования базируется на таких общетеоретических методах как анализ, синтез, индукция, дедукция, обобщение.

Результаты исследования.

Утрата - прекращение права собственности, это важный институт гражданского права, который обеспечивает баланс интересов собственников, общества и государства. Каждый случай утраты (прекращения) собственности имеет свои особенности и требует внимательного подхода с учетом положений ГК РМ и других законодательных актов [1, с.644].

Основания утраты-прекращения права собственности - это юридические факты (в виде действий или событий), влекущие утрату права собственности лица на определенное имущество-вещь. При анализе ст. 536 Гражданского кодекса Республики Молдова, явствует, что помимо прямо указанных императивных оснований, данная статья предусматривает, что «никто не может быть принужден уступить свою собственность, кроме случаев, когда в соответствии с законом производятся: [...] иные действия, предусмотренные законом».

Иными словами, цитируемая статья указывает на утрату права собственности и в других случаях, предусмотренных законом.

В свою очередь, анализ действующего законодательства РМ дает основание резюмировать, что таким особым и специальным случаем прекращения права собственности представляет собой утрата права собственности на оружие гражданского назначения, вследствие наступления обстоятельств, предусмотренными ст. 18 Закона РМ о режиме оружия и боеприпасов гражданского назначения № 130/2012. Это специальное основание прекращения права собственности именно на оружие гражданского назначения¹².

Гражданское оружие - это особый объект гражданского права, соответственно требует особой регламентации, в том числе связанные с условиями их приобретения, отчуждения, владения ими, их ношения, использования и совершения с ними операций на территории Республики Молдова. В соответствии с ст. 2 Закона - *гражданское оружие* это оружие, устройства, материальные средства, находящиеся в частной или государственной собственности, предназначенные (приспособленные) для гражданского использования, годные с технической точки зрения для нанесения вреда или иммобилизации человека либо животного, для спортивных целей или охоты, для самообороны, для защиты и охраны материальных ценностей или для имитации их боевых характеристик.

Изначально обратим внимание на два основополагающие моменты этого особого основания прекращения права собственности. А именно:

Во-первых, этот особый случай прекращения права собственности на оружие гражданского назначения *не следует отождествлять с конфискацией*.

Аргументация:

1) В смысле Закона РМ о режиме оружия и боеприпасов гражданского назначения № 130/2012, оружие - это законно добытая вещь. А в свете нормы ч. (5) ст. 501 ГК РМ, повторяющая конституционную норму части (3) ст. 46 Конституции РМ, гарантирующие права собственности, в том смысле, что законно добытые вещи не могут быть конфискованы, за исключением вещей, предназначенных либо использованных для совершения правонарушений или преступлений. При этом, законность добытого предполагается (подразумевается). Поэтому, утрата права собственности на оружие гражданского назначения, вследствие наступления обстоятельств, предусмотренными ст. 18 Закона № 130/2012 осуществляется в соответствии с правилами, установленными исключительно этим специальным законом.

2) Конфискация оружия гражданского назначения (как и любого имущества) эта *мера безопасности* и допускается на основании судебного решения или административного акта, а не санкция по безвозмездному изъятию имущества у собственника.

3) Утрата права собственности на оружие гражданского назначения, вследствие наступления обстоятельств, предусмотренными ст. 18 Закона РМ № 130/2012 представляет собой именно *санкцию* по безвозмездному изъятию оружия у собственника за конкретные нарушения - определенные ситуации (не обязательно контравенции или преступления – наше прим.), установленные этой статьей закона.

В этом контексте отметим, что меры безопасности имеют целью устранения последствий деяния в процессе производства о правонарушениях, устранения опасности или предупреждения совершения правонарушений (контравенций) и преступлений. Разница между санкцией и мерой безопасности состоит в том, что санкция прямо предусмотрена в санкции той или иной статьи КоП, УК или другого специального закона, и она применяется только при назначении соответствующего наказания (решением или приговором судебной инстанции, а иногда и решением административного органа), а мера безопасности не

¹² Действие указанного закона не распространяется на режим *военного оружия*, находящегося в ведении органов публичного управления, обладающих полномочиями в области национальной обороны, государственной безопасности и общественного порядка, который установлен специальными законами и нормативными актами.

предусмотрена в статьях специальной части КоП или УК и она может применяться даже в случае истечения срока давности привлечения к уголовной или контравенциональной ответственности. Конфискация как мера безопасности применяется только на основании Кодекса о правонарушениях (контравенциях) РМ (КоП РМ) – ст. 439⁴ и 439⁷, а также на основании Уголовного кодекса РМ – УК РМ (ст. 106 - специальная конфискация и ст. 106¹ - расширенная конфискация).

Во-вторых, также особенно его не следует отождествлять с таким основанием утраты права собственности как *утрата права собственности вследствие отчуждения имущества, которое в соответствии с законом (в силу закона) не может принадлежать данному лицу на праве собственности (ст. 539 ГК РМ)*.

Аргументация:

1) В данном случае обстоятельства совершенно разные. А именно, основание по ст. 539 ГК РМ хоть и принудительные, но всегда возмездные, ибо здесь, даже в случае принудительного отчуждения вещи на основании решения судебной инстанции (по требованию органа местного публичного управления) бывшему собственнику передается вырученная сумма с отчуждением (продажи). Конечно, с удержанием расходов на отчуждение. А в случае, если судебная инстанция постановляет передачу вещи в собственность государства, то бывшему собственнику также возмещаются убытки в размере, установленном судебной инстанцией.

2) Утрата права собственности на оружие гражданского назначения, вследствие наступления обстоятельств, предусмотренными специальными нормами ст. 18 Закона РМ № 130/2012 это, в принципе не принудительное основание утраты права собственности, а основание *вследствие объективных фактов, конкретно указанных* в ст. 18 Закона № 130/2012.

В этом контексте обращаем внимание, что в соответствии с ст. 5 Закона о нормативных актах № 100/2017 (Официальный монитор Республики Молдова, 2018 г., № 7–17, ст. 34), - «По своему характеру правовые нормы подразделяются на общие, специальные и исключительные. Общие правовые нормы применяются ко всем общественным отношениям или субъектам права либо к некоторым категориям отношений или субъектов без утраты ими своего общего характера. Специальные правовые нормы применяются исключительно к отдельным категориям общественных отношений или прямо определенным субъектам. *В случае противоречия между общей нормой и специальной нормой, которые содержатся в нормативных актах одного уровня, применяется специальная норма.* Исключительные правовые нормы отличаются от рамочных норм в соответствующей области и применяются к определенным *ситуациям*. В случае противоречия между общей или специальной нормой и исключительной нормой, содержащимися в нормативных актах одного уровня, применяется исключительная норма».

Из сравнительного анализа норм ст. ст. 539 ГК РМ и норм ст. 18 Закона № 130/2012, на основе положения ст. 5 Закона о нормативных актах № 100/2017 вытекает, что по своему характеру нормы ст. 539 ГК РМ являются обще правовыми нормами, а нормы ст. 18 Закона № 130/2012 являются специальными нормами и, в определенных ситуациях, являются даже исключительными. Из этого прямо вытекает, что нормы ст. 18 Закона № 130/2012 имеют приоритет в применении над нормами ст. 539 ГК РМ, в случае их противоречия. Хотя, их общий буквальный сравнительный анализ не дает какой-либо логический повод утверждать об их противоречии в толковании.

Таким образом, основание утраты права собственности на оружие гражданского назначения, вследствие наступления обстоятельств-ситуаций, предусмотренными ст. 18 Закона РМ о режиме оружия и боеприпасов гражданского назначения № 130/2012, является отдельным самостоятельным, но специфическим основанием утраты права собственности.

Анализ ст. 18 Закона № 130/2012, «Прекращение права на владение и ограничение права собственности на оружие» показывает, что данная статья имеет своим предметом регулирования 1) прекращение права на владение оружием и 2) ограничение права

собственности на оружие. Из буквального смысла наименования статьи не явствует, что предметом ее регулирования является и утрата, т.е. прекращение права собственности на оружие. Однако из содержания нормы части (9), конкретно из последней ее синтагмы-словосочетания «*а в случае пропуска указанного срока оружие изымается в принудительном порядке*» прямо и недвусмысленно вытекает, что данная статья имеет своим предметом регулирования и утрату права собственности на оружие. И эта «неопределенность наименования статьи vis-a-vis ее содержания» теоретически вполне допустима, ибо если исходить из смысла части (2) ст. 51 Закона о нормативных актах № 100/2017, то «наименование статьи отражает в сжатом виде предмет регулирования, не являясь значимым элементом содержания статьи». Иными словами, наименование статьи не всегда отражает полный предмет ее регулирования.

Статья 18 в части (1), пкт. а)-g) указывает на семь случаев, когда право *на владение* (именно на владение, а не на право собственности - наше прим.) оружием прекращается. Из них, кроме прочих пкт. б) указывает на случай, - когда лицо-владелец находится в одном из положений, предусмотренных пунктами е) – g) части (2) статьи 7, а пкт.с) на случай, когда лицо - не является для визирования разрешения на оружие в течение одного года со дня истечения срока, предусмотренного в части (2) статьи 11.

Учитывая, что цитируемые пункты б) и с) нормы части (1) ст. 18 являются отсылочными, то есть прямо указывающие на конкретную статью или пункт того же акта, где содержание изложено, в избежание двусмысленности рассмотрим далее эти конкретные статьи и пункты. Так, статья 7 «Условия выдачи разрешения на приобретение летального и не летального оружия, подлежащего авторизации, и, по обстоятельствам, разрешения на оружие» в части (2) кроме прочих указывает, что разрешения на оружие не выдаются лицам, которые находятся в одном из трех следующих положений: [...] е) были осуждены вступившим в законную силу судебным решением за умышленное совершение преступлений с использованием оружия или боеприпасов, взрывчатых или отравляющих веществ и материалов, а также наркотических, психотропных веществ и прекурсоров, а равно за их незаконное ношение, хранение, приобретение, производство, изготовление, перевозку или продажу; f) были осуждены вступившим в законную силу судебным решением к лишению свободы за тяжкие, особо тяжкие и чрезвычайно тяжкие преступления, совершенные умышленно; g) представляют опасность для общественного порядка, жизни и физической целостности людей и находятся на специальном учете в органах полиции.

А часть (2) и последующие статьи 11, регулируют процесс визирования разрешения на оружие. Что значит визирование разрешения на оружие? - Разрешение на оружие должно визироваться один раз в 5 лет компетентными органами, а этими органами в условиях Республики Молдова являются орган полиции по месту жительства владельца оружия и уполномоченная служба Генерального инспектората полиции Министерства внутренних дел. Процесс визирования¹³ заключается в том, что компетентный орган (читай, орган полиции по месту жительства владельца оружия) заново проверяет если владелец соответствует первоначальным условиям при выдаче разрешения на оружие, а также проверяет если владелец за этот период не совершил какое-либо одно из правонарушений, за совершение которого закон предусматривает лишение права на ношение и использование оружия. В частности, владелец оружия проверяется на предмет обучения владению огнестрельным оружием; проверяются условия обеспечения безопасности и целостности оружия и боеприпасов, т. наличие металлического сейфа, прикрепленным к полу или к стене; проверяется если владелец оружия является дееспособным с психологической и медицинской

¹³ Более подробно о процедуре визирования разрешения на оружие смотри: пкт. 64-68 (Глава VII) Положения о режиме оружия и боеприпасов гражданского назначения, утвержденная Постановлением Правительства РМ №293 от 23.04.2014. Опубликовано: 06-05-2014 в Monitorul Oficial № 104-109 статья № 324

точек зрения; не имеет ли судимости или если, не являются обвиняемыми или подсудимыми по уголовным делам за совершение умышленных деяний в соответствии с действующим законодательством; были ли владельцы осуждены вступившим в законную силу судебным решением к лишению свободы за тяжкие, особо тяжкие и чрезвычайно тяжкие преступления, совершенные умышленно, в что числе, за умышленное совершение преступлений с использованием оружия или боеприпасов, взрывчатых или отравляющих веществ и материалов, а также наркотических, психотропных веществ и прекурсоров, а равно за их незаконное ношение, хранение, приобретение, производство, изготовление, перевозку или продажу; проверяются на предмет если вообще не представляют опасность для общественного порядка, жизни и физической целостности людей и находятся на специальном учете в органах полиции; также проверяется если в течение последних пяти лет не теряли или у них не было похищено по их собственной вине оружие; проверяется если оружие за 5-летний период подверглось периодическому техническому осмотру в порядке, предусмотренном Правительством и другие.

В случае констатации что, владелец оружия находится в одном из вышеназванных негативных положений, компетентный орган полиции *отзывает* разрешение на оружие, или, по обстоятельствам, *аннулирует* ее. Вследствие этого прекращается право на владение или ограничивается право собственности, путем наложения запрета на владение оружием. В зависимости от конкретного обнаруженного случая ограничение права собственности путем наложения запрета на владение оружием (отзыв разрешения на оружие) может применяется на 5-летний срок, по истечении которого лицо может восстанавливать права хранения, ношения и использования оружия, но перед этим должно повторно пройти курс теоретического и практического обучения владению огнестрельным оружием, организованный в установленном порядке. При этом, на все это время он, в 10-дневный срок, обязан сдать оружие и все боеприпасы к нему в орган полиции по месту жительства с целью их отчуждения или хранения у авторизованного оружейника на весь период, за исключением случаев, когда оружие и боеприпасы к нему изымаются компетентным органом полиции¹⁴.

А в случае констатации серьезных обстоятельств прямо указанных в ч. (9) ст. 18 Закона, ведущих к аннулированию разрешения на оружие, право *на владение* оружием прекращается бессрочно и, как следствие, ограничивается права собственности путем наложения запрета на владение оружием. Соответственно, в этом последнем случае, обладатель права собственности на оружие (он уже потерял статус владельца, ибо его право на ношение оружия, т.е. разрешение аннулировано) в течение не более чем 15 дней обязан: а) произвести отчуждение оружия (например, дарить) или б) сдать его уполномоченному оружейнику (в оружейный магазин) для отчуждения (т.е. продажи) с извещением об этом органа полиции. И это, потому что в соответствии с этим же законом данная вещь, то есть оружие, не может более принадлежать ему на праве собственности. В случае пропуска указанного 15-дневного срока оружие (и боеприпасы к нему) изымаются в принудительном порядке. Принудительное изъятие осуществляется компетентным органом полиции.

В данном случае, принудительное безвозмездное изъятие оружия у собственника выступает как санкция за конкретное нарушения – за не выполнении юридических обязательств, а конкретно – за пропуск 15-дневного срока произвести отчуждение оружия самому либо сдать его уполномоченному оружейнику (в оружейный магазин) для отчуждения. Анализ нормы части (9) ст. 18 Закона РМ о режиме оружия и боеприпасов гражданского назначения № 130/2012 в действующей редакции вызывают споры в ее толковании. Так, сегодня эта норма буквально изложена в следующей редакции: «(9) С момента наступления обстоятельств, предусмотренных пунктами б) или с) части (1), обладатель права

¹⁴ Более подробно смотри: пкт. 72-75 Положения о режиме оружия и боеприпасов гражданского назначения, утвержденная Постановлением Правительства РМ №293 от 23.04.2014. Опубликовано: 06-05-2014 в Monitorul Oficial № 104-109 статья № 324.

собственности на оружие обязан в течение не более чем 15 дней произвести отчуждение оружия или сдать его уполномоченному оружейнику для отчуждения с извещением об этом органа полиции, а в случае пропуска указанного срока оружие изымается в принудительном порядке». Во избежание дальнейших двояких интерпретаций, считаем целесообразным уточнить характер изъятия оружия, а также внесудебного порядка этого изымания. Поэтому, в этом логическом смысле, в качестве предложения *de lege ferenda* считаем целесообразным в, в конце предложения после слов «изымается в принудительном порядке», добавить словосочетание «компетентными органами полиции на безвозмездной основе».

Далее, по истечении одного года компетентный орган полиции в соответствии с требованиями пкт.24 ппкт.5) или б) Положения о Государственной комиссии по оценке, уценке и выбраковке оружия, утвержденная Постановлением Правительства №1447/2016 о Государственной комиссии по оценке, уценке и выбраковке оружия¹⁵ передает оружие в эту Государственную комиссию, которая осуществляет оценку, уценку (в зависимости от ее износа) или выбраковку оружия. После оценки и утверждения членами Комиссии акт в 10-дневный срок печатывается на бумаге, а оружие передается для продажи в магазины экономических агентов, которые обладают лицензией в области продажи оружия, согласно законодательству (деньги в государственный бюджет). Оружие с дефектами, или износ которого не превышает 50% подлежит разборке с оценкой основных деталей оружия (ствол, затвор и т.д.), которые при соответствии требованиям безопасности передаются в оружейный магазин для продажи (деньги от продажи перечисляются в государственный бюджет), а непригодные детали передаются Главному инспекторату полиции Министерства внутренних дел для уничтожения для уничтожения.

Вывод:

Анализ законодательства Республики Молдова, современных тенденций развития в области владения и собственности оружием гражданского назначения, проведенный в представленном исследовании, позволяет сделать некоторые выводы и внести ряд предложений по совершенствованию законодательства об оружии гражданского назначения. А именно, утрата права собственности на оружие гражданского назначения, вследствие наступления обстоятельств, предусмотренными именно ч. (9) ст. 18 Закона РМ о режиме оружия и боеприпасов гражданского назначения № 130/201 представляет собой особый и специальный случай прекращения права собственности, а принудительное безвозмездное изъятие оружия у собственника выступает как санкция за конкретное нарушения – за не выполнении юридических обязательств, а конкретно – за пропуск 15-дневного срока произвести отчуждение оружия самому либо сдать его уполномоченному оружейнику (в оружейный магазин) для отчуждения. Это специальное основание прекращения права собственности именно на оружие гражданского назначения и ее не следует отождествлять с таким основанием утраты права собственности, указанное в ст. 359 ГК РМ как утрата права собственности вследствие отчуждения имущества, которое в соответствии с законом (в силу закона) не может принадлежать данному лицу на праве собственности. В качестве предложения *de lege ferenda* считаем целесообразным в части (9) ст. 18 Закона РМ о режиме оружия и боеприпасов гражданского назначения № 130/2012, в конце предложения после слов «изымается в принудительном порядке», добавить словосочетание «компетентными органами полиции на безвозмездной основе».

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¹⁵ Официальный монитор Республики Молдова, 2017 г., № 19–23, ст. 33), с последующими изменениями.



Conferința internațională științifico-practică în onoarea a 35-a aniversării a Universității de Stat Comrat

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УДК 347.2/3

СОБСТВЕННОСТЬ НА ВРЕМЯ (PROPRIETATEA PERIODICĂ) И ЕЕ ПРАВОВОЙ РЕЖИМ

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Adnotare. Abordarea dreptului de proprietate periodică din perspectiva implementării acestuia în practica juridică a Republicii Moldova reprezintă o adevărată provocare, întrucât presupune analiza științifică a acestei noi instituții de drept civil pentru Republica Moldova, care guvernează dreptul de proprietate privată. Studiul debutează printr-o incursiune în timp și spațiu asupra conceptelor de timeshare și proprietate periodică (I), pentru ca apoi să abordeze, în mod sistematic noțiunea dreptului de proprietate periodică (II), temeiul nașterii (III), analiza regimului ei juridic (IV), diferența dintre proprietatea comună pe cote-părți și proprietate periodică (V) și, cauzele de încetarea a acesteia.

Cuvinte-cheie: timeshare; proprietate periodică; cota-parte de proprietate corespunzătoare unității de timp (cotă parte temporală); proprietate comună pe cote-părți.

Аннотация. Рассмотрение нового для молдавского правового института собственности на время с точки зрения его реализации в правовой практике Республики Молдова представляет собой серьезную задачу, поскольку оно предполагает научный анализ этого нового института гражданского права, регулирующего право частной собственности. Исследование начинается с анализа во времени и пространстве, понятия таймшера как прородителя собственности на время (I), а затем систематически рассматриваются понятие

собственности на время (II), основания для ее приобретения (III), анализ ее правового режима (IV), различие между долевой собственностью и собственностью на время (V) и конкретные способы ее прекращения.

Ключевые слова: timeshare, собственность на время, доли права собственности на промежуток времени; общая долевая собственность.

Annotation. Approaching the right to periodic ownership from the perspective of its implementation in the legal practice of the Republic of Moldova represents a real challenge, as it involves the scientific analysis of this new civil law institution for the Republic of Moldova, which governs private property rights. The study begins with an incursion in time and space on the concepts of timeshare and periodic ownership (I), and then systematically approaches the notion of periodic ownership (II), the basis for its birth (III), the analysis of its legal regime (IV), the difference between common ownership in shares and periodic ownership (V) and the causes of its termination.

Keywords: timeshare; private time ownership; shares of ownership rights for a period of time; joint ownership in shares (common shared ownership).

Введение.

Целью настоящей публикации является выяснение сущности правовой природы собственности на время и в какой степени реализация этого вида собственности эффективно как для Республики Молдова, так и для других юрисдикций.

В соответствии с целью исследования были выделены следующие задачи:

- исследовать исторические корни собственности на время;
- сделать детальный теоретический анализ правового режима данного правового института;
- провести сравнительный анализ между собственностью на время и ее смежным институтом- общей долевой собственностью.

Методология исследования базируется на таких общетеоретических методах как анализ, синтез, индукция, дедукция, обобщение.

Статья отражает часть результатов исследования научной подпрограммы «Securitatea națională a Republicii Moldova în contextul aderării la Uniunea Europeană: abordări juridice, politologice și sociologice» - «Национальная безопасность Республики Молдова в свете присоединения к Европейскому Союзу: юридические, политологические и социологические аспекты» - код: 01.05.01 при Институте юридических, политических и социологических исследований Государственного университета Молдовы, в рамках институционального проекта (2024-2027).

Результаты исследования.

Сегодня отношения собственности в Республике Молдова предусматривает такую разновидность собственности как собственность на время. Вопросы собственности на время и ее правового режима определены в ст. 575 – 580 ГК РМ. Это редкий случай, когда в отсутствие особого регулирования на движимое или недвижимое имущество (вещь), принадлежащее двум и более лицам (сособственникам), на основании сделки (договора) *последовательно и повторно* осуществляется полномочие пользования права собственности специфическим образом, а именно - в определенные, равные или неравные, промежутки времени. «Собственность на время» хоть и не является классическим правовым термином в молдавском гражданском праве, однако этот концепт с 01.03.2019 года уже реализуется через этот специфический правовой институт. В Молдове данный правовой институт из 6 статей был рецептирован в 2019 году нашим законодателем из ГК Румынии (ст. 687-692).

1. История возникновения института «Собственность на время».

В основу становления института «Собственность на время» стоит институт *таймшера*¹⁶. Концепция *таймшера* появилась очень давно, в XVII веке, 7 ноября 1659 года, когда Людовик XIV Французский и Филипп IV Испанский подписали Пиренейский договор, согласно которому остров Фазана, расположенный посреди реки Бидассоа, на границе между двумя странами, должен был принадлежать Испании 6 месяцев в году, а Франции - также 6 месяцев в году. Это соглашение, заключенное в XVII веке, сохраняется до сих пор, лишь корректируясь с течением времени в результате заключения последующих договоров между двумя государствами (Байонский договор от 2 декабря 1856, 1862 и 1866 годов, который определял франко-испанскую границу и действует до сих пор). В международном публичном праве это формальное соглашение о разделении суверенитета над общей территорией, принадлежащей нескольким государствам, встречается в рамках концепции кондоминиума, которую можно считать основой таймшера.

В правовой системе понятие таймшера, впервые заимствованное в Соединенных Штатах Америки из области информационных технологий (ИТ), в рамках которой оно до сих пор обозначает «систему или услугу, в которой несколько абонентов одновременно используют один компьютер из разных мест» [1, с. 1486], понимается как «совместное владение или найм незанятой недвижимости несколькими лицами, которые по очереди занимают ее в течение определенного периода времени» [2]. Сегодня с развитием цифровых платформ «временная собственность» в области информационных технологий де-факто реализуется через т.н. краткосрочное владение и шеринг (Sharing Economy), означающего переход права владения и пользования на короткий срок (минуты/часы) на основании публичного договора присоединения [3, с.126]. Большинство прав на «временное владение» фиксируется в смарт-контрактах или реестрах цифровых платформ [4, с. 36].

В европейской правовой системе концепция таймшера была введена в начале 1960-х годов как инновационный способ расширения возможностей отдыха в том смысле, что вместо ежегодной покупки недели в курортном комплексе или приобретения недвижимости для отдыха, система таймшера предлагала возможность приобретения прав на проживание в недвижимости для отдыха в течение одной недели или кратных ей периодов, либо бессрочно, либо на определенный период [5, с.213].

В европейском законодательстве Европейский парламент и Совет Европейского союза первоначально приняли Директиву № 94/47/ЕС от 16 октября 1994 года с целью «создания минимальной основы общих правил, касающихся договоров *приобретения права пользования* одним или несколькими объектами недвижимости на условиях таймшера», поскольку национальное законодательство, принятое каждым отдельным государством, было неоднородным, что могло создавать препятствия для надлежащего функционирования внутреннего рынка и исказить конкуренцию.

В тот же период, годом позже, в 1995 году, на основе этой Европейской директивы № 94/47/ЕС от 16 октября 1994 года (Румыния еще не была членом ЕС) автономная администрация «Национальная лотерея Румынии» выпустила новую серию конвертных билетов под названием «Золотая вилла» [6, с. 237], вдохновленную системой таймшеринга. В рамках этой серии конвертных билетов победители, согласно рекламному проспекту, *приобретали право собственности* (а не просто право пользования) на одну неделю в году на трехкомнатную квартиру, меблированную и оборудованную электроникой и бытовой техникой, расположенную на роскошной вилле в курортной зоне Пояна-Брашове. Владелец

¹⁶ *Таймшер* (право на использование в определенный период). Это наиболее близкая форма к «собственности на время», популярная в курортной недвижимости. Его **правовая природа заключается в том, что чаще всего это не право собственности в чистом виде, а долгосрочное право пользования (найм, аренда или членство в клубе).** А по правовому режиму – это переход права владения и пользования на определенно короткий срок (минуты/часы/дни/недели) на основании договора и владелец имеет право находиться на объекте, например, строго определенное количество дней в году. При этом, это право может наследоваться или перепродаваться.

периодического права собственности имел возможность отчуждать, сдавать в найм, передавать по наследству или переуступать свое право собственности. Этим первым примером, система таймшера была практически введена в Румынии.

Позже, институт таймшера впервые был включен в национальное законодательство Румынии путем имплементации Европейской директивы № 94/47/ЕС от 16 октября 1994 года в Закон № 282 от 23 июня 2004 года о защите покупателей в отношении определенных аспектов договоров, касающихся приобретения права пользования недвижимым имуществом на ограниченный срок [7]. Таким образом, институт таймшера был официально включен в национальное законодательство Румынии.

В начале 2009 года, европейская директива Европейская директива № 94/47/ЕС от 16 октября 1994 года была отменена принятием Европейским парламентом и Советом 14 января 2009 года Директивы 2008/122/EU о защите потребителей в отношении некоторых аспектов договоров таймшера, договоров на долгосрочный отдых и договоров перепродажи и обмена, целью которой было восполнение пробелов в предыдущем регламенте и укрепление правовой определенности в отношении заключения таких договоров.

В этом же 2009 году в Румынии был принят Новый гражданский кодекс Румынии (Закон №287/2009), который заменил ГК Румынии 1864 года. Соответственно, в отличие от регулирования использования (пользование) имущества в режиме таймшера, румынский законодатель ввел в качестве новшества институт «собственность на время» в Гражданском кодексе Румынии, вступившем в силу 1 октября 2011 года, в главе V раздела II (Частная собственность) книги III (О вещах). Так, согласно статье 687 Гражданского кодекса Румынии, *«собственность на время - это тот вид собственности, посредством которого «несколько лиц последовательно и повторно (неоднократно) осуществляют полномочие пользования, атрибут специфический для права собственности на движимое или недвижимое имущество, в разные, определенные, равные или неравные временные интервалы (промежутки)»*. Хотя румынский законодатель, регулируя собственность на время, исходил из института специфического использования имущества в рамках таймшера, в румынской гражданско-правовой доктрине после принятия Гражданского кодекса сформировалось твердое мнение, с которым мы согласны, согласно которому *право собственности на время устанавливается как подлинное непринужденное вещное право общей собственности на «временную» долю* [8, с. 62] и никоим образом не является простым правомочием права собственности, т.е. правом пользования, или просто каким-либо личным обязательственным правом (правом требования). Хотя, в периоде с 2004 (принятие Закона № 282 от 23 июня 2004) до 2009 (принятие ГК Румынии) на основе института таймшера, считалось, что это классическое право пользования как правомочие (атрибут) права собственности [9, с.223]. И это мнение справедливо вытекает из смысла, что по своему характеру *право собственности на время* является общим (на основе сделки), а не принужденным законом вещным правом [10, с.211].

Таким образом, с 2009 года в румынской правовой системе признаются как институт таймшера, так и институт *право собственности на время (как единоличное последовательное и повторное специфическое пользование единым целым имуществом в заранее определенные, равные или неравные, промежутки времени без передачи права собственности, с четко установленными правилами)*, причем эти два института имеют различные правовые нормы. Что касается четкого закрепления различия этих двух правовых институтов, то в специализированной доктрине один из авторов подчеркнул тот факт, что «ни в одном другом государстве, и особенно во Франции, мы не встречали, чтобы это право рассматривалось как истинное право собственности, а все правовые системы ограничивались рассмотрением его лишь как права пользования, поскольку нетипичный способ его использования не соответствует классической структуре собственности» [11].

II. Понятие собственности на время.

Из смысла нормы ч. (1) ст. 575 ГК РМ собственность на время – это юридический режим, когда несколько лиц (сособственников) в отсутствие особого регулирования, специфическим

образом, то есть *последовательно и повторно* осуществляют *полномочие пользования* права собственности на движимое или недвижимое имущество *в определенные, равные или неравные, промежутки времени*.

Сущность собственности на время состоит в том, что ее участники (сособственники) используют единое целое имущество – вещь (с сохранением ее материального единства), *последовательно и повторно в заранее определенные, равные или неравные, промежутки времени* без передачи права собственности, с четко установленными правилами. Имеет место как-бы «*расщепление права собственности*» на заранее определенные, равные или неравные, промежутки времени. Такой режим собственности предусматривает не разграничение всей собственности на части (доли в имуществе), как при режиме обще-долевой собственности, а имеет место темпоральное разграничение именно правомочие пользования (как одной из трех правомочий права собственности) на определенные промежутки времени, где за каждым собственником закрепляется право на это специфическое использование общей собственностью (при этом, промежутки времени по специфическому использованию общего имущества могут быть равными или неравными). Это называется «доли права собственности на промежутки времени».

