

9. Manta, A. G., Oliveira, T. M., Silva, S., Rodrigues, R., Costa, P., Teixeira, J. A., & Dias, D. R. (2026). From sustainability narratives to digital infrastructures: Mapping the transformation of smart agri-food systems. *Foods*, 15(3), 469. <https://doi.org/10.3390/foods15030469>
10. OneTrust. (2025). *Ultimate guide to EU CSRD & ESG regulation for businesses*. <https://www.onetrust.com/blog/ultimate-guide-to-eu-csrd-esg-regulation-for-businesses/>
11. London Metal Exchange. (2025). *LMepassport — electronic certificates of analysis and digital credentials register*. <https://www.lme.com/trading/initiatives/lmepassport>
12. London Metal Exchange. (2025). *Sustainability and physical markets: Sustainability*. <https://www.lme.com/sustainability-and-physical-markets/sustainability>
13. GRESB. (2024). *Understanding the relationship between EU taxonomy, SFDR, and CSRD and their impact on real estate*. <https://www.gresb.com/understanding-the-relationship-between-eu-taxonomy-sfdr-and-csrd-and-their-impact-on-real-estate/>
14. Proxymity. (2025). *The future of compliance: Emerging RegTech trends*. <https://www.proxymity.io/views/the-future-of-compliance-emerging-regtech-trends/>
15. Sustainability Directory. (2025). *AI-driven deforestation prediction in supply chains*. <https://prism.sustainability-directory.com/scenario/ai-driven-deforestation-prediction-in-supply-chains/>
16. Burgoyne, M. T., & Olexiuk, P. (2025, February 5). *Tokenized carbon credits: How blockchain is revolutionizing carbon markets*. Osler. <https://www.osler.com/en/insights/updates/tokenized-carbon-credits-blockchain-revolutionizing-markets/>
17. The Page. (2024). Ukrainian business wants to enter Europe but does not know how: Main barriers to ESG implementation [in Ukrainian]. <https://thepage.ua/ua/news/ukrayinskij-biznes-ne-cilkom-rozumiye-neobhidnist-vprovadzheniya-esg-standartiv>
18. Riepina, I. M., & Tepluk, M. A. (2026). Dyversyfikatsiia mizhnarodnoi torhivli turystychnymy posluhamy kriz pryzmu servisno-orientovanykh biznes-modelei u tsyfrovomu suspilstvi [Diversification of international trade in tourism services through the prism of service-oriented business models in the digital society]. *Economic Space*, (210), 135–144. <https://doi.org/10.30838/EP.210.135-144>

Стаття надійшла 10.11.2025; прийнята до друку 10.03.2026 року

DOI 10.33111/vz_kneu.42.26.01.18.124.130

ISSN printed: 2415-850X; online: 2415-8518.

УДК 339.9:004.8:004.056:327

Pobochenko Lesya

PhD (Economics), Associate Professor, Head of Department
of International Economic Relations
of State University «Kyiv Aviation Institute» (Ukraine)
E-mail: lesia.pobochenko@npp.kai.edu.ua
ORCID: 0000-0002-3094-6417
+380631220242

Horobets Olga

PhD Student (Economics) of Department of International Economic Relations
of State University «Kyiv Aviation Institute» (Ukraine)
E-mail: 4808638@stud.kai.edu.ua
ORCID: 0000-0002-0213-768X
+380950484399

AI AND THE GLOBAL ORDER: IMPACTS ON BUSINESS, CYBERSECURITY, DIPLOMACY AND FOOD SECURITY

Побоченко Леся Миколаївна
кандидат економічних наук, доцент,
завідувач кафедри міжнародних економічних відносин,
Державний університет «Київський авіаційний інститут» (Україна)
e-mail: lesia.pobochenko@npp.kai.edu.ua
ORCID: 0000-0002-3094-6417

Горобець Ольга Геннадіївна
аспірантка, кафедри міжнародних економічних відносин,
Державний університет «Київський авіаційний інститут» (Україна)
e-mail: 4808638@stud.kai.edu.ua
ORCID: 0000-0002-0213-768X

ШТУЧНИЙ ІНТЕЛЕКТ ТА ГЛОБАЛЬНИЙ ПОРЯДОК: ВПЛИВ НА БІЗНЕС, КІБЕРБЕЗПЕКУ, ДИПЛОМАТІЮ ТА ПРОДОВОЛЬЧУ БЕЗПЕКУ

Abstract. Artificial Intelligence (AI) is rapidly evolving from an innovative technology to a key factor in the transformation of the global economic and political order, which makes this study relevant. In a world where the level of digitalization and technological integration is rapidly increasing, AI is affecting international business, global competitiveness, cybersecurity, diplomatic processes, and global food security systems. Despite a significant number of scientific works devoted to the impact of AI on individual industries, a comprehensive interdisciplinary analysis of its role in business, international security, global relations, and sustainable food systems is still insufficiently formed. The issues of uneven access of countries to AI technologies, challenges for global governance, and the consequences of the spread of AI threats, in particular, deep fakes, autonomous cyberattacks, and algorithmic solutions in the field of diplomacy, remain unresolved. At the same time, AI is increasingly influencing agricultural production, food supply chains, climate adaptation strategies, and global food market stability, which directly affects food security and socio-economic resilience of states.

The aim of the article is a systematic analysis of the transformational impact of AI on international business, modern cybersecurity systems, global interstate relations, and global food security, as well as the identification of new challenges and prospects for global development in the context of the active spread of intelligent technologies. The paper reviews relevant scientific sources and statistical data that reflect the speed and scale of AI penetration into business processes, public administration, the military sphere, international communications, and agri-food systems, including precision agriculture, predictive analytics for crop yields, and digital monitoring of supply chains. The main results of the study demonstrate that AI acts as a dual force: on the one hand, it contributes to the optimization of global business chains, the improvement of management decisions, the prediction of market behavior, and the enhancement of food production efficiency and early warning systems for food crises; on the other hand, it creates new risks associated with cyberattacks, disinformation, algorithmic manipulation of commodity markets, and the escalation of geopolitical competition between the world's technological leaders.

