

## ECOLOGICAL COMPONENT OF THE RUSSIAN-UKRAINIAN WAR

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**Abstract:** *The article examines issues related to the environmental consequences of military actions, based on the full-scale invasions of the Russian Federation to Ukraine. It was determined that in addition to economic consequences, destruction of infrastructure, and forced migration, the war causes serious direct and indirect environmental consequences, in particular, a negative impact on the landscape and habitats, loss of biodiversity, fires in ecosystems, and the consequences of fires at industrial facilities, chemical and radiation pollution, soil and sea pollution by oil products, water, and air pollution. Full-scale Russian aggression against Ukraine will have very serious negative consequences both in the short and long term, and it is especially dangerous that this war is taking place in times of global climate change. The author showed that the processes that take place in the combat zone, in particular, intentional damage to the natural environment and crimes against the environment can be qualified as ecocide, which will make it impossible to achieve the commitments made by Ukraine and the EU countries regarding climate neutrality. It is concluded that the presence of the topic of Russia's environmental crimes in the national and global media space will prevent the transformation of the problem of the deterioration of the environment as a result of armed aggression from an economic problem to an issue of information security.*

**Keywords:** ecocide, Russian-Ukrainian war, environmental consequences, environmental security, information security

### 1. Introduction

The consequences of Russian military aggression in Ukraine are the loss of life, destruction of homes, destruction of civil and military infrastructure, mass migration, and impoverishment. These wars led to the deterioration of the economic condition of the countries and the living conditions of the population. But in addition to this, the actions of Russian troops threaten the environment of the countries that are the objects of aggression. It is about the deliberate actions of the occupiers, causing man-made accidents and threatening the environmental security of millions of people living far beyond the borders of hostilities.

From the first hours of the full-scale Russian invasion of Ukraine in 2022, oil depots and large industrial facilities throughout Ukraine were shelled, as a result of which heavy metals from shells and military equipment entered the soil and groundwater, and fires in forests and steppes destroyed the natural environment of rare species flora and fauna. The capture and shelling of nuclear power plants - Chernobyl and Zaporizhzhia, the largest in Europe, placing equipment there and detonating munitions violate the requirements of nuclear and radiation safety and threaten a man-made catastrophe. Due to hostilities, colossal damage has already been caused and is being caused to many

ecosystems. In various regions of Ukraine, the problems of handling waste, hazardous chemical substances, and objects are worsening, there are a deterioration of the quality of water resources and water supply, soil pollution, disturbance of landscapes, nature conservation objects, and territories. Accidents at enterprises, destruction of critical infrastructure objects, and environmentally hazardous enterprises that occur during enemy missile attacks create long-term risks for the life and health of the population. Since the consequences of Russia's military aggressions spread far beyond the borders of the territories where hostilities were or are being fought, the issue of informing the public about the consequences and challenges that Russia's military aggressions bring to the world community has become topical, intending to form environmentally conscious behavior and further influence on making political decisions.

## **2. Analysis of Recent Researches and Publications**

The issue of the ecologic consequences of military conflicts is considered in the works of both domestic and foreign researchers. The works of Ukrainian researchers H. Bilyavskiy, M. Khylyko, O. Plahotnik, V. Shvab, M. Khizhnyak, V. Savytskyi, V. Yakymets, S. Artemyev, O. Blekot, V. Marushchenko contain an analysis of modern ideas about the goals and methods of military ecology, its theoretical provisions and laws, local and global problems that it is designed to solve in order to ensure the survival of humanity and its sustainable development, the causes of environmental problems caused by military activities in the world and in Ukraine and the possibilities of overcoming them. The impact of military conflicts on humanity and the climate is considered in the studies of D. Hay-Edie, A. Palazzo, E. Kreike, the theme of the ecology of war is analyzed by S. Lanier-Graham, W. Wilcox, T. Marler, Charles E. Closmann, where it is

shown that environmental damage during war is considered inevitable, therefore military ecology covers all issues of environmental protection, and is related to military activities in peacetime, preparation for war, hostilities and post-war reconstruction operations.

## **3. Methods of Investigation and Sources**

The study was conducted using a systemic approach and its component as an analyst of international relations, which gave a holistic view of the specifics of the interstate relations. The method of analysis and synthesis helped to study, systematize and characterize the consequences for the environment of the studied countries and the region in general, caused by the military actions of the Russian army. The method of document analysis contributed to the formation of an understanding of how international organizations and international law determine intentional damage to the natural environment. The induction method helped to find out how Russia's military actions in Ukraine will affect the habitability of the regions.

