

Mon23-072

Threats and risks of ecological and economic security of Ukraine in the conditions of war

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SUMMARY

The article substantiates that military aggression has affected every component of the environment, in particular, landscapes have been affected, air, water resources, soils are polluted, flora and fauna, and their habitats are destroyed. Significant damage is observed at infrastructure facilities of environmental importance, threats are growing at nuclear power, chemical, petrochemical, and metallurgical facilities. The authors have defined an objective list of risks and threats to the economic and ecological security of the state in the conditions of a full-scale invasion of the Russian Federation. The main components of threats to the ecological and economic security of Ukraine, the security-oriented ecological environment is generalized. It has been proven that considering a wide range of threats to ecological and economic security is an important step in the formation of effective strategies for the stability and protection of the state. The priority of considering the process of risk transformation in wartime is substantiated, which helps to develop strategies to preserve both the ecological and economic security of the country.



XVII International Scientific Conference “Monitoring of Geological Processes and Ecological Condition of the Environment”

7–10 November 2023, Kyiv, Ukraine

Introduction

The military actions of the Russian Federation are undoubtedly an unjustified and unprovoked act of aggression against an independent and sovereign Ukraine. This is also a violation of all applicable international environmental law. There is a violation of many international humanitarian and environmental agreements, including the Geneva Conventions, the Convention for the Protection of the Black Sea from Pollution, the UNECE Convention “On the Protection and Use of International Watercourses and International Lakes”, the Ramsar Convention on Wetlands and many others (Materials of the hearings ..., 2023). In turn, ecological and economic security are critical to the national economy. They reflect the ability of the national economy to maintain stability and protection against various internal and external threats. Ensuring competitiveness and ability for sustainable growth play an important role in determining the strategy of the state. In the context of growing threats and global instability, the study of ecological and economic security is a relevant and integral part of the strategic planning of the state, which helps to identify and adapt to new challenges in a timely manner, as well as to develop effective measures to ensure sustainability and appropriate response to situations that may affect the ecological and economic security of the country.

Method and/or Theory

The study of risks and threats to ecological and economic security is an extremely important area among scientists. The works of such leading scientists as Onyshchenko S. (Onyshchenko et al., 2023), Havlovska N. (Havlovska, 2016), Rudnichenko Y. (Rudnichenko et al., 2020), Krymchak L. (Krymchak, 2023), Pashniuk L. (Pashniuk, 2013) and Babets I. (Babets, 2021) play an important role in the study and understanding of this issue. These studies contribute not only to identifying potential risks and threats, but also to developing strategies to prevent and minimize them. However, despite the actualization of this issue, the full-scale war of the Russian Federation against Ukraine has created qualitatively new risks and threats to the ecological and economic security of the state, which require further thorough research.

Results

Among the many industrial enterprises that suffered damage or malfunctions as a result of hostilities, were the most environmentally hazardous, such as Chernobyl, Zaporizhzhya, Khmelnytsky, Rivne and South Ukrainian NPPs, Kyiv, Dnieper, Kremenchug, Dniester and Kakhovka HPPs, numerous thermal power plants and thermal power plants, chemical and metallurgical enterprises, mines, oil refineries, oil storage facilities, etc. (Figure 1).

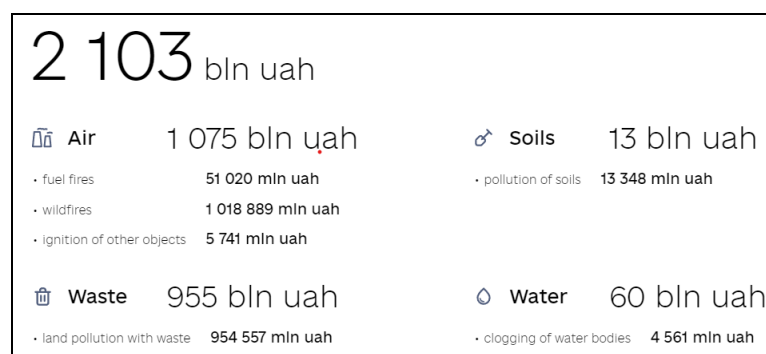


Figure 1 Approximate damage calculations by the State Environmental Inspection in accordance with approved methods (Official resource of the Ministry of Environmental Protection and Natural Resources of Ukraine, September, 2023)



As a result, there is an increase in the concentration of harmful substances in the air, water, soils, the risks of emergencies increase. Debris from explosions and damage is in landfills or simply left abandoned on the ground. On the verge of destruction are the Black Sea Biosphere Reserve, the national natural parks “Holy Mountains”, “Kreminsky Forests”, “Dvurechansky”, etc. The Black Sea and the Azov Sea suffer catastrophic consequences of the war. Active hostilities caused a significant leakage of hydrogen sulphide into the sea in Mariupol. Due to the ongoing hostilities and the continuation of Russian aggression, today it is impossible to finally estimate the number of contaminated and destroyed territories.