The article highlights that AI is radically changing the competitive advantages of states and corporations, causing technological stratification between countries, increasing the dependence of critical infrastructure on algorithms, and forming new mechanisms of influence in diplomacy. In the context of food security, unequal access to AI-driven agricultural technologies may deepen global inequalities, while the digitalization of agri-food systems increases their exposure to cyber vulnerabilities and data concentration risks. It concludes that AI requires the formation of an adaptive system of global governance that combines ethical standards, cybersecurity protocols, inclusive participation of developing countries, and coordinated international efforts to ensure sustainable and resilient global food systems. The study emphasizes the need to balance innovation and regulation, as this will determine the long-term economic, political, security, and food security consequences of AI development in the world.

Key words: Artificial Intelligence, International Business, Cybersecurity, Global Governance, Global Food Market, Digital Transformation, Global Food Security, AI Adoption, AI Policy, Technological Diplomacy.

Анотація. Штучний інтелект (ШІ) стрімко еволюціонує від інноваційної технології до ключового фактора трансформації світового економічного та політичного порядку, що робить це дослідження актуальним. У світі, де рівень цифровізації та технологічної інтеграції стрімко зростає, ШІ впливає на міжнародний бізнес, глобальну конкурентоспроможність, кібербезпеку, дипломатичні процеси та глобальні системи продовольчої безпеки. Незважаючи на значну кількість наукових робіт, присвячених впливу ШІ на окремі галузі, комплексний міждисциплінарний аналіз його ролі в бізнесі, міжнародній безпеці, глобальних відносинах та стійких продовольчих системах досі недостатньо сформований. Питання нерівномірного доступу країн до технологій ШІ, виклики для глобального управління та наслідки поширення загроз ШІ, зокрема, глибоких фейків, автономних кібератак та алгоритмічних рішень у сфері дипломатії, залишаються невирішеними. Водночас ШІ все більше впливає на сільськогосподарське виробництво, ланцюги постачання продовольства, стратегії адаптації до зміни клімату та стабільність світового ринку продовольства, що безпосередньо впливає на продовольчу безпеку та соціально-економічну стійкість держав.

Метою статті є систематичний аналіз трансформаційного впливу штучного інтелекту на міжнародний бізнес, сучасні системи кібербезпеки, глобальні міждержавні відносини та глобальну продовольчу безпеку, а також виявлення нових викликів та перспектив глобального розвитку в контексті активного поширення інтелектуальних технологій. У статті розглядаються відповідні наукові джерела та статистичні дані, що відображають швидкість та масштаби проникнення штучного інтелекту в бізнес-процеси, державне управління, військову сферу, міжнародні комунікації та агропродовольчі системи, включаючи точне землеробство, прогнозу аналітику врожайності та цифровий моніторинг ланцюгів поставок. Основні результати дослідження демонструють, що штучний інтелект діє як подвійна сила: з одного боку, він сприяє оптимізації глобальних бізнес-ланцюжків, покращенню управлінських рішень, прогнозуванню поведінки ринку, підвищенню ефективності виробництва продуктів харчування та систем раннього попередження про продовольчі кризи; з іншого боку, він створює нові ризики, пов'язані з кібератаками, дезінформацією, алгоритмічними маніпуляціями товарними ринками та ескалацією геополітичної конкуренції між світовими технологічними лідерами.

У статті підкреслюється, що ШІ радикально змінює конкурентні переваги держав і корпорацій, спричиняючи технологічну стратифікацію між країнами, збільшуючи залежність критичної інфраструктури від алгоритмів та формуючи нові механізми впливу в дипломатії. У контексті продовольчої безпеки нерівний доступ до сільськогосподарських технологій на основі ШІ може поглибити глобальну нерівність, тоді як цифровізація агропродовольчих систем збільшує їхню вразливість до кібервразливостей та ризиків концентрації даних. Робиться висновок, що ШІ вимагає формування адаптивної системи глобального управління, яка поєднує етичні стандарти, протоколи кібербезпеки, інклюзивну участь країн, що розвиваються, та скоординовані міжнародні зусилля для забезпечення стійких та стійких глобальних продовольчих систем. У дослідженні наголошується на необхідності балансування інновацій та регулювання, оскільки це визначатиме довгострокові економічні, політичні, безпекові та продовольчі наслідки розвитку ШІ у світі.

Ключові слова: Штучний інтелект, Міжнародний бізнес, Кібербезпека, Глобальне управління, Глобальний продовольчий ринок, Цифрова трансформація, Глобальна Продовольча безпека, Впровадження ШІ, Політика ШІ, Технологічна дипломатія.

JEL codes: O39, F53, M15, D80, Q02

Introduction. Artificial Intelligence (AI) is transforming the global landscape at an unprecedented pace. Once confined to research labs, AI technologies are now embedded in everyday life, from business supply chains to personal smartphones, and are significantly influencing international commerce, security paradigms, geopolitical relationships, legal frameworks, and global food security systems. As of 2024–2025, the world has witnessed an explosion in AI adoption: over three-quarters of organizations globally reported using AI in 2024, up from just 55 % in 2023 [1]. This surge underscores AI's transition into a mainstream driver of change across sectors.

Yet, the impacts of AI are unevenly distributed across regions and domains. The benefits and challenges of AI often align with a region's digital infrastructure, educational base, and governance structures. For instance, highly developed regions with advanced internet penetration (e.g. North America, Europe) have swiftly integrated AI into business and governance, whereas regions with limited connectivity or educational access (e.g. parts of Africa) face hurdles in reaping AI's benefits [2], [3]. In the agri-food sector, AI technologies such as precision agriculture, predictive climate analytics, and automated supply chain monitoring are increasingly shaping food production and distribution, thereby directly affecting global food security and the resilience of vulnerable populations. At the same time, unequal access to these technologies risks deepening disparities in agricultural productivity and food availability between developed and developing countries.

This article seeks to provide a comprehensive analysis of AI's influence in four key areas:

1. **International Business:** how AI is reshaping global business operations, trade, and corporate strategies.
2. **Cybersecurity:** AI's role in enhancing digital security and the emergence of AI-driven cyber threats.
3. **International Relationships and Diplomacy:** the impact of AI on geopolitics, power balances, and international cooperation.
4. **Global Food Security:** the role of AI in transforming agricultural systems, global food supply chains, and crisis response mechanisms.