Необходимость существования законного специфического режима *собственности на время* над общим имуществом связана с тем, что сособственники не обязаны каждый раз заключать соглашения о способе его единоличного использования целиком в определенные промежутки времени. Сособственники изначально определяют свои «доли права собственности на промежутки времени». В современных условиях Республики Молдова, когда очень большая часть населения, воспользовавшиеся реальным правом на свободное передвижение выехала за рубеж (кто на более оплачиваемую работу, кто на ПМЖ), а на родине оставили свое имущество, иногда без какого-то присмотра, данный институт как никогда наиболее актуален.

Таким образом, собственность на время - это важный правовой механизм, позволяющий эффективно использовать общее имущество без передачи права собственности, с четко установленными правилами.

III. Основания приобретения собственности на время.

В соответствии с нормой ч. (1) ст. 576 ГК РМ собственность на время приобретается (возникает) *на основании сделки* (т.е. договора или завещания). Договор, как многосторонняя сделка или завещание как односторонняя сделка являются основным документом, устанавливающие промежутки времени, а также права и обязанности сторон по собственности на время. Гражданский кодекс РМ регулирует общие положения и требования к такому виду договору, соответственно, виду собственности, если это не урегулировано договором или завещанием. *Например*, завещатель в завещании прямо указывает и устанавливает, что его дом, земельный участок и т.д., после его смерти останутся его детям (родственникам и т.д.) на праве собственности на время, с указанием временного промежутка для каждого, или просто общего временного промежутка (например, по 6 месяцев, либо по 3 года на каждого и т.д.).

При этом, временной характер собственности на время, принадлежащей нескольким сособственникам, *должен быть прямо предусмотрен указанием определенного промежутка времени*, который предоставляется приобретателю на основании приобретенной доли права собственности на промежутки времени. Промежутки времени выражается ссылкой на первый и последний день и месяц *исключительного пользования*.

Таким образом, из действующих правовых норм следует, что собственность на время (периодическая собственность) представляет собой особую форму договорной (непринудительного) совместной собственности, характеризующуюся четырьмя существенными особенностями: 1) множественностью собственников; 2) материальным единством имущества; 3) последовательным осуществлением права собственниками в установленные промежутки времени, равные или неравные; 4) недопустимостью судебного раздела (раздел, только договором).

IV. Правовой режим собственности на время.

1) Положения о праве собственности на время *применяются, в отсутствие* особого регулирования право общей долевой собственности.

2) Положения о праве собственности на время *не применяются* в случае, если на имущество имеется режим право общей долевой собственности, а сособственники договорились о способе его использования в определенные промежутки времени (ч. (2) ст. 575 ГК РМ). Ибо, при собственности на время использование права собственности на движимое или недвижимое имущество всегда имеет место последовательно (друг за другом) и повторно (по кругу).

3) При этом, правовые положения об общей долевой собственности *применяются* соответствующим образом к собственности на время в той мере, в какой они не противоречат собственности на время (ч. (3) ст. 575 ГК РМ).

4) Предмет права собственности на время (вещь) материально остается **единым целым**, не дробленным, не делится на доли, а на временные промежутки-периоды, в которые каждый сособственник единолично осуществляет все свои правомочия собственника (владеть, пользоваться и распоряжаться).

5) В отношении принадлежащего ему промежутка времени либо его части любой сособственник может совершать в соответствии с законом *сделки по сохранению, управлению и распоряжению*. Так, он может свободно произвести ремонт вещи, облагородить ее, сдать ее в безвозмездное пользование, в имущественный найм, в аренду (если это участок земли), может обременить залогом или ипотекой, или даже, может отчуждать (продать, дарить, менять и т.д.) свою долю права собственности на промежуток времени.

5.1) При этом, при совершении сделки по распоряжению своей доли права собственности на промежуток времени путем продажи прочие сособственники не обладают преимущественным правом покупки на основании закона, как при общей долевой собственности.

5.2) В случае, когда сособственник захочет совершать сделки по **управлению или распоряжению**, то есть сдать ее в безвозмездное пользование, в имущественный найм, в аренду (если это участок земли), обременить залогом или ипотекой, или отчуждать не только в отношении своей доли права собственности на промежуток времени, а и доли права собственности на промежуток времени другого сособственника, то он обязательно должен истребовать согласия сособственника/ов. В противном случае, сделка в части, в которой устанавливаются либо передаются права, касающиеся доли права собственности на промежуток времени принадлежащая *другому сособственнику*, в отношении третьих лиц (добросовестного покупателя или нанимателя, например) будет считаться *недействующей*¹⁷ до тех пор, пока не получит одобрения со стороны этого сособственника. Как только сособственник/и одобрит ее - (т.е. постфактум даст согласие и устранил основание бездейственности), сделка становится действующей незамедлительно. Если нет, то ее правовые-юридические последствия останутся в состоянии подвешенности (бездейственность сделки). Это вытекает из принципа «*nemo ad alium transferre potest quam ipse habet; nemo dat quod non habet*» - никто не может передать или создать больше прав, чем есть у него самого (ч. (1) ст. 358 ГК РМ). *Например*, сособственник в начале своего 3-годового промежутка времени, в качестве наймодателя заключил договор имущественного найма и передал нанимателю дом на 5 лет.

6) Каждый сособственник обязан совершать все *сделки по сохранению* таким образом, чтобы не препятствовать или не затруднять осуществление прав прочих сособственников.

¹⁷ Смотри ст. 357 ГК РМ: Недействующая сделка - это сделка, чьи правовые (юридические) последствия находятся в состоянии подвешенности. Если она не является ничтожной или оспоримой, то в этой части является недействующей (бездейственной), то есть не создает юридических последствий.

Сособственник, осуществляющий необходимые расходы на *крупный ремонт*, имеет право на возмещение убытков соразмерно стоимости прав прочих сособственников.

7) Сделки, вследствие которых *полностью или частично потребляется сущность имущества*, могут осуществляться только *с согласия* прочих сособственников

8) По завершении промежутка времени сособственник должен передать имущество сособственнику, правомочному использовать его в последующий промежуток времени.

9) Сособственники могут заключить *договор об управлении* с соответствующим применением положений об общей долевой собственности. При этом, *условие в договоре об управлении недвижимым имуществом*, предусматривающее, что приобретатель доли автоматически присоединяется к договору управления вместо лица, которое произвело отчуждение соответствующей доли, создает последствия (для приобретателя-третьего лица) лишь с момента, когда этот договор внесен в реестр недвижимого имущества (ст. 578 ГК РМ).

10) Несоблюдение обязанностей со стороны сособственника/ов, влечет *обязанность возмещения убытков остальным потерпевшим сособственникам/у*.

11) В случае если один из сособственников серьезно нарушает осуществление права собственности на время, он *может быть исключен судебным решением по требованию потерпевшего сособственника*. При этом, важно, что исключение может быть постановлено, *только если один из прочих сособственников или третье лицо покупает долю исключенного сособственника*. То есть доля права собственности на промежуток времени никак не может переходить по основании судебного исключения, автоматически к остальным сособственникам/у – как говорится, свято место пусто не бывает. Этом механизм предусмотрен именно для того, чтобы предотвратить изменение режима право собственности на время посредством исключения сособственника/ов нарушителя.

12) *Собственности на время* характеризуется недопустимостью судебного раздела. Тот есть сособственник *не вправе требовать раздела имущества*, принадлежащего ему на праве собственности на время, если сособственники не согласились об ином договоре. Раздел имущества осуществляется *только на основании договора* (единым соглашением) между всеми сособственниками. При этом, при разделе недвижимого имущества (земельных участков и строений), раздел становится противопоставимым всем остальным лицам только вследствие *внесения отметки о нем в реестр недвижимого имущества* на основе ст. 435 ГК РМ [12, с.153].

V. В чем состоит разница между обще-долевой собственностью и собственностью на время?

- В *долевой собственности* нет материальное единство имущества. То есть за каждым собственником или участником закрепляется право на долю в общей собственности (доли могут быть равными или неравными). Доля собственности может быть выражена в процентах или в виде дроби, где числитель обозначает долю, которая принадлежит конкретному лицу или группе лиц, а знаменатель обозначает общее количество долей. Участники (сособственники) используют **единое целое** имущество (вещь) непрерывно (т.е. постоянно и ежедневно), но реализуют-осуществляют свои правомочия собственника (по владению, пользованию и распоряжению) исключительно на свою идеальную долю.

- В *собственности на время* сохраняется материальное единство имущества. То есть за каждым собственником закрепляется право на долю в общей собственности, но доли выражены темпорально, то есть в заранее определенные промежутки времени, используемые последовательно и повторно (доли права собственности на промежуток времени могут быть равными или неравными). Сособственники **исключительного пользуются** (используют) **единым целым** имуществом (вещью), но в строго определенные промежутки времени, последовательно и повторно (а не непрерывно и не только в отношении отдельной своей доли, как при обще-долевой собственности) [6, с. 236]. Например, «Р» будет исключительного

пользоваться домом/автомобилем весной «V» - летом, «Т» - осенью, а «I» - зимой. Или, другой пример на более длительные периоды: «Р» будет исключительно пользоваться водоемом в период 2025-2028 гг, для воспроизведения и выращивания рыбы; «V» в период 2029-2031 для организации спорта и отдыха (развитие и коммерческая эксплуатация пляжей и зон отдыха), а «Т» - в период 2032-2034 осуществит сброс воды из водного объекта и будет использовать его земельный участок для сельскохозяйственных работ и т.д.

- *В долевой собственности* при продаже одним собственником своей доли остальные собственники обладают преимущественным правом покупки на основании закона.

- *В собственности на время* при продаже одним собственником своей доли права собственности на промежуток времени остальные собственники не обладают преимущественным правом покупки на основании закона.

- *В долевой собственности* допустим как договорной, так судебный раздел имущества.

- *Собственности на время* характеризуется недопустимостью судебного раздела имущества (раздел, только договором (единым соглашением) между всеми собственниками).

VI. Прекращение собственности на время.

Собственность на время прекращается:

- a) уничтожением общего имущества. При этом, акт об уничтожении имущества (вещи) должен быть согласован всеми собственниками.

- b) на основании приобретения одним лицом всех долей в праве собственности на время. Например, в случае, когда один из собственников приобретает у остальных доли права собственности на промежуток времени или, когда третье лицо одновременно приобретает доли у всех собственников.

- c) в других предусмотренных законом случаях. *Например*, в случае одновременного отказа от права собственности; или одновременного раздела между собой имущества (предмета собственности); экспроприации имущества в случае общественной необходимости и т.д. При этом, в случае одновременного раздела между собой предмета собственности недвижимого имущества право собственности на время прекращается и становится противопоставимым вследствие внесения отметки о нем в реестр недвижимого имущества.

Заключение.

По результатам исследования можно сделать вывод, что несмотря на то, собственность на время по своей правовой природе похож на классическую обще-долевою собственность, данные правовые институты отличны по их правовому режиму. Собственность на время в законодательствах Румынии и Республики Молдова также отличается от современного понятие «таймшера», так как последнее является обязательственным правом требования, а не вещным правом. Собственность на время - это важный правовой механизм, позволяющий эффективно использовать общее имущество с сохранением ее материального единства, без передачи права собственности, с четко установленными правилами и ограничениями.

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REGIONAL AND LOCAL TAX AUTONOMY UNDER EU CONSTRAINTS: THE EXTERNAL DIMENSION OF SUBNATIONAL TAX POLICY

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Abstract

Subnational taxation is increasingly used to finance local public services and to shape place-based development strategies. In the European Union, however, regional and local tax autonomy operates within a dense set of legal constraints whose effects are not purely internal: they structure cross-border tax competition, determine the credibility of investment incentives, and condition the Union's external commitments to good tax governance. This article develops a compliance-oriented framework for subnational tax policy by connecting (i) the Treaty freedoms and the Member States' retained competence over direct taxation, (ii) the State aid selectivity test and its autonomy-based refinement for regional measures (*Portugal v Commission (Azores)*, Case C-88/03; *UGT-Rioja and Others*, Joined Cases C-428/06 to C-434/06), and (iii) the Union's broader anti-harmful-tax-competition agenda (Code of Conduct, BEPS Action 5, and Pillar Two). The analysis argues that the decisive issue is not whether a region may differentiate, but whether it can do so through a genuinely general territorial tax system for which it bears real fiscal responsibility and which does not, by design or effect, target a predetermined set of undertakings. The conclusion proposes drafting and governance techniques for regional and local taxes that preserve democratic autonomy while reducing litigation and recovery risks under Article 107(1) TFEU.

Key words: State aid; selectivity; regional autonomy; fiscal federalism; EU law; BEPS.

1. Introduction: why subnational taxes have an “external dimension” in the EU

Regional and local taxation is a central instrument of multilevel governance. Subnational governments use taxes to fund services (fiscal capacity), to manage territorial externalities

(environment, mobility, tourism), and to support development strategies (infrastructure and business ecosystems). In a decentralised state, such policies are normally discussed as an internal constitutional choice: autonomy is traded off against solidarity and equalisation. Within the European Union (EU), however, subnational tax autonomy is structurally exposed to supranational constraints that transform local tax choices into matters of cross-border relevance. The “external dimension” of subnational tax policy is therefore not limited to international spillovers in the economic sense; it is also legal and institutional. EU law determines whether a regional tax rule will be treated as a general expression of territorial autonomy or as a selective advantage equivalent to a subsidy, with consequences for investment decisions, intergovernmental coordination, and ex post recovery of unlawful aid [3, para. 131-139].

This external dimension is reinforced by the EU’s participation in global anti-harmful-tax-competition standards. The Code of Conduct for business taxation commits Member States to roll back harmful regimes and refrain from introducing new ones [9, p. 1-6]. The OECD/G20 BEPS Action 5 framework evaluates preferential regimes against transparency and substance, and has influenced EU and Member State practices [10, p. 17-35]. More recently, the global minimum tax (Pillar Two) has changed the practical payoff of many tax incentives by “top-up” mechanisms that may neutralise low rates and certain credits [12, art. 5-9]. Even when regions act within domestic competence, these layers of constraints shape the feasible design space of local taxation and the credibility of territorial incentives vis-a-vis mobile capital.

2. Competence and constitutional background: autonomy as a protected but conditioned value

Direct taxation remains, in principle, a Member State competence. At the same time, the Union must respect Member States’ national identities and their fundamental political and constitutional structures, including regional and local self-government [1, art. 4(2)]. The European Charter of Local Self-Government similarly recognises that local authorities should have adequate resources of their own, and that at least part of those resources may derive from local taxes or charges within the limits of law [11, art. 9]. These provisions establish the legitimacy of fiscal decentralisation as a governance choice. They also clarify that the EU’s intervention is not, conceptually, a denial of autonomy: it is a discipline on the use of autonomy where it intersects with the internal market and with a common competition framework.

The practical implication is that “autonomy” is evaluated through legal tests that convert constitutional arrangements into EU-relevant benchmarks. This is particularly visible in State aid law. While Treaty freedoms may constrain discriminatory or restrictive measures (for example, where a local tax burdens non-resident operators), the decisive compliance risk for many regional incentives is the State aid selectivity assessment under Article 107(1) TFEU [2, p. 91-92]. Under this framework, a tax advantage may constitute aid where it reduces charges that would normally be borne under the relevant tax system and thereby favours certain undertakings. For subnational measures, the key question becomes: what is the “normal” system, and who is the proper comparator set?

Even where a local tax constitutes a restriction, EU law does not prohibit it per se. Restrictions may be justified by overriding reasons in the public interest and must be proportionate. In corporate taxation, the Court has accepted justifications such as preserving the balanced allocation of taxing powers and preventing tax avoidance, while insisting that measures be targeted and not go beyond what is necessary. Marks and Spencer (Case C-446/03) illustrates this proportionality discipline: even legitimate objectives cannot support blunt measures that over-restrict cross-border activity [14]. For

local policymakers, the compliance lesson is practical: subnational taxes should be designed with a clear objective, a transparent link to the local public service or externality they address, and neutral application criteria. This internal-market constraint complements State aid law by pushing regions away from discriminatory or opaque place-based rules and toward general, territorially coherent tax instruments.

EU free-movement law adds a complementary constraint: local taxes must respect non-discrimination and proportionality where they affect establishment or capital movements (e.g., territorial surcharges, tourism/environmental levies, or taxes linked to a permanent presence) [2, art. 49; art. 63].

3. State aid and taxation: advantage, State resources, and the three-step selectivity analysis

In tax matters, State aid analysis typically focuses on three components: (i) the existence of an advantage (a reduction of the tax burden compared to the normal regime), (ii) imputability and State resources (a loss of revenue equivalent to a transfer of resources), and (iii) selectivity (a differentiation between comparable undertakings) [3, para. 66-99; 3, para. 117-139]. The Court has consistently held that a reduction of tax revenue can constitute an economic advantage granted through State resources because the State forgoes revenue it would otherwise collect [7, para. 23-26]. This reasoning applies irrespective of whether the measure is enacted at national or subnational level, provided the advantage is attributable to the State and affects the public budget in the relevant sense.

Selectivity is the pivotal element. The Commission and the Court apply a consolidated three-step method: (i) identify the reference system (the “normal” regime); (ii) verify whether the measure derogates from that system by differentiating between operators in a comparable factual and legal situation; and (iii) if a derogation exists, assess whether it is justified by the nature or general scheme of the system [3, para. 133-141; 16, para. 36-45]. World Duty Free (Joined Cases C-20/15 P and C-21/15 P) confirms that the reference system/derogation logic is central in tax cases and that selectivity cannot be inferred solely from the existence of an advantage [8, para. 54-58]. *Adria-Wien* (Case C-143/99) shows that a relief confined to certain undertakings remains selective even when framed through objective criteria [15, para. 41-53]. Conversely, *Paint Graphos* (Joined Cases C-78/08 to C-80/08) clarifies that a tax difference may escape selectivity only where it follows directly from the system’s internal logic (nature/general scheme), not from extrinsic policy goals [16, para. 64-76]. The reference-system approach, and the specific problems of fiscal selectivity in tax rulings and territorial regimes, have been extensively analysed in the scholarship on fiscal State aid and harmful tax competition [20; 21; 22; 23; 27].

For subnational taxation, the reference system problem becomes territorial: should the benchmark be the national system or the regional system? If the national system is the benchmark, any territorial differentiation appears as a derogation and thus a candidate for selectivity. If the regional system is the benchmark, the same measure may be general within that territory. The Court’s autonomy-based case law provides criteria for shifting the benchmark, and thereby for constitutionalising certain forms of fiscal decentralisation within State aid doctrine [4, para. 57-67].

4. Regional selectivity and the Azores criteria: autonomy as a jurisdictional rule

In *Portugal v Commission (Azores)*, Case C-88/03, the Court held that a tax reduction limited to part of a Member State’s territory is not automatically selective if the territorial authority has sufficient autonomy for its rules to constitute the “normal” regime in that territory [4, para. 57]. The Court articulated three cumulative criteria. Institutional autonomy requires a political and

administrative status distinct from central government; procedural autonomy requires that the authority can adopt the measure without central intervention; economic autonomy requires that the authority bears the financial consequences of the measure, without compensation through transfers from central government [4, para. 62-67]. Only if these conditions are met can the regional rule define the reference system for selectivity analysis.

The economic autonomy criterion is decisive and policy-relevant. It transposes a fiscal federalism insight into legal form: where the region internalises the cost of tax cuts, voters can meaningfully trade off lower taxes against reduced spending or alternative revenues. Where the cost is externalised through compensatory grants or equalisation that neutralises the revenue loss, regional tax differentiation resembles a subsidy financed by general resources, thus triggering State aid concerns. This criterion also disciplines tax competition. It limits the ability of regions to engage in “beggar-thy-neighbour” strategies funded by national resources while capturing local benefits.

5. UGT-Rioja and the intergovernmental reality: autonomy must be “effective”

The UGT-Rioja (Basque Country) judgments (Joined Cases C-428/06 to C-434/06) refined the autonomy test by emphasising that formal legislative competence is insufficient. The regional authority must act as a truly autonomous decision-maker within the intergovernmental framework, and must bear real fiscal responsibility in practice [5, para. 46-54]. Autonomy is evaluated contextually: central “framework” rules may predetermine essential parameters; administrative supervision may amount to a de facto veto; and equalisation mechanisms may offset the regional cost of tax cuts. If these features undermine effective responsibility, the benchmark remains the national tax system, and territorial differentiation becomes a derogation subject to selectivity scrutiny.

For policy design, UGT-Rioja implies that compliance is not only about drafting the tax rule, but also about documenting the governance and public finance context. Regions seeking to introduce differentiated rates or bases must be able to demonstrate: (i) independent decision-making procedures; (ii) stable competence to legislate on the relevant tax elements; and (iii) a credible fiscal incidence analysis showing that the subnational budget absorbs the revenue effect. In practice, this calls for transparent intergovernmental accounting and for ex ante fiscal impact assessments attached to regional tax legislation. The evidentiary dimension is critical because State aid assessment is often ex post and adversarial, with the risk of recovery and interest that can retroactively alter the economics of investment.

6. “Designed selectivity” and the Gibraltar warning: generality cannot be purely formal

Even where a tax regime is territorially general, EU law may treat it as selective if its structure is designed to benefit a predetermined class of undertakings. In *Commission and Spain v Gibraltar* (Joined Cases C-106/09 P and C-107/09 P), the Court held that a regime may be materially selective where its tax base and rules, taken together, have the effect of excluding certain undertakings from any real tax burden, even if the regime applies to all companies in law [6, para. 101-106]. This doctrine is particularly relevant for subnational regimes because regions may be tempted to use “general” systems (for example, alternative bases, turnover proxies, or nominal rates coupled with exclusions) to attract mobile activities without drafting explicit exemptions.

Gibraltar suggests a functional test: a region may choose local policy objectives, but the internal logic of the tax must be consistent with those objectives and must not systematically spare the targeted beneficiaries. A local corporate tax that is effectively zero for entities with specific business models or cross-border structures risks being treated as an advantage. Similarly, local taxes based on proxies (property footprint, payroll, or headcount) may unintentionally privilege highly mobile, asset-light

undertakings, raising a Gibraltar-type concern if the system is engineered to achieve that result. The practical consequence is that “generality” must be both territorial and economic: the regime must impose a real and non-illusory burden on comparable undertakings within its scope.

7. The external dimension beyond State aid: harmful tax competition standards and Pillar Two

EU constraints on subnational taxation interact with broader standards on harmful tax competition. Under the Code of Conduct for business taxation, Member States politically commit to identify and roll back measures that significantly affect the location of business activity within the Union and that have harmful features [9, p. 1-6]. Although the Code is not a binding legal instrument, it influences coordination and can lead to legislative or administrative changes at national and subnational levels. BEPS Action 5 adds an international layer by assessing preferential regimes against transparency, exchange of information, and substance requirements, with an emphasis on preventing “ring-fencing” and artificial profit shifting [10, p. 17-35].

Comparative snapshot. Italy’s Constitution frames fiscal decentralisation through Articles 117 and 119, combining territorial autonomy with coordination and solidarity; in practice, regional/local tax space is largely exercised via surcharges and earmarked levies (e.g., regional IRPEF add-ons, municipal surcharges, and property-based taxation), with limited room for region-specific corporate-rate competition, so EU constraints tend to bite through selective reliefs and administrative discretion rather than through full parallel corporate tax systems [17]. Spain offers the most jurisprudentially salient model: the foral territories (Basque Country/Navarra) possess meaningful competence over corporate taxation within the *Concierto* framework, which made the autonomy/economic-responsibility analysis decisive in *UGT-Rioja* and related litigation [5, para. 46-54; 18]. Germany represents a different pattern: *Länder* have constrained rate-setting powers for major direct taxes, but municipalities can calibrate the *Gewerbsteuer* via the *Hebesatz* and shape local fiscal competitiveness; here the key EU risk again concentrates on selective exemptions or base-engineering rather than on decentralised “mini-systems” [19]. Across these models, the compliance core is stable: territorial differentiation is sustainable only when embedded in a general territorial tax system, fiscally internalised, and not designed to preselect beneficiaries [4, para. 62-67; 6, para. 101-106]. In Italy, the post-2001 constitutional settlement is complemented by the fiscal federalism delegation and implementation acts (Law No. 42/2009; Legislative Decree No. 68/2011), which channel regional autonomy mainly through surcharges and earmarked taxes, limiting the structural scope for subnational corporate-rate competition [28; 29]. In Spain, beyond the *Concierto*, the general framework of regional financing is set by the Organic Law on the Financing of the Autonomous Communities (LOFCA), which reinforces the distinction between ordinary autonomy and foral autonomy in practice [30]. In Germany, the municipal trade tax (*Gewerbsteuer*) is anchored in federal legislation with a local multiplier (*Hebesatz*), which makes competition largely rate-based at municipal level while keeping the base federally harmonised [31].

The global minimum tax (Pillar Two) further alters the incentive landscape. Where a multinational group is subject to an effective minimum rate, subnational low-rate regimes may be neutralised by top-up taxation at parent or domestic level, depending on implementation choices [12, art. 5-9]. This changes the external effects of regional tax competition: incentives may become less about statutory rates and more about legally robust, generally available measures that qualify as non-selective, non-aid instruments or as permitted tax credits under minimum-tax rules. As a result, the “external dimension” of regional tax policy now includes not only EU State aid scrutiny but also the

compatibility of incentive design with global minimum-tax mechanics. Regions may shift from headline rate competition to competition through administrative efficiency, legal certainty, and infrastructure-backed place-based policies.

8. Compliance-by-design: drafting and governance techniques for robust subnational tax policy

The case law supports a compliance-by-design approach that preserves autonomy by embedding it into legally robust general taxation. First, articulate a coherent territorial reference system: define the objective of the tax (revenue raising for local services, environmental correction, congestion management) and ensure that the charge applies on objective criteria to all undertakings within scope [3, para. 133]. Second, avoid *ad personam* or sector-tailored design. Where differentiation is needed, it should follow from measurable externalities or from objective ability-to-pay proxies, applied uniformly to comparable operators.

Third, ensure and document economic autonomy. If the region introduces a rate reduction or an incentive, it should internalise the fiscal cost and avoid compensatory transfers that neutralise the loss [4, para. 65-67]. Where equalisation exists, transparency is essential: the system should not mechanically reimburse tax cuts. Fourth, pre-empt Gibraltar-type risks by stress-testing the tax base and exclusions against foreseeable business models. The regime should not be constructed so that the intended beneficiaries systematically fall outside the charge [6, para. 101-106]. Fifth, align with good tax governance standards: transparency and exchange-of-information compatible administrative design reduces reputational risk and may support the argument that measures are not “harmful” in the BEPS/Code sense [10, p. 17-35].

Finally, governance tools matter. *Ex ante* consultation with central authorities on State aid risk, publication of fiscal impact assessments, and adoption of clear administrative guidance can reduce the probability of *ex post* recovery and can strengthen investor reliance. In multilevel systems, coordinated rules on tax rulings and on interpretation of regional taxes can prevent fragmentation and help demonstrate that the regional regime is general rather than discretionary.

9. Conclusions

Subnational tax autonomy in the EU is best understood as a structured space of permissible differentiation. EU law does not deny decentralised taxation, but it disciplines it through a benchmark logic: differentiation is acceptable when it stems from a genuinely autonomous territorial tax system that is general in application and whose fiscal consequences are borne by the territorial authority. Azores and UGT-Rioja constitutionalise effective autonomy within State aid doctrine by allowing the benchmark to shift to the regional level where institutional, procedural, and economic conditions are met [4, para. 62-67; 5, para. 46-54]. Gibraltar warns that formal generality is insufficient where the design of the tax system systematically spares a predetermined group [6, para. 101-106].

The external dimension of subnational tax policy emerges from the interaction between these legal tests and broader standards against harmful tax competition, now further reshaped by the global minimum tax. For regional and local policymakers, the strategic response is compliance-by-design: use general, transparent and fiscally responsible instruments, integrate governance safeguards, and shift the focus from selective incentives to durable place-based competitiveness grounded in legal certainty and public services.

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**МЕЖДУНАРОДНО-ПРАВОВЫЕ И ГУМАНИТАРНЫЕ ПОСЛЕДСТВИЯ
НЕПРИЗНАНИЯ ПРАВИТЕЛЬСТВА ИСЛАМСКОГО ЭМИРАТА АФГАНИСТАН****Хабибзада Замзама**

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Abstract: This article analyzes the consequences of the international non-recognition policy towards the Islamic Emirate of Afghanistan (IEA). The study argues that this strategy has produced a counterproductive outcome: while aimed at pressuring the regime, it has precipitated a severe humanitarian crisis and inadvertently strengthened the position of the Islamic State – Khorasan Province (ISKP), thereby heightening threats to regional security instead of mitigating them.

Keywords: Afghanistan, international recognition; Taliban, humanitarian crisis regional security

Вопрос международного признания занимает центральное место в современной политической истории Афганистана, особенно после установления Исламским Эмиратом Афганистан (ИЭА) полного контроля над территорией страны в августе 2021 года. В основе современных дискуссий о статусе ИЭА лежат два фундаментальных подхода в международно-правовой доктрине: декларативный и конститутивный.

Согласно декларативной теории (сторонниками которой являются Ф.Ф. Мартенс, А.Н. Стоянов, О.О. Эйхельман, С.В. Черниченко, А. Кассезе), государство представляет собой объективно существующую политико-правовую единицу. [3. С. 145] Его возникновение обусловлено совокупностью фактических (эмпирических) критериев и не зависит от актов признания со стороны других субъектов международного права. Классической кодификацией данного подхода служит Конвенция Монтевидео о правах и обязанностях государств (1933 г.), которая закрепляет четыре критерия государственности [1. С. 19]:

1. постоянное население;
2. определённая территория;
3. действующее правительство;
4. способность вступать в международные отношения.

Таким образом, государство существует *de facto*, а признание выполняет исключительно декларативную (констатирующую) функцию, не влияя на его правосубъектность [8. С. 310].

Конститутивная теория, напротив, рассматривает международное признание в качестве субъектообразующего акта [10. С. 88], который непосредственно определяет момент возникновения и объем правосубъектности государства. С точки зрения этого подхода, отсутствие признания со стороны международного сообщества означает юридическую несостоятельность режима, даже при наличии у него эффективного контроля над территорией.

Применительно к ситуации с ИЭА данный теоретический дуализм порождает принципиальное противоречие. С одной стороны, правительство талибов формально соответствует декларативным критериям Конвенции Монтевидео: оно контролирует территорию и население, обладает административным аппаратом и ведёт внешние сношения (хотя и ограниченные). С другой стороны, фактически универсальное непризнание ИЭА на уровне ООН (по состоянию на январь 2026 г. ни одно государство не оспорило полномочия

предыдущего правительства в Комитете по проверке полномочий ГА ООН) и последовательная блокировка его доступа к международным институтам отражают доминирование конститутивного подхода в политике ключевых западных держав [7. С. 22]. Это создаёт уникальный правовой парадокс: де-факто существующее государство лишено полноценной де-юре правосубъектности в системе ООН.