It is important to note that considering a wide range of threats to economic security is an important step in the formation of effective strategies for the stability and protection of the state. Analysis of the complex of threats and their relationships helps to reveal vulnerabilities and potential risks in economic systems. This is reflected in the development of long-term development strategies aimed at reducing vulnerability and improving economic sustainability.

Thus, in Ukraine, the first months of the war required the mobilization of all possible resources and efforts to ensure the economic security of Ukraine. Accumulated reserves, cohesion of citizens and international support played a crucial role in the country's resilience to the existential threat of the Russian Federation.

In a protracted war of attrition, fighting affects the country's economy, especially through directed attacks on infrastructure and economic resources. In addition, the use of hybrid tools can further deepen economic disparities and threats. In such circumstances, it is important to define strategies to preserve economic sustainability and ensure environmental safety in the face of relentless challenges.

Thus, the analysis and monitoring of ecological and economic risks and threats during the war period is extremely important for successful counteraction. This helps the state to make operational decisions and develop effective strategies to ensure economic and ecological security, even in the face of complex challenges of war.

Study of modern threats to economic security, conducted by the National Institute for Strategic Studies (Actual challenges ..., 2023; Transformation of challenges ..., 2022) based on desk research and expert surveys, is an important initiative to identify and understand the key challenges facing Ukraine. This approach helps to identify the most relevant and significant threats that may affect economic sustainability and environmental safety and provides for the updating and identification of new specific threats to the ecological and economic security of Ukraine, which is an important component of the process of ensuring effective countermeasures. Considering the transformation of risks in wartime helps to better understand the situation and develop strategies for preserving the ecological and economic security of the country.

Considering in this kind of research the principles of representativeness, including those specified in the Strategy of Economic Security of Ukraine for the period up to 2025 and the Strategy of the State Environmental Policy of Ukraine for the period until 2030 indicators, helps to create an objective list of threats.

In the context of military aggression, investment and innovation activities may lose the previous pace, so understanding the needs of restoring this sphere is important to ensure future economic stability. Incorporating this aspect helps to develop appropriate strategies to support investment (Chyckalo-Kondratska, Buryak, 2014; Kravets, Mukhalchenko, Buriak, Davidiyuk, Dubych, 2020) during martial law and during the post-war reconstruction. A specialized action plan for investment and innovation security, developed considering the peculiarities of the war period, can become an effective tool for maintaining and ensuring stability in this important area. It will help to adapt investment and



innovation strategies to the difficult conditions of war and contribute to the restoration of the development of this sector in the post-war period.

It is worth noting the key areas of action to reduce threats to food security. For short- and medium-term food security, it is important to implement the following measures:

1. Restoration and maintenance of infrastructure for the production, processing and storage of agricultural products.
2. Development of reliable logistics for the export of agricultural products.
3. Providing agricultural enterprises with sufficient material and technical equipment and financial support.
4. Creation of food reserves.

These measures are important to coordinate and implement in cooperation with relevant state and public organizations in order to effectively ensure the country's food security. It is important to continue to pay attention to these aspects to ensure sustainable improvement of the economic situation. Risk reduction assessment may be the result of specific actions of the state and business aimed at adapting and reducing the impact of military conditions on the environment and economy.

Diversification of activities, adaptation of business models and resumption of economic activity can play an important role in ensuring the sustainability and environmental and economic security of the state. Continuation of such efforts can contribute to further improvement of the situation in environmental and economic terms.

Conclusions

Consequently, the uncertainty that arises during the full-scale military invasion of Russia in Ukraine has a significant negative impact on ecological and economic security. A military conflict leads to the destruction of infrastructure, the destruction of production capacities, a decrease in economic activity, and the loss of jobs. In addition, military danger can lead to restrictions in international economic relations, the rupture of logistics chains. This necessitates proper measures to ensure environmental and economic sustainability and recovery from military conflict. The state should respond effectively to these challenges by developing development strategies, supporting enterprises and citizens, and establishing measures to ensure national ecological and economic security.

The purpose of further research in this direction is to show the significant direct and indirect impact of the war on the environment, risk assessment, to unite different stakeholders on the environmental front of fixing the damage caused, risks of disasters, environmental protection and joint work out an action plan. Each environmental object, territory should be studied and each introduced its own program. The search for ways to restore should begin now with the support and consideration of international and scientific experience in Ukraine.

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