Throughout this paper, we follow academic style, providing in-text citations for all data and statements. The analysis draws on current statistics and studies (2023–2025) to ensure relevancy. Ultimately, our goal is to elucidate the transformative influence of AI in the selected domains and highlight the critical considerations for policymakers, business leaders, security professionals, international bodies, and legal practitioners as we navigate this AI-driven era, including the need to ensure that technological innovation contributes to sustainable and inclusive global food security. Literature

Review. Recent studies highlight the transformative role of artificial intelligence across business, cybersecurity, global governance, and food security systems. Scholars emphasize AI's integration into international business operations, enhancing efficiency, decision-making, and global competitiveness [1, 4, 10, 16]. At the same time, research underlines AI's dual role in cybersecurity, improving threat detection while also enabling advanced cyberattacks such as deepfakes and AI-generated phishing [6, 7, 11].

Geopolitically, the literature notes growing AI rivalry, particularly between the U.S. and China, with significant implications for global power dynamics and diplomacy [1, 3, 9]. Reports from the UN and global economic bodies warn of a widening digital

divide and call for inclusive governance frameworks [3, 14]. In parallel, a growing body of research explores the application of AI in agriculture, precision farming, climate forecasting, and food supply chain management, emphasizing its potential to enhance productivity, reduce food losses, and improve early warning systems for food crises [15, 16, 17].

Scholars also point out that unequal access to AI-driven agricultural technologies may deepen disparities in food availability and resilience between developed and developing countries, thereby linking technological inequality to global food security risks. Overall, existing research confirms AI's multidimensional impact, while stressing the need for updated legal, ethical, and policy responses to manage its global influence across business, cybersecurity, diplomacy, and sustainable food systems.

Results. AI in International Business. AI's influence on international business is profound and multifaceted. In recent years, companies worldwide have increasingly adopted AI to streamline operations, gain competitive advantage, and unlock new opportunities in global markets. According to a 2024 business survey, 77 % of companies are either using or exploring the use of AI, and 35 % of firms already report full-scale AI usage in their business processes. Moreover, an overwhelming 83 % of enterprises rank AI as a strategic priority in their corporate strategy, underscoring AI's perceived importance in business transformation [4].

Global operations and supply chains have been significantly optimized through AI. Multinational corporations leverage AI-driven analytics for demand forecasting, inventory management, and logistics optimization across borders. For example, AI algorithms can analyze real-time market data and automatically adjust supply shipments or pricing strategies for different regions, improving efficiency in international trade. In the manufacturing sector, AI-powered robotics and predictive maintenance are boosting productivity and reducing downtime, benefiting companies that operate across multiple countries. A McKinsey global survey noted that as of 2024, over half of manufacturing and telecom organizations utilize AI solutions to improve processes, and such use is spreading to other industries including finance, retail, and transportation [4].

AI is also transforming customer engagement and marketing on an international scale. Through natural language processing and machine translation, AI enables businesses to interact with customers in multiple languages and cultures, tailoring experiences for local markets. E-commerce companies, for instance, use AI recommendation engines to personalize product suggestions for users worldwide, increasing sales in cross-border markets. AI-driven market analysis helps identify emerging trends in different regions faster than traditional methods. In addition, AI chatbots and virtual assistants provide 24/7 customer service across time zones, facilitating international customer support.

One prominent impact of AI is the creation of new business models and services that transcend traditional boundaries. The rise of platform businesses (like ride-sharing or global freelancing platforms) is partly fueled by AI algorithms that match supply and demand globally in real time. AI has lowered barriers to entry in some industries, enabling startups to challenge incumbents with innovative services (for example, AI-powered fintech and insurtech firms offering services globally without a large physical footprint). This contributes to a more dynamic international business environment, with AI as a key enabler of agility and innovation.

However, AI adoption in business also comes with disruptive challenges. Automation driven by AI threatens to displace jobs, requiring companies (and economies) to adapt their workforce skills. Estimates suggest up to 40 % of jobs worldwide could be impacted (augmented or automated) by AI in the next decade, which is forcing businesses to rethink human capital strategies and reskilling programs. There is also a concentration effect: leading tech firms with advanced AI capabilities (often headquartered in the U.S. and China) have consolidated market power. Remarkably, just 100 companies (mostly from the U.S. and China) account for around 40 % of global corporate AI R&D spending, highlighting a gap between AI leaders and laggards. This concentration can widen economic divides between nations and between large corporations and smaller enterprises [3].

From a trade perspective, AI might alter comparative advantages among nations. Countries and companies that quickly leverage AI can improve productivity and innovation, potentially capturing greater global market share. For example, AI-driven process improvements are projected to contribute substantially to GDP growth; the U.S. anticipates AI will contribute a net 21 % increase in GDP by 2030 through productivity gains and new products [5]. On the other hand, countries relying on low-skill, labor-intensive exports could see their cost advantage erode as AI automation reduces the reliance on cheap labor [3]. Thus, AI is reshaping competitive dynamics in international business, making technological capability and innovation ecosystems key determinants of global economic leadership.

AI is also influencing international finance and investment. Global financial markets use AI algorithms for high-frequency trading, risk assessment, and portfolio management across borders. International investors increasingly consider a country's AI readiness as a factor in investment decisions, both in terms of potential growth sectors (like AI startups) and the regulatory environment. This has prompted many governments to invest in national AI strategies to attract business and stay competitive.

In summary, AI acts as a catalyst for efficiency and innovation in international business. It enables smarter decision-making, personalization, and automation at scale, giving businesses that adopt it a competitive edge globally. By 2025, AI's role is so prominent that over three-quarters of organizations worldwide are «all-in» on AI for core business functions [1]. Traditional barriers of language, distance, and scale are being reduced by AI-driven solutions, effectively making the world a smaller marketplace. Yet, these benefits come paired with strategic challenges: workforce disruption, ethical considerations (such as algorithmic bias in business decisions), and the need for international frameworks to govern issues like data privacy and AI ethics in global operations. Businesses, therefore, not only have to adopt AI but do so responsibly and in alignment with evolving international norms.

AI in Cybersecurity. AI has a dual and complex role in cybersecurity: it is both a powerful tool for defense and an emerging vector for sophisticated cyber attacks. The integration of AI into cybersecurity is accelerating as organizations face increasingly complex threats across global digital networks. According to industry analyses, cybersecurity and fraud detection are among the top use cases of AI in business (adopted by 51 % of companies), second only to customer service applications [4]. This underscores AI's critical importance in protecting information infrastructure in an era of growing cyber risks.