На сегодняшний день руководство Исламского Эмирата Афганистан осуществляет устойчивый де-факто контроль над всей территорией страны, реализуя ключевые суверенные прерогативы, включая фискальные функции, охрану правопорядка и монополию на легитимное насилие. Вопреки первоначальным прогнозам о скором коллапсе, правительство талибов демонстрирует административную стабильность: поддерживает работу шариатской судебной системы, эффективно контролирует государственные границы и обеспечивает отсутствие масштабного организованного внутреннего сопротивления после распада вооруженных сил Исламской Республики Афганистан.

Подобная реализация государственных функций в полной мере соответствует классическому в международном праве принципу эффективного контроля, который рассматривается как основание для легитимности *де-факто* власти [10. С. 94]. Однако в случае с ИЭА этот принцип вступает в противоречие с формально-правовой процедурой. Комитет по проверке полномочий Генеральной Ассамблеи ООН на протяжении всего периода с 2021 года систематически откладывает решение о признании полномочий делегации, представляющей талибов. В результате формируется уникальная ситуация правового вакуума и «двойного представительства» [7. С. 40]: место Афганистана в организации *де-юре* сохраняется за представителями свергнутого в 2021 году правительства, в то время как реальный и эффективный контроль над территорией и населением страны осуществляет непризнанное *де-факто* руководство ИЭА.

Правовой основой для ограниченного взаимодействия международного сообщества с ИЭА стала резолюция 2593 [2] Совета Безопасности ООН, принятая 30 августа 2021 года. Данный документ, поддержанный всеми постоянными членами СБ ООН, заложил условный и нормативный фундамент для любого диалога с новыми властями в Кабуле. В резолюции были чётко сформулированы минимальные критерии, соответствие которым рассматривается как необходимое предварительное условие для легитимации режима в глазах ключевых мировых акторов. К ним относятся:

1. Абсолютный запрет на использование афганской территории в качестве базы для деятельности международных террористических группировок, таких как «Аль-Каида» и «Исламское государство – провинция Хорасан» (ISKP);
2. Борьба с терроризмом и обеспечение своевременного вывода иностранных боевиков;
3. Гарантии соблюдения основных прав человека, включая права женщин, девочек и этнорелигиозных меньшинств;
4. Сохранение и беспрепятственное функционирование критической гражданской инфраструктуры (в частности, гражданской авиации) и обеспечение беспрепятственного доступа для гуманитарных организаций.

Выполнение этих условий, особенно в части прав женщин и борьбы с терроризмом, прямо увязано в документах ведущих держав и резолюциях международных финансовых институтов с вопросом о разблокировке замороженных за рубежом активов афганского центрального банка и нормализации экономических отношений. Таким образом, Резолюция 2593 [2] не только фиксирует требования, но и создаёт систему политико-экономических рычагов давления на ИЭА, переводя проблему признания из плоскости деклараций в плоскость конкретных действий и взаимных обязательств. В дополнение к этому, Резолюция 2615 [4] позволила осуществлять гуманитарные операции в обход санкций, а Резолюция 2721 [5] предложила долгосрочную «дорожную карту» по выполнению этих критериев. Несмотря на политический тупик, работа Миссии ООН (UNAMA) была продлена до марта 2026 года согласно Резолюции 2777 [6]

В результате сформировалась гибридная и двойственная модель взаимодействия между международным сообществом и ИЭА. Её суть заключается в сочетании прагматического, преимущественно гуманитарного диалога с принципиальным отказом от юридической легитимации правительства талибов. Эта модель реализуется через несколько каналов:

1. Гуманитарно-административное взаимодействие: Ключевая роль отводится структурам ООН (Миссия ООН в Афганистане – UNAMA, Управление по координации гуманитарных вопросов – УКГВ, Всемирная продовольственная программа – ВПП), через которые обеспечивается доставка жизненно необходимой помощи гражданскому населению и осуществляется оперативный диалог с де-факто властями по техническим вопросам.
2. Опосредованные политические контакты: Политический диалог ведется преимущественно через третьи стороны и на нейтральных площадках. К ним относятся Дохийский офис (постоянное представительство талибов в Катаре), а также многосторонние форматы, такие как «Московский формат» с участием стран Центральной Азии, России, Китая и других региональных акторов.
3. Сохранение дипломатической и финансовой блокады: При этом сохраняется системный отказ от полноценного дипломатического признания. Ни одно государство не открыло посольство или постоянную дипломатическую миссию в Кабуле. Доступ Афганистана к международной финансовой системе остаётся заблокированным: активы центрального банка заморожены, страна исключена из системы межбанковских переводов SWIFT, а взаимодействие с Международным валютным фондом и Всемирным банком приостановлено.

Таким образом, международное сообщество сознательно занимает позицию на стратегическом распутье. С одной стороны, оно вынуждено оказывать гуманитарную поддержку для предотвращения катастрофы, что неизбежно предполагает определенный уровень взаимодействия с властями на местах. С другой стороны, оно стремится избежать любого шага, который мог бы быть интерпретирован как укрепление легитимности ИЭА или предоставление ему финансовых ресурсов, способных консолидировать режим. Эта противоречивая политика направлена на оказание давления с целью выполнения условий СБ ООН, но одновременно порождает глубокие внутренние дисбалансы, усугубляя экономический коллапс и гуманитарный кризис.

Несмотря на то, что Исламский Эмират Афганистан технически сохраняет пассивное членство в ряде специализированных учреждений системы ООН (Всемирной торговой организации, Всемирной организации здравоохранения, Международной организации гражданской авиации и др.), он полностью лишён права голоса и возможности влиять на принятие решений. Это превращает его участие в чисто формальную, не наделённую реальным содержанием процедуру. Более того, попытки правительства талибов получить полноправное членство или вступить в ключевые региональные организации, такие как Шанхайская организация сотрудничества (ШОС) и Организация исламского сотрудничества (ОИС), блокируются на неопределённый срок.

Международные санкции, закреплённые в резолюциях Совета Безопасности ООН (в частности, 1267, 1988, 2593 и 2664), а также отключение от глобальной межбанковской системы SWIFT создали режим жёсткой финансовой блокады. Её последствия носят системный характер: легальная внешняя торговля парализована, а государственный бюджет лишился ключевых налоговых поступлений от экспорта. В результате сложился парадокс, при котором де-факто власть осуществляет суверенный контроль над территорией, но при этом системно исключена из мировой финансово-экономической архитектуры.

Это стало одной из фундаментальных причин тотального экономического кризиса. Финансовая изоляция имеет катастрофические последствия для экономики страны. Национальные валютные резервы, оценивавшиеся в 2021 году в \$9,5 млрд, остаются замороженными за рубежом. Лишь часть этих средств (\$3,5 млрд), переданных в целевой

«Афганский фонд» в Швейцарии, используется для финансирования критического импорта (такого как продовольствие и медикаменты), минуя официальные счета правительства ИЭА. Международный валютный фонд заблокировал доступ к запланированным кредитным линиям на сумму около \$450 млн. Единственным регулярным источником ликвидности в стране остаются поставки наличных долларов США, осуществляемые агентствами ООН (примерно \$40 млн ежемесячно) для финансирования гуманитарных программ. Эта схема, хотя и предотвращает полный коллапс, лишает национальную экономику инвестиционных ресурсов, необходимых для восстановления, и ещё больше усиливает её зависимость от внешней помощи.

Таким образом можно констатировать, что дипломатическая изоляция ИЭА достигла беспрецедентного уровня. В столице Кабуле на сегодняшний день не функционирует ни одно иностранное посольство с полным дипломатическим статусом. Представительства ИЭА за рубежом (например, в Катаре, России, Китае) действуют в ограниченном режиме, не обладая полным набором консульских привилегий и иммунитетов.

Правительство талибов также отстранено от участия в ключевых глобальных и региональных политических и экономических форумах. Так, на Конференции ООН по изменению климата (COP29) Афганистан был представлен лишь в качестве наблюдателя-«гостя», а на последующей COP30 его делегация и вовсе не была допущена, несмотря на то, что страна входит в число наиболее уязвимых к последствиям засухи и изменения климата. ИЭА также не представлен на глобальных форумах по противодействию терроризму и в важнейших региональных треках безопасности, связанных с масштабными инфраструктурными проектами, такими как Китайско-пакистанский экономический коридор (СРЕС) и Туркменистан-Афганистан-Пакистан-Индия (ТАПИ).

Эта всеобъемлющая маргинализация имеет прямые стратегические последствия. Лишённые государственной легитимности на международной арене, представители ИЭА вынуждены вести переговоры исключительно на техническом или рабочем уровне. Это существенно ослабляет их позиции в спорах по жизненно важным вопросам, включая демаркацию границ (в частности, «линии Дюранда» с Пакистаном), трансграничное управление водными ресурсами и регулирование потоков беженцев. Таким образом, политика непризнания не только консервирует внутренний кризис, но и подрывает потенциал для урегулирования нестабильности на региональном уровне.

К настоящему моменту Афганистан достиг состояния системного экономического тупика. Экономика страны характеризуется глубокой рецессией и стагнацией с практически нулевыми темпами роста. Паралич банковской системы, вызванный финансовой изоляцией, привёл к острой нехватке ликвидности («денежному голоду») [9], что, вопреки ожиданиям гиперинфляции, спровоцировало устойчивую дефляцию. Её основной причиной является катастрофическое падение совокупного спроса из-за крайне низкой платежеспособности подавляющего большинства населения.

Продовольственный кризис приобрёл беспрецедентные масштабы. По данным структур ООН, в 2026 году от острого голода страдают более 17 миллионов человек — показатель, выросший в разы по сравнению с периодом трёхлетней давности, в особенности от недоедания страдают дети и женщины, не обладающие в силу текущих правовых ограничений достаточными возможностями для обеспечения своих базовых нужд и доступа к ресурсам [11]. При этом гуманитарные программы обеспечены финансированием лишь на 12% от необходимого объёма, что ставит страну на грань массового голода. Хотя де-факто власти предпринимают определённые меры, Афганистан остаётся в критической зависимости от внешней помощи. Любое сокращение внебюджетного финансирования каналов, осуществляемого через Всемирную организацию здравоохранения (ВОЗ) и международные НПО, грозит немедленным закрытием сети первичных медицинских клиник и резким ростом детской смертности, которая уже демонстрирует устойчивую негативную динамику из-за хронического недоедания.

Дополнительным ключевым фактором дестабилизации стал мощный миграционный кризис. Принудительная репатриация более 1,5 миллионов афганских беженцев из Пакистана в 2024–2025 годах создала колоссальную нагрузку на инфраструктуру и ресурсы приграничных провинций, спровоцировав новые волны внутренне перемещённых лиц и беженцев в направлении Ирана и стран Центральной Азии. Миллионы людей оказались в «ловушке перемещения» без надежды на стабильность и средства к существованию.

Социально-экономическая политика де-факто властей также усугубляет кризис. Указ о полном запрете на выращивание опийного мака (апрель 2022 года), не сопровождавшийся реалистичными программами альтернативной занятости и доходов для сельских общин, уничтожил традиционные источники существования для сотен тысяч семей. Возникающая в результате социальная безнадёжность и экономическое отчаяние создают благодатную почву для радикализации [12].

Это напрямую способствует укреплению позиций террористической группировки «Исламское государство» – провинция Хорасан (ИГ-К), которая наращивает число атак внутри страны и активизирует вербовку новых членов. Деятельность ИГ-К создаёт прямую угрозу безопасности ключевых транснациональных инфраструктурных проектов в регионе, таких как СПЕС и ТАПИ, и вынуждает соседние государства сохранять режим повышенной готовности на границах, увеличивая риски региональной конфронтации. Таким образом, анализ показывает, что текущая политика условного взаимодействия и непризнания ИЭА привела к опасному тупику с катастрофическими гуманитарными издержками. Стратегические расчеты международного сообщества, направленные на оказание давления на талибов, обернулись непоправимым ущербом для самого уязвимого населения Афганистана, углубляя экономический коллапс и создавая условия для новой волны нестабильности. Политика, призванная минимизировать угрозы, на практике парадоксальным образом способствует их росту, подпитывая почву для терроризма и миграционных кризисов, которые напрямую затрагивают интересы соседних государств и международной безопасности в целом.

На основе проведённого комплексного анализа можно сделать вывод, что политика универсального непризнания Исламского Эмирата Афганистан не только не способствует снижению угроз международной безопасности, но и создает обратный эффект. Масштабная гуманитарная катастрофа, обусловленная экономическим коллапсом, массовым голодом и деградацией социальной инфраструктуры, напрямую способствует укреплению позиций экстремистской группировки «Исламское государство» – провинция Хорасан (ИГ-К). Отчаявшееся население, лишённое базовых средств к существованию и перспектив, становится ресурсной базой для радикальной идеологии, что ведёт к росту рисков вербовки и террористической активности как внутри страны, так и в регионе.

По мнению автора стратегия давления через правовую и финансовую изоляцию не сдерживает террористические угрозы, а системно усугубляет гуманитарный кризис, обрекая миллионы афганцев на жизнь в условиях крайней уязвимости. Де-факто правительство в Кабуле не претерпело ожидаемой международным сообществом либеральной трансформации, однако страна в результате этой политики оказалась на грани полного социально-экономического распада.

Вместо достижения декларируемых целей стабилизации политика непризнания породила порочный круг: попытка обеспечить безопасность через изоляцию ИЭА объективно ведёт к углублению внутреннего кризиса, который, в свою очередь, становится питательной средой для новых, ещё более дестабилизирующих угроз.

Перспективы преодоления кризиса требуют принципиального пересмотра текущих подходов в сторону большей прагматичности и дифференциации. Основой новой стратегии должен стать прагматичный баланс между сохранением политического давления для выполнения ключевых условий (соблюдение прав человека, борьба с терроризмом) и

неотложным выполнением гуманитарных обязательств перед гражданским населением Афганистана. Конкретные меры могут включать:

1. Дифференциация взаимодействия: Разделение гуманитарного, технического и политического диалога. Поэтапная нормализация взаимодействия с техническими министерствами ИЭА (здравоохранение, экономика, по борьбе с наркотиками) при сохранении жёстких ограничений на политическом уровне.

2. Целевое разблокирование активов: Рассмотрение механизмов частичного и строго контролируемого размораживания активов исключительно на финансирование критических импортных закупок (продовольствие, медикаменты, оборудование для водоснабжения) и выплаты зарплат работникам жизнеобеспечивающих секторов (здравоохранение, энергетика) под надзором международных структур (например, через расширенный мандат «Афганского фонда»).

3. Стимулирование регионального диалога: Активная поддержка региональных форматов (Московский формат, консультации с участием Центральной Азии, Китая, Пакистана, Ирана) как платформ для выработки совместных подходов к вопросам безопасности, управления миграционными потоками и реализации инфраструктурных проектов, что может создать косвенное давление на ИЭА в интересах региональной стабильности.

4. Увязка помощи с конкретными шагами: Чёткое, прозрачное и мониторируемое увязывание любых шагов по смягчению финансовой блокады с поддающимися проверке действиями властей ИЭА в сферах, обозначенных резолюцией СБ ООН 2593.

Только такой сбалансированный и прагматичный подход, признающий как реальность контроля ИЭА над страной, так и неприемлемость его внутренней политики, может разорвать порочный круг и создать условия для постепенной стабилизации, отвечающей интересам как афганского народа, так и международного сообщества.

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THE 2020 AMENDMENTS TO THE RUSSIAN CONSTITUTION AS AN ACT OF DEMODERNIZATION

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Abstract: The article examines the 2020 amendments to the Constitution of the Russian Federation through the theoretical lens of demodernization. Drawing on scholarship on post-Soviet political and social transformations, demodernization is understood not as a simple return to pre-modern or traditional forms, but as a process in which ruling elites replace modern institutions and values with distorted simulacra of tradition that serve contemporary power interests. The article situates the Russian case within broader debates on demodernization, using qualitative textual analysis. The article argues that, taken together, the amendments represent a coherent demodernization project: they resist globalization and pluralism, appropriate for the language of tradition, and institutionalize paternalism as a governing principle. Rather than reviving genuine traditional values, the constitutional changes institutionalize their ideological imitation, confirming the demodernizing trajectory of contemporary Russian constitutionalism.

Keywords: demodernization, constitutional amendments, Russia, traditional values, authoritarianism, post-Soviet space, paternalism, sovereignty, constitutional ideology.

“And everything that in the traditionalist society has not been hybridized is torn away at the level of public consciousness becoming imaginary social values and legal fictions” [18, p. 1245]

The concept of demodernization and its characteristics in the post-Soviet space

One of the earliest discussions of demodernization appears in T.A. Brindley, who sees it as a reaction against modernization by those for whom modern social structures and culture are unacceptable. He emphasises that modernization is not only technological but also involves changes in thought and social organization [5, p. 210], and contrasts modern individualism with demodernist collectivism, portraying demodernization as a utopian longing for a lost order [5, p. 214].

Focusing on the post-Soviet literature, M. Minakov similarly contrasts public and private spheres, arguing that the public leans toward modernism while the private retains traditional forms; he stresses that demodernization differs both from modernization and from genuine tradition, since it erodes the traditional moral orientation of the individual [15, p. 64-65] and instrumentalizes traditional patterns for ideological ends [15, p. 76]. Minakov further describes a variant of demodernization arising after the destruction of “life-world resources,” when distorted archaic patterns are reproduced to fill social voids [16, p. 249]; he also links demodernization to economic crises and inequality, especially where privatization failed [16, p. 255].

A. Etkind highlights the role of the “resource curse”: extractive economies shape institutions and social ties (for example, oil creates an isolated, better-paid class), and because resource regimes do not require broad human-capital development, they foster demodernizing forms of governance rather than technological modernization [8]. M. Rabkin cautions that deindustrialization and demodernization are distinct—abandoning some industries can be modernizing (e.g., for environmental reasons)—yet he, too, sees rising inequality as part of demodernization [20, p. 23]. Etkind and Minakov note that the ruling party’s mode of holding power, plus vertical centralization and the weakening of local self-government, are key demodernizing factors in post-Soviet Russia [9, p. 9]; Minakov likewise identifies reduced local authority as demodernizing [16, p. 257].

Some scholars treat broad mobilization as a modernization process within realist paradigms, since collective state coercion can advance state capacity [11]. Ordenov and Lesha show how elites, seeking to minimize risk, implement minimal changes that preserve their power; when traditionalists steer modernization, it becomes demodernizing and distorts pre-modern practices for elite ends [18, p. 1245]. Finally, Malyarenko and Kormych apply a demodernization framework to Russia's policies in occupied Ukrainian territories, arguing these policies combined intentional and inadvertent export of Russian institutions and legal collapse (2014–2022), though they tend to equate demodernization with deindustrialization—a narrower reading this essay finds incomplete [14].

Overall, the literature suggests demodernization is not a simple return to pre-modernity but a political project: ruling groups manufacture the appearance of tradition, using distorted simulacra of pre-modern values to occupy spaces left by modernity, thereby serving contemporary power interests.

Amendments to the Russian Constitution in 2020

Amendments to the Russian constitution were proposed by Vladimir Putin on January 15, 2020, in his address to the Federal Assembly. On March 14 of that same year, the State Duma prepared an amendment document (in the singular), which contained over 200 amendments. A referendum was held from June 25 to July 1 (however, legally, this referendum was not necessary), and then, on July 3, the Russian president signed the document [10]. There are already some scholarly works devoted to studying the amendments to the Russian Constitution. For example, one examines the legal aspect of how constitutional amendments on state sovereignty have influenced the interpretation of international law [13], other researchers point to the change in the composition of the legislative body, such as the Federal Assembly, and conclude that this amendment has further disrupted the political balance of power [3; 17].

Another researcher, conducting a comparative analysis of the amendments, points out that they are intended to create only the appearance of reform and a connection between the state and society, but in reality are aimed at strengthening the authoritarian regime and were carried out primarily for the sake of one amendment: the ability for Vladimir Putin to continue to run for re-election in presidential elections, since one of the amendments (which received virtually no public discussion in the official state media) removed his previous presidential term limits and allowed him to be elected for two more terms [19]. While agreeing with the author on the main points, it is still worth noting that the content of the remaining amendments, even if they are declaratory, still matters. Of course, if we look at this process from a political science perspective, the remaining amendments were added solely to distract citizens from the amendment resetting presidential terms, which, being the only one on the list, could have raised questions among certain groups of citizens, posing certain risks. However, the content of these amendments had to be precisely such that citizens themselves would want to vote for them. Therefore, from an ideological perspective, it is also important to study the remaining amendments, even if they duplicate previous legal provisions, since their declaratory nature is important in this context.

Another researcher points out that the social benefits promised in some of the amendments could have been an important distraction for citizens. Since the constitution is the country's fundamental law, enshrining minimum wage and pension guarantees therein proved sufficient to sway many citizens to support these amendments [7]. An interesting attempt for this essay is to analyze the content of the constitutional amendments from a postcolonial perspective. Thus, the researcher demonstrates how amendments concerning traditional family values are a marker of a return to imperial Russia. The researcher uses the term "anti-modernism" to describe the amendments regarding traditional values. However, according to the author, the amendments do not introduce anything new but rather expand and entrench existing non-colonialist Russian tendencies [12].

All these studies make an important contribution to the study of amendments to the state's fundamental document under the authoritarian regime. However, an examination of the content of the amendments to the Russian constitution from the perspective of demodernization has apparently not yet been conducted. To fill this gap, this essay will attempt to analyze the 2020 amendments to the Russian constitution from the perspective of demodernization.

Analysis of amendments

To properly structure the analysis of the amendments, they must be divided into groups not by their constitutional number, but by their semantic content. It was decided to divide the amendments into two groups: ideological and structural. The ideological group contains amendments with explicit wording that do not directly change the functioning of government bodies but merely declare certain values and narratives. The structural group will contain amendments that change political rules and processes that directly impact the country's political system. It is also worth noting that among the amendments, there are purely technical ones that do not carry significant value for this study. Therefore, the essay will not mention all available amendments, but only those that are of interest from the point of view of demodernization processes.

Let's start with the addition of Article 67.2.1, which introduces an addition regarding the protection of sovereignty and territorial integrity: *"The Russian Federation shall ensure the protection of its sovereignty and territorial integrity. Actions... aimed at alienating a part of the territory of the Russian Federation, and also calling for such actions, are prohibited."* [6]. Clearly, emphasizing sovereignty and territorial integrity serves a declaratory function. If we consider modernization in the context of globalization, then demodernization will attempt to resist globalist tendencies. In this regard, an emphasis on sovereignty fits perfectly with the logic of demodernization. This also includes additions to Article 79, which declares the maintenance of peace within the state and the prevention of interference in the internal affairs of the state [6, Art. 79.1].

Article 67.1.1 states that "the Russian Federation is the legal successor of the USSR" [6], including in international associations and treaties. However, the Russian Federation already received a permanent seat on the UN Security Council as the successor to the USSR, so this article also serves a declarative function, demonstrating that Russia continues to adhere to certain values and ideals that were characteristic of the USSR. This also has a colonial slant, as the USSR consisted of 15 republics that were formally considered equal entities. The way this continuity is formalized in the constitution demonstrates that the remaining states are not perceived as equal entities. *"United by a millennial history, the Russian Federation, safeguarding the memory of the ancestors who have passed on to us ideals and faith in God as well as the continuity of development of the Russian state, recognises the historically established unity of the state."* [6, Art 67.1.2] Article 67.1.2 is extremely rich in markers of demodernization: references to a thousand-year history, ancestral memory, and faith in God demonstrate the exploitation of the narrative of traditional values. An important point lies in the corollary: the continuity of the state makes it clear that past actions, which occurred many centuries earlier, continue to determine current Russian policy. This approach leaves no room for critical interpretation of past events; they are presented as infallible and something to be unquestioningly relied upon in current political actions. Also significant is the renewed emphasis on "unity of the state", which is also based on events from the historical past.

The next two paragraphs emphasize that the Russian Federation "reveres the memory of defenders of the Fatherland" and "ensures the protection of historical truth," [6, Art. 67.1.3] which demonstrates yet another appeal to the past. The very phrase "historical truth" precludes any interpretation of historical events other than the dominant state narrative, which is also a sign of demodernization, where historical events are presented as the absolute truth, precisely as it suits the current political regime. History as a science is always built on the clash of different approaches and interpretations.

The fact that the state is only using the rhetoric of traditional values, although these values are not such, is indirectly confirmed by the following text of the amendment: *"Children are an essential priority in the state policy of Russia. The state shall create conditions conducive to their comprehensive spiritual, moral, intellectual and physical development of children, and the fostering of patriotism, civic consciousness and respect for their elders."* [6, Art. 67.1.4]. According to traditional values, the state should not be involved in raising children; responsibility for their upbringing lies with parents. The family is the one sphere of life in which the state should not interfere. The emergence of kindergartens, public schools, and state youth organizations is a product

of the modern era [1]. The declaration that the state instills in children a sense of patriotism and respect for elders reveals a certain artificiality in the traditional values narrative, since in this picture, without state assistance, parents would be unable to raise their children properly.

Article 68, which prior to the amendments stated the status of Russian as the state language, has now been supplemented with the statement that Russian is the "language of the state-forming people." [6, Art. 68.1] Beyond the obvious colonial marker, which suggests that the Russian people are more important than all others, it's also important to note that this statement envisions not simply a static state of affairs, but "formation," that is, an action aimed at creating a state. In other words, a specific people creates a state, albeit a multinational one. It's also worth paying attention to the articles defining the powers of federal and regional authorities, as these powers have been expanded in the amendments. For example, Article 72.1 was amended to include "*protection of the family, maternity, paternity, and childhood; protection of marriage as a union of a man and a woman; creation of conditions for adequate family upbringing of children, and also for adult children to fulfill the duty of care for their parents*" [6, Art. 72.1]. During the discussion of the 2020 amendments, many drew attention to the phrase "marriage as a union between a man and a woman," but few public figures noted that this is one of the provisions encompassing the jurisdiction of federal and regional authorities. Just as with child-rearing, this is de-subjectifying the family as an independent actor, which speaks not of a return to traditional values, but of demodernization, which merely exploits the narrative of traditional values to serve the interests of the state. Clause 4 of Article 68 is also indicative: "*Culture in the Russian Federation is a unique heritage of its multi-ethnic people. Culture shall be supported and protected by the state.*" [6], as it contains the same symbiosis observed in previous amendments. On the one hand, there is a reference to the past. Culture is a heritage, meaning it is a value inherited from historical times. On the other hand, the same clause immediately after states that culture is protected by the state. Perhaps this refers to the material part of culture; for example, architecture truly needs to be preserved. However, if we are talking about the intangible part of culture, it is not entirely clear what could threaten it and why such a value needs protection from the state at all. Here, the state again appropriates subjectivity from other groups, in this case, the indigenous peoples of Russia.

It should also be mentioned that some of the "declaratory" amendments do not contain direct markers of demodernization, but rather manifest the theses of the welfare state. The number of areas covered by state programs in Article 71 has been expanded, and the obligation to provide medical care and to foster a culture of responsible citizen health care are also specifically outlined (the latter again has a patronage nature, with the state guiding and educating citizens on how to live their lives). Article 75 has been expanded to include three paragraphs on protecting workers' rights through a minimum wage guarantee, pension provision, and pension indexation, as well as social insurance and the indexation of social benefits. The following article states that conditions for economic growth and prosperity are being created for Russian citizens [6]. The inclusion of an environmental agenda in the amendments also seems surprising. For example, one of the additional clauses in Article 114 stipulates that the state will implement measures to protect the environment, preserve natural diversity, and foster a responsible attitude toward animals in society. The state will also create conditions for environmental education of citizens and "fostering ecologically minded attitudes" [6, art. 114]. The word "fostering" is very revealing in this context, as the state once again takes on the mentoring role of a teacher who guides citizens and instills in them certain values, even on a topic that is far removed from classic "traditional Russian values."

By comparison, environmental protection is also enshrined in the constitutions of other countries. In the German constitution, it is formulated as "the state shall protect the natural foundations of life and animals." [2, Art 20a], in the Brazilian Constitution: "All have the right to an ecologically balanced environment." [4]. Sometimes the constitution contains restrictions on people extracting natural resources and controlling organizations, but the narrative that the state should teach citizens anything is absent. Thus, this mentoring stance is an integral part of the 2020 amendments to the Russian constitution and can be interpreted as a marker of demodernization, since under the guise

of caring for citizens, the state assumes a dominant and instructive stance. This narrative also introduces a new clause about supporting compatriots abroad. In addition to promising to protect their rights and interests, it also states that the state supports the "conservation of an all-Russian cultural identity." [6, Art. 69.2]. This formulation again leaves no alternative and assumes that Russians abroad will strive to preserve their Russian cultural identity, something that, in my opinion, is far from obvious to all citizens living outside their own country. Furthermore, citizens are stripped of their agency and presented as someone who needs the government's assistance and protection. Almost all of the amendments from the structural group are aimed at changing the institutional design, so there is no point in analyzing them verbatim. However, it is important to look at how exactly they complement the existing vertical power structure, which, according to some researchers, is also a demodernization project [15, p. 74].

From a semantic standpoint, the only interesting phrase is "public authority," which is presented as a kind of body uniting all branches and organs of government. For example, the local government was included in the "unified system of public authority." [6, Art. 132]. Other researchers have noted in previous works that the reduction of local government is part of demodernization¹⁸. The new structure of public authority unites all three branches of presidential power. This innovation has had virtually no impact on the Russian political institutions, but nevertheless, formally, it represents another step toward centralization of power. Articles 81 and 83, which describe the election and powers of the president, saw the most changes. Following the amendments, the president can dismiss and appoint ministers without the government's consent, as well as appoint additional senators to the upper house of parliament, who will represent his personal interests rather than regional ones. The amendments also provide a reduction in the number of judges on the Constitutional Court from 19 to 11 [6]. In short, all these amendments are aimed at expanding the powers of the president and reducing the powers of other government bodies. Finally, Article 79, which allows for non-compliance with decisions of international authorities, is another example of resistance to globalization. In essence, it simply grants the right to disregard decisions of the European Court of Human Rights. However, in the context of the discourse on sovereignty, this also constitutes a demodernizing legislative addition.

Conclusion

Analyzing the 2020 amendments to the Russian Constitution through the lens of demodernization, one can conclude that they are twofold. On the one hand, many of the amendments employ a narrative of traditional values, the state's concern for citizens, and the creation of an image of Russia as independent from other countries. However, even purely declaratory amendments are extremely paternalistic. The government must educate the younger generation, instill in its citizens a love and care for the environment, attention to their health, and respect for their elders. The very fact that the state is taking on such tasks demonstrates that these pre-modern values can no longer be reproduced on their own, because modernism, if not destroyed them, has significantly relegated them to the background.

