

CRIMINAL RESPONSIBILITY FOR ECOCIDE RESULTING FROM THE MILITARY AGGRESSION OF RUSSIA

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ABSTRACT

Russia's military aggression against Ukraine has led to the destruction of natural resources, ecosystems, and infrastructure. These actions have violated international principles of environmental safety. The hostilities have caused serious damage to nature reserves, wetlands, and soil. Air and water pollution have a transboundary effect. Russia's actions threaten future generations and the climate. That is why the creation of a mechanism to ensure environmental safety is an urgent problem for world civilization. Therefore, the aim of this study is to analyze the criminal responsibility for ecocide in the context of Russia's military aggression and identify the existing legislative problems in this area and ways to overcome them. The methodology of the study of ecocide and its connection with Russia's military aggression includes analysis, synthesis, induction, deduction, dialectic, analytics, analogy, abstraction, and generalization. These methods help to reveal the essence of the problem, establish legal norms, and develop recommendations and priorities for regulating ecocide.

Keywords: criminal responsibility; ecocide; environmental damage; environmental losses; environmental safety; legal protection of the environment

Introduction

Russia's full-scale military aggression against Ukraine that started on February 24, 2022, has created a new reality. Crimes against the Ukrainian environment and people are being committed every day. Since the beginning of the invasion, the deliberate destruction of Ukrainian natural resources, ecosystems, and industrial and infrastructure facilities, resulting in many environmental problems have occurred. Russia's attack is a strong reason for revising international guidelines and frameworks that link environmental damage to crimes against humanity. This is why ecocide is of particular relevance in the context of Russian aggression, as any war is "the greatest threat to humanity and the environment".

Due to the ongoing hostilities, the functioning of ecosystems is being disrupted, which negatively affects the state of natural resources and their survival. The Ukrainian environment is a silent victim of war. According to the official website of the Ministry of Environmental Protection and Natural Resources of Ukraine, EcoThreat, as of January 5, 2023, there were 2,278 reports of crimes against the environment recorded in Ukraine and the estimated cost of the minimum damage is 441 billion UAH. In addition, 42,371 tons of aerial emissions, 372,877 tons of waste and almost 20 thousand pieces of Russian equipment are recorded. The hostilities have affected one-third of Ukraine's nature reserves and large areas of wetlands designated for protection under the Ramsar Convention on Wetlands of International Importance. In addition, the movement of heavy equipment, construction of fortifications and military operations has damaged the soil,

resulting in the degradation of vegetation and an increase in erosion by wind and water. Approximately 2.9 million hectares in the Emerald Network (an ecological network consisting of areas of special conservation interest), in other words, approximately 200 sites of scientific importance are likely to be destroyed.

War affects every natural object, and the resultant pollution has long-lasting negative transboundary effects. Experts, politicians, scientists, and civil society in Europe should bear this in mind. Currently, the intervention in the performance of the Zaporizhzhia NPP, the fires and occupation of the Chornobyl exclusion zone and the missiles flying over the South Ukrainian NPP are of great concern. On August 25, 2022 the Zaporizhzhia NPP was completely disconnected from the Ukrainian power grid for the first time in its history. Fires in ash dumps at the Zaporizhzhya TPP, located next to the Zaporizhzhya NPP, resulted in the last (fourth) power line being disconnected twice. However, Russia has only been excluded from one Environmental Convention for such violations of international law. In addition, in June 2023, the explosion caused by the Russian Federation at the Kakhovka hydroelectric power plant resulted in ecocide and had extremely harmful consequences for the environment not only in Ukraine but also around the world.

An analysis of these violations indicates that crimes against the environment, humanity, and war crimes disrupt the international balance, thereby leading to dissonance in global international environmental security that jeopardise the right to a safe environment for future generations. Thus, Russia's invasion has harmed the international community and violates the norms of

international law. Against this background, the relevance of research into the environmental and legal aspects of criminal responsibility for ecocide is very important. An urgent problem for world civilization is the creation of a mechanism for ensuring environmental safety.