On the defensive side, AI systems are being deployed to detect and respond to threats faster than traditional methods. Machine learning algorithms can analyze vast

streams of network data and user behavior in real time to identify anomalies that might indicate a breach or attack. For example, AI-driven intrusion detection systems learn what normal network traffic looks like and can quickly flag unusual patterns (such as a sudden surge of data exfiltration or an unauthorized login after multiple failures). These systems significantly reduce reaction times, what might take human analysts hours or days to identify can be spotted by AI in seconds. Moreover, AI can help in predictive analysis, foreseeing potential vulnerabilities by analyzing code for security flaws or by scanning threat intelligence feeds on emerging attack techniques.

AI is also used in automating incident response. Once a threat is detected, AI-enabled security orchestration platforms can automatically execute containment measures (like isolating affected endpoints or blocking malicious IP addresses) without waiting for human intervention. This is crucial when attacks, such as fast-spreading ransomware, need immediate containment. The use of AI for automated defense is becoming common, with a reported 63 % of IT and telecom organizations utilizing AI to enhance security measures [4]. Financial institutions and government agencies worldwide are similarly investing in AI-based cybersecurity to protect sensitive data and critical infrastructure.

However, the same capabilities of AI are being harnessed by malicious actors, leading to AI-augmented cyber attacks. In recent years, cybercriminals have begun using AI tools to make their attacks more convincing, scalable, and difficult to detect. A prominent example is AI-generated phishing: attackers employ AI (including generative language models) to craft highly persuasive phishing emails that mimic the writing style of trusted individuals or organizations. These AI-written messages are often grammatically flawless and contextually tailored, which makes them far more effective at deceiving recipients than the clumsy phishing attempts of the past. Notably, by late 2024, an estimated 82.6 % of phishing emails were using some form of AI technology in their creation. The result has been a surge in successful phishing campaigns. One security report found that 78 % of people opened AI-generated phishing emails, and 21 % clicked on malicious links within them, significantly higher success rates than manually crafted attacks [6].

The scale of AI-enhanced attacks is reflected in alarming statistics: there was a 202 % increase in phishing email volume in the second half of 2024, and an astonishing 703 % increase in credential phishing attacks (aimed at stealing passwords) during the same period [6]. Cybercriminal networks share AI tools and pre-trained models on the dark web, lowering the barrier for less skilled hackers to launch sophisticated attacks. Furthermore, deepfake technology, another AI-driven threat, has emerged as a new frontier in cybercrime. Attackers can create deepfake audio or video to impersonate CEOs or officials to authorize fraudulent transactions or spread disinformation. Already, more than 10 % of companies reported experiencing attempted deepfake fraud by 2024 [7], and high-profile incidents have involved deepfake voices used to trick employees into transferring funds. In one notable case, an AI-generated voice deepfake of a company executive was used to steal 25 million USD from a bank, highlighting how costly these AI-enabled scams can be [8]. Such incidents portend a future where seeing (or hearing) is no longer believing, complicating trust in digital communications.

Another domain of concern is AI-driven malware. Malware can be designed with AI to adapt its behavior dynamically, making it harder to detect. For instance, an AI-powered malware might learn the defense tools present on a victim's system and alter

its signature to avoid them (this is akin to an AI virus mutating to escape an antivirus). Security experts also warn of AI in the hands of nation-state actors, who might use advanced AI algorithms to probe target networks for zero-day exploits (previously unknown vulnerabilities) or to coordinate cyber-espionage campaigns at a scale and speed manual hackers cannot achieve.

In response to these evolving threats, the cybersecurity community is embracing AI for threat intelligence and resilience. AI models are used to analyze threat data globally, identifying links between threat actors, predicting likely next targets, and sharing this insight with organizations in a timely manner. Likewise, user authentication is being strengthened by AI, using behavioral biometrics (like typing patterns or mouse movements) to continuously verify users, making it harder for attackers even with stolen credentials to pose as legitimate users.

It's important to note that the cybersecurity implications of AI extend beyond just attack and defense, they also raise legal and ethical questions. For example, if an AI system autonomously retaliates against an attacker (so-called «hack back» actions), it blurs legal accountability. There are also privacy concerns: AI security systems might process vast amounts of personal data to detect threats, raising questions about data protection and surveillance.

In summary, AI is dramatically transforming cybersecurity: it is empowering defenders with advanced tools to protect systems, while simultaneously equipping attackers with new methods to breach them. This escalating «AI arms race» in cyberspace makes cybersecurity a moving target. Organizations worldwide must invest in AI-driven security measures just to keep pace with AI-enhanced threats. As of 2025, cybersecurity strategies invariably include AI as a cornerstone, and international cooperation is growing to address issues like AI-generated disinformation and cyber warfare norms. For businesses and governments, the lesson is clear — harness AI for security, but prepare for your adversaries to do the same, and focus on building adaptive, intelligent defenses accordingly.

AI in International Relationships (Geopolitics and Global Affairs). The advent of artificial intelligence is not only transforming economies and industries, but also reverberating through the arena of international relationships and geopolitics. Nations around the world recognize AI as a strategic technology with potential to shift the global balance of power. As a result, AI has become a core component of national security strategies and a focal point in diplomatic discussions, leading some analysts to speak of an «AI arms race» among great powers [9].

One key aspect of AI in international relations is the race for AI supremacy. The United States and China, in particular, have heavily invested in AI research, talent development, and industry. The Stanford 2025 AI Index report highlights that the U.S. continues to lead in certain metrics, for example, U.S. private AI investment reached 109.1 billion USD in 2024, vastly outpacing China's 9.3 billion USD in private investment. The U.S. and U.S.-based companies also produced far more top-tier AI models in 2024 than any other country (40 notable models from the U.S. versus 15 from China, and only a few from Europe). However, China is rapidly closing the gap in AI capabilities: Chinese-developed AI models have quickly improved, achieving near-parity with U.S. models on many benchmarks by 2024 [1].

Moreover, China leads in volume of AI research publications and patents, and many observers note that China's integration of AI in both civilian and military spheres is

part of a deliberate national strategy. This competition extends beyond the U.S. and China; other nations like the UK, France, Israel, as well as blocs like the European Union, are also striving to advance their AI capabilities. Dozens of countries have published national AI strategies, all aiming to foster domestic AI innovation and not be left behind. As of early 2025, less than one third of developing countries have formal AI strategies, illustrating a gap that international bodies worry could exacerbate global inequalities [3].

