

RISKS AND ANTI-CRISIS MANAGEMENT IN THE AGRICULTURAL SECTOR

The agricultural sector consistently faces diverse risks that can have significant negative impacts on productivity, sustainability, and profitability. This research explores the key categories of risks in Ukraine's agricultural sector, analyzes their economic implications, and examines effective anti-crisis management strategies that can help agricultural enterprises maintain resilience in an uncertain environment. Special attention is given to the integration of innovative technologies and risk diversification approaches in modern agricultural risk management systems

Keywords: agricultural risks, anti-crisis management, risk mitigation, agricultural economics, sustainability, agricultural innovations.

Аграрний сектор постійно стикається з різноманітними ризиками, які можуть мати значний негативний вплив на продуктивність, стійкість та прибутковість. Це дослідження розглядає основні категорії ризиків в аграрному секторі України, аналізує їх економічні наслідки та вивчає ефективні стратегії антикризового управління, які можуть допомогти аграрним підприємствам підтримувати стійкість у нестабільному середовищі. Особлива увага приділяється інтеграції інноваційних технологій та підходів до диверсифікації ризиків у сучасних системах управління аграрними ризиками.

Ключові слова: аграрні ризики, антикризове управління, зниження ризиків, аграрна економіка, сталий розвиток, аграрні інновації.

The agricultural sector in Ukraine and globally faces a complex and diverse set of risks that significantly affect its sustainable development and economic stability. Agricultural production, by its very nature, remains one of the most risk-prone economic activities due to its dependence on natural, climatic, biological, and market factors [1]. The relevance of developing effective risk management and anti-crisis systems in agriculture has been further highlighted by recent global challenges, including climate change, geopolitical tensions, and market volatility.

Agricultural risks can be categorized into several major groups. Production risks are primarily associated with weather conditions, pests, diseases, and other natural factors that directly impact crop yields and livestock productivity. According to research by Prokopenko et al. [2], crop losses due to adverse weather conditions in Ukraine can reach 30-40% in particularly challenging years, representing billions of hryvnias in economic damage. Climate change has exacerbated these risks, with increasing frequency of extreme weather events such as droughts, floods, and unseasonable frosts.

Market risks constitute another significant category, manifesting through price volatility, changes in demand, and disruptions in supply chains. Khodakivska et al. [3] note that price fluctuations for agricultural products in Ukraine can reach 30-70% within a single marketing year, creating substantial challenges for financial planning and sustainability of agricultural enterprises. These fluctuations are often exacerbated by global market dynamics, changes in trade policies, and currency exchange rate volatility.

Financial risks in agriculture are related to access to capital, credit availability, interest rate changes, and liquidity issues. According to the National Bank of Ukraine data, the agricultural sector continues to face challenges in accessing affordable long-term financing, with only 7% of agricultural enterprises having sufficient access to banking credit resources [4]. This limitation significantly hinders technological modernization and implementation of innovative solutions necessary for risk mitigation.

Institutional and political risks, including changes in agricultural policies, regulatory frameworks, and international trade regulations, also play a crucial role in the sector's stability.

Research by Lupenko and Mesel-Veselyak [5] indicates that regulatory uncertainty and frequent changes in agricultural support mechanisms create additional challenges for strategic planning in Ukrainian agricultural enterprises.

Effective anti-crisis management in agriculture requires a comprehensive and integrated approach. Proactive risk identification and assessment serve as the foundation for developing appropriate mitigation strategies. Successful agricultural enterprises implement systematic risk monitoring using both traditional methods and modern digital technologies. Early warning systems based on data analytics help identify potential threats before they materialize into significant problems.

Diversification remains one of the most effective strategies for risk mitigation in agriculture. This includes diversification of crops, production technologies, markets, and income sources. Research by Khodakivska et al. [3] demonstrates that agricultural enterprises implementing diversification strategies show 15-20% higher economic resilience during crisis periods compared to highly specialized farms. Integration of crop and livestock production creates synergistic effects that enhance overall farm sustainability.

Technological innovation plays an increasingly important role in agricultural risk management. Precision farming technologies, which leverage GPS, remote sensing, and IoT sensors, allow for more efficient resource utilization and reduce production risks. Implementation of precision agriculture systems can reduce production costs by 10-15% while simultaneously decreasing vulnerability to adverse weather conditions through optimized irrigation and crop protection. Similarly, digital platforms for market analysis help farmers make more informed decisions regarding product sales timing and market selection.

Financial risk management instruments, including agricultural insurance, futures and options contracts, and forward agreements, represent another critical component of anti-crisis strategies. However, the agricultural insurance market in Ukraine remains underdeveloped, with less than 5% of agricultural land being insured. Development of innovative insurance products, index insurance schemes, and public-private partnerships in this area could significantly enhance the sector's resilience.