In this regard, there is a need to determine criminal responsibility for ecocide at the national and international levels. Environmental lawyers actively discuss and attempt to include ecocide in the list of crimes against humanity, which would create a mechanism for determining international legal responsibility for damaging the environment. Many scholars, such as Nigreeva (2021), Martynenko (2021), Sivodyed (2022), Borshchevska (2023), Mynkovich-Slobodyanyk (2023) have studied this issue. Therefore, the aim of this study is to analyze the criminal responsibility for ecocide in the context of Russia's military aggression and identify the existing legislative problems in this area and ways to overcome them.

Materials and Methods

In this research several approaches and methods are used to analyse the concept of ecocide and its connection with Russia's military aggression against Ukraine, to determine legal norms for the environment and provide recommendations aimed at preventing and punishing crimes against the environment.

The analysis of international legal acts related to environmental protection and countering military aggressions helped in the identification of existing legal norms and obligations that define the legal framework for regulating ecocide. A comparative analysis allows the national and international legislations on ecocide and its relation to military aggression to be compared. Moreover, the legal analysis presupposes the analysis of international humanitarian law, international environmental law, and human rights in the context of regulating ecocide caused by military aggression. Moreover, the principles applicable to ecocide in the context of military aggression are determined.

Generalization and systematization are used to formulate conclusions and recommendations on criminal responsibility for ecocide. Apart from that, synthesis allows different aspects and approaches to be combined in the regulation of ecocide. As a result, recommendations for amending the legislation on ecocide are formulated. Moreover, they help in determining general patterns in ecocide based on the analysis of specific cases. By analysing examples of ecocide due to Russia's military aggression, general trends, and characteristics of crimes against the environment are established. Deduction indicates how international law should be applied in each case.

The dialectical method facilitates considering ecocide as a complex social and legal problem. It is used to understand the causes, consequences and relationships between ecocide and Russia's military aggression.

Furthermore, the analytical method is used to reveal the essence and features of the problem of ecocide in the context of military aggression. The effect of military aggression on the environment is studied by dividing the problem into separate components and analysing the causes and consequences. Moreover, the method of analogy helps compare situations like cases of ecocide in the context of Russia's military aggression in order to determine the specific features of ecocide and identify those in common with other legal issues. The use of abstraction highlights the main aspects of the problem of ecocide and Russia's military aggression and thus the key factors and characteristics, the main provisions and formulation of the principles of regulation.

The scope of these methods helps in the systematic analysis of the problem of ecocide and its connection with Russia's military aggression, formulate recommendations for criminal responsibility and ensure proper environmental protection. The combination of these methods provides for a comprehensive and in-depth understanding of the problem and identifying effective ways to regulate ecocide in the context of Russia's military aggression.

Results

The international community and governments of most countries have realized the need and urgency of ensuring environmental safety, not only at the national level, but also on a global scale. The deterioration of the environment can be caused by various intentional economic, military, and political factors. Thus, the attacks of Russia on Ukrainian nuclear power plants, infrastructure and industrial facilities, nature reserves and ecosystems and water resources are the most dangerous for the environment. These actions can be classified as ecocide, which in turn provides grounds for considering it a crime against human security and the environment (Negri 2022; Yaroshenko et al. 2023).

International agreements on environmental protection are one of the most effective mechanisms for cooperation between states and international organizations for preventing damage to nature and human health, such as the World Charter for Nature (1982), the Rio Declaration on Environment and Development (1992), the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention 1998), the Johannesburg Declaration on Sustainable Development (2002). Apart from these agreements, various international intergovernmental and non-governmental organizations dealing with environmental issues (UN, IAEA, UNESCO, IMO, FAO, etc.) are interested in ecocide.

Attention to environmental pollution is quite justified because of human activity, production processes and wars, men destroy the ecological safety of the planet,

pollute and degrade the quality of the environment, thereby causing irreversible damage and bringing us closer to an environmental catastrophe. Such actions are defined in international law as ecocide, which is a partially criminalized act both under international criminal law and in the national law of many countries (Prakasa 2021).