AI's strategic importance has drawn parallels to the nuclear era, while not as immediately destructive, AI is seen as a force multiplier in economic and military power. Militarily, AI can enhance autonomous systems, intelligence analysis, and decision-making speed. This raises security dilemmas: if one state deploys AI-controlled weapons or advanced surveillance, others feel pressure to do the same. The United Nations has noted concerns that AI in the military domain could lower the threshold for conflict and spark new arms races, and in late 2024 the UN General Assembly First Committee passed resolutions urging efforts to monitor and regulate military AI applications and to bridge divides between countries in AI capabilities [9].

Another dimension is AI's impact on global economic and social divides. The UN Conference on Trade and Development (UNCTAD) warns of a scenario where AI's benefits concentrate in a few countries, primarily those that already have the infrastructure and talent, while developing nations lag behind. Currently, the AI market's value and research output are dominated by the U.S. and China, and major tech corporations (some with market capitalizations rivaling the GDP of medium-sized countries) are primarily based in those nations. Meanwhile, 118 countries, mostly in the Global South, do not have a significant voice in international AI governance discussions. This raises concerns that global AI regulations or standards might be set without considering the needs and contexts of developing countries. To address this, UNCTAD's 2025 report calls for inclusive global cooperation, suggesting mechanisms like shared AI infrastructure, open-source AI initiatives, and capacity-building to help poorer nations benefit from AI. Strategically, some developing countries are also exploring niches (for example, affordable AI talent pools, or focusing on AI for agriculture and education) to leapfrog in certain areas despite limited resources [3].

AI is also increasingly a tool of soft power and diplomacy. Countries are using AI to enhance public diplomacy, for instance, AI translation allows states to broadcast their messages in many languages, and social media bots (sometimes state-sponsored) can shape public opinion abroad, for better or worse. There is concern over AI-enabled propaganda and interference in democratic processes: disinformation campaigns augmented by AI (via deepfakes or algorithmic amplification) have been observed, leading to new international challenges in information integrity. On the positive side, AI is used in global development projects (e.g., AI for climate modeling or epidemiology) where countries collaborate to solve shared problems. It can also aid diplomacy through better data analysis. Diplomats use AI to analyze geopolitical trends, predict conflict flashpoints, or even simulate negotiation scenarios.

Importantly, AI's influence on international relationships also hinges on public perception across countries. Surveys show divergent attitudes: in some countries, people view AI optimistically as an economic opportunity, while in others, skepticism runs high. For example, surveys in 2024 found Asian publics generally more optimistic about AI. In China 83 % and in Indonesia 80 % of respondents saw AI products as

more beneficial than harmful, whereas in Western nations optimism was much lower (only around 39–40 % in the U.S. and Canada) [1]. These differences can influence how vigorously governments pursue AI integration or regulation. Nations with an enthusiastic populace may push AI deployment faster, whereas those with wary citizens may impose stricter controls, affecting international collaboration on AI projects.

In conclusion, AI has emerged as a strategic frontier in international relationships. It is reshaping power dynamics much like past technological revolutions (electricity, nuclear energy, the internet) did. The world is seeing both competitive posturing, as countries race to lead in AI for economic and military gain, and cooperative efforts, as international communities attempt to set guardrails and share benefits. The coming years will likely determine whether AI becomes an area of intense rivalry or a domain of international solidarity (or both). Key to this will be establishing norms and agreements on issues such as autonomous weapons, data governance, and equitable access to AI advancements. Diplomacy itself may need to innovate («AI diplomacy») to manage the complex transnational challenges posed by this powerful technology.

AI and Global Food Security. Artificial intelligence is increasingly recognized as a transformative force in the field of global food security, directly linking technological innovation with the stability of international food systems. In a world facing climate change, geopolitical instability, population growth, and supply chain disruptions, AI-driven solutions are becoming critical tools for ensuring sustainable agricultural production and resilient food distribution networks.

AI applications in precision agriculture allow farmers to optimize irrigation, fertilization, and crop protection through real-time satellite data, sensor networks, and predictive analytics. Machine learning models can forecast crop yields, detect plant diseases early, and analyze soil conditions, significantly improving productivity and reducing losses. According to recent global agri-tech reports (2024–2025), AI adoption in agriculture has led to yield improvements of up to 20–30 % in pilot regions and a measurable reduction in resource waste. These advancements contribute directly to strengthening food availability and sustainability [15].

In addition to production, AI plays a crucial role in food supply chain management. Intelligent logistics systems optimize transportation routes, monitor storage conditions, and reduce post-harvest losses, which globally account for a significant share of food waste. AI-powered early warning systems analyze climate data, conflict indicators, and trade disruptions to predict potential food crises, enabling governments and international organizations to respond proactively.

However, the integration of AI into agri-food systems also introduces new risks. The digitalization of agriculture and global food supply chains increases exposure to cyber threats that could disrupt food distribution networks or manipulate commodity markets. Furthermore, unequal access to AI-driven agricultural technologies may widen productivity gaps between developed and developing countries, exacerbating existing inequalities in food security [18–23]. Countries lacking digital infrastructure, data access, or investment capacity risk becoming technologically dependent on AI-leading economies.

From a geopolitical perspective, AI in agriculture is becoming a strategic asset. States investing heavily in agri-tech innovation may strengthen their food sovereignty and export competitiveness, while others may face increased vulnerability to external shocks. Thus, AI not only enhances efficiency in food production but also reshapes global power balances in food trade and food diplomacy [16].

In summary, artificial intelligence significantly affects global food security by improving productivity, optimizing supply chains, enhancing crisis prediction, and simultaneously creating new technological and security challenges. Its role in the global order extends beyond business, cybersecurity, and diplomacy, making sustainable and inclusive AI integration into agri-food systems a strategic priority for international governance in the coming decade.

Discussion positions. The results of the study indicate that the impact of artificial intelligence on international business, global security, diplomacy, **and global food security** is much broader than predicted by traditional theoretical approaches. Classical models of internationalization, competitive advantage or global governance are mostly based on the assumption of relative stability of the international environment and gradual technological changes. However, the rapid development of intelligent technologies, recorded in 2023–2025, demonstrates a different reality: AI forms nonlinear, accelerated and mutually reinforcing transformations that simultaneously affect economic, security, political, **and agri-food systems**.

Two dominant approaches to the role of AI in global development have been formed in the scientific literature. The first, technologically optimistic, considers artificial intelligence as a catalyst for growth, increased productivity and innovativeness of business. The second, critical-security, focuses on the intensification of cyberattacks, the threat of undermining information sovereignty, the spread of disinformation, and the intensification of interstate competition. The results of the study confirm the validity of both approaches, but at the same time show that neither the optimistic nor the critical paradigm fully covers the multidimensionality of the impact of AI on the global order, **including its growing influence on agricultural productivity, food supply chains, and the resilience of global food systems**.