A situation in which government bodies do not guarantee certain aspects of life, but directly infiltrate every social institution (family, social communities, different age groups), is no longer inherently consistent with pre-modern traditional values, since the state (at least according to the logic of the amendments) needs to artificially support these narratives. As has been demonstrated, these narratives are not traditional values in themselves but merely imitate their outward attributes to exploit them for its own ends. Based on this, it can be concluded that the 2020 amendments to the Russian Constitution are, in fact, demodernizing in nature.

¹⁸ e.g. "[Russian] local self-governance is politically subordinate to the center as part of the power vertical in the demodernization phase" [Minakov 2018, p. 257].

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THE DUTY TO COOPERATE FOR THE PROTECTION OF THE ENVIRONMENT IN INTERNATIONAL ENVIRONMENTAL LAW

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Abstract

From a legal perspective, the evolution of international environmental cooperation can be interpreted in three main phases. First, general international law: the 1945 United Nations Charter recognised cooperation as a fundamental principle. Continuing this approach, the 1970 Declaration on Friendly Relations and Cooperation between States clarified the principle of cooperation, confirming its relevance in general international law. Second stage: environmental functionalism: The 1972 Stockholm Declaration [7], while non-binding, states in Article 24 that States must manage environmental protection and improvement in accordance with the principle of international cooperation. This stage is characterised by sectoral treaties based on the principle of prevention of harm. Third stage: environmental globalism: The 1992 Rio Declaration on Environment and Development [4] extends international cooperation to global environmental issues, concretely applying the concept of sustainable development, anticipated by the 1987 Brundtland Report. In particular, Principle 7 recognises the duty of States to cooperate in environmental protection as an essential element in managing global issues. Subsequently, the duty to cooperate became binding through international treaties such as the United Nations Framework Convention on Climate Change, the Kyoto Protocol [3], and the Paris Agreement [2]. Finally, the International Court of Justice, in its Opinion of 23 July 2025, confirmed the binding nature of the duty to cooperate even in the context of global climate change. This paper analyses the evolution of the duty to cooperate in international environmental law through selected legal instruments, highlighting its role in developing a coherent, progressively binding global legal system.

Keywords: Environmental Law; International Environmental Law; Treaties and Conventions; Sustainable Development Law; Environmental Agreements;

1. Introduction

This work reconstructs the evolution of international environmental law from the Stockholm Conference to the Paris Agreement [2], drawing on a critical synthesis developed personally by the author based on the work of Sergio Marchisio and supplemented by the original texts of the conventions, protocols, and agreements cited.

In international environmental law, the duty of cooperation between States is articulated in three fundamental phases. The first concerns the United Nations Charter of 1945, which establishes cooperation as a guiding principle for the conduct of States.

In the second phase, when the international community recognises the need to address ecological problems, cooperation takes the form of a rule of conduct that specifies States' behaviour. In this phase, known as the phase of sectoral international environmental functionalism, the common interest of States in collaborating on environmental issues begins to consolidate.

Of particular importance in this regard is the United Nations Declaration on the Human Environment in Stockholm 1972 [7], which represents the first concrete expression of the principle of cooperation. The third stage, known as the phase of environmental globalism, sees cooperation crystallise as a binding legal obligation, with the beginning of the second period in the evolution of international environmental law.

To this end, the Brundtland Commission was entrusted with preparing the report *Our Common Future*, which integrated the emerging concept of sustainable development.

In 1992, the United Nations Conference on Environment and Development was held in Rio de Janeiro, and the Rio Declaration [4] was adopted, which includes Principle 7, which recognises cooperation as an essential element of environmental protection.

During the Conference, two key conventions were opened for signature: the United Nations Framework Convention on Climate Change, which entered into force on 21 March 1994, and the Convention on Biological Diversity, which entered into force on 29 December 1993.

In 1997, the Kyoto Protocol [3] was implemented, aimed at implementing the Framework Convention on Climate Change, which aims to stabilise greenhouse gas concentrations in the atmosphere at levels that prevent dangerous anthropogenic interference with the climate system. In December 2015, during the 21st Conference of the Parties (COP21), the Paris Agreement [2] was adopted, marking a further milestone in international climate cooperation.

2. The Origins of Cooperation: First Moment, General International Law

Article 1, paragraph 2 of the UN Charter [8] establishes that the purposes of the United Nations are to develop friendly relations among nations, based on respect for the principle of equality and the rights of peoples, and to adopt appropriate measures to strengthen peace. Paragraph 3 states that the purposes of the United Nations include promoting international cooperation in solving problems of an economic, social, and humanitarian nature among Member States (UN).

Subsequently, with the Resolution 2625 XXV of 1970 [5], the United Nations General Assembly adopted the Declaration on Principles of International Law relating to Friendly Relations and Cooperation, setting forth fundamental principles for the guidance of cooperation among States (ONURIS).

The document emphasises the content of the duty to cooperate, qualifying it as a general principle of international law. It identifies cooperation not as a political requirement, but as a legal criterion that guides the conduct of States in their mutual relations, respecting sovereignty, equality, and territorial integrity.

Environmental Functionalism Phase: Second Stage, Environmental Functionalism.

Stockholm Conference

States' attention to international environmental issues began to emerge in the 1970s, when a shared interest in mitigating environmental degradation began.

During that period, several accidents occurred, such as the one in the English Channel caused by the spill of tons of oil from a tanker, which destroyed a large portion of marine biological resources.

This event demonstrated the inadequacy of the instruments available to address the situation. During the same period, numerous international environmental conventions on the prevention of marine pollution were adopted. A turning point occurred in 1972 when the United Nations General Assembly convened the Conference on the Human Environment [1, p. 1-12] in Stockholm, during which a Declaration of Principles and a Global Plan of Action were adopted [7].

Among the principles enunciated, Principle 24, which affirms that States should address environmental issues, is of particular importance to this paper, in a spirit of international cooperation.

This phase marks the first evolution of sectoral environmental law, aimed at preventing significant ecological risks.

2. Phase of Environmental Globalism: Third Moment, Environmental Globalism

Rio Conference

Following the evolution of sectoral environmental law in the early 1980s, a new phase of international environmental law began. During this phase, the United Nations assigned experts with

proven expertise to prepare a report, the Brundtland Commission, that included the concept of Sustainable Development.

It was precisely the United Nations Conference on Environment and Development, held in Rio de Janeiro in June 1992 [1, p. 1-12; 4], which marked the beginning of this new phase. The Conference's objective is to reconcile economic development and environmental protection, and also to expand international cooperation to address global environmental problems, such as climate change, biodiversity loss, and deforestation.

At the conclusion of the Conference, the following documents were adopted: the Rio Declaration on Environment and Development [4], consisting of twenty-seven principles; Agenda 21, a program of action aimed at identifying State actions to achieve sustainable development; and an authoritative declaration of non-binding principles on the management, conservation, and sustainable development of forests. For reasons of space, the analysis will be limited to Principle 7 of the Rio Declaration.

This principle states that States have a duty to cooperate for the conservation and protection of the Earth system, in accordance with the principle of common but differentiated responsibilities, taking into account the different impacts of States on environmental degradation. Principle 7 itself recognises cooperation as an essential element for environmental protection [4].

Framework Convention on Climate Change

Another outcome of the Rio Conference was the establishment of global environmental conventions that were opened for signature in 1992. Among these, the analysis [1, pp 12-24] focuses on the United Nations Framework Convention on Climate Change UNFCCC [6].

The UNFCCC is an international treaty binding on the states that have ratified it, establishing general principles and obligations. Established by Resolution 43/53 of the United Nations General Assembly UNGA and adopted on 6 December 1988, it entered into force on 21 April 1994. The Resolution recognised climate change as a common concern for humanity.

To address the climate problem, an intergovernmental body, the Intergovernmental Panel on Climate Change (IPCC), was established around the same time.

This mechanism was created under the auspices of the World Meteorological Organisation WMO and the United Nations Environment Programme UNEP to assess the severity of the problem. In 1990, the IPCC published its first environmental assessment report, highlighting the impact of human activities on climate. The report was discussed in the UN General Assembly. In the next phase, the United Nations General Assembly UNGA decided to establish the Intergovernmental Panel ING to negotiate a framework convention on climate change.

The United Nations Framework Convention on Climate Change is a framework instrument that establishes general principles and obligations regarding climate change. It contains framework provisions whose concrete implementation is delegated to additional and executive protocols, to be negotiated at a later stage.

The Convention is implemented through the Conferences of the Parties (COPs), a decision-making body that brings together the States Parties to negotiate protocols, adopt operational measures, and define guidelines for the implementation of their obligations.

The Convention also established some general commitments regarding the limitation of CO₂ emissions. In accordance with the principle of common but differentiated responsibility, the Convention provides for a dual legal regime.

The first regime concerns industrialised countries and those with economies in transition. Given that industrialised countries are responsible for the largest share of CO₂ emissions, they are obliged to adopt national policies to mitigate climate change. The Convention's implementation measures were subsequently clarified and implemented through the Kyoto Protocol [3], adopted in 1997, which introduced quantitative emission reduction obligations for industrialised countries and those with economies in transition.

Kyoto Protocol and the Evolution Toward the Paris Agreement

The Kyoto Protocol is the first binding international instrument translating the general principles of the Framework Convention into measurable and verifiable legal obligations. It was adopted at COP3 in Kyoto in December 1997 and entered into force on 16 February 2005, following ratification by the Russian Federation in 2004 [3]. The Protocol commits industrialised countries and those with economies in transition to a 5% reduction in their primary CO₂ emissions by 2010, relative to 1990 levels.

The targets are uneven: the EU is targeted for an 8% reduction, the United States for 7%, Japan for 6%, while Russia, Ukraine, and New Zealand are targeted only to stabilise emissions [1, pp. 24-31]. The Protocol introduces specific flexibility mechanisms to allow states to meet their reduction obligations through cooperative means.

The United States, although not participating in the negotiations, did not ratify the Protocol, believing it would have negative economic impacts and preferring a voluntary system.

In 2007, the United States was invited to COP 13, held in Bali in December 2007, where negotiations began on a new agreement to reduce CO₂ emissions for the years after 2012. At the conclusion of the Conference, with the consent of the United States, a work plan was defined to reach a new multilateral treaty. The Plan contained proposals for CO₂ reductions.

Based on the scientific data of the fourth IPCC report, the EU proposed that industrialised countries reduce CO₂ emissions by 25–40% compared to 1990 levels by 2020. However, the United States opposed it. The Plan, however, contained significant references to technology transfer and incentives to reduce emissions from deforestation [1, pp. 24-31]. In 2009, during COP 15 in Copenhagen, a new binding treaty was not reached, but the Copenhagen Accord was adopted, to limit global warming to 2°C and voluntary contributions NDCs from states.

Subsequent COPs defined two tracks: extending the Kyoto Protocol [3] until 2020 and negotiating a new post-2020 treaty. Concerning the second objective, the negotiations launched in Durban led to the Paris Agreement on 12 December 2015, during COP21 [2].

The Agreement establishes the goal of maintaining global warming within 2°C and promotes adaptation through dedicated financial resources. Article 3 maintains the system established in Copenhagen in 2009, namely nationally determined contributions NDCs, which are the CO₂ reduction targets unilaterally declared by individual states.

Therefore, the Agreement does not impose binding reduction obligations or set quotas for Parties, but promotes cooperation in mitigation and adaptation and the transfer of technologies for developing countries, least-developed states, and Small Island Developing States SIDS. Compliance mechanisms and the so-called "global stocktake" are provided for.

The Paris Agreement [2] has not changed the principle of shared but differentiated responsibilities and respective capabilities in light of different national situations, and it will cover the period from 2020 to 2050.

Conclusions

This paper highlights how the principle of international cooperation has become a binding obligation in international environmental law, through conventions, protocols, and multilateral agreements.

The International Court of Justice's opinion of 23 July 2025 confirms that this obligation also applies to climate change, strengthening States' responsibility for global environmental protection.

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«СОВЕТ МИРА» И ЭВОЛЮЦИЯ СИСТЕМЫ МЕЖДУНАРОДНОЙ БЕЗОПАСНОСТИ

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Abstract: This article provides an international legal analysis of the new international organization, the Board of Peace, created at the initiative of the United States. It examines its founding documents, structure, decision-making mechanisms, and potential implications for the modern system of multilateral diplomacy. Particular attention is paid to potential conflicts of jurisdiction with the UN and the impact on the existing international security system.

Keywords: Board of Peace, international organizations, UN, international security, conflict resolution, international law

22 января 2025 г. на Всемирном экономическом форуме в Давосе была учреждена новая международная организация – Совет мира. Несмотря на то, что формальным поводом для ее создания послужила реализация т.н. «мирного плана по Газе», одобренного резолюцией 2803 Совета Безопасности ООН от 17 ноября 2025 г.[1], уже сейчас понятно, что изначальный мандат и заявленные цели организации выходят далеко за рамки решения палестинского вопроса. Более того, заявление инициатора создания, президента США Д. Трампа, о том, что Совет мира потенциально «может заменить ООН» [2], указывает на весьма амбициозную цель нового образования.

Целью настоящей статьи является анализ Совета мира с точки зрения норм международного права, оценка его институциональной структуры, особенностей функционирования и возможного влияния на существующую систему международной безопасности.

Данный вопрос является новым и представляет собой значительный интерес для международного права. 20 января 2026 г. от имени Республики Беларусь глава государства А.Г. Лукашенко подписал документ о присоединении Беларуси к Совету мира и выполнении положений Устава организации [3].

Следует отметить, что история создания организации показывает ее тесную связь с ООН. Так, Совет мира является прямым «порождением» резолюции Совета Безопасности ООН 2803, что придает определенную легитимность в рамках главы VII Устава ООН. Вместе с тем, дальнейшее развитие пошло по пути институционального обособления от ООН.

Устав Совета мира, подписанный 22 января 2026 г. [4], закрепляет следующие ключевые принципы его функционирования:

1) ограниченное и избирательное членство – членство в Совет мира предоставляется исключительно по приглашению, что изначально отличает новую организацию от универсальной ООН. Интересным условием также является возможность предоставления статуса постоянного члена за взнос в размере 1 млрд долларов США, что вводит финансовый критерий в основу формирования руководящего органа.

2) централизация власти – Устав устанавливает уникальную для международного права процедуру принятия решений. Хотя решения формально принимаются большинством голосов государств-членов, они вступают в силу только после одобрения Председателя организации. Председатель также обладает правом вето на решения исполнительных органов и решающим голосом при равенстве голосов [4]. Таким образом, такая конструкция позволяет концентрировать исключительные полномочия в руках одного человека – президента США Д. Трампа, что является беспрецедентным для традиционных межправительственных организаций.

3) добровольный выход – членство в организации может быть прекращено простым уведомлением о выходе, что, на наш взгляд, свидетельствует о слабости международных обязательств и потенциальной неустойчивости состава организации.

Кроме того, первоначальный состав учредителей организации (19 стран, включая США, ряд стран Ближнего Востока, Центральной Азии и Восточной Европы) указывает на определенную региональную и политическую избирательность. Приглашение стать членом организации Косово и вовсе демонстрирует политический подход к формированию состава организации уже на самой ранней стадии. Такой же, политически обусловленный характер, подчеркивается и публичным отзывом приглашения Канаде после критической речи ее премьер-министра [5].

Структура Совета мира отражает ее гибридный характер, сочетающий, с одной стороны, дипломатические, а с другой стороны, экономические функции. Ключевым органом организации выступает Исполнительный совет, в состав которого вошли как политические деятели (в том числе, бывшие), так и представители крупного финансового сектора. Это указывает на ставку на экономическое партнерство как на один из двигателей урегулирования конфликтов. В структуре Совета мира есть и Исполнительный совет по Газе – специализированный орган, созданный для управления восстановлением территории. Данная структура фактически должна выполнять функции временной администрации, что сближает ее мандат с историческими примерами международных протекторатов. Примечательно, что штаб-квартира организации расположена во Флориде, а не в традиционных центрах международной дипломатии (Женева, Гаага, Нью-Йорк), что также может символизировать дистанцирование от традиционной дипломатии.

Анализируя Устав Совета Мира, можно отметить отсутствие прямого упоминания сектора Газа, что позволяет рассматривать мандат организации значительно шире, с потенциальным распространением и на другие «кризисные регионы».

Создание Совета мира порождает ряд вопросов, связанных, прежде всего, с возможной правовой и политической коллизией с системой ООН. Несмотря на то, что создание организации частично связано с резолюцией Совета Безопасности ООН, декларируемая

неоднократно президентом США Д. Трампом цель потенциально заменить ООН ставит под сомнение принцип универсальности и равноправия государств, заложенный в Уставе ООН. Некоторые критики справедливо характеризуют Совет мира как «имиджевый проект», направленный на создание альтернативной, менее обременительной с точки зрения процедур и более контролируемой площадки для продвижения интересов ее создателей [6]. На наш взгляд, расширение мандата Совета мира, может привести к наложению его деятельности на усилия, принимаемые Советом Безопасности ООН и ее специализированными учреждениями. Это, в свою очередь, может привести к правовой неопределенности и парализовать усилия по урегулированию кризисных ситуаций.

Отдельно следует остановиться на позиции ряда ведущих государств, которые демонстрируют определенный скепсис. Так, Франция открыто выразила обеспокоенность «попыткой подмены и снижения влияния ООН» [7]. Угроза же Д.Трампа ввести 200% пошлины на французское вино в ответ на отказ присоединиться переводит дипломатический спор в торгово-экономическую плоскость, подрывая сам дух многостороннего сотрудничества, заложенный Уставом ООН. Российская Федерация, в свою очередь, отреагировала на предложение США финансировать свой взнос в размере 1 млрд долларов за счет активов, ранее замороженных США [8].

Анализировать перспективы развития организации пока рано, однако очевидно, что Совет мира представляет собой попытку создания т.н. «гибкой коалиции» с централизованным управлением для решения конкретных кризисных ситуаций. Потенциальными преимуществами организации являются оперативность, свобода от бюрократии ООН, привлечение частного капитала. Однако эти преимущества одновременно являются его главными рисками.

Так, деятельность Совета мира может привести к дальнейшей эрозии ООН, особенно если последняя не будет способна разрешать существующие кризисные ситуации из-за блокировки резолюций Совета Безопасности ООН, используя право вето. Доминирование в структуре Совета мира представителей финансового сектора ставит под сомнение приоритетность задач организации: устойчивый политический мир или же получение финансовой прибыли. Концентрация власти у Председателя, отсутствие прозрачных процедур и механизмов обжалования решений противоречит стандартам управления международными межправительственными организациями. Наконец, избирательный принцип членства в составе организации может привести к созданию нового клуба «дружественных государств», внося еще больше раскола в международное сообщество.

Таким образом, Совет мира является не просто новой международной организацией. а признаком глубокого кризиса в системе международной безопасности и всей послевоенной системы многосторонности, олицетворяемой ООН. Институциональная структура Совета мира, его «избирательность» бросает вызов традиционным принципам функционирования международных организаций. В краткосрочной перспективе организация, вероятно, сосредоточится на управлении сектором Газа. Однако уже сейчас создание Совета мира актуализировало дискуссию о реформе ООН и о том, какие формы глобального управления могут возникнуть. Очевидно, что в условиях кризиса системы международной безопасности, новая организация может усилить уже существующее недоверие к ООН как к глобальному актору.

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ЕВРОПЕЙСКИЕ ТЕНДЕНЦИИ РЕГУЛИРОВАНИЯ ИМУЩЕСТВЕННЫХ ОТНОШЕНИЙ СУПРУГОВ И ИХ ЗНАЧЕНИЕ ДЛЯ РАЗВИТИЯ ИНСТИТУТА БРАЧНОГО ДОГОВОРА В РЕСПУБЛИКЕ МОЛДОВА

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Abstract: The article analyzes modern European trends in the legal regulation of property relations between spouses in the context of the development of the institution of a marriage contract. Special attention is paid to the legal standards of the European Union, primarily Regulation (EU) No. 2016/1103, aimed at expanding cooperation in the field of jurisdiction, applicable law, as well as recognition and enforcement of decisions on the regime of marital property. The main approaches of the EU member states to the contractual regulation of marital property relations and the role of the autonomy of the will of the parties in shaping the property regime of marriage are considered. The study provides a comparative legal analysis of European standards and the national legislation of the Republic of Moldova in the field of marriage contracts, identifies similarities and differences in legal regulation, as well as problems of law enforcement practice. The author substantiates the conclusion that the European experience is an important guideline for further improvement of the institution of marriage contract in the Republic of Moldova, especially in terms of the development of contractual principles of family law and the possible adaptation of the mechanisms of private international law.

Аннотация: В статье анализируются современные европейские тенденции правового регулирования имущественных отношений супругов в контексте развития института брачного договора. Особое внимание уделяется правовым стандартам Европейского союза, прежде всего Регламенту (ЕС) № 2016/1103, направленному на расширение сотрудничества в области юрисдикции, применимого права, а также признания и приведения в исполнение решений по вопросам режима супружеской собственности. Рассматриваются основные подходы государств-членов ЕС к договорному регулированию имущественных отношений супругов и роль автономии воли сторон в формировании имущественного режима брака. В рамках исследования проводится сравнительно-правовой анализ европейских стандартов и национального законодательства Республики Молдова в сфере брачного договора, выявляются сходства и различия в правовом регулировании, а также проблемы правоприменительной практики. Обосновывается вывод о том, что европейский опыт представляет собой важный ориентир для дальнейшего совершенствования института брачного договора в Республике Молдова, особенно в части развития договорных начал семейного права и возможной адаптации механизмов частного международного права.

Keywords: marriage contract; property relations of spouses; marital property regime; family law of the European Union; cross-border family relations; family law of the Republic of Moldova; harmonization of law

Ключевые слова: брачный договор; имущественные отношения супругов; режим супружеской собственности; семейное право Европейского союза; трансграничные семейные отношения; семейное право Республики Молдова; гармонизация права.

Современное семейное право в странах Европейского союза (ЕС) находится под воздействием процессов глобализации, роста трансграничной мобильности граждан и усиления правоохранительной кооперации. Эти факторы обусловили необходимость упорядочения правового регулирования имущественных отношений супругов, в том числе через гармонизацию частноправовых норм, таких как институт брачного договора. В ЕС данный институт рассматривается не только как инструмент регулирования имущественных прав между супругами, но и как элемент частного международного права, призванный обеспечивать правовую определённость для трансграничных семейных ситуаций. Рассмотрение европейских правовых стандартов несёт важное значение для государств-соседей, таких как Республика Молдова.

Целью настоящего исследования является анализ европейских тенденций регулирования имущественных отношений супругов и оценка их значения для совершенствования института брачного договора в Республике Молдова.

Имущественные отношения супругов охватывают владение, пользование и распоряжение имуществом, нажитым до брака и в период брака, включая порядок его раздела в случае расторжения брака или смерти одного из супругов. Брачный договор выступает специфическим правовым механизмом, позволяющим супругам изменить законный режим совместной собственности и определить правовой режим имущества в браке и после его прекращения [7].

В классической юридической доктрине брачный договор определяется как соглашение лиц, вступающих в брак, или уже состоящих в браке супругов, определяющее их имущественные права и обязанности [5, С.53]. Данный институт исторически восходит к римскому праву, где имущественные отношения было решающим элементом брачных правовых норм.

В контексте Европейского союза ключевым нормативным актом, регулирующим вопросы имущественных отношений супругов с трансграничным элементом, является Регламент Совета (ЕС) «О расширении сотрудничества в области юрисдикции, применимого права, а также признания и приведения в исполнение решений по вопросам режима супружеской собственности» № 2016/1103 [6].

Регламент применяется в государствах-участниках механизма усиленного сотрудничества (например, Франция, Италия, Германия, Испания и др.) и направлен на:

- установление единых правил определения применимого права к режиму супружеской собственности;
- определение юрисдикции компетентных органов в трансграничных делах;
- обеспечение признания и исполнения решений по спорным вопросам имущественных прав супругов в других государствах-членах ЕС.

Регламент распространяется только на гражданские режимы имущества супругов и не затрагивает вопросы правоспособности, брака как такового, алиментных обязательств или наследования.

Регламент предусматривает возможность супругам выбрать право, которым будет регулироваться их имущественный режим: это право государства их общей или индивидуальной национальности либо права той страны, где супруги имеют общую обычную резиденцию в момент выбора.

Если супруги не сделали выбор, применимое право определяется по ряду связанных критериев:

- первая общая обычная резиденция после заключения брака;
- общее гражданство супругов;
- право государства, с которым супруги имеют наиболее тесную связь.

Также регулирование предусматривает принципы универсальности и единства применимого права: выбранное право применяется ко всему имуществу супругов, независимо от его расположения или происхождения [6].

Регламент содержит детальные нормы о взаимном признании и исполнении решений и аутентичных актов, касающихся режима супружеской собственности. Это направлено на уменьшение барьеров, с которыми сталкиваются международные пары при реализации своих имущественных прав, и на упрощение правоприменительной практики между странами-членами ЕС.

Хотя ЕС устанавливает общие рамки, регулирование имущественных отношений супругов в рамках семейного права остаётся прерогативой национального законодательства. В национальных правовых системах брачный договор часто рассматривается как способ модификации законного режима совместной собственности (community property) в индивидуальный порядок [1].

Например, в ряде стран ЕС, таких как Люксембург, супруги при заключении брачного договора могут устанавливать режим, при котором имущество каждого остаётся личной собственностью, за исключением определённых обязательств или взаимных прав.

В целом, национальные системы обеспечивают значительную свободу в выборе имущественного режима, однако такое регулирование может сопровождаться ограничениями, направленными на защиту основополагающих принципов семейного права, таких как обязательство взаимной поддержки.

В Республике Молдова институт брачного договора закреплён в Семейном кодексе. Согласно ст. 27 Семейного кодекса Республики Молдова, брачный договор представляет собой соглашение, добровольно заключаемое лицами, желающими вступить в брак, или супругами, которое определяет их имущественные права и обязанности в период брака и/или в случае его прекращения [7].

Брачный договор может быть заключён до регистрации брака или в любой момент в период брака, оформляется письменно и подлежит нотариальному удостоверению. Несоблюдение этих требований приводит к недействительности договора.

По содержанию, брачный договор даёт супругам возможность:

- изменить установленный законом режим совместной собственности;

– определить, что имущество, приобретённое каждым из супругов в браке, является его личной собственностью;

- урегулировать порядок взаимного содержания и участие в доходах и расходах;
- предусмотреть имущественные санкции в случае развода.

Однако супругам запрещено включать положения, которые нарушали бы основные права и свободы личности, такие как ограничение правоспособности или право на обращение в суд, а также ущемляющие интересы детей и других лиц, защищённых законом.

Проведя аналогию между законодательством ЕС и Республики Молдова можно выявить, что между ними существуют следующие сходства:

1. Автономия волеизъявления супругов: и ЕС, и молдавское семейное законодательство признают свободу супругов самостоятельно определять режим имущества через заключение брачного договора.
2. Изменение режима имущества: в обеих системах супруги могут, посредством соглашения, изменить законный режим совместной собственности.

Наряду со сходствами присутствуют также отличия между законодательством ЕС и Республики Молдова:

1. Трансграничность: европейские правовые стандарты содержат комплексные нормы, регулирующие вопросы юрисдикции, применимого права, признания и исполнения решений в трансграничных ситуациях между государствами-членами ЕС. Молдавское право, являясь внутренним, не содержит аналогичных норм частного международного права.
2. Международная защита: ЕС стремится к единой правоприменительной практике для международных пар, тогда как в Молдове институционально такие нормы отсутствуют, что создаёт риски правовой неопределённости в международных бракоразводных делах с имущественными спорами.

Сравнительный анализ правового регулирования брачного договора кратко представлен в таблице 1.

Таблица 1:
Сравнительный анализ правового регулирования брачного договора

Критерий	Европейский союз	Республика Молдова
Нормативная база	Регламент Совета (ЕС) «О расширении сотрудничества в области юрисдикции, применимого права, а также признания и приведения в исполнение решений по вопросам режима супружеской собственности» № 2016/1103; национальное семейное законодательство государств — членов ЕС	Семейный кодекс Республики Молдова
Правовая природа брачного договора	Инструмент договорного и коллизионного регулирования имущественных отношений супругов	Договорное средство регулирования имущественных отношений супругов
Автономия воли супругов	Широко признана; допускается выбор применимого права	Признана; ограничена рамками национального законодательства
Возможность выбора применимого права	Прямо предусмотрена Регламентом Совета (ЕС) 2016/1103	Не предусмотрена
Трансграничное применение	Детально урегулировано (юрисдикция, признание, исполнение решений)	Отсутствует специальное регулирование
Ограничения содержания договора	Защита публичного порядка, прав детей и экономически слабой стороны	Защита прав супругов, детей, недопустимость ограничения правоспособности

Источник: Составлено автором публикации

Несмотря на гармонизирующие нормы Регламента Совета (ЕС) «О расширении сотрудничества в области юрисдикции, применимого права, а также признания и приведения в исполнение решений по вопросам режима супружеской собственности», на практике возникают вопросы в определении применимого права, особенно в случаях, когда супруги не имеют общей обычной резиденции сразу после заключения брака, что вызывает сложности в применении критериев, предусмотренных данным Регламентом [6].

Также возникшие коллизии интерпретации отдельных норм, например, касательно изменения права в случае смены общей резиденции супругов, показывают необходимость дальнейшей судебной практики и разъяснений для устойчивой правоприменительной практики.

В Республике Молдова практическая реализация норм о брачном договоре сталкивается с несколькими проблемами:

- Низкая правовая культура населения: многие супруги не используют брачный договор как инструмент планирования имущественных отношений, что приводит к судебным спорам при расторжении брака.

- Ограниченная судебная практика: относительно небольшой объём судебных решений по делам о признании и исполнении брачных договоров снижает предсказуемость правоприменения.

- Отсутствие норм частного международного права: в случаях, когда супруги имеют имущественные интересы за рубежом, национальное законодательство не содержит комплексных правил для решения таких споров, что влечёт за собой неопределённость правового статуса.

Европейские тенденции регулирования имущественных отношений супругов отражают стремление создать комплексную систему норм, обеспечивающих правовую определённость, единообразное применение права и эффективную защиту имущественных интересов в трансграничных ситуациях. Регламент Совета (ЕС) «О расширении сотрудничества в области юрисдикции, применимого права, а также признания и приведения в исполнение решений по вопросам режима супружеской собственности» является значимым примером таких усилий, предоставляя чёткие правила выбора права, юрисдикции и признания решений.

Для Республики Молдова изучение европейского опыта несёт ценность как ориентир совершенствования национального семейного законодательства, особенно в части развития частноправового регулирования брачных договоров и возможной гармонизации с нормами частного международного права. Внедрение подобных элементов законодательства может способствовать более эффективной защите имущественных прав супругов в международных ситуациях и повышению правовой предсказуемости.

