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## **ENVIRONMENTAL SECURITY IN WAR CONDITIONS. CHALLENGES FOR UKRAINE**

Against the backdrop of increasingly severe global climate change, environmental security is of paramount importance. However, for Ukraine, the impact of a full-scale war has further complicated its environmental security issues. Military operations have transformed environmental risks into direct threats to public lives, economic stability, and the normal functioning of the state. Therefore, environmental security transcends traditional environmental discourse and becomes an important component of national and international economic security.

The significance of this study lies in the fact that Ukraine has suffered severe long-term environmental losses, which are increasingly seen as manifestations of ecological extinction. According to estimates by Ukrainian national authorities, the total environmental losses have exceeded 2 trillion hryvnia [1, p. 18]. This paper aims to analyze the challenges to Ukraine's environmental security under wartime conditions and to demonstrate the role of the circular economy as a recovery tool.

In the research process, key issues affecting the current state of environmental security should be identified.

1. Large-scale ecosystem destruction and hydrological disturbance. Military operations have led to the systematic destruction of natural processes. In particular, the destruction of the Kakhovka hydroelectric power station in 2023 resulted in the flooding of over 600,000 hectares of land, loss of agricultural potential, and alteration of the region's hydrological conditions [2, p. 27]. These processes have long-term consequences, including soil degradation, water supply disruptions, and decreased ecosystem productivity.

2. Environmental chemical pollution and natural resource degradation. War results in the introduction of toxic substances, heavy metals, munitions residues, and combustion products into the environment. Damage to industrial facilities exacerbates the risk of localized environmental disasters. According to international experts, over 20% of Ukraine's territory has suffered varying degrees of environmental damage [3, p. 52]. This limits land use possibilities and poses a threat to public health.

3. Mining activities are a contributing factor to long-term environmental and economic instability. Large tracts of farmland remain covered by landmines, effectively rendering them unusable economically. Ukraine is one of the countries with the highest concentration of landmines in the world, negatively impacting food security and export potential [4, p. 33]. Furthermore, demining requires significant funds and time.

4. Deteriorating air quality and increased climate risks. Explosions, fires, and infrastructure damage result in substantial emissions of pollutants. This not only affects public health but also increases greenhouse gas emissions, contradicting international climate goals [5, p. 41].

5. Loss of biodiversity and reduction of ecosystem services. The destruction of protected areas and forests leads to species loss and disruption of ecological balance. This hinders natural recovery and negatively impacts the economy due to reduced ecosystem services.

6. Ecological Extinction as a New Dimension of Environmental Security Ecological extinction, as an international legal phenomenon, requires special attention. Large-scale destruction of ecosystems, environmental pollution, and damage to critical infrastructure can all constitute ecological extinction. While Ukrainian national legislation has established liability for such actions, the issue remains controversial at the international level. Meanwhile, identifying environmental crimes creates preconditions for obtaining international compensation [7, p. 14].

In addition to environmental challenges, the economic impacts should also be considered. Destruction of natural capital leads to decreased output, reduced export potential, and increased recovery costs. War also complicates fulfilling international environmental obligations and adapting to EU standards [6, p. 58].

In this context, implementing a circular economy as a tool for sustainable recovery is particularly important.

7. Circular Economy as the Foundation of Post-War Reconstruction A circular economy refers to the efficient use of resources and the minimization of waste and material reuse. Large quantities of demolition waste, especially concrete, bricks, and metal, can be reused. Experts estimate the total amount to be tens of millions of tons [4, p. 39].

8. The Inclusive Development and Innovation Potential of the Circular Economy The implementation of a circular economy model helps create new jobs, promotes innovation, and attracts investment. This helps to achieve a balance between economic benefits, environmental safety, and social stability.

Therefore, wartime environmental safety is a complex issue encompassing multiple aspects, including the environment, economy, and society. The most critical issues remain environmental pollution, natural resource degradation, and overexploitation of land.

To overcome these problems, the following measures are recommended:

1. Establish a legal framework for construction waste management. A clear regulatory system for the collection, sorting, and recycling of construction waste must be established. Relevant legislation should align with European standards and include

economic incentives for businesses, such as tax breaks and public-private partnerships, to promote the development of the recycled materials market.

2. Implement circular economy principles in reconstruction efforts. Integrating circular economy principles into post-war reconstruction helps to efficiently utilize resources and reduce environmental impact. Material reuse and closed-loop production cycles can reduce reconstruction costs, decrease reliance on imported raw materials, and promote innovation.

3. Strengthen environmental monitoring and control. Improving environmental monitoring systems through digital technology and data analytics can quickly identify environmental risks. Strengthening the institutional capacity and transparency of environmental governance is also crucial for effective oversight.

4. Develop international cooperation and raise funds. Given the scale of environmental damage, international support is essential. Providing funding, technology, and expertise will contribute to effective restoration and the implementation of modern environmental measures.

Implementing these measures will not only mitigate the environmental and economic consequences of war, but will also lay the foundation for sustainable and resource-efficient development in Ukraine.

### **References:**

1. *Ministry of Environmental Protection and Natural Resources of Ukraine. Assessment of Environmental Damages of the War. 2024.*
2. *UNEP. Ukraine Environmental Assessment. 2023.*
3. *FAO. Impact of War on Agriculture in Ukraine. 2023.*
4. *World Bank. Ukraine Rapid Damage and Needs Assessment. 2023.*
5. *OECD. Environmental Impacts of the War in Ukraine. 2022.*
6. *European Commission. EU Environmental Policy and Ukraine. 2023.*
7. *Stop Ecocide Foundation. Legal Definition of Ecocide. 2021.al Policy and Ukraine. 2023.*