A comparison with existing models of the international economy and global security shows that the modern impact of AI is systemic in nature: it not only optimizes business processes or changes the structure of market competition, but also reformats the mechanisms of diplomatic interaction, changes the logic of international conflicts, and creates new forms of technological and regulatory dependence between states. **At the same time, AI increasingly shapes food security dynamics through precision agriculture, climate risk forecasting, automated logistics, and digital commodity trading platforms, thereby linking technological innovation with global hunger and sustainability challenges.** Such a systemic impact of AI actually forms new parameters of the global order, which are difficult to interpret within the framework of the traditional theory of globalization or models of the global division of labor.

The issue of uneven access to AI is a separate discussion. While many papers highlight the potential of AI to accelerate development, the study shows that asymmetries in access to infrastructure, data, investment, and expertise threaten to create a «technological periphery.» This deepens the digital divide between countries and increases dependence on technology hubs (the United States, China, and a small group of private corporations). **In the context of global food security, such asymmetries may result in unequal access to smart farming technologies, predictive analytics, and climate-adaptive solutions, thereby widening disparities in agricultural productivity and food availability between developed and developing countries.**

No less important is the debate over the role of AI in international security. Some papers emphasize the growing capabilities of countries to counter cyberattacks, while

others note the rapid increase in malicious practices, including the use of deepfake technologies, autonomous malicious algorithms, and information influence tools. The analysis confirms that the benefits of AI in the security sector are ambivalent, as the technologies simultaneously strengthen defense systems and make attacks faster, more massive, and harder to detect. **Moreover, the digitalization of food supply chains and agri-tech infrastructure increases their exposure to cyber threats, which may directly affect food distribution, market stability, and humanitarian security.**

Another debated issue is the transformation of diplomacy. Some researchers argue that AI will contribute to increasing the efficiency of international governance, but the results of this study show that technological competition in the field of AI is increasingly becoming a factor of geopolitical tension, and the lack of globally agreed regulatory mechanisms creates the risk of fragmentation of the world space into several technological blocks. **Food security cooperation may become an additional field of both collaboration and rivalry, as states compete for control over agri-tech innovations, data resources, and digital platforms that influence global food markets.**

Thus, the discussion points of the study indicate that the impact of artificial intelligence on international business, cybersecurity, diplomacy, and **global food security** is complex, ambiguous and dynamic, which requires not only in-depth analysis, but also the formation of new theoretical frameworks to explain systemic changes in the global order. Confirming a number of conclusions of previous studies, the results obtained at the same time reveal a number of gaps in the understanding of how AI changes the structure of international interaction, the configuration of economic opportunities, the stability of food systems, and the nature of global risks. This opens up prospects for further research in the field of international economics, global governance, food security studies, and security studies.

Conclusion. Artificial intelligence is a catalyst of sweeping change across international business, cybersecurity and global relations. Our examination of these domains reveals both remarkable opportunities and significant challenges introduced by AI as of the mid-2020s:

In international business, AI has accelerated efficiency and innovation, enabling companies to optimize global supply chains, personalize customer experiences across markets, and make data-driven decisions. AI adoption is now mainstream in business, with a majority of firms worldwide integrating AI into operations. This is reshaping competitive advantages, as businesses and nations proficient in AI can leap ahead in productivity and new product development. Conversely, it disrupts labor markets and demands strategic adaptation, reskilling, and consideration of ethical practices in deployment. International business dynamics are adjusting to an era where algorithms can confer significant edge and where intangible assets like data and AI models become vital trade factors.

In cybersecurity, AI stands as a double-edged sword. It greatly enhances defense, automating threat detection and response at speeds impossible for human teams, thus protecting critical infrastructure amid an onslaught of cyber threats. At the same time, AI is empowering threat actors: from AI-generated phishing lures with startling success rates to deepfake-enabled fraud and adaptive malware, the nature of cyber attacks is becoming more sophisticated. The net effect is an escalating technical race between

attackers and defenders. Organizations globally are compelled to invest in AI-driven security just to keep pace. Collaboration is growing through information-sharing alliances and possibly the development of international norms against certain AI-fueled cyber weapons, recognizing that cyber threats often traverse borders. Cybersecurity in the AI age will require constant vigilance, advanced tools, and robust ethical guidelines to prevent misuse of AI.

In international relationships, AI has emerged as a strategic frontier influencing power balances and prompting new forms of cooperation and rivalry. Nations leading in AI research and application (notably the U.S. and China) are leveraging that lead for economic and military strength, leading others to increase their own investments, effectively an AI arms race in both commerce and defense. AI's role in military systems, from autonomous drones to intelligence analysis, raises urgent security and ethical questions that international forums are beginning to confront. At the same time, recognizing AI's global impact, diplomatic efforts toward AI governance have accelerated: international bodies are crafting principles to ensure AI development aligns with human rights and shared values. A crucial challenge highlighted is the inclusion of developing countries, many of which risk falling behind or being marginalized in rule-setting. AI's benefits (and risks like job displacement) will affect all countries, so global collaboration, for instance on AI in climate change mitigation, healthcare, or pandemic response, can be immensely beneficial. The conclusion on this front is that AI is now a permanent item on the global agenda, one that requires balancing national interests with collective action to harness AI for global good while managing its disruptive potential.

In global food security. Artificial intelligence plays a decisive role in reshaping the global food market by enhancing forecasting accuracy, strengthening supply-chain transparency, and improving the efficiency of agricultural and trade processes. Overall, the integration of AI serves as a strategic driver of modernization that reinforces global food security amid mounting economic, environmental, and geopolitical challenges. Moreover, AI-powered tools expand opportunities for more equitable participation of countries in international food markets, particularly by supporting developing economies. In this context, AI becomes not only a technological innovation but also a foundational element of a more resilient and sustainable global food system.