The empirical basis of the work was the reports of the UN and OSCE international organizations, international research projects "Conflict Observatory", PAX, WWF, national specialized environmental research centers EcoDiya, Zelena Khvylya, Ukrainian Scientific Center for Marine Ecology, analytical think tanks National Institute of Strategic Studies, Institute of World History of the National Academy of Sciences of Ukraine, reports of the Ministry of Environmental Protection of Ukraine, reports of the international and national media of the BBC, Radio Svoboda, etc.

## **4. Investigation Results**

Of all human activities, war has the worst impact on the environment. From the first days of Russia's full-scale invasion of Ukraine in 2022, shelling and bombing of industrial and energy facilities, burning of forests, blowing up of oil depots, and

pollution of the Black and Azov seas (primarily due to the sinking of ships) were recorded.

*Environmental consequences of russia's military intervention.* The analysis of research by the National Institute of Strategic Studies and the Center for Environmental Initiatives “Ekodia” made it possible to systematize the consequences of war on the ecosystems of countries. These main types of eco-consequences are, in particular, a negative impact on the landscape and habitats, loss of biodiversity, fires in ecosystems, chemical and radiation pollution, soil and sea pollution by oil products, consequences of fires at industrial facilities, water, and air pollution [1-2].

*Impact on the landscape and habitats.* The armed aggression caused the emergence of new threats to environmental security due to mining and contamination of natural landscapes and agricultural lands with explosive objects and mines. Today, according to the UN, Ukraine is one of the most mined countries in the world. The pyrotechnic units of the State Emergency Service of Ukraine remove and defuse from 2,000 to 6,000 explosive items every day - ten times more than before the russian invasion [3]. Demining of cities and villages is usually done quite quickly, and forests remain unmined for decades. According to WWF-Ukraine experts, such places, in particular in Polissia, will retain traces of the war for many years [4]. Shells and mines from the Second World War are still found here. Research by the Geneva International Center for Humanitarian Demining shows that 12 of the 17 Sustainable Development Goals are directly related to demining and mine action [5].

*The loss of biodiversity and the threat to red-listed species* are among the direct environmental consequences of war. Fighting disturbs the peace of wild animals, they either die or try to escape from hot spots, and there is a great risk of breeding offspring. Noise or light in the dark, especially during the quiet season, as well

as stress, can disrupt the life cycles of birds and mammals [6]. The war rudely intervened in the ecosystem of the Black Sea. The russian military has mined part of its water area and is firing powerful projectiles from surface and submarine boats.

*Chemical and radiation pollution from shelling and rockets* is especially dangerous both in the short and long term. According to the Ministry of Defense of Ukraine, only in the first 20 days of the full-scale military invasion of russia on the territory of Ukraine, about 900 missiles of various calibers and types launched. For example, on March 21, 2022, russian troops shelled big chemical entity “Sumikhimprom”, as a result of which ammonia leaked into the air. It is known that there are more than 1,000 warehouses of dangerous substances in Ukraine, and if bombs get there accidentally or intentionally, air, water bodies, soil, etc. may be polluted [7].

*Nuclear blackmail.* On the first day of the full-scale invasion of Ukraine, the russian military seized the Chornobyl nuclear power plant, the exclusion zone was under occupation for over a month. Ukraine's loss of control over the Chornobyl nuclear power plant led to the loss of control over radioactively hazardous facilities located in the Chornobyl Exclusion Zone; spent nuclear fuel storage facilities; liquid radioactive waste processing plants. The Director General of the International Atomic Energy Agency, Rafael Grossi, who later visited the Chornobyl nuclear power plant, said that “the situation was completely abnormal and very, very dangerous” [8]. According to the Ukrainian Minister of Environmental Protection, the seizure of nuclear facilities is “an attempt to blackmail the whole world” [9]. At the beginning of March, the russians fired at the power units of the largest nuclear power plant in Europe - Zaporizhzhya NPP. For the first time in the history of mankind, the military

deliberately shot and aimed at a nuclear facility. The russians have placed military equipment on the territory of the ZNPP, which at the time of writing is still under their control.

*Ecocide and global consequences of russian war.* Therefore, the problem of averting ecological threats to the environment due to russian military aggression requires special attention from media, domestic specialists and the world community. Many researchers today claim that those processes that take place in the war zone, in particular, crimes against the environment can be qualified as ecocide [10]. For example, more than 200 ecocides were recorded in Ukraine only in the first months of the full-scale invasion. The largest one is the explosion of the Kakhovka hydroelectric power station dam, which occurred on June 6. In 2021, Ukraine made a voluntary commitment to reduce greenhouse gas emissions. But as a result of russian aggression, the funds that were planned to be spent on energy efficiency, green economy, renewable energy sources, creation of new nature reserves, and conservation of species, are now spent on military actions, which experts define as lost opportunities.