Creating reserves and buffer systems represents a traditional but still relevant approach to crisis management in agriculture. This includes not only financial reserves but also technological reserves (backup irrigation systems, alternative energy sources) and strategic inventory management. Agricultural enterprises with adequate reserve systems demonstrate 25-30% higher survival rates during prolonged crisis periods.

Knowledge management and continuous education of agricultural producers are equally important components of effective anti-crisis management. Farmers with higher levels of professional knowledge and access to advisory services implement more effective risk management practices and demonstrate greater adaptability to changing conditions.

Public policy measures also play a crucial role in supporting agricultural risk management systems. These include development of market infrastructure, information systems, insurance mechanisms, and targeted support during crisis periods. According to Lupenko and Mesel-Veselyak [5], countries with well-developed agricultural support systems that include risk management components show 30-40% higher sector resilience during economic downturns.

The integration of these diverse approaches into a coherent anti-crisis management system represents the most effective strategy for enhancing agricultural resilience. Modern agricultural risk management requires a balanced combination of traditional wisdom and innovative solutions, adapted to the specific conditions of each agricultural enterprise and region.

The effectiveness of anti-crisis management in agriculture is significantly enhanced when implemented at multiple levels: individual farm, cooperative or industry association, and national policy levels. Coordinated actions across these levels create synergistic effects and allow for more efficient resource utilization during crisis periods.

In conclusion, effective risk and anti-crisis management in the agricultural sector requires a systematic, proactive, and integrated approach. The combination of diversification strategies,

technological innovation, financial instruments, knowledge management, and supportive public policies creates a robust framework for agricultural resilience. As climate change, market volatility, and other challenges continue to intensify, the importance of developing and implementing such comprehensive risk management systems will only increase. Further research should focus on developing region-specific risk assessment methodologies and innovative financial instruments tailored to the unique needs of Ukrainian agriculture.

References:

1. Hudz, O.Ye. (2022). Economic mechanisms of ensuring financial stability of agricultural enterprises. *Ekonomika APK*, 4(330), 45-53.
2. Prokopenko, N.S., Hudz, O.Ye., & Ulianchenko, O.V. (2021). The impact of climate change on agricultural production: assessment and adaptation strategies. *Economy of Ukraine*, 3(712), 52-65.
3. Khodakivska, O.V., Pugachov, M.I., & Patyka, N.I. (2024). Diversification as a tool for risk management in agricultural enterprises. *Ekonomika APK*, 2(334), 72-84.
4. National Bank of Ukraine. (2024). Report on financial stability. Kyiv, 78 p. https://bank.gov.ua/admin_uploads/article/FSR_2024-H1.pdf
5. Lupenko, Yu.O., & Mesel-Veselyak, V.Ya. (2022). Strategic directions of agricultural development of Ukraine until 2030. Kyiv: NSC IAE, 156 p.

УДК 811.111

Хасхачих О. Г.
Матвєєва А.Л.

HARNESSING THE POWER OF TIDES (ВИКОРИСТАННЯ ЕНЕРГІЇ ПРИПЛИВІВ ТА ВІДПЛИВІВ)

У статті досліджено використання енергії припливів та відпливів як надійного джерела відновлюваної енергії. Розглянуто основні технології генерації, такі як греблеві системи, припливні лагуни та динамічні припливні установки. Аналізуються технічні, економічні та екологічні аспекти, зокрема вплив на морські екосистеми, фінансова ефективність і перспективи інтеграції з іншими видами енергетики. Також розглядаються інноваційні рішення для підвищення продуктивності та можливості міжнародної співпраці.

Ключові слова: *припливна енергетика, відновлювані джерела, гідродинаміка, екологічний вплив, альтернативна енергетика, економічна ефективність, інноваційні технології.*

The article explores the use of tidal energy as a reliable source of renewable energy. The main generation technologies, such as dam systems, tidal lagoons, and dynamic tidal plants, are considered. Technical, economic, and environmental aspects are analyzed, including the impact on marine ecosystems, financial efficiency, and prospects for integration with other types of energy. Innovative solutions to increase productivity and opportunities for international cooperation are also considered.

Keywords: *tidal energy, renewable sources, hydrodynamics, environmental impact, alternative energy, economic efficiency, innovative technologies..*

Tidal energy is a renewable and sustainable source of power generated by the gravitational interaction between the Earth, Moon, and Sun. It is one of the most predictable energy sources due to the periodic nature of tides, making it a highly reliable option for energy production. The movement of ocean waters follows a consistent and measurable pattern, ensuring a stable supply of energy compared to other renewable sources like solar and wind power, which can be affected by unpredictable weather conditions. This unique characteristic makes tidal energy an attractive option