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Cadrul normativ național privind încetării procesului penal la faza urmăririi penale

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Rezumat

Urmărirea penală este o fază importantă a procesului penal, desfășurându-se în condițiile stabilite de lege, care are menirea constatării tuturor circumstanțelor și împrejurărilor faptei. Ofițerul de urmărire penală considerând că probele acumulate sunt suficiente pentru luarea deciziei întocmește raportul privind terminarea urmăririi penale și transmite cauza penală procurorului cu solicitarea de a fi emisă una dintre următoarele soluții: înaintarea învinuirii și transmiterea cauzei în judecată, încetarea urmăririi penale, clasarea procesului penal, scoaterea persoanei de sub urmărire penală.

Cuvinte-cheie: proces penal, legiuitor, cadrul juridic, făptuitor, organ de stat, material probatoriu, etc.

National regulatory framework regarding the termination of criminal proceedings at the criminal prosecution phase

Summary

The criminal prosecution is an important phase of the criminal trial, taking place under the conditions established by law, which aims to ascertain all the circumstances and circumstances of the act. The criminal prosecution officer, considering that the accumulated evidence is sufficient for making a decision, draws up the report on the termination of the criminal prosecution and transmits the criminal case to the prosecutor with the request to issue one of the following solutions: filing the accusation and sending the case to court, termination of the criminal prosecution, closing the criminal trial, removing the person from criminal prosecution.

Keywords: criminal trial, legislator, legal framework, perpetrator, state body, evidentiary material, etc.

Introducere. În faza urmăririi penale, organul de urmărire penală realizează un șir de acțiuni care sunt orientate spre soluționarea sesizării, identificarea făptuitorilor și stabilirea vinovăției, pentru atragerea la răspundere penală. Totodată, urmărirea penală nu poate dura la nesfârșit. Aceasta se datorează prevederilor reglementate de legislația procesual penală, și anume¹⁹:

- Desfășurarea procesului penal în termeni rezonabili (art.20 din Codul de procedură penală a Republicii Moldova – *în continuare CPP*);

¹⁹ Codul de procedură penală, aprobat prin Legea nr.122-xv din 14 martie 2003 // Monitorul Oficial al Republicii Moldova nr.104-110/447 din 07.06.2003.

- Termenul urmăririi penale (art.259 CPP);
- Circumstanțele care urmează a fi dovedite în procesul penal (art.96 CPP);
- Aprecierea probelor (art.101 CPP);
- Circumstanțele care exclud urmărirea penală (art.275 CPP);
- Remiterea cauzei procurorului cu propunerea de terminare a urmăririi penale (art.289 CPP).

Terminarea urmăririi penale este etapa finală a fazei prejudiciale. Această etapă are scopul:

- protecției drepturilor și libertăților părților la proces;
- verificării realizării acțiunilor de urmărire penală exhaustiv și obiectiv;
- identificării și înlăturării erorilor admise în cadrul urmăririi penale;
- stabilirii cursului de mai departe a procesului penal.

Ajuns la etapa de terminare a urmăririi penale, ofițerul de urmărire penală apreciază nu doar probele administrate în cauza penală, dar putem spune că își autoevaluează activitatea realizată. Orice soluție propusă și ulterior dispusă, trebuie să fie argumentată faptic și juridic.

Argumentarea faptică o constituie totalitatea probelor acumulate, iar cea juridică totalitatea normelor de drept care reglementează decizia luată.

Conținutul de bază. Constatând „că probele administrate sunt suficiente pentru a termina urmărirea penală, organul de urmărire penală înaintează procurorului dosarul însoțit de un raport, în care consemnează rezultatul urmăririi penale și cu propunerea de a dispune una din soluțiile prevăzute la art.291 CPP”²⁰:

- de a pune sub învinuire făptuitorul conform prevederilor art. 281 și 282 CPP dacă acesta nu a fost pus sub învinuire în cursul urmăririi penale, și transmiterea ulterioară în judecată conform art. 289, 291, 297 CPP;
- încetarea urmăririi penale, clasarea cauzei penale sau scoaterea persoanei de sub urmărire penală.

Încetarea urmăririi penale este actul de liberare a persoanei de răspundere penală și de finisare a acțiunilor procedurale, în cazul care pe temeiurile prevăzute la art.275 CPP, legea împiedică continuarea acesteia.

Urmărirea penală nu poate fi pornită, iar dacă a fost pornită, nu poate fi efectuată, și va fi încetată dacă²¹:

- 1) nu există faptul infracțiunii;
- 2) fapta nu este prevăzută de legea penală ca infracțiune;
- 3) fapta nu întrunește elementele infracțiunii, cu excepția cazurilor când infracțiunea a fost săvârșită de o persoană juridică;
- 4) a intervenit termenul de prescripție sau amnistia;
- 4¹) fapta constituie contravenție;
- 5) a intervenit decesul făptuitorului;
- 6) lipsește plângerea victimei în cazurile în care urmărirea penală începe, conform art.276, numai în baza plângerii acesteia sau plângerea prealabilă a fost retrasă;
- 7) în privința unei persoane există o hotărâre judecătorească definitivă în legătură cu aceeași acuzație sau prin care s-a constatat imposibilitatea urmăririi penale pe aceleași temeiuri;
- 8) în privința unei persoane există o hotărâre neanulată de neîncepere a urmăririi penale sau de încetare a urmăririi penale pe aceleași acuzații;
- 9) există alte circumstanțe prevăzute de lege care condiționează excluderea sau, după caz, exclud urmărirea penală.

Temeiurile enumerate sunt reglementate atât de Codul de procedură penală cât și de alte acte normative și recomandări juridice.

²⁰ Codul de procedură penală, aprobat prin Legea nr.122-xv din 14 martie 2003 // Monitorul Oficial al Republicii Moldova nr.104-110/447 din 07.06.2003.

²¹ Codul de procedură penală, aprobat prin Legea nr.122-xv din 14 martie 2003 // Monitorul Oficial al Republicii Moldova nr.104-110/447 din 07.06.2003.

La adoptarea soluției de încetare (stingere) a procesului penal la faza de urmărire penală în baza temeiurilor prevăzute la pct.1)-3), alin.1, art.275 CPP, trebuie să fie luate în calcul și prevederile Codului penal²² și anume: art.3 (principiul legalității, conform căruia numai legea penală prevede care fapte constituie infracțiuni), art.10 (efectul retroactiv al legii, regulă potrivit căreia operează instituția dezincriminării), art.14 (noțiunea de infracțiune), art.21 (subiectul infracțiunii, conform căreia *până la împlinirea vârstei de 14 ani nici o persoană nu răspunde penal*), art.23 (iresponsabilitatea), art.51 (temeiurile răspunderii penale), art.52 (componenta de infracțiune, iar imposibilitatea dovedirii de către organul de urmărire penală a tuturor semnelor componente de infracțiune atrage stingerea procesului penal în fapt sau în persoană).

Intervenirea termenului de prescripție (pct.4 alin.1 art.275 CPP) este reglementată și de art.60 CP²³ (prescripția tragerii la răspundere penală, conform căreia *prescripția este o cauză care înlătură atât răspunderea penală, cât și executarea pedepsei, deoarece trecerea timpului, în anumite condiții, face fie ca legea penală să nu se mai aplice, fie ca sancțiunea aplicată să nu se mai execute*), cât și de art. 16²⁴ (clasificarea infracțiunilor, în funcție de caracterul și gradul prejudiciabil, infracțiunile prevăzute de codul penal sânt clasificate în următoarele categorii: ușoare, mai puțin grave, grave, deosebit de grave și excepțional de grave).

Un alt temei de încetare a procesului penal este amnistia (pct.4 alin.1 art.275 CPP), care este reglementată de art.107 CP²⁵ (*amnistia este actul care are ca efect înlăturarea răspunderii penale sau a pedepsei fie reducerea pedepsei aplicate sau comutarea ei*).

Fapta constituie contravenție (pct.4¹alin.1 art.275 CPP), este reglementată de normele Codului Contravențional dar și de art.10 (efectul retroactiv al legii, regulă potrivit căreia operează instituția dezincriminării), art.5²⁶ (componenta de infracțiune, iar imposibilitatea dovedirii de către organul de urmărire penală a tuturor semnelor componente de infracțiune atrage stingerea procesului penal în fapt sau în persoană).

Lipsește plângerea victimei în cazurile în care urmărirea penală începe, conform art.276, numai în baza plângerii acesteia sau plângerea prealabilă a fost retrasă (pct.6 alin.1 art.275 CPP), este un temei de neîncepere a urmăririi penale iar dacă a fost declanșat este un temei de încetare a urmăririi penale, care de rând cu normele de procedură penală este reglementată și de prevederile Codului penal, art.109²⁷ (*împăcarea este actul de înlăturare a răspunderii penale pentru o infracțiune ușoară sau mai puțin gravă, iar în cazul minorilor, și pentru infracțiune gravă prevăzute la capitolele II – VI, precum și în cazurile prevăzute de procedura penală, dacă persoana nu are antecedente penale pentru infracțiuni similare comise cu intenție sau dacă în privința sa nu a mai fost dispusă încetarea procesului penal, ca rezultat al împăcării, pentru infracțiuni similare comise cu intenție în ultimii cinci ani*).

Încetare a urmăririi penale, în cazurile în care „în privința unei persoane există o hotărâre judecătorească definitivă în legătură cu aceeași acuzație sau prin care s-a constatat imposibilitatea urmăririi penale pe aceleași temeiuri” (art.275, pct.7 CPP) și „în privința unei persoane există o hotărâre neanulată de neîncepere a urmăririi penale sau de încetare a urmăririi penale pe aceleași acuzații” (art.275, pct.8 CPP), avem reglementarea art.7 al CP²⁸ (principiul individualizării răspunderii penale și pedepsei penale, conform căreia *nimeni nu poate fi supus de două ori urmăririi penale și pedepsei penale pentru una și aceeași faptă*).

Existența altor circumstanțe prevăzute de lege care condiționează excluderea sau, după caz, exclud urmărirea penală sunt reglementate atât de legislația procesual penală cât și de legea penală și

²² Codul de procedură penală a Germaniei, Strafprozessordnung – StPO: <https://www.gesetze-im-internet.de/stpo/BJNR006290950.html>.

²³ Codul penal, Legea nr.985 din 18.04.2002//Monitorul Oficial al Republicii Moldova nr.72-74 din 14.04.2009.

²⁴ Codul penal, Legea nr.985 din 18.04.2002//Monitorul Oficial al Republicii Moldova nr.72-74 din 14.04.2009.

²⁵ Codul penal, Legea nr.985 din 18.04.2002//Monitorul Oficial al Republicii Moldova nr.72-74 din 14.04.2009.

²⁶ Codul penal, Legea nr.985 din 18.04.2002//Monitorul Oficial al Republicii Moldova nr.72-74 din 14.04.2009.

²⁷ Codul penal, Legea nr.985 din 18.04.2002//Monitorul Oficial al Republicii Moldova nr.72-74 din 14.04.2009.

²⁸ Codul penal, Legea nr.985 din 18.04.2002//Monitorul Oficial al Republicii Moldova nr.72-74 din 14.04.2009.

anume: Capitolul III „Cauzele care înlătură caracterul penal al faptei”²⁹, art.36 *Legitima apărare*, art.37 *Reținerea infractorului*, art. 38 *Starea de extremă necesitate*, art.39 *Constrângerea fizică sau psihică*, art.40 *Riscul întemeiat*, art.40¹ *Executarea ordinului sau dispoziției superiorului*; Capitolul VI „Liberarea de răspundere penală”³⁰, „*persoana care a săvârșit o faptă ce conține semnele componenței de infracțiune poate fi liberată de răspundere penală de către procuror în cadrul urmăririi penale și de către instanța de judecată la judecarea cauzei în cazurile: minorilor; tragerii la răspundere contravențională; renunțării de bună voie la săvârșirea infracțiunii; căinței active; schimbării situației; liberării condiționate; prescripției de tragere la răspundere penală (art.54-60)”*.

Întru adoptarea soluțiilor de stingere a procesului penal la faza urmăririi penale pe temeiurile prevăzute art.275 CPP, indică asupra importanței cunoașterii minuțioase, în procesul calificării juridice a infracțiunilor, nu numai a semnelor reieșite din conținutul infracțiunii, ci și a unor reguli generale și speciale de calificare a faptelor în limitele unui sau altui conținut normativ, în limitele unei sau altei răspunderi juridice, cu referire la una sau la altă formă de vinovăție prin care se manifestă actul infracțional.

Un alt act normativ care reglementează temeiurile de încetare a procesului penal este Legea fundamentală a statului Constituția Republicii Moldova, și anume, dezincriminarea poate fi identificată și în art.22 din Constituție *Neretroactivitatea legii*³¹, conform căreia nimeni nu va fi condamnat pentru acțiuni sau omisiuni care, în momentul comiterii, nu constituiau un act delictuos (*fapta nu este prevăzută de legea penală ca infracțiune*), iar art.53 *Dreptul persoanei vătămate de o autoritate publică*³², este cu referință asupra drepturilor persoanei în privința căreia urmărirea penală a fost încetată pe temeiuri de reabilitare.

Amnistia la rândul ei se aplică prin lege organică. De la proclamarea independenței Republicii Moldova, legiuitorul a adoptat mai multe legi cu privire la amnistie:

- decret nr. 135 din 14.06.1991 cu privire la amnistia în legătură cu aniversarea adoptării Declarației suveranității Republicii Moldova Publicat: în Monitorul Oficial Nr. 6/ 1991³³;
- hotărârea nr.203 din 29.07.1994 cu privire la amnistia în legătură cu adoptarea Constituției Republicii Moldova, Publicat: în Monitorul Oficial Nr. 4-5/1994³⁴;
- legea nr.565 din 22.07.1995 privind amnistia în legătură cu aniversarea primului an de la adoptarea Constituției Republicii Moldova, Publicat: în Monitorul Oficial Nr. 45- 46/1995³⁵;
- legea nr. 972 din 24.07.1996 privind amnistia în legătură cu aniversarea a V-a de la proclamarea independenței Republicii Moldova, Publicat: în Monitorul Oficial Nr. 56/1996³⁶;
- legea nr.1379 din 20.11.1997 privind amnistia unor categorii de persoane Publicat: în Monitorul Oficial Nr. 70/1998³⁷;
- legea nr.561 din 29.07.1999 privind amnistia în legătură cu aniversarea a V-a de la adoptarea Constituției Republicii Moldova, Publicat: în Monitorul Oficial Nr. 93/1999³⁸;
- legea nr.420 din 26.07.2001 privind amnistia în legătură cu aniversarea a X-a de la

²⁹ *Codul penal*, Legea nr.985 din 18.04.2002//Monitorul Oficial al Republicii Moldova nr.72-74 din 14.04.2009.

³⁰ *Codul penal*, Legea nr.985 din 18.04.2002//Monitorul Oficial al Republicii Moldova nr.72-74 din 14.04.2009.

³¹ Constituția Republicii Moldova din 29.07.1994.

³² Constituția Republicii Moldova din 29.07.1994.

³³ Decret nr.135 din 14.06.1991 cu privire la amnistia în legătură cu aniversarea adoptării Declarației suveranității Republicii Moldova Publicat: în Monitorul Oficial nr.6/1991.

³⁴ Hotărârea Curții Constituționale nr.27 din 21.09.2017, privind excepția de neconstituționalitate a unor prevederi din art.109 alin.(1) din Codul penal (limitarea împăcării în cauzele penale) (pct.48)/ <https://www.constcourt.md/>.

³⁵ Legea nr. 565 din 22.07.1995 privind amnistia în legătură cu aniversarea primului an de la adoptarea Constituției Republicii Moldova, Publicat: în Monitorul Oficial Nr. 45-46/1995.

³⁶ Legea nr. 972 din 24.07.1996 privind amnistia în legătură cu aniversarea a V-a de la proclamarea independenței Republicii Moldova, Publicat: în Monitorul Oficial Nr. 56/1996.

³⁷ Legea nr. 1379 din 20.11.1997 privind amnistia unor categorii de persoane Publicat: în Monitorul Oficial Nr. 70/1998.

³⁸ Legea nr. 561 din 29.07.1999 privind amnistia în legătură cu aniversarea a V-a de la adoptarea Constituției Republicii Moldova, Publicat: în Monitorul Oficial Nr. 93/1999.

proclamarea independenței Republicii Moldova, Publicat : în Monitorul Oficial Nr. 94- 96/2001³⁹;

- legea nr.278-XV din 16 iulie 2004 privind amnistia în legătură cu aniversarea a X-a de la adoptarea Constituției Republicii Moldova, Publicat: în Monitorul Oficial Nr.125/2004⁴⁰;

- legea nr.88 din 10.07.2008 privind amnistia în legătură cu declararea anului 2008 An al Tineretului, Publicat : în Monitorul Oficial Nr. 127-130/2008⁴¹;

- legea nr.210 din 29 iulie 2016 privind amnistia în legătură cu aniversarea a 25-a de la proclamarea independenței Republicii Moldova[102], cât și Recomandarea nr. 97 din 9 februarie 2017, Cu privire la aplicarea prevederilor din Legea nr. 210 din 29 iulie 2016 privind amnistia în legătură cu aniversarea a 25-a de la proclamarea independenței Republicii Moldova⁴²;

- legea nr.243 din 24.12.2021 privind amnistia în legătură cu aniversarea a XXX-a de la proclamarea independenței Republicii Moldova, Publicat : în Monitorul Oficial Nr. 325-333/2021⁴³.

Împăcarea părților este o procedură legală de remediere a unui conflict de drept penal care poate să fie realizată și în cadrul unui proces de mediere, iar acordul de mediere poate servi drept temei de încetare a procesului penal. Procedura și mecanismul de declanșare, desfășurare și soluționare a raportului de mediere este reglementat de Legea nr. 137 din 03.07.2015 cu privire la mediere⁴⁴. Interpretarea legală a instituției împăcării părților și retragerii plângerii prealabile se regăsește în Recomandarea nr. 56 a Curții Supreme de Justiție *cu privire la aplicarea art. 109 CP și 276 CPP în cazurile împăcării părților*⁴⁵ și în Hotărârea Curții Constituționale nr. 27 din 21.09.2017⁴⁶, *privind excepția de neconstituționalitate a unor prevederi din art. 109 alin. (1) CP (limitarea împăcării în cauzele penale)*.

Totodată, există o tendință pe plan mondial potrivit căreia statele caută să se asigure că sistemele lor de justiție sunt în concordanță cu dreptul internațional în domeniul drepturilor omului. Astfel, statele din toată lumea inclusiv și Republica Moldova au preluat principiile internaționale în propriile legi și politici și, drept rezultat, legislațiile în domeniul justiției au fost refăcute.

Există o serie de reguli adoptate de comunitatea internațională ce detaliază modalitățile de lucru de zi cu zi în justiția penală, și anume:

1. „*Dreptul de a nu fi urmărit, judecat sau pedepsit de mai multe ori*”, reglementat de art.4 al Protocolului nr.7 al Convenției Europene pentru Apărarea Drepturilor Omului și Libertăților Fundamentale⁴⁷ și art.50 din Carta drepturilor fundamentale ale Uniunii Europene⁴⁸, este punct de origine pentru temeiurile de încetare a urmăririi penale prevăzute de pct.7)-8) alin.1 art.275 al CPP;

2. Recomandarea nr.R.19(99) a Comitetului de Miniștri al Consiliului Europei către statele membre cu privire la mediere în cauzele penale, adoptată la cea de-a 69-a întâlnire a reprezentanților

³⁹ Legea nr. 420 din 26.07.2001 privind amnistia în legătură cu aniversarea a X-a de la proclamarea independenței Republicii Moldova, Publicat : în Monitorul Oficial Nr. 94-96/2001.

⁴⁰ Legea nr. 278-XV din 16 iulie 2004 privind amnistia în legătură cu aniversarea a X- a de la adoptarea Constituției Republicii Moldova, Publicat: în Monitorul Oficial Nr.125/2004.

⁴¹ Legea nr. 88 din 10.07.2008 privind amnistia în legătură cu declararea anului 2008 An al Tineretului, Publicat : în Monitorul Oficial Nr. 127-130/2008.

⁴² Recomandarea nr. 97 din 9 februarie 2017, Cu privire la aplicarea prevederilor din Legea nr. 210 din 29 iulie 2016 privind amnistia în legătură cu aniversarea a 25-a de la proclamarea independenței Republicii Moldova, de către instanțele judecătorești.

⁴³ Legea nr. 243 din 24.12.2021 privind amnistia în legătură cu aniversarea a XXX-a de la proclamarea independenței Republicii Moldova, Publicat : în Monitorul Oficial Nr. 325-333/2021.

⁴⁴ Legea nr. 137/2015 din 03.07.2015 cu privire la mediere, publicat în Monitorul Oficial Nr. 224-233.

⁴⁵ Recomandări CSJ nr. 56 din 04.11.2013, cu privire la aplicarea art.109 CP și art.276 CPP.

⁴⁶ Hotărârea Curții Constituționale nr.27 din 21.09.2017, privind excepția de neconstituționalitate a unor prevederi din art.109 alin.(1) din Codul penal (limitarea împăcării în cauzele penale) (pct.48)/ <https://www.constcourt.md/>.

⁴⁷ Protocolul nr.7 al Convenției Europene pentru Apărarea Drepturilor Omului, din 22.11.1984 ratificat prin Hotărârea Parlamentului nr. 1298 din 24 iulie 1997 privind ratificarea Convenției pentru apărarea drepturilor omului și a libertăților fundamentale, precum și a unor protocoale adiționale.

⁴⁸ *Carta drepturilor fundamentale a Uniunii Europene* proclamată de către Comisia Europeană, Parlamentul European și Consiliul Uniunii Europene la data de 7 decembrie 2000, în cadrul Consiliului European de la Nisa.

miniștrilor⁴⁹, este actul internațional, izvor al Legii nr. 137/2015 din 03.07.2015 cu privire la mediere;

3. Dezincriminarea sau principiul neretroactivității legii, potrivit căruia nimeni nu va fi condamnat pentru acțiuni sau omisiuni care, în momentul comiterii, nu constituiau un act delictuos este oglindit în mai multe acte internaționale, cum ar fi: Declarația Universală a Drepturilor Omului (art.11)⁵⁰, Pactul internațional cu privire la drepturile civile și politice (art. 15)⁵¹, Convenția Europeană pentru Apărarea Drepturilor Omului (art. 7)⁵².

Încetarea urmăririi penale este reglementată de art. 285, capitolul V, titlul I, Partea specială CPP, care se poate lua în orice moment al fazei de urmărire penală, dacă se constată existența unei circumstanțe care exclude urmărirea penală.

În cazul în care se constată că fapta nu a fost săvârșită de către bănuیت sau de către învinuit, sau în cazul în care se constată alte temeiuri de reabilitare, procurorul dispune prin ordonanță motivată *scoaterea persoanei de sub urmărire penală* (art. 284 din CPP).

Scoaterea persoanei de sub urmărire penală este o încetare a urmăririi penale în privința persoanei bănuite, învinuite de săvârșirea unei infracțiuni.

La emiterea deciziei de scoatere a persoanei de sub urmărire penală, subiectul competent, trebuie să ia în calcul prevederile art.63-66 CPP, care reglementează noțiunea și statutul procesual al bănuitului, învinuitului, inculpatului.

Conform art.64 CPP⁵³, „*bănuitul este persoana fizică față de care există anumite probe că a săvârșit o infracțiune până la punerea ei sub învinuire*”. Bănuitul își obține statutul procesual prin trei acte procesuale: procesul-verbal de reținere, ordonanța de recunoaștere în calitate de bănuیت, ordonanța sau încheierea de aplicare a unei măsuri preventive neprivative de libertate.

Admiterea din partea organului competent, a erorilor și ilegalităților, la dispunerea și menținerea calității procesuale a bănuitului, învinuitului poate avea ca efect scoaterea persoanei de sub urmărire penală.

De aceea, Procesul-verbal de reținere trebuie să corespundă anumitor condiții, prevăzute în art. 167 CPP, iar Ordonanța de aplicare a unor măsuri preventive neprivative de libertate este reglementată de art. 175 CPP. Termenul de 72 ore prevăzut la alin.2, art.63 CPP, începe să curgă din momentul privării *de facto* a libertății și nu din momentul încheierii procesului-verbal de reținere. Odată cu expirarea termenilor de 72 ore (pct.1, alin.2, art.63), 10 zile (pct.2, alin.2, art.63), 3 luni sau 6 luni (pct.3 alin.2, art.63), starea de bănuitală prevăzută în ordonanță încetează de drept. În cazul dat, chiar dacă nu este emisă ordonanța și nu este scoasă de sub urmărire penală, starea de bănuیت nu mai poate fi prelungită⁵⁴.

Conform art.65 CPP, învinuit este „*persoana fizică față de care s-a emis, în conformitate cu prevederile codului de procedură penală, o ordonanță de punere sub învinuire*”.

Clasarea procesului penal (art. 286 CPP), este actul de finalizare a oricăror acțiuni procesuale într-o cauză penală sau pe marginea unei sesizări cu privire la infracțiune, când în cauza penală nu este bănuیت sau învinuit și există una din circumstanțele prevăzute la art. 275 pct. 1)–3).

Concluzii. Urmărirea penală este o fază importantă a procesului penal desfășurându-se în condițiile stabilite de lege, care are menirea constatării tuturor circumstanțelor și împrejurărilor faptei. Ofițerul de urmărire penală considerând că probele acumulate sunt suficiente pentru luarea deciziei

⁴⁹ Recomandarea nr. R 19(99) a Comitetului de Miniștri al Consiliului Europei către Statele membre cu privire la mediere în cauzele penale, adoptată la 15.09.1999 la cea de-a 69-a întâlnire a reprezentanților miniștrilor.

⁵⁰ Declarația Universală a Drepturilor Omului, din 10.12.1948, Publicat: în Tratatul internațional nr.1 din 30.12.1998.

⁵¹ Pactul internațional al ONU, cu privire la drepturile civile și politice Nr. 31 din 16.12.1966, ratificat prin Hotărârea Parlamentului nr. 217 din 28 iulie 1990 cu privire la aderarea R.S.S. Moldova la Declarația Universală a Drepturilor Omului și ratificarea pactelor internaționale ale drepturilor omului.

⁵² Convenția Europeană pentru Apărarea Drepturilor Omului și Libertăților Fundamentale, ratificat prin Hotărârea Parlamentului nr. 1298 din 24 iulie 1997.

⁵³ Codul de procedură penală, aprobat prin Legea nr.122-xv din 14 martie 2003 // Monitorul Oficial al Republicii Moldova nr.104-110/447 din 07.06.2003.

⁵⁴ Dolea, Ig., *Codul de procedură penală (comentariu aplicativ)*, Ed. Cartea Juridică, Chișinău 2016, ISBN 978-9975-3111-3-7, p.176.

întocmește raportul privind terminarea urmăririi penale și transmite cauza penală procurorului cu solicitarea de a fi emisă una din următoarele soluții: înaintarea învinuirii și transmiterea cauzei în judecată, încetarea urmăririi penale, clasarea procesului penal, scoaterea persoanei de sub urmărire penală.

Totodată în contextul racordării cadrului normativ național la cel internațional, privind respectarea drepturilor și libertăților cetățenilor, legislatorul în adoptarea normelor ce reglementează procedura și mecanismul de încetare a procesului penal s-a condus de așa acte internaționale cum ar fi: Declarația Universală a Drepturilor Omului (art.11), Pactul internațional cu privire la drepturile civile și politice (art. 15), Convenției Europene pentru Apărarea Drepturilor Omului (art. 7), Protocolului nr.7 al Convenției Europene pentru Apărarea Drepturilor Omului și Libertăților Fundamentale (art.4), Carta drepturilor fundamentale ale Uniunii Europene (art.50), Recomandarea nr.R.19(99) a Comitetului de Miniștri al Consiliului Europei către statele membre cu privire la mediere în cauzele penale, adoptată la cea de-a 69-a întâlnire a reprezentanților miniștrilor.

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- 12) Legea nr. 278-XV din 16 iulie 2004 privind amnistia în legătură cu aniversarea a X- a de la adoptarea Constituției Republicii Moldova, Publicat: în Monitorul Oficial Nr.125/2004;
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19) Protocolul nr.7 al Convenției Europene pentru Apărarea Drepturilor Omului, din 22.11.1984 ratificat prin Hotărârea Parlamentului nr. 1298 din 24 iulie 1997 privind ratificarea Convenției pentru apărarea drepturilor omului și a libertăților fundamentale, precum și a unor protocoale adiționale;

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Apariția și stingerea raportului juridic în procesul penal

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Rezumat

Obiectul procesului penal constă în existența unei infracțiuni care a dat loc unui conflict de drept în urma căruia a luat naștere un raport juridic de drept penal. În cursul desfășurării procesului penal între subiecții implicați în cauza penală se formează anumite raporturi juridice. Spre deosebire de raportul de drept material penal care se naște prin săvârșirea unei infracțiuni, raportul procesual-penal se naște când organele publice competente stabilesc probabilitatea existenței unui raport de drept penal. Subiecții raportului de drept penal devin și subiecți ai raportului de drept procesual penal. Astfel, făptuitorul, care este subiect al infracțiunii într-un raport de drept penal, devine și subiect important al unui raport de drept procesual-penal, pe lângă ceilalți participanți procesuali. Prin intermediul reglementării juridice, faptele sociale capătă o trăsătură specifică și devin raporturi juridice. Într-o formulare lapidară se poate spune că raportul juridic este o relație socială reglementată de norma juridică. Condițiile fundamentale ale apariției raportului juridic sânt: existența normei juridice, a subiecților de drept și a faptelor juridice.

Cuvinte-cheie: raport juridic, stat de drept, proces penal, instituții de aplicare a legii, urmărirea penală, făptuitor, legiuitor, etc.

Summary

The object of criminal proceedings consists in the existence of an offense that gave rise to a conflict of law as a result of which a legal relationship of criminal law was born. During the criminal trial, certain legal relationships are formed between the subjects involved in the criminal case. Unlike the substantive criminal law relationship that arises through the commission of an offense, the

procedural-criminal relationship arises when the competent public bodies establish the probability of the existence of a criminal law relationship. The subjects of the criminal law relationship also become subjects of the criminal procedural law relationship. Thus, the perpetrator, who is the subject of the offense in a criminal law relationship, also becomes an important subject of a procedural-criminal law relationship, in addition to the other procedural participants. Through legal regulation, social facts acquire a specific feature and become legal relationships. In a concise formulation, it can be said that the legal relationship is a social relationship regulated by the legal norm. The fundamental conditions for the emergence of the legal relationship are: the existence of the legal norm, of legal subjects and of legal facts.