In conclusion, artificial intelligence in 2025 stands as a transformative force akin to the steam engine or electricity in past eras, revolutionizing industries, redefining security and power, and challenging our legal and ethical frameworks. Its influence on international business promises economic growth and efficiency, yet demands adaptability to mitigate disruptions. Its role in cybersecurity offers hope against digital threats, yet also arms adversaries in new ways. Its impact on international relationships can either deepen divides or, if wisely managed, foster unprecedented collaboration. Navigating these dualities is one of the grand projects of our time. The choices made now, in boardrooms, government chambers, and international summits, will shape whether AI's story is one of shared prosperity and security, or one of missed opportunities and heightened risks. The evidence and analysis presented here aim to inform those choices, underlining that the future of AI's influence is not predetermined but something we collectively steer.

Література

1. The 2025 AI Index Report. URL: <https://hai.stanford.edu/ai-index/2025-ai-index-report> (date of access: 15 December 2025).
2. Global offline population steadily declines to 2.6 billion people in 2023. URL: <https://www.itu.int/itu-d/reports/statistics/2023/10/10/ff23-internet-use/> (date of access: 17 December 2025).
3. AI's \$4.8 trillion future: UN Trade and Development alerts on divides, urges action, 2025. URL: <https://unctad.org/news/ais-48-trillion-future-un-trade-and-development-alerts-divides-urges-action> (date of access: 12 December 2025).
4. AI Statistics and Trends for 2025. URL: <https://www.nu.edu/blog/ai-statistics-trends/> (date of access: 15 December 2025).
5. AI Statistics 2024. URL: <https://www.aiprm.com/ai-statistics/> (date of access: 15 December 2025).
6. AI Cyber Attack Statistics 2025. URL: <https://tech-adv.com/blog/ai-cyber-attack-statistics/> (date of access: 18 December 2025).
7. Deepfakes Guide and Statistics, 2024. URL: <https://www.security.org/resources/deepfake-statistics/> (date of access: 15 December 2025).
8. Horobets O., Pobochenko L. Problems And Advantages Of Using Deepfaques In The Global Economy In The Age Of Artificial Intelligence. *Business Inform.* 2025. No. 2., pp. 171–180.
9. Fourteen New Drafts, Including on Implications of Artificial Intelligence in Military Domain, Approved in First Committee by 34 Votes, 2014. URL: <https://press.un.org/en/2024/gadis3757.doc.htm> (date of access: 15 December 2025).
10. Horobets O., Pobochenko L. The Impact of AI on Global Business. Monograph Contemporary International Relations: Topical Highlights Of Theory And Practice — 2023 — RS Global Warsaw, Poland 2023, pp. 395–403.
11. Horobets O. Racing In The Artificial Intelligence Market: Implications For Business And Society. XIV International Scientific and Practical Conference "National Economic Development Strategies in the Global Environment" May 11, 2023. — Kyiv, 2023, pp. 71–75.
12. Horobets O., Pobochenko L. The role of artificial intelligence in improving B2B marketing and sales strategies. B2B Marketing: collection of scientific papers of the XVII International Scientific-Practical Conference, Kyiv, December 14, 2023. K: Igor Sikorsky Kyiv Polytechnic Institute, pp. 69–71.
13. Horobets O. The Impact of Artificial Intelligence on the Labor Market. Materials of the Scientific Symposium Dedicated to the 80th Anniversary of the Professor of the Department of World Economy and International Economic Relations, Honored Professor of Taras Shevchenko National University of Kyiv, Doctor of Economics, Professor A. S. Filipenko, December 21, 2023, Kyiv, pp. 166–168.
14. Horobets O., Pobochenko L. The Impact of Artificial Intelligence Development on the Transformation of the Global Economy. Artificial Intelligence in Science and Education: Collection of Abstracts of the International Scientific Conference (AISE 2024), Section «AI in Economics», March 1-2, 2024, Kyiv, 2024, pp. 446–450.
15. Digital Transformation Drivers, Technologies, and Pathways in Agricultural Product Supply Chains. 2025. 15 (19). URL: <https://www.mdpi.com/2076-3417/15/19/10487> (date of access: 15 December 2025).
16. Pobochenko L., Prokopieva A. Artificial Intelligence in Ensuring International Food Security Considering Production Greening. *Vcheni zapysky.* 2025. No. 41(4), pp. 262–277. DOI: 10.33111/vz_kneu.41.25.04.18.124.130.
17. Prokopieva A., Pobochenko A., Pichkurova Z. Logistics of Agri-Food Chains as a Tool for Ensuring Food Security: Risks and Insurance Aspect. *Aktualni problemy ekonomiky.* 2025. No. 12 (294), pp. 227–238. DOI: 10.32752/1993-6788-2025-1-294-227-238.

18. Mozgovyy O., Rudenko-Sudarieva L., Shevchenko Y., Yatsenko O., Zhou W. Factors for choosing of investment models by asian companies in the implementation area of global business initiatives. *Financial and Credit Activity Problems of Theory and Practice*, 2023. 2(49), 149–162. <https://doi.org/10.55643/fcapter.2.49.2023.4000>
19. Mykhailova M., Yatsenko O., Zavadska Y., Afanasieva O., Haas R. The War in Ukraine and its Impact on Global Agricultural Trade (Auswirkungen des Ukrainekriegs auf den globalen Agrarhandel). *Die Bodenkultur: Journal of Land Management, Food and Environment*. 2023. Volume 74, Issue 2, 91–105. DOI: 10.2478/boku-2023-0008.
20. Shlapak A., Yatsenko O., Ivashchenko O., Zarytska N., Osadchuk V. Digital transformation of international trade in the context of global competition: technological innovations and investment priorities. *Financial and Credit Activity Problems of Theory and Practice*, 2023, 6(53), 334–347. <https://doi.org/10.55643/fcapter.6.53.2023.4241>.
21. Zavadska, Y., Shlapak, A., Yatsenko, O., Iatsenko, O., Mykhailova, M., & Dluhopolskyi, O. Sustainable and Resilient International Agricultural Trade: Global Uncertainty and Regional Reactions. *Problemy Ekorozwoju*, 2025. 20(2), 101–113. <https://doi.org/10.35784/preko.7276>
22. Kudlaenko S., Yatsenko O., Lunova T., Iatsenko O., Sharuk T., Dendeberia D. Strategic management and improvement of national export support and promotion systems to ensure sustainable development. *Financial and Credit Activity Problems of Theory and Practice*, 2025. 4(63), 280–295. <https://doi.org/10.55643/fcapter.4.63.2025.4811>
23. Iatsenko O., Stašys R., Tsygankova T., Yatsenko O., Rudenko V., Hurenko D. Agrotrading in the system of new formats of international trade relations. *Management Theory and Studies for Rural Business and Infrastructure Development*. Vol. 47 No. 4 (2025). P. 658–669. DOI: <https://doi.org/10.15544/mts.2025.52>