The term “ecocide” comes from Greek and Latin, with “oikos” meaning house and “credo” meaning to destroy or kill. Currently, its meaning is the destruction of large areas of the natural environment because of human activity in peacetime or wartime. In addition, in international legal space, there is an approach whereby ecocide also means the use of meteorological, geophysical and other means to change the composition, dynamics, or structure of the Earth, including all layers of its atmosphere and outer space, which in turn will entail mass destruction of the living world, poisoning of the air, water and other serious consequences (Mynkovich-Slobodyanyk 2023). The term “ecocide” was first used at the 1972 UN Conference on the Human Environment, when the destruction of the environment because of bombing, herbicide use and large-scale constructions in natural areas was discussed. In addition, the fact that the United States used chemical weapons during the war in North Vietnam is important as it resulted in the destruction of a significant part of its forests (Rawal 2022; Yaroshenko and Lutsenko 2022).

Considering the legality of ecocide, it should be noted that it was first officially enshrined in 1991 in Article 26 of the Code of Crimes against the Peace and Security of Mankind. This article states that “a person who intentionally causes or orders damage to the environment shall, if found guilty, be punished”. This wording, although indirect, includes ecocide. However, already in 1995, after many legal discussions, this article was deleted, making it impossible to bring individuals to international legal responsibility under the article on ecocide. The next attempt was the international criminalization of this crime in the Rome Statute of the International Criminal Court in 2002, but it is not defined as a separate offense in the context of war crimes and armed conflicts, or crimes against humanity, which involves the destruction of the natural environment through mass attacks against the population of a region (Borshchevska 2023).

Therefore, at present, there is no direct enshrining of ecocide in international legal documents. However, discussions on this issue started on June 22, 2021, when a group of international law experts, with the support of the Stop Ecocide Foundation, presented a definition of the concept. This was launched with support of Swedish parliamentarians in November 2020 on the 75th anniversary of the opening of the Nuremberg War Crimes Trials of Nazi leaders in 1945. The work was coordinated by Philip Sands of University College London and Florence Mumba, a former judge of the International Criminal Court. As a result of their work, governments and the International Criminal Court should investigate

crimes committed against the environment (Panigaj and Bernikova 2023).

Thus, Article 5 of the Rome Statute of the International Criminal Court (International Criminal Court 1998) states that it can consider “questions relating to four categories of crimes: genocide, war crimes, crimes against humanity and crimes of aggression”, which is widely criticized. In response, Philip Sands stated that “the time has come to use the power of international criminal law to protect our global environment – 75 years ago crimes against humanity and genocide were first spoken of in the hall of Nuremberg, and I hope that this group can build on the experience of that day to formulate a definition that is practical, effective and sustainable, and that can attract support to allow for amendments to the ICC Statute”.

It was proposed that the preamble to the Rome Statute of the International Criminal Court should be amended, noting that the environment is being seriously destroyed and degraded every day, which, as a result, poses a threat to humanity and the world. In addition, it is suggested to supplement Article 5 “Crimes within the Jurisdiction of the Court” with clause “e” “The crime of ecocide” and to add Article 8 to the international legal act, which sets out its composition. According to the proposed Article 8, ecocide is defined as “unlawful or unjustified acts committed with the knowledge that there is a substantial likelihood that such acts will cause serious and widespread or long-term damage to the environment” (Allouzi 2019). Moreover, in its advisory opinion on the Legality of the Threat or Use of Nuclear Weapons of July 8, 1996, the International Criminal Court, recognized that “the environment is under daily threat” and confirmed that “it is not an abstraction but represents the living space, quality of life and very health of people, including unborn generations” and confirmed that “the general obligation of States” is to protect it within international law.

Although the term “ecocide” emerged only in the 20th century, cases of ecocide have occurred throughout history. For example, in Ancient Rome, during the wars, it was common for Germanic soldiers to poison water to kill the enemy army (Artamonova and Kutnyakova 2022). Moreover, during the First World War, German troops first used chemical weapons of mass destruction near the city of Ypres in Belgium, which contained mustard gas and chlorine, both of which are hazardous to the environment. There were also cases of ecocide during World War II such as the export of soil from Ukraine to Germany, subsequently affecting soil fertility in Ukraine (Hasler 2022).