Keywords: legal relationship, rule of law, criminal trial, law enforcement institutions, criminal prosecution, perpetrator, legislator, etc.

Introducere. Raporturile juridice sunt relații sociale reglementate de normele juridice. Conformându-se normelor juridice sau încălcându-le, cetățenii, destinatarii acestora, adoptă anumite conduite care determină nașterea unor drepturi și obligații juridice. Aceste drepturi și obligații se nasc datorită existenței unei norme juridice care le descrie și care le oferă forță juridică, adică leagă de nerespectarea lor intervenția forței coercitive a statului. Raportul juridic reprezintă deci modul, forma în care dreptul se transpune, se realizează în viața socială⁵⁵.

Raporturi sociale care se formează în baza normelor juridice și în care subiecții apar ca titulari de drepturi și obligații reciproce și a căror respectare este garantată de forța coercitivă a statului, sunt raporturi juridice.

Raporturile juridice pot fi de o varietate mare, în funcție de relațiile sociale pe care le reflectă (de familie, de muncă, de relații civile, penale, etc.).

Conținutul de bază. Prin săvârșirea unei infracțiuni ia naștere un raport de drept penal substanțial denumit și raport substanțial de conflict. Aducerea raportului substanțial de conflict în fața organelor de drept conduce la apariția unor raporturi juridice procesual penale. Organele de drept, la rândul lor, au în sarcină soluționarea raportului substanțial de conflict prin îndeplinirea tuturor atribuțiilor care le sunt atribuite de lege.

Norma juridică reprezintă acea normă de drept care prescrie o conduită tipică pe care oamenii au obligația să o urmeze, stabilește limitele și obligațiile fiecărui subiect al unui raport social, anume, în mod generic și în forma lui tipică.

Prin norme juridice procesual penale înțelegem regulile de conduită care au ca obiect de reglementare desfășurarea procesului penal.

Spre deosebire de normele dreptului esențial care se adresează în general, tuturor cetățenilor, regulile procesual penale, denumite în doctrină, de conduită particulară, privesc numai participanții la activitatea procesuală.

Normele de drept procesual sunt cele care stabilesc⁵⁶:

- autoritățile publice care au dreptul și în același timp obligația să constate infracțiunile, să identifice făptuitorii și să-i tragă la răspundere, prevăzând în același timp structura și atribuțiile autorităților judiciare abilitate prin lege în acest sens;
- persoanele fizice sau juridice ce pot fi antrenate în activitatea de îndeplinire a justiției, atribuțiile, drepturile și obligațiile procesuale ale acestora;
- actele și măsurile procesuale precum și mijloacele ce pot fi folosite de organele judiciare, părți și alte persoane în desfășurarea procesului penal;
- sancțiunile ce pot fi aplicate în cazul încălcării normei procesuale (nulitatea,

⁵⁵ Zărie, I.M., Teoria generală a dreptului, culegeri de curs, an.I, http://file.ucdc.ro/cursuri/F_1_N16_Teoria_generala_a_dreptului_Ioan_Mircea_Zarie.pdf, (accesat la 20.12. 2024).

⁵⁶ <https://biblioteca.regielive.ro/referate/drept/structura-normelor-juridice-procesual-penale-raportul-juridic-procesual-penal-obiectul-si-trasaturile-acesteia-45599.html>, (accesat la 21.12. 2024).

inadmisibilitatea, decăderea, amenda judiciară, aducerea silită la organul judiciar, sancțiuni penale). Sancțiunile prevăzute de norma procesuală sunt evidente, de grade diferite, în funcție de importanța normei încălcată.

Normele juridice procesual penale au, în general, aceleași trăsături ca și cele ce se referă și altor ramuri de drept. Ele reglementează relațiile sociale ce se stabilesc între autoritățile statului (organele judiciare), părți și alte persoane antrenate la desfășurarea procesului penal, pe de o parte, și făptuitorul faptei penale, pe de altă parte. Acestea sunt norme speciale de conduită, spre deosebire de normele dreptului substanțial, care se adresează tuturor cetățenilor⁵⁷.

Desfășurarea procesului penal impune prezența anumitor persoane, cu anumite calități procesuale chemate sau care intervin din proprie inițiativă în acest cadru procesual⁵⁸. Astfel, persoanele care cooperează în vederea atingerii scopului lor, formează sfera participanților la procesul penal.

Categoria de subiecți ai procesului penal este diferită de cea pe care o cunoaște dreptul penal. În dreptul penal noțiunea de subiect înglobează persoana fizică și juridică pasibile, potrivit art. 21 din CP, de răspundere penală, în dreptul procesual penal noțiunea de subiecți conține organele și persoanele care își desfășoară activitatea împreună în vederea realizării procesului penal, finalitatea căruia constituie rezolvarea conflictului născut din săvârșirea infracțiunii. Fiind suprapuse sferele celor două noțiuni, se observă că subiectul în sensul dreptului penal apare în persoana unui singur subiect din categoriile organelor și persoanelor implicate în procesul penal, în persoana bănuțitului, învinutului, inculpatului⁵⁹.

Procesul penal, privit în structura sa, poate fi considerat ca fiind un raport juridic, care se dezvoltă progresiv între diferite persoane participante, interesate în soluționarea conflictului de drept penal substanțial creat prin săvârșirea unei infracțiuni.

Procesul penal, pornind de la prevederile alin. (1) al art. 1 din CPP, este o activitate complexă reglementată de lege, desfășurată progresiv și coordonat, care implică activitatea organelor de urmărire penală și a instanțelor judecătorești cu participarea părților în proces și a altor persoane. Prin urmare, subiecții procesului penal sunt organele și persoanele ca titulari de drepturi și obligații, cu interese, poziții sau roluri diferite.

Faptele juridice procesual penale sunt împrejurări de fapt care determină apariția, nașterea, modificarea, stingerea raporturilor juridice procesuale ori împiedicarea nașterii acestora. În funcție de criteriul efectelor pe care le produc asupra raporturilor juridice procesual penale, faptele juridice procesual penale sunt constitutive, modificatoare, extinctive și impeditiv⁶⁰:

Fapte juridice constitutive, dau naștere unor raporturi juridice procesual penale (sesizarea organelor competente despre săvârșirea sau pregătirea unei infracțiuni, recunoașterea în calitate de parte vătămată, recunoașterea în calitate de parte civilă);

Fapte juridice modificatoare, modifică statutul procesual al participanților la procesul penal (victima care solicită să fie recunoscută în calitate de parte vătămată și parte civilă, calitate care îi conferă alte drepturi și obligații);

Fapte juridice extinctive, sting raporturile juridice procesual penale (retragerea plângerii prealabile, împăcarea părților, intervenția prescripției răspunderii penale);

Fapte juridice impeditiv, împiedică nașterea raporturilor juridice procesual penale (lipsa plângerii prealabile împiedică declanșarea procesului penal).

Raporturile juridice procesual penale sunt acele raporturi juridice care apar în cursul

⁵⁷ <https://dreptmd.wordpress.com/cursuri-universitare/drept-international-public/notiunea-si-trasaturile-caracteristice-ale-dreptului-international/>, (accesat la 29.12.2024).

⁵⁸ Crișu A., Drept procesual penal. Partea generală, Ediția 2, C.H. Beck, București, 2007, p.57, ISBN: 978-973-115-139-7

⁵⁹ Dongoroz, V., Drept penal, București, Institutul de Arte Grafice, 1939, p.135.

⁶⁰ Coltuc, M., Noțiunea și clasificarea faptelor și raporturilor juridice procesual-penale, revista „Suceava News”, februarie 2014, <https://www.svnews.ro/notiunea-si-clasificarea-faptelor-si-raporturilor-juridice-procesual-penale/31731/>.

desfășurării procesului penal⁶¹.

Ca orice raport juridic, raportul juridic procesual penal este constituit din următoarele elemente⁶²:

„- *subiecții raportului juridic procesual penal sunt participanții la procesul penal, respectiv: organele judiciare (organul de urmărire penală, procurorul, judecătorul de instrucție, instanța de judecată), avocații, părțile (învinuitul, partea vătămată, partea civilă, partea responsabilă civilmente), precum și alți subiecți procesuali (martorul, expertul, interpretul);*

- *conținutul raportului juridic procesual penal este compus din totalitatea drepturilor și obligațiilor conferite de lege subiecților raportului juridic procesual penal. În funcție de particularitatea cauzei și de etapa procesuală, subiecții raporturilor juridice procesuale penale dobândesc drepturi și obligații specifice, care dau o nuanță aparte fiecărui raport juridic procesual penal;*

- *obiectul raportului juridic procesual penal constă în stabilirea existenței (sau inexistenței) raportului juridic penal și determinarea conținutului acestui raport juridic. Astfel, pe măsură ce procesul penal se desfășoară, fiind administrate probele necesare lămuririi cauzei sub toate aspectele, raportul penal se definitivează, iar soluția pronunțată la terminarea procesului penal stabilește existența sau inexistența raportului de drept penal material”.*

Raportul juridic procesual penal, comparativ cu raporturile juridice proprii altor ramuri ale dreptului, se caracterizează prin anumite trăsături specifice⁶³:

- sunt raporturi juridice de putere (de autoritate). În cadrul acestor raporturi juridice se realizează tragerea la răspundere a persoanelor care au comis infracțiuni, organele judiciare ale statului fiind singurele în drept a-l trage la răspundere penală pe făptuitor, prin aplicarea sancțiunii adecvate normei juridice încălcate.

- în marea majoritate a raporturilor juridice procesuale penale, unul dintre subiecți este organul statului. Există, însă, și raporturi juridice procesuale penale în care nu se regăsesc în calitate de subiecți organe ale statului (de pildă, raportul dintre parte și apărătorul său).

- de regulă, raporturile juridice procesuale penale apar în afara acordului de voință al părților. Din momentul apariției raportului penal conflictual, prin comiterea unei fapte prevăzute de legea penală, dacă organele judiciare sunt sesizate, nu se poate pune problema realizării acordului de voință în scopul declanșării procesului penal (acesta este guvernat de principiul oficialității). Există și cazuri în care raportul juridic procesual penal apare cu acordul de voință al subiecților procesuali (de exemplu, adresarea plângerii prealabile de către persoana vătămată organelor competente, constituirea ca parte civilă în procesul penal, intervenția părții responsabile civilmente în procesul penal etc.).

- drepturile subiective ale organelor judiciare au valoare de obligații pentru aceste organe[97, p.15]. Acest caracter al drepturilor organelor judiciare este explicabil prin natura scopurilor procesului penal[131, p.19].

Din analiza celor expuse, reiterăm că, raporturile juridice procesuale penale iau naștere doar în cadrul unui proces penal, care la rândul său se declanșează odată cu sesizarea organului de urmărire penală despre săvârșirea sau pregătirea pentru săvârșirea unei infracțiuni. Fiecare participant al unui proces penal poate declanșa unul sau mai multe raporturi juridice procesuale penale.

Odată născut, *raportul juridic procesual penal* se desfășoară în timp prin impunerea cerinței de respectare a regulii de conduită pe care o instituie și executarea de către destinatarii normei procesuale penale a obligației de a se supune dispozițiilor legii.

Fiecărui raport juridic procesual penal îi corespunde o anumită perioadă de timp, prevăzută de legislație sau stabilită de organele judiciare, în conformitate cu legea, una este cert, că orice raport

⁶¹ Volonciu, N., *Drept procesual penal*, Ed. Didactică, București, 1972, p.17.

⁶² Poiană, I., Păcurariu, I., *Drept procesual penal – partea generală*, București, Ed. Universul Juridic, 2014, ISBN 978-606-673-477-6, p.10.

⁶³ Neagu, I., *Drept procesual penal, partea generală, tratat*, București, Ed. Global Lex, 2006 ISBN (10) 973-87230-1-9; (13) 978-973-87230-1-6, p.40.

juridic procesual penal încetează odată cu soluționarea definitivă a procesului penal.

Modificarea *raportului juridic procesual penal* poate interveni pe parcursul procesului penal, ca urmare a modificărilor ce intervin în conținutul normei procesual penale, fie prin modificarea statutului procesual, fie prin aplicarea unor norme de constrângere, etc. Drepturile și obligațiile participanților la raportul juridic procesual penal se vor adapta din mers, în dependență funcție de modificările normative făcute și care au fost aduse la cunoștință public, potrivit dispozițiilor legale, sau altor modificări procesuale intervenite.

Încetarea oricăror raporturi juridice procesual penale, după cum am menționat, au loc odată cu soluționarea definitivă a procesului penal.

Soluționarea definitivă a procesului penal are loc doar prin pronunțarea unei hotărâri penale definitive. Totodată, putem considera că soluțiile de încetare (stingere) a procesului penal la faza urmăririi penale, dispuse de procuror, dacă nu au fost contestate sau nu au dispărut temeiurile, în baza cărora au fost dispuse, de asemenea pot fi considerate ca soluții definitive care cauzează stingerea raporturilor juridice procesual penale.

Referitor la încetarea raporturilor juridice procesual penal la faza de urmărire penală putem conchide următoarele, că „ofițerul de urmărire penală, finalizând examinarea cauzei penale, face anumite concluzii pe rezultatele activităților sale, apreciază probele administrate din punct de vedere dacă ele obiectiv, complet și sub toate aspectele relevă circumstanțele cauzei și dacă sunt eficiente și destule pentru a lua decizia definitivă în cauza penală”⁶⁴.

Un raport juridic procesual penal, la faza urmăririi penale, încetează în legătură cu existența circumstanțelor care împiedică continuarea urmăririi penale sau existența unor motive pentru eliberarea unei persoane de răspundere penală.

Circumstanțele care impun intervenția încetării raportului procesual penal sunt prevăzute la art. 275 CPP⁶⁵.

Concluzii. În cursul desfășurării procesului penal între subiecții implicați în cauza penală se formează anumite raporturi juridice. Spre deosebire de raportul de drept material penal care se naște prin săvârșirea unei infracțiuni, raportul procesual-penal se naște când organele publice competente stabilesc existența unui raport de drept penal.

Urmărirea penală este o fază importantă a procesului penal desfășurându-se în condițiile stabilite de lege, care are menirea constatării tuturor circumstanțelor și împrejurărilor faptei. Ofițerul de urmărire penală considerând că probele acumulate sunt suficiente pentru luarea deciziei întocmește raportul privind terminarea urmăririi penale și transmite cauza penală procurorului cu solicitarea de a fi emisă una din următoarele soluții: înaintarea învinuirii și transmiterea cauzei în judecată, încetarea urmăririi penale, clasarea procesului penal, scoaterea persoanei de sub urmărire penală.

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Geopolitical Polarization in the Republic of Moldova and Its Influence on the Political Attitudes of the Gagauz and Bulgarian Minorities

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Abstract. The article examines how geopolitical polarization affects the political attitudes of the Gagauz and Bulgarian minorities in Moldova. Drawing on media monitoring data and sociological surveys by Media Birlii (Comrat) and official statistics, it shows that the media space in the south of the country is highly segmented. In Gagauzia, the primary news sources are the Internet (88.3%) and television (55.6%)[1][2], while the most popular outlets are local media (GRT, Nokta, Laf.md, etc. [3]) and social networks (Instagram 28.3%, Telegram 23.3%, Facebook 21.3%[4][5]). Content analysis reveals the dominance of pro-Russian narratives – “us vs. them” framing, historical analogies, and the victimization of the population[6]. The Bulgarian minority (~2% of the population[7]), concentrated in Taraclia, faces a similar information isolation (the Russian language dominates the public sphere)[8]. The study concludes that southern Moldova effectively operates as a semi-autonomous information space, reinforcing pro-Kremlin attitudes. To mitigate this polarization, targeted measures are needed – bilingual communication campaigns, expanded Romanian-language education, and support for independent local media[9][10].

Keywords: Moldova; Gagauzia; Bulgarian minority; geopolitical polarization; disinformation; media narratives; social media; political attitudes.

Introduction

Moldova’s political life is characterized by a strong confrontation between the pro-European and pro-Russian camps[1]. This split is especially noticeable in the autonomous regions with compact minority populations (Gagauzia, Taraclia)[2]. The Gagauz people comprise about 4.6% of the country’s population (2014 census – 126,010 people)[3][4] and 83.8% of the population of the Gagauz autonomous region. They speak the Gagauz language (a Turkic dialect) and primarily Russian[3][4]. Bulgarians make up approximately 2% of the population[5] and are concentrated in

the southern Taraclia district (where they form the majority). In everyday life they maintain the Bulgarian language, but in the public and media sphere Russian predominates[6][7].

Under such conditions, informational influences from outside (Russian and other foreign propaganda) have a particularly pronounced effect on the political attitudes of these groups. The aim of this study is to identify the mechanisms by which geopolitical narratives influence the Gagauz and Bulgarian minorities of Moldova[4].

Theoretical Context

Modern studies show that information fault lines along linguistic and ethnic divisions can amplify political polarization in society[8][9]. In Moldova, significant segments of the population are split into Russian-speaking groups (including the majority of national minorities: Gagauz, Bulgarians, Ukrainians, etc.) and Romanian-speaking groups, which exist in virtually separate media spaces[8]. Social media algorithms and specialized information campaigns can intensify such divides, creating “echo chambers”[10][8]. The theory of political polarization emphasizes the role of group identity and media strategies in forming entrenched “us vs. them” narratives. In this analysis, that paradigm is applied to assess the information environment of Moldova’s southern regions and its influence on minority attitudes.

Methodology

The study is based on a comprehensive methodological approach. The empirical basis includes:

- publications and reports of civil society organizations (AO Media Birlîi – Uniunia Media, the Center for Strategic Communication, etc.),
- results of field surveys of the population of Gagauzia,
- official statistical data.

Materials from the monitoring of disinformation narratives compiled by Media Birlîi[11] were used for content analysis, along with survey data on the residents of Gagauzia (Media Birlîi, 2024). To assess trust in media and freedom of the press, independent indices were utilized – for example, the Press Freedom Index (CIJ, 2025)[12]. Demographic and linguistic characteristics of the regions were verified against the population census (2014)[13][11] and relevant official statistics. Thus, the combination of qualitative (discourse analysis, expert evaluations) and quantitative (surveys, content monitoring) methods enabled a comprehensive analysis of the influence of media content on the political attitudes of the groups under study[14].

Empirical Analysis

Media Consumption in Gagauzia

According to a Media Birlîi survey (N≈1010), the majority of Gagauzia’s residents obtain news primarily via the Internet (88.3% of respondents)[15]; television remains an important source for 55.6%[15]. Among online media, local outlets lead: GRT (16.6%), Nokta (15.9%), and Laf.md (15.0%)[15]. Respondents’ preferences are fairly diverse – for example, the websites Gagauzinfo.md and Gagauznews each garner about 14–15% of the audience’s votes[16]. Notably, almost all respondents actively follow the news: 28.2% read news daily and 39.4% do so several times a week[17]. Thus, residents of the region are generally engaged in consuming information, while still preferring local or Russian-language sources.

Social Networks and Narratives

In the realm of social networks, the people of Gagauzia use Instagram most actively (28.3% of those surveyed) and Telegram (23.3%)[18]. Facebook remains in third place (21.3%)[18]. Independent monitoring analysis confirms that in recent years Telegram has become the main channel for disseminating political information in the region[18][19].

In the collected Russian-language media flow, the most noticeable manipulative strategies are evident: messages are often structured in an “us–them” scheme (fostering an image of conflict), and they contain references to historical events and rhetoric of victimhood[20][21]. For example, narratives have been observed about the “oppression” of Gagauz by the central authorities, calls to protect Gagauz identity, and associations with external powers (Russia, Turkey)[21]. These themes are transformed into a political message: Gagauz voters are urged to support candidates oriented

toward the Kremlin. Taken together, the Gagauz information sphere is saturated with pro-Kremlin and anti-European messages and attitudes[22][23].

Characteristics of the Bulgarian Minority

The Bulgarian minority (~2% of the country's population[7]) lives mainly in Taraclia (Bulgarians constitute the majority there). Within Gagauzia itself, the Bulgarian population is small. Nevertheless, the conditions of information exposure are similar: in the public life of Moldova's Bulgarians, the Russian language dominates[24]. This in part isolates them from the country's Romanian-language information space. The 2014 census shows that a significant portion of Moldova's Bulgarians do not know Romanian and rely on Russian-language media. Researchers note that residents of Taraclia have limited access to national (Romanian) news sources[25][26].

At the same time, there is a factor that counteracts this isolation – close ties with Bulgaria. It is known that many Moldovan Bulgarians obtain Bulgarian citizenship and participate in cultural exchange programs, which gives them greater contact with pro-European networks[27]. These ties can partially mitigate their information isolation by creating alternative channels for information.

Discussion

Data from the monitoring and surveys clearly show that southern Moldova remains an informationally fragmented zone. The Gagauz media space is essentially closed off and forms its own information bubble. Key narratives for the Gagauz are set within regional networks and channels that are close to Russia[28][29]. State media (for example, local broadcasts of Moldovan public TV in Russian) cannot overcome this dominance, and pro-Ukrainian or pro-European messages virtually do not penetrate the daily lives of residents[30][31].

A similar situation is observed among the Bulgarians: limited access to Romanian sources makes them less engaged in nationwide discourse[32][33]. Experts consider such divisions in language and media space to be a vulnerability of the minority communities to malign propaganda[33][34]. The high level of Russian media consumption in Gagauzia is reflected in political orientations: according to election results and surveys, Gagauz and Bulgarians more often support pro-Russian parties and candidates[34][35]. All these facts are consistent with the observation that in Moldova, “geopolitical polarization” is very strong and influences electoral conflicts[34][36].

Conclusions

Isolation of the information space. Southern Moldova (Gagauzia, Taraclia and adjacent districts) effectively functions as a distinct media subsystem. Most of the news content in this space conveys pro-Kremlin positions and stigmatizes the central government[37][38]. Social networks and messaging apps (especially Telegram) reinforce the “us–them” divide.

Vulnerability of minorities. The Gagauz and Bulgarians remain predominantly Russian-speaking in their media consumption, which creates a cultural distance from the pro-European segment of society[39][40]. The Bulgarian minority somewhat compensates for this through ties with Bulgaria (diaspora, dual citizenship), but the Gagauz have far fewer external channels for connectivity.

Necessary measures. Targeted policies could reduce polarization and strengthen information integration, for example: bilingual communication initiatives (Russian/Gagauz–Romanian) for local communities, active promotion of the Romanian language in Gagauzia and Taraclia[41], and support for independent regional media. International reports recommend developing bilingual platforms (Russian or Gagauz together with Romanian) and educational programs that do not infringe on minority rights[42][43]. These steps would “blur” the information boundaries and increase society's resilience to hostile propaganda.

In summary, geopolitical polarization in Moldova is reinforced by the localized information bubbles in the south of the country. Progress toward a sustainable information environment will require systemic efforts in media literacy, the development of bilingual media, and the civic engagement of minority communities, which corresponds with the recommendations of international experts[44].

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**ВЛАДЕНИЕ И ВЛАДЕЛЬЧЕСКАЯ ЗАЩИТА В ГРАЖДАНСКОМ ПРАВЕ
РЕСПУБЛИКИ МОЛДОВА: АКТУАЛЬНЫЕ ПРОБЛЕМЫ И ПУТИ
СОВЕРШЕНСТВОВАНИЯ**

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Abstract: Possession as a legal category occupies a distinctive place within the system of real rights, functioning as a connecting link between the factual state of control over a thing and legally recognized proprietary rights. Despite its factual nature, possession is traditionally regarded in legal doctrine as an autonomous object of legal protection, which is обусловлено the need to ensure stability in civil circulation and to prevent arbitrary interference with established property relations.

In the civil law of the Republic of Moldova, the institution of possession has been normatively закреплено in the provisions of the Civil Code of the Republic of Moldova, reflecting a trend toward strengthening its legal significance. The legislator proceeds from the recognition of possession as a legally relevant state deserving protection irrespective of the existence of a real right, which is consistent with contemporary European approaches to the regulation of property relations.

At the same time, the theoretical understanding of possession and its protection within the national legal system remains incomplete. In legal scholarship, there is ongoing debate regarding the legal nature of possession, the correlation between its factual and legal elements, as well as the limits of its protection. Particular attention is paid to issues of classification of possession, the differentiation of its types, and the determination of good faith criteria, all of which directly affect the applicability of protective mechanisms.

Judicial practice in applying the rules governing possessory protection also reveals a number of significant problems. In particular, there is a tendency to substitute possessory remedies with proprietary (real-right) remedies that require proof of ownership, which contradicts the very essence of possessory protection. Moreover, there is a lack of uniformity in judicial practice regarding the determination of the subject matter of proof and the range of persons entitled to protection of possession.

The relevance of this study is further reinforced in the context of harmonization of national legislation with European legal standards. In the case law of the European Court of Human Rights, the concept of “possession” is interpreted broadly and encompasses various proprietary interests, which necessitates the adaptation of national approaches to the understanding and protection of possession.

Key words: possession; possessory protection; right of ownership; factual control; subject matter of proof; good-faith possessor; vindictory action; protection of property rights; law enforcement practice.

Введение: Владение как правовая категория занимает особое место в системе вещных прав, выступая связующим звеном между фактическим состоянием господства над вещью и юридически признанными имущественными правами. Несмотря на свою фактическую природу, владение традиционно рассматривается в правовой доктрине как самостоятельный объект правовой защиты, что обусловлено необходимостью обеспечения устойчивости гражданского оборота и недопустимости самовольного нарушения сложившихся имущественных отношений.

В гражданском праве Республики Молдова институт владения получил нормативное закрепление в положениях Гражданского кодекса Республики Молдова, в которых отражена тенденция к усилению его правовой значимости. Законодатель исходит из признания владения как юридически значимого состояния, подлежащего защите независимо от наличия вещного права, что соответствует современным европейским подходам к регулированию имущественных отношений.

Вместе с тем, теоретическое осмысление владения и его защиты в национальной правовой системе остается недостаточно завершенным. В научной литературе сохраняется дискуссионность относительно правовой природы владения, соотношения фактического и юридического элементов, а также пределов его защиты. Особое внимание уделяется вопросам квалификации владения, разграничения его видов и определению критериев добросовестности, что напрямую влияет на возможность применения механизмов защиты.

Практика применения норм, регулирующих владельческую защиту, также выявляет ряд существенных проблем. В частности, наблюдается тенденция к подмене владельческой защиты вещно-правовыми способами защиты, требующими доказывания права собственности, что противоречит самой сущности посессорной защиты. Кроме того, отсутствует единообразие судебной практики в вопросах определения предмета доказывания и круга лиц, имеющих право на защиту владения.

Актуальность статьи усиливается в условиях гармонизации национального законодательства с европейскими правовыми стандартами. В практике Европейского суда по правам человека категория «possession» трактуется расширительно и охватывает различные имущественные интересы, что требует адаптации национальных подходов к пониманию и защите владения.

ПРАВОВАЯ ПРИРОДА ВЛАДЕНИЯ В ГРАЖДАНСКОМ ПРАВЕ. Владение как правовая категория занимает особое место в системе вещных прав, представляя собой фактическое состояние господства лица над вещью, которому придается юридическое значение. В отличие от права собственности, являющегося субъективным гражданским правом, владение не обязательно основано на правовом титуле, однако подлежит самостоятельной защите в силу своей социальной и экономической функции.

В доктрине гражданского права владение традиционно рассматривается через призму двух взаимосвязанных элементов: объективного (**corpus**) и субъективного (**animus**). Объективный элемент выражается в фактическом обладании вещью и возможности осуществлять над ней физический контроль, тогда как субъективный элемент предполагает намерение лица владеть вещью как своей. Наличие указанных элементов позволяет отграничить владение от простого держания, при котором лицо осуществляет фактическое обладание вещью, но признает за другим субъектом право на неё [3, р.53].

Особенностью владения является его двойственная природа: с одной стороны, оно представляет собой фактическое состояние, а с другой — приобретает юридическое значение в силу признания и защиты со стороны государства. Такая двойственность обуславливает сложность его правовой квалификации и является причиной существования различных научных подходов к определению сущности владения.

В зависимости от характера отношения лица к вещи в доктрине и законодательстве выделяются различные виды владения. Прежде всего различают законное и незаконное владение, в зависимости от наличия правового основания для обладания вещью. Наряду с этим

существенное значение имеет деление на добросовестное и недобросовестное владение, которое определяется наличием или отсутствием у лица убеждения в правомерности своего владения. Указанные категории имеют важное значение для решения вопросов, связанных с защитой владения и приобретением права собственности, в частности в порядке приобретательной давности (*uzucapiune*).

Отдельного внимания заслуживает разграничение владения и держания. В отличие от владельца, держатель осуществляет фактическое обладание вещью в интересах и по воле другого лица, не имея намерения владеть ею как своей. Данное различие имеет принципиальное значение для определения круга лиц, обладающих правом на владельческую защиту, поскольку такая защита предоставляется именно владельцу, а не любому фактическому обладателю вещи.

Возникновение владения в гражданском праве Республики Молдова рассматривается как юридически значимый процесс установления фактического господства лица над вещью, которому правопорядок придаёт правовые последствия независимо от наличия у лица права собственности. В современной молдавской цивилистике подчёркивается, что владение не возникает в силу правового акта или государственной регистрации, а формируется как объективно распознаваемое фактическое состояние, выражающееся в устойчивом контроле над вещью и признанное законом в целях обеспечения стабильности имущественного оборота [2, р.34].

Прекращение владения **недвижимостью** имеет свою специфику, связанную с устойчивым характером таких объектов. Владение земельным участком или строением прекращается в момент фактического оставления объекта, выселения, передачи ключей либо утраты реальной возможности пользования имуществом.

ВЛАДЕЛЬЧЕСКАЯ ЗАЩИТА КАК САМОСТОЯТЕЛЬНЫЙ СПОСОБ ЗАЩИТЫ.

Владельческая защита представляет собой самостоятельный институт гражданского права, направленный на охрану фактического владения независимо от наличия у лица вещного права на соответствующее имущество. Её сущность заключается в обеспечении стабильности гражданского оборота посредством оперативного восстановления нарушенного фактического состояния, без необходимости разрешения спора о праве.

В отличие от вещно-правовых способов защиты, в частности виндикационного иска, направленного на защиту права собственности, владельческая защита ориентирована исключительно на защиту факта владения. Данное различие имеет принципиальное значение, поскольку определяет предмет доказывания и пределы судебного разбирательства.

В рамках владельческой защиты предметом доказывания выступают, прежде всего, наличие факта владения у истца, факт его нарушения, а также причинно-следственная связь между действиями ответчика и нарушением владения.³ При этом установление права собственности или иного вещного права не входит в предмет рассмотрения по данной категории дел. Требование доказывания титула владения противоречит самой природе посессорной защиты и фактически приводит к её подмене петиторными способами защиты [4, р. 17].