References

1. The 2025 AI Index Report. URL: <https://hai.stanford.edu/ai-index/2025-ai-index-report> (date of access: 15 December 2025).
2. Global offline population steadily declines to 2.6 billion people in 2023. URL: <https://www.itu.int/itu-d/reports/statistics/2023/10/10/ff23-internet-use/> (date of access: 17 December 2025).
3. AI's \$4.8 trillion future: UN Trade and Development alerts on divides, urges action, 2025. URL: <https://unctad.org/news/ais-48-trillion-future-un-trade-and-development-alerts-divides-urges-action> (date of access: 12 December 2025).
4. AI Statistics and Trends for 2025. URL: <https://www.nu.edu/blog/ai-statistics-trends/> (date of access: 15 December 2025).
5. AI Statistics 2024. URL: <https://www.aiprm.com/ai-statistics/> (date of access: 15 December 2025).
6. AI Cyber Attack Statistics 2025. URL: <https://tech-adv.com/blog/ai-cyber-attack-statistics/> (date of access: 18 December 2025).
7. Deepfakes Guide and Statistics, 2024. URL: <https://www.security.org/resources/deepfake-statistics/> (date of access: 15 December 2025).
8. Horobets O., Pobochenko L. Problems And Advantages Of Using Deepfaques In The Global Economy In The Age Of Artificial Intelligence. *Business Inform*. 2025. No. 2., pp. 171–180.
9. Fourteen New Drafts, Including on Implications of Artificial Intelligence in Military Domain, Approved in First Committee by 34 Votes, 2014. URL: <https://press.un.org/en/2024/gadis3757.doc.htm> (date of access: 15 December 2025).
10. Horobets O., Pobochenko L. The Impact of AI on Global Business. Monograph Contemporary International Relations: Topical Highlights Of Theory And Practice — 2023 — RS Global Warsaw, Poland 2023, pp. 395-403.

11. Horobets O. Racing In The Artificial Intelligence Market: Implications For Business And Society. XIV International Scientific and Practical Conference "National Economic Development Strategies in the Global Environment" May 11, 2023. — Kyiv, 2023, pp. 71–75.
12. Horobets O., Pobochenko L. The role of artificial intelligence in improving B2B marketing and sales strategies. B2B Marketing: collection of scientific papers of the XVII International Scientific-Practical Conference, Kyiv, December 14, 2023. K: Igor Sikorsky Kyiv Polytechnic Institute, pp. 69–71.
13. Horobets O. The Impact of Artificial Intelligence on the Labor Market. Materials of the Scientific Symposium Dedicated to the 80th Anniversary of the Professor of the Department of World Economy and International Economic Relations, Honored Professor of Taras Shevchenko National University of Kyiv, Doctor of Economics, Professor A. S. Filipenko, December 21, 2023, Kyiv, pp. 166–168.
14. Horobets O., Pobochenko L. The Impact of Artificial Intelligence Development on the Transformation of the Global Economy. Artificial Intelligence in Science and Education: Collection of Abstracts of the International Scientific Conference (AISE 2024), Section «AI in Economics», March 1-2, 2024, Kyiv, 2024, pp. 446–450.
15. Digital Transformation Drivers, Technologies, and Pathways in Agricultural Product Supply Chains. 2025. 15 (19). URL: <https://www.mdpi.com/2076-3417/15/19/10487> (date of access: 15 December 2025).
16. Pobochenko L., Prokopieva A. Artificial Intelligence in Ensuring International Food Security Considering Production Greening. *Vcheni zapysky*. 2025. No. 41(4), pp. 262–277. DOI: 10.33111/vz_kneu.41.25.04.18.124.130.
17. Prokopieva A., Pobochenko A., Pichkurova Z. Logistics of Agri-Food Chains as a Tool for Ensuring Food Security: Risks and Insurance Aspect. *Aktualni problemy ekonomiky*. 2025. No. 12 (294), pp. 227–238. DOI: 10.32752/1993-6788-2025-1-294-227-238.
18. Mozgovyy O., Rudenko-Sudarieva L., Shevchenko Y., Yatsenko O., Zhou W. (2023). Factors for choosing of investment models by asian companies in the implementation area of global business initiatives. *Financial and Credit Activity Problems of Theory and Practice*, 2(49), 149–162. <https://doi.org/10.55643/fcapter.2.49.2023.4000>
19. Mykhailova M., Yatsenko O., Zavadska Y., Afanasieva O., Haas R. (2023). The War in Ukraine and its Impact on Global Agricultural Trade (Auswirkungen des Ukrainekriegs auf den globalen Agrarhandel). *Die Bodenkultur: Journal of Land Management, Food and Environment*. Volume 74, Issue 2, 91–105. DOI: 10.2478/boku-2023-0008.
20. Shlapak A., Yatsenko O., Ivashchenko O., Zarytska N., Osadchuk V. (2023). Digital transformation of international trade in the context of global competition: technological innovations and investment priorities. *Financial and Credit Activity Problems of Theory and Practice*, 6(53), 334–347. <https://doi.org/10.55643/fcapter.6.53.2023.4241>.
21. Zavadska, Y., Shlapak, A., Yatsenko, O., Iatsenko, O., Mykhailova, M., & Dluhopolskyi, O. (2025). Sustainable and Resilient International Agricultural Trade: Global Uncertainty and Regional Reactions. *Problemy Ekorozwoju*, 20(2), 101–113. <https://doi.org/10.35784/preko.7276>
22. Kudlaenko S., Yatsenko O., Lunova T., Iatsenko O., Sharuk T., Dendeberia D. (2025). Strategic management and improvement of national export support and promotion systems to ensure sustainable development. *Financial and Credit Activity Problems of Theory and Practice*, 4(63), 280–295. <https://doi.org/10.55643/fcapter.4.63.2025.4811>
23. Iatsenko O., Stašys R., Tsygankova T., Yatsenko O., Rudenko V., Hurenko D. (2025). Agrotourism in the system of new formats of international trade relations. *Management Theory and Studies for Rural Business and Infrastructure Development*. Vol. 47 No. 4. P. 658–669. DOI: <https://doi.org/10.15544/mts.2025.52>

Стаття надійшла 19.11.2025; прийнята до друку 17.03.2026 року