Thus, full-scale russian aggression against Ukraine will have very serious negative consequences both in the short and long term. This war is taking place at a time of global climate change, which may also worsen negative climate trends.

*Public awareness regarding military environmental consequences.* Russia's military aggressions actualized the need to raise awareness of the negative consequences of military actions among the general public. For example, among the Ukrainian public, there is an understanding of the seriousness of the consequences of the war for the ecosystem of the country and the region. This is confirmed by the results of the "Info Sapiens" study, which showed that 98% of residents of large and medium-sized cities directly associate the

negative impact of military operations on the natural environment of Ukraine [11]. On the other hand, only every fifth (19%) of citizens of Ukraine are aware of the possibility of reporting environmental crimes if they witness such a fact. So, we see an understanding among the Ukrainian community of the ecological danger from the russian invasion, but if this issue is not present in the media, it may eventually be displaced by other relevant information. Therefore, in our opinion, the presence of this topic in the regional, national, and world media, is of particular importance. Thanks to the presence of the topic of long-term environmental consequences in the mass media, makes it possible to cover quite wide sections of the population of different countries, such as those who suffered from the war, as well as those who live in other countries.

It should be noted that the European Union is aware of the threat to the environment due to russian aggression in Ukraine. The presence of the environmental theme in the European media can be considered an indicator of this, because the issue of ecology and climate neutrality is not the problem of one country. France 24, The Guardian, Bloomberg, Green European Journal, Radio Free Europe, Polske Radio, Business Insider and other influential media wrote about the potential impact on the environment in EU countries. For example, France 24 emphasized that "Ukraine is one of the most industrialized countries in Europe, where, according to estimates, 6 billion tons of liquid waste are stored, which are generated by coal mines, chemical plants and other branches of heavy industry. During the war, these extremely sensitive objects were constantly bombarded" [12]. The Guardian notes that "politically, the war risks jeopardizing the European Green Deal's biodiversity plan as the EU delays publication of a directive on sustainable pesticide use and 'nature restoration' targets, citing concerns about war-induced food security" [13] Bloomberg

reports on the need to rebuild cities devastated by the Russian invasion in a way that is cautious to the environment and helps fight climate change. For Ukraine, the EU plan for the aesthetics of green transformation of the continent “New European Bauhaus” can be a model. Analysts positively assess the prospects of implementing this approach in Ukraine, as Europe's highest executive body supports this idea to go beyond the union and play a role in the reconstruction of war-torn Ukraine [14].

Therefore, environmental educational activity and its media component in the context of awareness of the negative global consequences of military actions on the ecology of countries and regions can act as a mechanism for the implementation of public ideas regarding the ecological restoration of the environment of countries after the military invasion and the establishment of the process of sustainable development.

## **5. Conclusions**

Destruction of ecosystems, pollution of soil and water space, reduction of biodiversity, and increase in the number of pests in forests are far from a complete list of environmental problems faced by countries as a result of Russian military aggression. The full-scale aggression causes significant damage not only to the economy and cultural heritage but also the environment of the country and region. Numerous cases of purposeful destruction of natural resources and infrastructural facilities have features of ecocide against the Ukrainian

people. It can be assumed that the future ecological disaster in Ukraine will have not only a local but also a regional character since the pollution of aquatic and marine ecosystems, groundwater with possible radiation, chemical or toxic waste will have a transboundary impact, which for decades will lead to a significant imbalance of ecosystems not only in Ukraine but also throughout Europe. Therefore, it is important today to ensure the presence of the topic of environmental crimes of Russia in the national and global media space for a long time. Such actions will contribute to the prolongation of the presence of the topic of environmental consequences of Russian military aggression, the development of national and international policies to overcome negative consequences, and the formation of environmentally friendly and conscious behavior of the general public.

## **6. Limitations**

At the same time, the issue of the environmental consequences of military interventions and its information component is presented fragmentarily in the public and scientific discourse, mainly in analytical studies of scientific institutes and specialized environmental organizations. Significant negative consequences for the environment of Ukraine and the region as a result of the full-scale Russian invasion, as well as the need for research on the communicative component of the ecology of the war determined the relevance of this study.

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