В гражданском законодательстве Республики Молдова положения о защите владения закреплены в Гражданский кодекс Республики Молдова, которые предусматривают возможность защиты владения независимо от наличия права собственности. Данные нормы отражают традиционный для континентальной правовой системы подход, согласно которому владение подлежит защите как самостоятельное юридически значимое состояние.

К числу основных способов владельческой защиты относятся требования о восстановлении владения в случае его утраты, а также требования об устранении препятствий в осуществлении владения. Указанные способы направлены на оперативное восстановление фактического положения, существовавшего до нарушения, и не предполагают разрешения спора о праве собственности.

Особое значение владельческой защиты проявляется в её превентивной функции. Предоставляя защиту фактическому владельцу, законодатель препятствует самовольному

захвату имущества и стимулирует разрешение споров в правовом порядке. Тем самым обеспечивается принцип правовой определенности и исключается возможность самоуправства.

Вместе с тем, анализ правоприменительной практики в Республике Молдова свидетельствует о наличии существенных отклонений от классической модели владельческой защиты. В частности, суды нередко требуют от истца доказательства права собственности либо иного титула, что выходит за пределы предмета доказывания по данной категории дел. Такая практика приводит к смешению владельческой и вещно-правовой защиты, снижая эффективность первой и усложняя доступ к правосудию.

Сравнительно-правовой анализ показывает, что в европейской правовой традиции владельческая защита рассматривается как автономный и упрощенный механизм защиты, ориентированный на быстрое восстановление нарушенного владения. В практике Европейский суд по правам человека также подчеркивается необходимость эффективной защиты имущественных интересов, включая фактическое владение, как элемента права на мирное владение имуществом.

Таким образом, владельческая защита в гражданском праве Республики Молдова представляет собой самостоятельный способ защиты, направленный на охрану фактического владения и обеспечение стабильности гражданского оборота. Эффективность её применения во многом зависит от правильного понимания её правовой природы и недопущения подмены вещно-правовыми способами защиты.

АКТУАЛЬНЫЕ ПРОБЛЕМЫ ВЛАДЕЛЬЧЕСКОЙ ЗАЩИТЫ И ПУТИ СОВЕРШЕНСТВОВАНИЯ. Несмотря на нормативное закрепление института владения и его защиты, правоприменительная практика Республики Молдова свидетельствует о наличии ряда существенных проблем, снижающих эффективность владельческой защиты и затрудняющих её реализацию.

Одной из ключевых проблем является смешение владельческой и вещно-правовой защиты. Как отмечается в доктрине, владельческая защита направлена исключительно на восстановление фактического владения, тогда как вещно-правовые способы защиты ориентированы на защиту субъективного права собственности¹. Однако на практике суды нередко выходят за пределы предмета доказывания, требуя от истца подтверждения права собственности или иного титула владения, что противоречит сущности посессорной защиты. Защита владения является не только частноправовой, но и общественно значимой гарантией правовой стабильности и предотвращения самоуправства [1, p.55].

Указанная проблема во многом обусловлена недостаточной определенностью подходов к пониманию правовой природы владения. В научной литературе подчеркивается, что владение представляет собой юридически значимое фактическое состояние, не тождественное праву собственности². Тем не менее, в судебной практике нередко наблюдается тенденция к отождествлению владения с правом, что приводит к искажению механизма его защиты.

Второй существенной проблемой является отсутствие единообразия судебной практики по делам о защите владения. Различные подходы судов к определению предмета доказывания, круга лиц, имеющих право на защиту, а также способов защиты создают правовую неопределенность и снижают уровень доверия к судебной системе³.

Отдельного внимания заслуживает проблема защиты добросовестного владельца. В соответствии с положениями Гражданский кодекс Республики Молдова добросовестность владения имеет значение, в частности, для приобретения права собственности по давности владения. Однако в контексте владельческой защиты критерии добросовестности не всегда получают должную оценку, что может приводить к необоснованному отказу в защите фактического владения.

Кроме того, следует отметить недостаточную разработанность процессуальных механизмов владельческой защиты. В отличие от классической модели посессорной защиты, предполагающей оперативное и упрощенное рассмотрение споров, в национальной практике

такие дела зачастую рассматриваются в общем исковом порядке, что снижает эффективность защиты и увеличивает сроки восстановления нарушенного владения.

Сравнительный анализ европейской практики свидетельствует о том, что эффективная владельческая защита должна носить ускоренный и автономный характер. В практике Европейский суд по правам человека подчеркивается, что защита имущественных интересов, включая фактическое владение, является элементом права на мирное владение имуществом, гарантированного статьей 1 Протокола № 1 к Европейской конвенции.

В целях повышения эффективности владельческой защиты в гражданском праве Республики Молдова представляется целесообразным:

- четко закрепить в законодательстве пределы владельческой защиты и исключить необходимость доказывания права собственности при рассмотрении соответствующих споров;
- обеспечить единообразие судебной практики посредством разъяснений высших судебных инстанций;
- рассмотреть возможность введения упрощенной (ускоренной) процедуры рассмотрения дел о защите владения;
- уточнить критерии добросовестности владения в контексте его защиты;
- усилить разграничение владельческой и вещно-правовой защиты на уровне правоприменения.

Таким образом, совершенствование института владельческой защиты требует комплексного подхода, включающего как развитие законодательства, так и формирование единообразной судебной практики. Реализация указанных мер позволит повысить эффективность защиты фактического владения и обеспечить стабильность гражданского оборота.

Дополнительного анализа требует проблема соотношения владельческой защиты с системой государственной регистрации прав на недвижимое имущество. В условиях функционирования кадастровой системы и придания приоритета зарегистрированным правам в правоприменительной практике нередко возникает тенденция игнорирования фактического владения как самостоятельного объекта защиты. Это приводит к ситуации, при которой лицо, фактически владеющее имуществом, но не обладающее зарегистрированным правом, оказывается в менее защищенном положении по сравнению с титульным владельцем.

Между тем, регистрация права и владение выполняют различные правовые функции. Государственная регистрация направлена на обеспечение публичности, достоверности и стабильности, вещных прав, тогда как владельческая защита ориентирована на охрану фактического состояния и предотвращение самоуправных действий. Смещение этих институтов приводит к искажению их правовой природы и снижает эффективность механизмов защиты.

В этой связи представляется важным закрепление в правоприменительной практике подхода, согласно которому наличие или отсутствие государственной регистрации права не должно иметь решающего значения при рассмотрении споров о защите владения. Основное внимание суда должно быть сосредоточено на установлении факта владения и факта его нарушения.

Ещё одной существенной проблемой является сложность доказывания факта владения в отдельных категориях дел, особенно когда речь идёт о недвижимом имуществе или длительных фактических отношениях. Отсутствие чётко закреплённых критериев оценки владения приводит к тому, что суды по-разному подходят к оценке доказательств, что негативно сказывается на единообразии судебной практики.

В целях устранения данной проблемы целесообразно выработать единые подходы к установлению факта владения, включая оценку таких обстоятельств, как:

- длительность владения;
- характер использования имущества;

- наличие внешних признаков владения;
- поведение лица в отношении имущества.

Указанные критерии позволят повысить объективность судебного рассмотрения и снизить уровень правовой неопределённости.

Особого внимания заслуживает проблема соотношения владельческой защиты и самозащиты, гражданских прав. В условиях недостаточной эффективности судебных механизмов защиты владения лица нередко прибегают к самостоятельным действиям, направленным на восстановление нарушенного владения. Однако такие действия могут выходить за пределы допустимой самозащиты и перерасти в самоуправство, что влечёт правовые последствия.

Эффективная владельческая защита должна минимизировать необходимость обращения к самозащите, обеспечивая быстрый и доступный судебный механизм восстановления владения. Это, в свою очередь, способствует укреплению принципа правового государства и снижению уровня конфликтности в обществе.

Дополнительно следует отметить проблему недостаточной теоретической и практической разработанности института владельческой защиты в национальной правовой системе. Несмотря на закрепление соответствующих норм в гражданском законодательстве, их применение требует более глубокого осмысления и систематизации, а также адаптации к современным условиям развития имущественных отношений.

Важным направлением совершенствования является развитие правовых позиций высших судебных инстанций. Принятие разъяснений по вопросам применения норм о владельческой защите позволит сформировать единообразную практику и обеспечить правильное понимание сущности данного института.

Кроме того, представляется целесообразным усиление роли доктрины в развитии института владельческой защиты. Научные исследования могут способствовать выявлению проблем правоприменения, а также разработке предложений по совершенствованию законодательства.

В условиях цифровизации и развития информационных технологий особую актуальность приобретает вопрос взаимодействия владельческой защиты с электронными системами учёта и регистрации. Внедрение цифровых кадастровых систем, автоматизация процессов регистрации прав и доступность информации о недвижимом имуществе создают новые условия для реализации владельческой защиты. В то же время это требует адаптации правовых механизмов к новым реалиям и обеспечения баланса между формальными и фактическими элементами имущественных отношений.

Таким образом, современные проблемы владельческой защиты носят комплексный характер и затрагивают как материально-правовые, так и процессуальные аспекты. Их решение требует системного подхода, включающего совершенствование законодательства, развитие судебной практики и углубление научных исследований.

В конечном счёте, эффективная владельческая защита должна обеспечивать оперативное восстановление нарушенного владения, предотвращение самоуправства и укрепление стабильности гражданского оборота. Реализация данных задач возможна только при условии правильного понимания правовой природы владения и последовательного применения соответствующих норм на практике.

Выводы: Таким образом, институт владения представляет собой самостоятельное юридически значимое фактическое состояние, выполняющее важную функцию в обеспечении стабильности гражданского оборота и защите имущественных интересов его участников. Владение, будучи не тождественным праву собственности, обладает собственной правовой природой и подлежит самостоятельной защите, что соответствует современным европейским подходам к регулированию вещных прав.

Владельческая защита выступает эффективным механизмом охраны фактического владения, направленным на оперативное восстановление нарушенного состояния без

необходимости доказывания права собственности. Такая конструкция способствует снижению уровня самоуправства, предотвращению конфликтов и формированию устойчивых правовых отношений в сфере имущественного оборота.

Вместе с тем, существует ряд проблем, препятствующих эффективной реализации владельческой защиты. К числу наиболее значимых из них относятся смешение владельческой и вещно-правовой защиты, отсутствие единообразной судебной практики, недостаточная определённость критериев оценки фактического владения, а также несовершенство процессуальных механизмов рассмотрения соответствующих категорий дел. Дополнительные сложности вызывает влияние системы государственной регистрации прав, которая в отдельных случаях приводит к недооценке значения фактического владения.

Кроме того, важным направлением развития является уточнение критериев добросовестности владения и формирование единых подходов к установлению факта владения. Существенную роль в этом процессе должна играть правовая доктрина, способствующая более глубокому осмыслению института владения и выработке научно обоснованных решений.

Таким образом, совершенствование института владения и владельческой защиты должно быть направлено на укрепление его самостоятельного значения, повышение эффективности судебной защиты и обеспечение баланса между формальными и фактическими элементами имущественных отношений. Реализация данных задач позволит повысить уровень правовой определённости, укрепить доверие к судебной системе и обеспечить стабильное развитие гражданского оборота.

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PERSONELE DISPĂRUTE FĂRĂ VESTE ȘI LUPTA CONTRA IMPUNITĂȚII – ASPECTE PRIVIND CONLUCRAREA ACESTOR DOUĂ INSTITUȚII

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Chestiunea persoanelor dispărute fără veste cu regret rămâne a fi o problemă stringentă în perioadele de conflicte armate. După mai multe regiuni ale globului – Balcani, America Latină, Africa centrală, Asia, iată că și Africa de nord se înscrie în această listă dramatică. Or, situația post-conflict de regulă nu tratează acest subiect ca pe unul prioritar.

Cuvinte-cheie: persoane dispărute fără veste, conflict armat, jurisdicție internațională.

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Key-words: persoane dispărute fără veste, conflict armat, jurisdicție internațională.

Problema persoanelor dispărute fără veste este una din cele mai stringente în dreptul internațional umanitar. Nedeterminarea în ce privește destinul celui apropiat reprezintă una din realitățile dure ale contemporaneității a unui număr impunător de familii în situații de conflict armat sau de violență internă. Părinții, frații și surorile, soții și copiii încearcă disperat să-și găsească rudele pierdute. Familii și societăți întregi, nefiind la curent dacă sunt sau nu în viață cei apropiați, nu pot întoarce pagina cu evenimentele de groază, ce le-au distrus viața. Ei nu pot adera la procesul de reabilitare și conceliere, nici ca persoane luate aparte, nici ca o societate *in integrum*. Asemenea răni pot deteriora țesuturile societății și submina relațiile între grupuri și națiuni, uneori și peste decenii după evenimentele ce au avut loc.

În ultimii ani ONU este preocupat de fenomenul dispariției forțate a persoanelor, fenomen, cu care se confruntă majoritatea conflictelor armate, indiferent de calificarea acestora, fie că este vorba despre conflict armat internațional, fie non-internațional. În plus, fenomenul în cauză este destul de des prezent în condițiile regimurilor autoritare. Această metodă este pe larg aplicată în diverse regiuni ale lumii,⁶⁶ de exemplu, de regimurile autoritare latinoamericane.

O atenție deosebită acestei probleme i se acordă începând cu ultimul deceniu al sec. XX. În calitate de punct de reper poate fi considerată rezoluția Adunării Generale a ONU nr.47/133 din 18.12.1992 „Declarația privind protecția persoanelor contra disparițiilor forțate”.⁶⁷

În opinia experților, progresele realizate în procesul de punere capăt impunității pentru crimele de război, constituind tribunale internaționale și conferind un rol mai activ jurisdicțiilor interne, va trebui să conducă la un respect crescând al dreptului internațional umanitar, iar ca rezultat – la reducerea numărului persoanelor dispărute, dat fiind că o bună parte din ei sunt rezultatul încălcărilor legale.⁶⁸ Așa cum persoanele care dețin informație relevantă au frica să fie predate pe mâna justiției, creșterea „pericolului de la Haga” sau, mai general, existența unui risc real judiciar antrenează pe calea consecințelor o diminuare proporțională a șanselor de a obține informații asupra soartei persoanelor dispărute prin intermediul mijloacelor tradiționale.⁶⁹ Este important să fie instaurat un echilibru între această recunoaștere generală a importanței urmăririi crimelor de război și punerea în aplicare a mijloacelor eficace de colectare și selectare a informației necesare asupra persoanelor dispărute.

Asemenea mecanisme vor cere motivarea, ca celor ce dețin informație despre soarta persoanelor dispărute să le expună și să nu rămână neutri în raport cu problema dată. Această sarcină este de durată. Dar între timp s-au înregistrat și anumite succese. Așa, în octombrie 2005, de exemplu, președinția CICR, care conducea grupul de lucru asupra dispăruților în Kosovo, a atenționat că numărul persoanelor dispărute se ridică la 2.557 contra celor 3.000 la început de an, menționând că progresul atins datorează eforturilor întreprinse de medicina legală.

Grupul de lucru s-a reunit la inițiativa reprezentantului special al Secretarului general al Națiunilor Unite în Kosovo și sub președinția CICR în calitate sa de intermediar neutru. Grupul de lucru are ca mabndat stabilirea urmelor persoanelor considerate dispărute, obținerea informațiilor privind soarta lor, precum și informarea familiilor acestora. Obiectivul grupului de lucru constă în atingerea unui progres real în fața acestei tragedii, întrucât familiile au dreptul să cunoască ce s-a întâmplat cu cei apropiați. Autoritățile ambelor părți au sarcina să întreprindă măsurile necesare pentru soluționarea problemei în cauză.

⁶⁶ În anii '70 ai secolului XX disparițiile forțate erau practicate în Cipru, Ethiopia, Indonezia și Filipine. În timpul războiului din Alger această metodă represivă era utilizată de militarii francezi.

⁶⁷ Rezoluția Adunării Generale a ONU A/RES/47/133 «Déclaration sur la protection de toutes les personnes contre les disparitions forcées» http://www.un.org/french/documents/view_doc.asp?symbol=A/RES/47/133 (consultat la 25.10.2011).

⁶⁸ Monique Crettol and Anne-Marie La Rosa. The missing and transitional justice: the right to know and the fight against impunity. International Review of the Red Cross. March 2006. Vol. 88. No 862, p.359 http://www.icrc.org/eng/assets/files/other/irrc_862_crettol-larosa.pdf (consultat la 18.04.2012).

⁶⁹ Marco Sassoli and Marie-Louise Tougas. The ICRC and the missing. International Review of the Red Cross. December 2002. Vol. 84. No 848, p.727 http://www.icrc.org/eng/assets/files/other/irrc_848_sassoli.pdf (consultat la 28.02.2012).

Ulterior, conform unei liste provizorii stabilite de către grupul de lucru după mai multe reuniuni, numărul persoanelor a coborât de la 2.919 la 2.716 înregistrat cu trei luni anterior.⁷⁰

Președinția CICR a estimat că grupul de lucru va trebui să dispună „de informații ce emană din surse care ar putea ajuta la elucidarea soartei persoanelor dispărute și la localizarea noilor îngropări comune”, să lucreze eficient și „să răspundă așteptărilor din ce în ce mai mari a familiilor celor dispăruți”.⁷¹

Practica ne demonstrează că autoritățile naționale pot adopta diverse strategii asupra aceste chestiuni. În unele cazuri acestea nu au ezitat să lanseze campanii publice de informatizare referitor la persoanele dispărute, demonstrând voința politică de soluționare a acestei chestiuni. Experții aduc ca exemplu Peru, Chili și Marocul.⁷² În mai multe cazuri CICR a publicat pe site, în cataloage sau în cărți numele persoanelor dispărute, cu plasarea pozelor acestora sau cu bunurile personale găsite pe corp, pe care autoritățile le-au folosit în eforturile întreprinse pentru clarificarea soartei persoanelor declarate dispărute. Și din nou ne referim la experți, care în acest sens aduc exemplul Serbiei, Bosniei, Angolei, Liberiei, Cote d'Ivoire-lui, în special în raport cu căutarea copiilor separați de părinți sau rude în urma conflictelor armate.⁷³ În unul din cazuri, cu consimțământul familiilor respective, CICR a acordat unei Comisii pentru adevăr și reconciliere informații importante ce reflectă peste 400 cazuri care nu figurau în nici o bază de date. Este vorba despre cazul Peru în cadrul unui parteneriat care prevedea exploatarea sistematică a datelor CICR în căutarea persoanelor și crearea unei liste unice a persoanelor dispărute.⁷⁴

În alte cazuri, au fost prevăzute diverse mijloace de comunicare a informației asupra persoanelor dispărute (linii telefonice, informație transmisă prin intermediul web sau centre de colectare a informației etc.). În unele situații au fost acceptate informații anonime înainte de a stabili legătura dintre persoana și anchetă sau de a examina aceste informații în cadrul unei proceduri penale. Chiar dacă precizarea informației recuperate poate fi pusă la îndoială, estimăm de exemplu, că în contextul național croat, 10% din informația anonimă recepționată a fost considerată utilă în căutarea persoanelor dispărute.⁷⁵ Autoritățile în egală măsură pot să-și concentreze eforturile vizând localizarea persoanelor dispărute prin intermediul procedurii penale, considerând ca factor atenuant transmiterea informației care ar putea ajuta la clarificarea soartei acestora sau care ar prevedea sancțiuni în caz de necooperare. Aceeași legătură ar putea fi instaurată cu procedurile de control puse în aplicare la nivel național și în cadrul cărora furnizarea informației privind persoanele dispărute ar fi considerată ca un factor pozitiv în procesul de evaluare. În final, unii au aplicat sau au planuri să acorde o amnistie limitată sau o imunitate de la urmărire acompaniate de forme alternative de justiție, chiar dacă această abordare pune numeroase întrebări privind compatibilitatea lor cu exigențele dreptului internațional umanitar. Măsurile care vor fi interpretate de o manieră ce ar permite criminalilor de război să nu fie urmăriți în justiție rămân insuficiente din punct de vedere al dreptului internațional umanitar. Acestea ar contraveni obligațiilor ce recomandă statelor să ancheteze crimele comise, să urmărească și să sancționeze persoanele presupuse că ar fi comis crime de război.

Mai mult, o amnistie la nivel național nu protejează persoanele nominalizate de pericolul unei urmăriri pe plan internațional. În cazul în care o amnistie a fost acordată în încălcarea obligațiilor internaționale, ea nu va avea acoperire legală și va fi ignorată de tribunalele internaționale.⁷⁶ Totodată

⁷⁰ KOSOVO : NOUVELLE REUNION DU GROUPE DE TRAVAIL SUR LES DISPARUS. 03-10-2005 COMMUNIQUE DE PRESSE 05/73

<http://www.icrc.org/fre/resources/documents/news-release/serbia-montenegro-news-031005.htm> (consultat la 23.03.2012).

⁷¹ Idem.

⁷² Monique Crettol and Anne-Marie La Rosa, op. cit., p.362.

⁷³ Idem.

⁷⁴ Idem.

⁷⁵ Ivo Josipovic. Responsibility for war crimes before national courts in Croatia. International Review of the Red Cross. Volume 88. Number 861. March 2006 http://www.icrc.org/eng/assets/files/other/irrc_861_josipovic.pdf (consultat la 05.03.2011).

⁷⁶ ICTY, Prosecutor v. Anto Furundzija. Judgement. Case No IT-95-17/1, Jugement 10 December 1998, par.155, p.59-60

o asemenea amnistie poate fi ignorată și la nivel național de către instanțele judiciare, în special în cazurile în care justiția se bucură de un suport logistic internațional.

Drept exemplu poate servi practica Curții Speciale pentru Sierra Leone, care la 13 martie 2004 a adoptat o decizie importantă referitor la acțiunea amnistiei din punct de vedere al dreptului internațional.⁷⁷ Camera de Apel a emis încheierea conform căreia amnistia acordată în baza așa numitor acorduri de pace de la Lomé persoanelor din cadrul grupărilor participante la războiul civil din Sierra Leone nu constituie obstacol în tragerea acestora la răspundere penală. Aceasta este prima hotărâre a unei instanțe judiciare internaționale, care prevede în mod expres, că amnistia nu constituie obstacol pentru a trage la răspundere penală persoanele culpabile în comiterea crimelor internaționale de către instanțele judiciare, inclusiv internaționale și naționale. Adevărul este că această decizie a Curții a trezit discuții referitor la influența ei asupra dezvoltării dreptului internațional umanitar.⁷⁸

În final remarcăm faptul că în toate cazurile asociațiile familiilor persoanelor dispărute, evident în cazul în care acestea există, trebuiesc consultate. Ele sunt nu doar beneficiari de măsuri întreprinse pentru a stabili destinul celor apropiați, ci, în egală măsură, au un rol deosebit în asigurarea faptului ca entitatea responsabilă în ansamblul său și în fiecare din componentele sale să țină cont de mandatul și de angajamentele sale.

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INFORMATION OPENNESS OF STATE AUTHORITIES AND LOCAL PUBLIC ADMINISTRATION BODIES IN THE REPUBLIC OF MOLDOVA: LEGAL FRAMEWORK AND IMPLEMENTATION MECHANISMS

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Abstract. The article examines the theoretical foundations and implementation mechanisms of information openness of state authorities and local public administration bodies in the Republic of Moldova. The regulatory framework governing citizens' access to information about the activities of government bodies is analyzed. Based on empirical research, the effectiveness of the information openness system of central authorities and local public administration bodies of the Autonomous Territorial Unit of Gagauzia is assessed. The main problems of implementing the principle of government transparency are identified, and recommendations for improving mechanisms for ensuring citizens' access to information about the activities of state and local government bodies are proposed. The study reveals that despite the creation of a comprehensive legal framework, the practical implementation of information openness, especially at the local level, faces significant

<http://www.icty.org/x/cases/furundzija/tjug/en/fur-tj981210e.pdf> (consultat la 30.04.2012).

⁷⁷ The Prosecutor v. Morris Kallon and Brima Buzzy Kamara, Special Court for Sierra Leone, SCSL-2004-15-AR72(E) and SCSL-2004-16-AR72(E), Decision on Challenge to Jurisdiction: Lomé Accord Amnesty (Appeals Chamber, 13 March 2004).

⁷⁸ Gamurari V., Barbăneagră A. Crimele de război. Chișinău: Reclama SA. 2008, p.459-477.

challenges including limited financial and human resources, insufficient understanding of the importance of transparency, and weak monitoring mechanisms.

Keywords: information openness, government transparency, access to information, state authorities, local public administration, Republic of Moldova, information policy, civil society, accountability, public participation.

Introduction

Information openness of state authorities represents one of the key principles of functioning of a democratic rule-of-law state. In contemporary conditions of civil society formation, government transparency serves not only as an indicator of the quality of interaction between the state and citizens, but also as a mechanism for preventing corruption, ensuring government accountability, and improving the efficiency of public administration [1, p. 30]⁷⁹.

The Republic of Moldova, having proclaimed the course towards building a democratic rule-of-law state and developing civil society, has adopted a number of legislative acts aimed at ensuring information openness of public authorities. The Constitution of the Republic of Moldova guarantees every citizen's right to access information concerning their rights and legitimate interests [2]⁸⁰. This constitutional provision has been developed in special legislation: the Law "On Access to Information" No. 982 of 11.05.2000 [3]⁸¹, the Law "On Transparency of the Decision-Making Process" No. 239 of 13.11.2008 [4]⁸², and the Government Resolution "On Official Pages of Public Administration Bodies on the Internet" No. 188 of 03.04.2012 [5]⁸³.

However, despite the creation of a legislative framework, the practical implementation of the principle of information openness of state authorities and local public administration encounters a number of problems. The study of mechanisms for ensuring citizens' access to information at the local level, where constitutional rights are directly implemented and daily interaction between authorities and the population takes place, acquires particular relevance.

The problems of information openness of authorities have been studied in the works of A.S. Panarin, N.M. Nikolaev, A.V. Shevchenko, I.M. Ibragimova, N.Yu. Korchenkova, M.A. Sinitsyna,

⁷⁹ Ibragimova I.M. Transparency of Power: Fundamentals of Ensuring Information Interaction of State Bodies with the Public (presentation schemes) // United Nations Development Programme in Ukraine; UNDP Project "Good Governance with Citizen Participation: Development of a Comprehensive and Transparent Policy Process in Ukraine". 2002. 132 p.

⁸⁰ Constitution of the Republic of Moldova. Adopted on 29.07.1994 // Official Monitor of the Republic of Moldova. 1994. No. 1.

⁸¹ Law of the Republic of Moldova "On Access to Information" No. 982 of 11.05.2000 // Official Monitor of the Republic of Moldova. 2000. No. 88-90.

⁸² Law of the Republic of Moldova "On Transparency of the Decision-Making Process" No. 239 of 13.11.2008 // Official Monitor of the Republic of Moldova. 2008. No. 215-217.

⁸³ Government Resolution of the Republic of Moldova "On Official Pages of Public Administration Bodies on the Internet" No. 188 of 03.04.2012 // Official Monitor of the Republic of Moldova. 2012. No. 70-71.

and other scholars [6–9]⁸⁴⁸⁵⁸⁶⁸⁷. At the same time, the specifics of implementing information openness of authorities in the Republic of Moldova, especially at the local public administration level, remain insufficiently studied.

Research objective – comprehensive analysis of the legal framework and implementation mechanisms of information openness of state authorities and local public administration bodies in the Republic of Moldova, assessment of the effectiveness of their functioning, and development of recommendations for improving the system of ensuring citizens' access to information about the activities of government bodies.

Research tasks:

- 1) To define the concept and essence of information openness of state authorities as a theoretical construct;
- 2) To study the regulatory framework governing information openness of state authorities and local public administration bodies in the Republic of Moldova;
- 3) To analyze mechanisms for ensuring citizens' access to information about the activities of government bodies;
- 4) To conduct an empirical study of information openness of central authorities and local public administration bodies of the ATU Gagauzia;
- 5) To develop recommendations for improving the system of information openness of government bodies.

Research methods. The study employed general scientific methods of cognition (analysis, synthesis, induction, deduction), special legal methods (formal-legal, comparative-legal), as well as empirical methods (monitoring of official websites of government bodies, content analysis of posted information, surveys of representatives of local public administration bodies).

1. Theoretical foundations of information openness of state authorities

Information openness of state authorities represents a complex socio-legal phenomenon located at the intersection of various spheres of social relations: legal, political, administrative, and informational. In scientific literature, the concept of "information openness" is defined as an organizational and legal regime of activity of a government body that ensures the possibility for interested parties to obtain the necessary volume of information about the structure, goals, objectives, financial and organizational conditions of its activities [10, p. 124]⁸⁸.

Information openness of authorities performs several crucial functions in a democratic society. First, it is a necessary condition for citizens to exercise their constitutional rights and freedoms. Without access to information about the activities of government bodies, effective protection of one's rights, participation in state governance, and oversight of government activities are impossible. Second, information openness contributes to improving the quality of administrative

⁸⁴ Panarin A.S. *Revenge of History: Strategic Initiative in the XXI Century*. Moscow: Logos, 2006. 392 p.

⁸⁵ Nikolaev N.M. *State Information Policy*. Moscow: Academic Project, 2008. 512 p.

⁸⁶ Shevchenko A.V. *Information Sustainability of the Political System*. Moscow: RAGS, 2007. 216 p.

⁸⁷ Sinitsyna M.A. *Issues and Proposals on Ensuring Access to Information within the Framework of "Electronic Government" Formation // Right to Access Information: Opportunities and Limitations in the Electronic Environment: collection of materials of the international scientific-practical conference / scientific ed. N.A. Sheveleva*. St. Petersburg: Presidential Library named after B.N. Yeltsin, 2012. P. 45-58.

⁸⁸ Korchenkova N.Yu. *The Principle of Information Openness as a Requirement of Modern Democracy // Bulletin of Nizhny Novgorod University named after N.I. Lobachevsky. Series: Law*. 2000. No. 1. P. 124-128.

decisions, as it ensures consideration of opinions and interests of various social groups. Third, it is a crucial tool for combating corruption and other abuses by government officials [11]⁸⁹.

The main principles of information openness of state authorities include:

- the principle of publicity, which implies the obligation of government bodies to actively disclose information about their activities, not limiting themselves to providing information only upon requests;
- the principle of completeness and reliability of information, requiring the provision of comprehensive and accurate data;
- the principle of timeliness, meaning the provision of current information within the timeframes established by law;
- the principle of accessibility, providing for the placement of information in forms and on media that ensure its availability to the widest possible range of citizens;
- the principle of free basic access to information about the activities of government bodies.

2. Legal framework for information openness of authorities in the Republic of Moldova

Legal regulation of information openness of state authorities and local public administration bodies in the Republic of Moldova is carried out on the basis of a multi-level system of regulatory legal acts.