Furthermore, the international legal responsibility was first used during the Vietnam War. The reason for this was the scale of the environmental crimes committed by the United States in this war. The U.S. Army conducted large-scale chemical attacks, which damaged the environment of Vietnam, which were later called “scorched earth tactics”. According to unofficial data, 96 thousand

tons of herbicides were used during these attacks on the jungles of Cambodia and Vietnam, including 57 thousand tons of dioxin; official data is currently classified as “secret” (Robinson 2022). The use many such weapons led to the conclusion that the United States was testing a new type of weapon of mass destruction, namely, ecocide. The consequence of such an effect on nature was the transformation of parts of the tropics into savannah and the loss of fertility of the land. In addition, the consequences for the local population are no less catastrophic. Most of the residents developed hormonal disorders affecting thyroid and pancreatic hormones, sexual and faetal development, and the percentage of stillbirths and children with congenital diseases increased (Sivodyed 2022).

Apart from that, during the Gulf War, 1,200 oil fields, bases, and tankers were deliberately blown up, resulting in many contaminations of soil and sea. The use of phosphorus bombs in military conflicts is also very common. They were used by the US army during the bombing of Iraqi cities, in the military conflict between Armenia and Azerbaijan in Nagorno-Karabakh and by the Russian army in Ukraine.

In addition, the damage to industrial enterprises is also significant because they can result in an environmental disaster. This is exemplified by the military conflict in Yugoslavia, during which many chemical, oil, and pharmaceutical facilities were damaged. In our opinion, it would be appropriate to legalize the international responsibility for developing various weapons that could cause ecocide in the future, such as phosphorus bombs, depleted uranium missiles or nuclear weapons.

Furthermore, there are cases of ecocide related to the economic goals of a state. For example, the Amazon forests were deliberately burnt by the local population to create agricultural land and industrial complexes. Forests in Siberia were set on fire for the same purpose and in the same way (Anisimova and Donets 2022). At the end of the 19th century, the extermination of bison began in America, and in 2002, there was a fish farm in Kamchatka where young salmon were being poisoned.

These examples demonstrate that it is essential to understand the consequences of ecocide and prevent them in the future. To achieve this, it is necessary to improve legislation and monitor its implementation. Thus, having studied the criminal responsibility at the international legal level, it can be argued that the term “ecocide” has not yet been used in criminal proceedings. However, there are several countries, including Ukraine, that have criminalized ecocide and established legal liability for its commission.

However, today’s crime of ecocide committed by Russia is not the first in Ukrainian history. In 1941, Soviet troops blew up the upper part of the Dnipro hydroelectric dam to halt the German offensive. Several thousand people drowned in the subsequent flood. On March 13, 1961, one of the largest man-made disasters in the Soviet Union occurred in Kyiv. On that day, the slurry waste from brick factories that was stored at Babyn Yar behind an earthen dam that collapsed resulted in a huge stream of slurry travelling at 3–5 meters per second that inundated Kurenivka and washed away vehicles, residential and administrative buildings, the tramway park, and