The foundation of constitutional and legal regulation is the Constitution of the Republic of Moldova, Article 34 of which guarantees the individual's right to access any information concerning public affairs, as well as the right to receive reliable information [2]⁹⁰. This constitutional provision establishes the fundamental principle of government openness and creates the legal basis for detailed legislative regulation.

The central place in the system of special legislation is occupied by the Law "On Access to Information" No. 982 of 11.05.2000, which regulates in detail the procedure and conditions for exercising citizens' right to access information held by public authorities [3]⁹¹. The Law establishes the list of information subject to mandatory publication, defines the procedure for submitting and considering requests for information, and regulates the grounds and procedure for restricting access to information.

The Law "On Transparency of the Decision-Making Process" No. 239 of 13.11.2008 regulates a special aspect of information openness – citizen participation in the process of developing and adopting regulatory legal acts and decisions of public authorities [4]⁹². The Law establishes the obligation of government bodies to publish draft normative acts in advance, organize public discussions, and consider received proposals and comments.

The Government Resolution "On Official Pages of Public Administration Bodies on the Internet" No. 188 of 03.04.2012 establishes mandatory requirements for the content and functioning of official websites of government bodies [5]. The document defines the list of information subject to mandatory placement on official websites, requirements for website structure, information update deadlines, and accessibility for persons with disabilities.

The Law "On Local Public Administration" No. 436 of 28.12.2006 contains special norms regulating information openness of local public administration bodies. The Law establishes the

⁸⁹ European Charter of Local Self-Government. Strasbourg, October 15, 1985 // Collection of Legislation of the Russian Federation. 1998. No. 36. Art. 4466.

² Constitution of the Republic of Moldova. Adopted on 29.07.1994 // Official Monitor of the Republic of Moldova. 1994. No. 1.

³ Law of the Republic of Moldova "On Access to Information" No. 982 of 11.05.2000 // Official Monitor of the Republic of Moldova. 2000. No. 88-90.

⁴ Law of the Republic of Moldova "On Transparency of the Decision-Making Process" No. 239 of 13.11.2008 // Official Monitor of the Republic of Moldova. 2008. No. 215-217.

obligation of LPA bodies to ensure transparency of their activities, inform the population about decisions made, and conduct public hearings on the most important issues of local significance [12]⁹³.

3. Mechanisms for ensuring information openness of government bodies

Analysis of current legislation allows identifying two main types of mechanisms for ensuring information openness of government bodies: mandatory (primary) mechanisms and auxiliary mechanisms.

Mandatory mechanisms include:

- 1) Official websites of government bodies. According to Resolution No. 188, each public administration body must have an official website with a specific list of information: regulatory framework of the body's activities, structure and contact information, procedure for providing public services, information about budget and expenditure, draft normative acts, activity reports, etc.
- 2) System for processing information requests. Citizens have the right to submit written or oral requests for information, which must be considered within the timeframes established by law (15 days for written requests, immediately for oral requests).
- 3) Public discussions of draft normative acts and decisions. Government bodies must organize public discussions of draft decisions affecting citizens' rights and interests.
- 4) Publication of information in official print media and mass media.

Auxiliary mechanisms include:

- creation of information centers and information access points;
- holding press conferences, briefings, open door days;
- use of social networks to inform citizens;
- organization of hotlines and trust phones;
- placement of information stands and publication of information bulletins.

4. Results of empirical research on information openness of government bodies

To assess the actual state of information openness of government bodies in the Republic of Moldova, an empirical study was conducted, including monitoring of official websites of central government bodies and local public administration bodies of ATU Gagauzia of levels I and II.

4.1. Information openness of central government bodies

Analysis of official websites of central executive bodies of the Republic of Moldova showed a relatively high level of compliance with legislative requirements on information openness. Most ministries and departments have functioning official websites on which mandatory information is posted.

At the same time, a number of shortcomings were identified:

- untimely updating of information (especially in sections on structure and leadership of bodies, contact information);
- absence or incomplete posting of information about budget and expenditure;
- insufficient detail of information about public services provided;
- formal approach to organizing public discussions of draft normative acts;
- lack of effective feedback with citizens (information requests are considered with violations of established deadlines).

4.2. Information openness of local public administration bodies of ATU Gagauzia

Research on information openness of local public administration bodies of ATU Gagauzia revealed significant problems in implementing the principle of government transparency at the local level.

¹² Law of the Republic of Moldova "On Local Public Administration" No. 436 of 28.12.2006 // Official Monitor of the Republic of Moldova. 2007. No. 32-35

Monitoring of LPA bodies of level I (district, city) showed that most of them have official websites, however, the quality of posted information does not meet legislative requirements. Typical problems include:

- incomplete posting of mandatory information (sections on budget, procurement, services provided are missing);
- untimely updating of information (outdated data on composition and structure of administrative bodies, contact information);
- lack of information about public discussions held and decisions made based on their results;
- low quality of website design, making navigation and search for necessary information difficult;
- absence of website versions for persons with disabilities.

The situation with information openness of LPA bodies of level II (rural and urban mayoralities) is critical. The conducted monitoring showed that a significant portion of mayoralities do not have their own official websites. Those mayoralities that do have websites, as a rule, post a minimum amount of information on them, insufficient to ensure real information openness.

A survey of LPA body representatives revealed the following main reasons for the low level of information openness at the local level:

- insufficient funding (lack of funds for creating and maintaining websites, conducting public events);
- absence of qualified specialists in information technology and information work;
- insufficient understanding by LPA body leadership of the importance of information openness for civil society development and improvement of governance quality;
- lack of effective oversight by higher authorities over compliance with legislative requirements on information openness.

Conclusion

The conducted research allows drawing the following conclusions:

1. Information openness of state authorities is a necessary condition for the functioning of a democratic rule-of-law state, ensures the implementation of citizens' constitutional rights, contributes to improving the efficiency of public administration, and combating corruption.
2. The Republic of Moldova has created a sufficiently comprehensive regulatory framework governing information openness of government bodies. The legislation establishes the obligation of government bodies to ensure citizens' access to information and defines mechanisms for implementing this obligation.
3. At the same time, the practical implementation of the principle of information openness, especially at the local public administration level, faces serious problems. A significant portion of LPA bodies do not comply with legislative requirements on information openness or comply with them formally.
4. The main reasons for the insufficient level of information openness of LPA bodies are: deficit of financial and human resources, insufficient understanding by LPA body leadership of the importance of information openness, weak oversight by higher authorities and civil society.

Based on the obtained results, the following recommendations for improving the system of information openness of government bodies in the Republic of Moldova are proposed:

- 1) Creation of a centralized technical platform for hosting official websites of LPA bodies with standard functionality and design, which will reduce the costs of creating and maintaining websites.
- 2) Organization of a training and professional development system for municipal employees in the field of information work and use of information technologies.
- 3) Creation of the institution of information access commissioners in LPA bodies, responsible for ensuring information openness.



- 4) Strengthening oversight by central government bodies over compliance with legislative requirements on information openness, introduction of a monitoring and evaluation system for information openness of LPA bodies.
- 5) Development of civil society institutions capable of exercising public oversight over ensuring information openness of government bodies.
- 6) Improvement of legislation in terms of establishing more detailed requirements for the content and forms of posting information about the activities of government bodies, strengthening responsibility for violations of information openness requirements.

Implementation of the proposed recommendations will contribute to increasing the level of information openness of government bodies, developing civil society, strengthening citizens' trust in authorities, and ultimately – building an effective democratic rule-of-law state in the Republic of Moldova.

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JUDICIAL CONTROL IN CIVIL PROCEDURE AS A LEGAL CONCEPT: ITS DEFINITION, NATURE, AND CLASSIFICATION

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Abstract: The analysis of judicial review in scientific research typically focuses on its application in cases related to administrative and public spheres. In these processes, the court acts as a controller, verifying the extent to which authorities, when making decisions or performing actions (or inactions), comply with established legal requirements. Scientific thought also frequently addresses judicial review as a mechanism for checking the conformity of normative legal acts with legislation. It is expedient to investigate the limits of judicial review in civil proceedings at the stage of preparing a case for trial. Such work is important not only due to the insufficient study of the topic but also because of its significance for practice. Establishing these limits will restrict the court's capabilities, prevent uncontrolled administration of justice, and ensure the protection of the rights of participants in the process at the stage preceding the direct consideration of the case.

Keywords: revizuire judiciară, procedură civilă, primă instanță, procedură de apel, acord de soluționare amiabilă, pretenții.

Judicial review is an integral part of civil proceedings. It involves the court's direct supervision of actions that create, modify, or terminate procedural legal relationships, as well as the need to obtain judicial authorization for certain procedural actions. This review is one means of ensuring the right to a fair trial, as provided for in the Convention for the Protection of Human Rights and Fundamental Freedoms [7], in the context of disputes concerning civil rights and obligations.

Within the framework of doctrinal research, control activity is defined as a systematized set of steps undertaken by the entity under supervision. This process includes assessing the performance of this entity, analyzing the methods it uses, and taking appropriate response measures. Issues related to the definitions of the terms "control" and "supervision," their differences, and their legal nature have repeatedly been the subject of in-depth academic and practical study by numerous specialists. [13, p.30]. In the context of this study, we interpret judicial review in civil proceedings as the process of monitoring the actions of participants in legal proceedings (including self-monitoring by the court) to ensure compliance with established legal norms. Moreover, the court is not limited to mere observation; it also has the right to apply appropriate measures aimed at preventing arbitrary actions by participants in the proceedings and maintaining general order. Without such measures, the exercise of control would be meaningless, since, in our opinion, one of the key objectives of judicial review is the prevention of violations and their deterrence in the future. This, in turn, is impossible without active intervention and response of the court to the actions of controlled entities. [1, p.438]

The importance of a judge maintaining order and respect for the rules of the courtroom is emphasized in paragraph 6.6 of the Bangalore Principles of Judicial Conduct. According to these principles, a judge is obligated to maintain order and decorum during court proceedings, demonstrating patience, dignity, and courtesy to all participants. Furthermore, a judge must demand the same conduct from everyone under their influence or control, including lawyers, court staff, and others.[3]

Continuing the analysis of the functional component of judicial review, it is worth noting the position of N.A. Kolokolov, who, within the framework of the functions of judicial authority, identifies the control function, defined as "keeping controlled entities within a defined legal framework." [9, p.241] P.P. Serkov, classifying legal proceedings according to three fundamental functions (regulatory, control, and protective), emphasizes that the essence of the control function of legal proceedings lies in the recording of procedural actions. Such recording allows all participants in the trial to monitor the legality of actions already completed. [12, p.167] This point of view appears justified, since the control component is inherent not only to the court but also, for example, to the defendant, who, if the plaintiff presents new evidence, can initiate a request for copies of it, which effectively confirms the defendant's control over the proper implementation of procedural actions by the plaintiff. Consequently, only the court can act as a direct supervisory entity implementing the control function. At the same time, such control may be initiated by one of the parties, which, while not the controlling party, may raise before the court the issue of abuse of rights by the other party or the presence of other unlawful actions (or inactions) related to the procedural conduct of the party. Moreover, the court, with its powers, may influence the participants in the trial, directing their actions or compelling them to take certain actions if violations are detected (for example, by requiring the plaintiff to provide the defendant with copies of the attached materials). [8, p.180]

According to I.V. Reshetnikova and V.V. Yarkov, when higher courts review the activities of lower courts, they view this as **an exercise of judicial authority**, not simply as one of the court's functions. Within the framework of such review bodies, judicial review assumes **key importance**, as it aims to verify the legality of both the court's procedural actions during the consideration of the case and the validity and reasoning of the rendered judicial decision. [4, p.180] This, in turn, ensures **the preventive aspect** of the review function in relation to the courts themselves: if a judicial error is discovered, the lower court is obligated to take this information into account and prevent similar violations in the future. Moreover, other courts, when analyzing judicial practice, must also take into account errors made in the consideration of similar cases.

An analysis of academic legal literature reveals that the concept of "function" in relation to the judiciary, legal proceedings, and the court is interpreted ambiguously. In this dissertation, we adhere to a narrow understanding of judicial review, viewing it solely as a procedural function of the court as a state body administering justice, and of the judiciary as a whole. The mechanism of judicial power in this context refers to a system of procedural means that ensure the court's control, management, and direction in resolving specific cases. [2, pp.8-9] We believe that judicial review should not be equated with the functions of civil and arbitration proceedings, which, in turn, represent a normatively established direction of procedural actions for the implementation of judicial proceedings.

Judicial review, an integral function of the judiciary, manifests itself in a variety of court actions. For example, a court may compel a person to provide necessary evidence. In this case, the review is indirect, as it is not aimed at verifying the legality of someone's actions in general, but only at ensuring the provision of specific evidence. In contrast, when considering a complaint against a notary, the court directly verifies the legality of their actions. Here, judicial review is implemented within the framework of the judicial process and involves assessing the legality of the actions of the subject to review—the notary. S.V. Nikitin expresses an interesting perspective, identifying two forms of judicial review: justice and "quasi-judicial jurisdictional forms." He includes review of the decisions of arbitration courts, foreign courts, and arbitration tribunals, as well as the actions of bailiffs, among the latter. [6, pp.6-10]

When analyzing the opinions of procedural experts on the supervisory role of courts in reviewing cases, it is important to consider the position of T.V. Sakhnova. [11, p.751] She sees a manifestation of the supervisory function in supervisory proceedings aimed at ensuring a uniform interpretation and application of the law. M.Yu. Lebedev, in turn, links the supervisory function to appellate review in civil proceedings. [5, p.331] However, his omission of supervision at the cassation and supervisory stages appears questionable, as the very essence of reviewing instances lies in

analyzing the decisions of lower courts and identifying legal violations. It should be noted that reviewing cases based on newly discovered or new circumstances is not a form of supervision over lower courts, as it does not involve the correction of judicial errors. In this context, V.N. Biryukova's opinion on supervision as the basis of modern appeal and cassation, as well as the essence of exceptional (supervisory) proceedings, appears quite justified.

Despite widespread belief, not all scholars agree that appellate and cassation courts exercise a supervisory function. For example, S.V. Nikitin argues that the activities of these review bodies have their own specific characteristics and should not be considered part of judicial review. [10, pp.6-7] He explains this by saying that judicial review, as a function of an independent branch of government, is intended to verify the legality of the actions of other state and public entities. According to Nikitin, judicial review is essentially the court's external oversight of the legality of the acts and actions of various bodies and organizations, carried out within the framework of legal proceedings. However, this view seems limited, as courts also perform a supervisory function in civil proceedings, preventing participants from acting without restrictions.

Based on the positions of scientists, it becomes obvious that before examining issues concerning the limits of judicial review, it is necessary to create a general classification based on the general system of judicial review.

Depending on the stage of implementation, E.G. Trishina distinguishes two types of judicial control: preliminary (current) and subsequent. [14, p.70]

Preliminary (current) judicial review, exercised by the court of first instance, fulfills two main functions: self-monitoring by the court and monitoring the actions (including managerial rights and other actions, or the lack thereof) of all participants in the proceedings, and even of individuals who are not such (for example, when evidence is being requested). This type of review also extends to maintaining order among the audience present at preliminary court hearings and to those in possession of materials requested by the court.

Subsequent judicial review is the process by which higher courts (review courts) review decisions rendered by trial courts. The primary task of these higher courts is to verify the legality of the decisions being contested. However, beyond this primary review, they may also exercise self-monitoring of their own actions, approve certain dispositions (if they are implementable during the appeal stage), and monitor the behavior of trial participants and those present in the courtroom.

Based on the analysis of doctrinal concepts of the legal essence of judicial review and its classifications (by time of implementation and form), as well as other types covered in the scientific literature, we propose the following typology of judicial review in civil proceedings:

1. By subject of control: Judicial review can be carried out both by courts that are considering a case for the first time and by courts that are reviewing decisions already made (appeal and cassation courts).

2. On the subject of judicial review: Judicial review can be directed both at the internal processes of the court itself (self-control, when the court reviews its own actions and decisions), and at the actions of external entities falling under its jurisdiction (checking the legality of their actions or inactions, including within the framework of direct judicial review).

To fully understand judicial review, it is important to further examine its focus and the specific objects of review. The author believes that judicial self-review deserves separate consideration as a distinct subject, as the court not only verifies the legality of its decisions but also, in cases defined by law, has the right to amend them.

3. Depending on the stage of the trial, court oversight may be exercised as follows: at the initiation stage: the court verifies whether the plaintiff (applicant) has a legal basis for filing a lawsuit and whether their application (statement of claim) complies with all procedural rules; during the consideration and resolution of the case: the court oversees the progress of the proceedings and the decision on the merits of the dispute. After the completion of the case, oversight is applied to ensure the enforcement of the rendered decision.

A study of existing classifications of judicial review in civil proceedings leads to the conclusion that it is important to define the concept of a "judicial review system." This is necessary to clearly define the meaning of the term "judicial review." E.G. Trishina defines the judicial review system as the activities of specialized review bodies (e.g., higher courts) and the activities of bodies for which review is an auxiliary function that facilitates the accomplishment of their primary task (e.g., self-review of the trial court). In this study, we partially agree with this approach but consider the judicial review system more broadly. It encompasses not only the self-review of the trial court but also its review functions in relation to participants in the proceedings and other persons who are not participants. Furthermore, self-review can also be exercised by higher courts, for example, when issuing an additional appellate ruling to correct technical errors.

Based on the above, we define ***the system of judicial review in civil proceedings*** as a set of actions performed by both the courts deciding the merits of a case (for which review is part of the judicial process) and higher courts (for which review is the primary objective). This system encompasses self-review, review of the actions of all participants in the proceedings (including direct judicial review), as well as the actions of persons who are not parties but involved in the proceedings (e.g., listeners or evidence custodians), and other entities subject to such review. The latter include the actions of bailiffs in enforcing decisions, as well as the decisions of arbitration courts and foreign courts.

Based on this, the following ***key characteristics of judicial review can be identified:***

1. Court initiative: The court exercises oversight functions primarily on its own initiative. However, if a party to the proceedings points out illegal actions or abuse of rights by another party, the court is obligated to respond. This includes an initial review of the validity of the complaint and the fact of the violation. If the violation is confirmed, the court takes measures to rectify it.

2. Object of review: In civil proceedings, judicial review extends to the actions and omissions of certain persons or bodies under the court's jurisdiction. The scope of these subjects may vary depending on the stage of the proceedings.

3. In civil cases, judicial review is primarily intended to ensure ***the rule of law and compliance with the fundamental principles of civil procedure***. This facilitates the proper and timely resolution of disputes. Furthermore, judicial review serves to prevent arbitrary action by both the court itself and by parties to the proceedings and third parties. It also aims to eliminate identified violations and prevent their recurrence. Therefore, defining the boundaries of judicial review is crucial, as its scope cannot be unlimited and requires established restrictions to prevent judicial arbitrariness.

4. Judicial review serves a ***preventative function***, as participants in the proceedings and other overseen entities, recognizing that violations of legal norms will not go unnoticed, strive to avoid procedural errors. This is achieved through the application of enforcement measures within the framework of review activities. A similar preventative mechanism applies to judicial bodies: the identification of judicial errors by higher courts serves as a signal to lower courts and other judges. Regular identification of similar errors or isolated but significant violations become grounds for higher courts to develop clarifications, summaries of judicial practice, and recommendations, as well as for court chairpersons to take organizational measures. Thus, awareness of the potential negative consequences of violations extends to all participants in the judicial process, including the court itself.

5. A balance between discretion and the scope of review. The review powers of the court hearing a case are not absolute. They cannot be exercised arbitrarily and must be clearly defined. Judicial discretion, although permitted, is only possible within established limits. For example, the legislator provides only an indicative list of preparatory actions, allowing the court to independently decide on other necessary measures for proper preparation. However, these expanded powers must not go beyond the objectives of a given stage of the proceedings. This is precisely what determines the scope of review of actions that the court may perform but that are not expressly listed in the law.

These characteristics of supervisory activity are universal, but their specific application varies depending on the court exercising the review. Higher courts typically review not only the parties to

the case (and sometimes other persons), but also the contested judicial act itself, its content, and the lower court's review process, with the goal of identifying violations in the dispute resolution process.

Judicial review serves as a guarantee against unlawful actions. Parties to the proceedings and other individuals understand that their activities are not uncontrolled and anticipate adverse procedural consequences should the court establish abuse of rights or violations of the rights and legitimate interests of other participants. The court's review function exerts a deterrent effect on participants in the proceedings and other individuals, preventing procedural and other violations and abuses. For example, the court has the authority to impose penalties for identified violations of the law. This review function is implemented not only through fines but also, for example, by limiting the regulatory powers of participants in the proceedings upon establishing a violation of the law or a violation of the rights and legitimate interests of others.

As part of its duties, the court performs a process management function, which includes maintaining order in the courtroom and guaranteeing the principle of equality before the law. At the same time, the court has powers that may affect the rights of persons not directly involved in the case. A striking example is the case in which the cassation court overturned the trial court's ruling approving a settlement agreement. The reason was that the terms of the agreement, obliging the defendant to transfer his vehicle to the plaintiff, violated the legitimate interests of another creditor of the defendant, who was already a claimant in the pending enforcement proceedings. Such actions by the court reflect its law enforcement function.

The primary objective of judicial review is to identify and address deficiencies in the handling of cases and prevent their recurrence. The court's oversight role is essential and inseparable from the judicial process, as only proper judicial review guarantees the fair and timely resolution of disputes.

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ENSURING A FAIR TRIAL THROUGH THE FORMATION AND APPLICATION OF JUDICIAL LEGAL POSITIONS.

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Abstract: Modern procedural law and civil law science face a serious challenge: how to ensure that laws are applied uniformly and that judicial practice is consistent. Our research aims to address this task by proposing legal foundations for the formation and application of judicial legal positions. It is this position that acts as a powerful tool, contributing to the development of a common approach to the interpretation and application of legal norms in similar situations, which directly leads to uniform law enforcement and, consequently, to the unity of judicial practice. In civil procedure, a judicial legal position acts not as a theoretical construct, but as a practical tool for resolving disputes when legislative regulation lacks sufficient certainty or systematicity. Consequently, in the science of procedural law, there is a pressing need for the theoretical development of an algorithm that would describe exactly how these judicial legal positions should be implemented. The development of a theoretical framework for the implementation of judicial legal positions, taking into account problems identified in practice, will not only deepen the understanding of this institution but also provide courts with a methodology for overcoming existing difficulties in its application.

Keywords: civil procedures, judicial legal positions, higher courts, judicial precedents

The court's procedural decisions help to understand how the right to a fair trial, enshrined in Article 6 of the Convention and in national law, is implemented in practice.

According to Article 6 of the Convention, everyone whose civil rights and obligations are at stake, or who is accused of a criminal offence, has the inherent right to a fair and public trial. This trial must be conducted within a reasonable time by an independent and impartial tribunal established by law. While judicial decisions must be public, there may be exceptions where the press and the general public are not admitted to hearings. Such restrictions may be imposed to protect public morals, order, or national security in a democratic society, as well as to protect minors, the privacy of those involved, or in those rare cases where publicity would prejudice the interests of justice.[3]

Summarizing the practice of interpreting Article 6 of the Convention on Human Rights by the European Court, it can be stated that the right to a fair trial is considered to be ensured if the following fundamental conditions are met during the process: 1) the opportunity to appeal to the court (access to justice), 2) the fairness of the process itself, 3) openness of court hearings, 4) compliance with reasonable time limits for consideration of the case and execution of the final decision, 5) independence and impartiality of judges, 6) legal competence of the court, 7) legal certainty.[1, pp.498-504]

1. *The principle of access to justice, or the right to access to a court*, was not originally enshrined in Article 6 of the European Convention on Human Rights. Its development resulted from the caselaw of the European Court of Human Rights (ECtHR), which underscores the power of judicial clarification. The ECtHR provided a key definition of this principle in the case of *Golder v.*

the United Kingdom.[6] In its decision, the Court rightly noted that the ability to initiate legal proceedings is a fundamental component of the right to a court, enshrined in Article 6(1) of the Convention. Thus, the right of access to a court is implicitly enshrined in Article 6, since without it, other principles of a fair trial would be deprived of practical significance.

The principle of access to justice guarantees that no one should face unreasonable obstacles when seeking legal protection in a national court. This right must not be merely declaratory, but rather "living" and effective, providing individuals with a genuine opportunity to challenge any infringement of their rights. It is important to understand that the right of access to court is not unlimited. It may be limited, but only to the extent necessary to uphold the law, and provided that these limitations do not undermine the very essence of the right to justice. Any limitations must pursue a legitimate aim and be proportionate to it. For example, setting time limits for filing claims, requiring payment of legal costs, or requiring legal representation are considered permissible.[12] At the same time, excessively high court fees, excessively formalized procedures, or laws blocking access to court for certain categories of citizens are considered incompatible with the principle of effective justice.

2. In its analysis of *fair trial criteria*, the European Court of Human Rights (ECtHR) has consistently stated that the fairness stipulated by Article 6(1) of the Convention is not substantive, but exclusively procedural in nature. This principle is practically embodied in the adversarial process, which involves hearing the parties' arguments and ensuring their equality before the court. In its legal acts, the ECtHR repeatedly emphasizes the need to establish a fair balance between the parties, recognizing a trial as fair only if equal procedural opportunities are guaranteed for all participants.[11] Consequently, to meet this standard, the parties must be guaranteed the equal exercise of their procedural rights and obligations.

3. According to Article 6, Part 1 of the Convention, *trials must be open and their results publicly announced*. However, there are grounds for restricting public and press access, such as considerations of morals, public safety, national security, the protection of minors, or the privacy of participants in the proceedings. In rare cases where publicity could prejudice the administration of justice, the court may also restrict access. Thus, unless there are compelling exceptions, the right to a public hearing means the right to an oral hearing, at least at first instance. The ECtHR explains that publicity includes: the opportunity for all parties and interested persons to be present at the hearing; the right of the parties to participate in person in the oral hearing (especially at first instance), actively pursuing all legal remedies; and mandatory public announcement and accessibility of judicial decisions to all interested parties.[4]

4. The European Court of Human Rights (ECtHR) interprets the requirement to consider a case within a *"reasonable time"* as an imperative to administer justice without delays that could jeopardize its effectiveness and legitimacy. The period subject to assessment for the reasonableness of the length of legal proceedings generally begins with the initiation of proceedings in the relevant judicial body. In cases where national legislation provides for a mandatory pre-trial dispute resolution procedure with an authorized body, the period is calculated taking into account the time spent complying with this procedure. The end of the period for considering a case, for the purpose of assessing its reasonableness, is the date of actual execution of the judicial decision on the merits of the dispute, including the completion of all ordinary court proceedings.[9]

The absence of mandatory time limits for the consideration of cases that ensure compliance with the principle of reasonableness is characteristic of both the text of the Convention and the case law of the European Court of Human Rights. The reasonableness of the length of proceedings is assessed on a case-by-case basis, taking into account all relevant circumstances. The key criteria for this assessment include the complexity of the case, the conduct of the parties to the proceedings (the applicant and state bodies), and the applicant's attitude toward the subject of the dispute.[5]

5. To ensure the fairness of judicial proceedings, it is crucial that a judge act *independently and impartially*. Independence implies autonomy from other government bodies (primarily the executive branch), from participants in the proceedings, and from the administrative apparatus of the judicial system. Equally important is the judge's internal freedom from personal likes, dislikes, or

bias when considering a case. Key indicators of independence include the appointment process and the length of the judge's tenure, the presence of mechanisms for protection from external pressure, and the external attributes of independence. Impartiality is assessed in two ways: subjectively (whether the judge has personal biases) and objectively (whether the court provides sufficient guarantees that eliminate reasonable doubts about their impartiality). [8]

6. *The principle of the rule of law* requires that courts be established solely in accordance with the law. This is essential for their legitimacy and ability to resolve disputes in a democratic society. "Establishment by law" encompasses both the legal basis for the court's existence and its compliance with all procedural rules.[10]

The principle of legal certainty, although not expressly stated in Article 6 of the European Convention on Human Rights, is an essential element of the right to a fair trial, according to the European Court of Human Rights (ECHR). This principle, derived from the rule of law, means that a final judicial decision must be final and may be reviewed only in exceptional cases, such as where serious judicial errors have been committed. The ECHR emphasizes that review of a decision should not be motivated solely by one party's desire to obtain a different decision on the same issue, which is effectively a disguised form of appeal.

An analysis of the presented court decisions demonstrates that the European Court of Human Rights (ECtHR) has given Article 6 of the Convention for the Protection of Human Rights and Fundamental Freedoms, which guarantees the right to a fair trial, a broad and multifaceted interpretation. The ECtHR's case law has established a set of procedural principles defining the content and characteristics of a fair trial. This system is constantly evolving and adapting to modern challenges.

In recent years, the European Court of Human Rights (ECHR) has undergone significant changes in its interpretation of the right to a fair trial, seeking to define the key characteristics of a truly fair process. A.I. Kovler rightly noted that the ECHR is steadily raising standards for compliance with the principles set out in Article 6 of the European Convention on Human Rights, which suggests the emergence of a new European procedural law based on conventional norms. [7, p.180]

A study of the relationship between how human rights are interpreted at the international and national levels led T.N. Neshataeva to the following conclusion: the common foundation of these rights, their origin in natural law, encourages courts at various levels to cooperate. They listen attentively to one another and jointly shape the foundations of future legislation. This process of judicial interpretation gives rise to an "evolving" precedent—a legal norm that develops gradually, through several judicial decisions issued over a long period of time. Both national and international courts participate in the creation of such a norm. Moreover, even a single national court, whose practice goes beyond the usual approaches adopted at both the national and international levels, can initiate changes.[2, p.141]

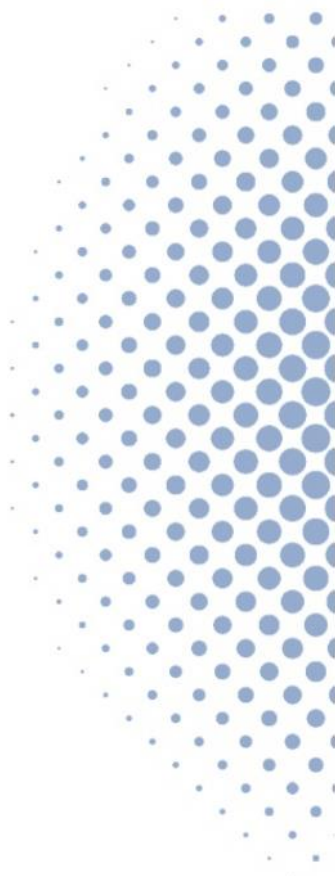
An analysis of the legal positions of the Constitutional Court and the Supreme Court of Justice of the Republic of Moldova, as well as the ECHR, shows that their interpretations of fair trial principles largely coincide. The judicial doctrines they have developed comprehensively elucidate the characteristics of a fair trial, thereby ensuring its correct and uniform application by all courts when considering cases.

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