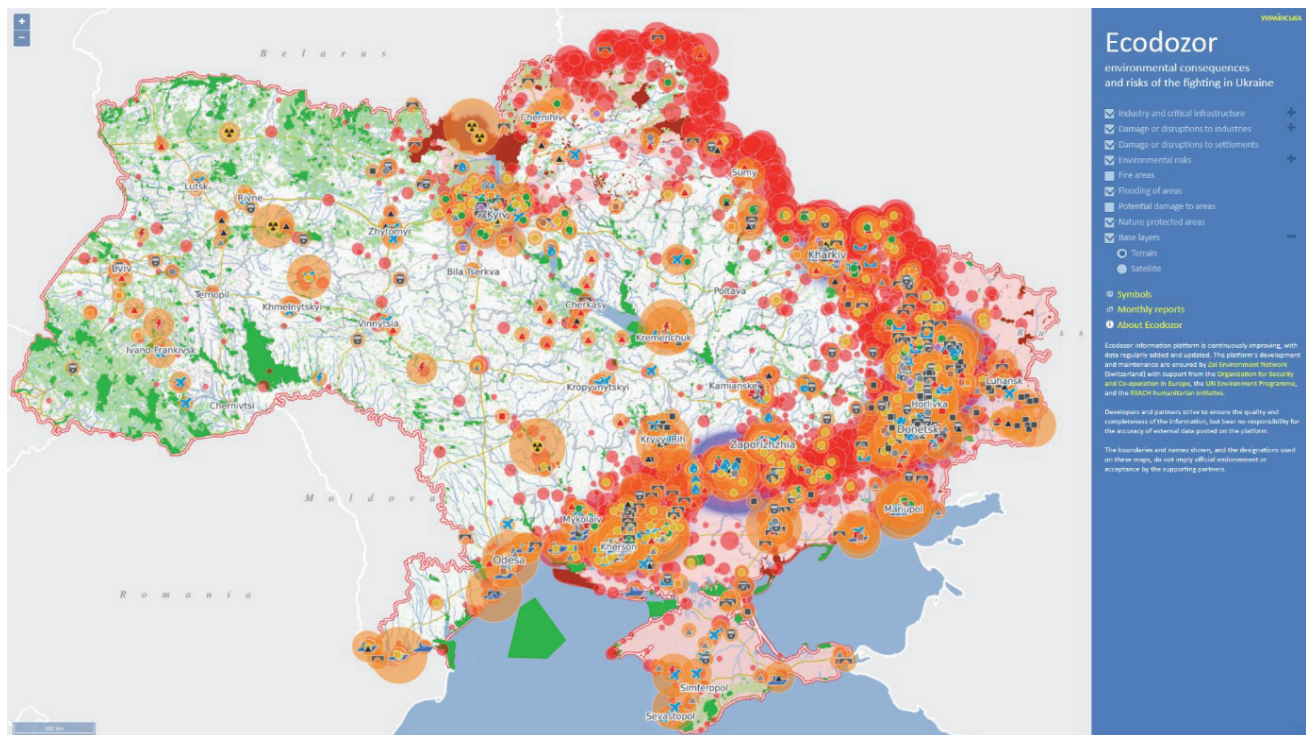


Fig. 1 Map of Ukraine showing the environmental consequences and risks of the war in Ukraine. Source: Ecodozor (2024).

Spartak stadium. The human toll, according to official figures, was about 200 people. The area covered by the slurry was 30 hectares (Martynenko 2021).

The numerous violations of international law by the Russian Federation are unprecedented (Fig. 1). The Eco-action NGO team documented more than 337 cases of potential environmental damage caused by the war, including the shelling of industrial areas and oil depots that may cause environmental pollution, violation of nuclear safety at Chornobyl and Zaporizhzhia NPPs, oil pollution of the sea, etc. Data gathered from public sources is currently updated on an online map. The highest number of such cases are documented for the Luhansk, Kyiv and Kharkiv regions (Ratushna 2022).

The Ukrainian authorities calculate that ecological damage recorded in the last year amount to no less than \$441 billion, with a proposed reparation demand of \$51 billion from Russia (Rubryka 2023). This war has resulted in an unparalleled instance of environmental devastation

in Ukraine, making it the most severe armed conflict Europe has witnessed since World War II. A summary of the most serious environmental effects of the war in Ukraine is presented in Table 1.

As the UNEP (United Nations Environment Programme 2023) reports, this war has caused extensive harm in numerous areas of Ukraine, resulting in incidents at nuclear power plants and installations, energy infrastructure such as oil storage vessels, refineries, drilling platforms and gas facilities, as well as the destruction of rare flora and fauna, natural parks pollution of water and air.

International institutions and international law have not been able to influence the aggressor and limit its criminal actions. Thus, there are many legal gaps in terms of investigating, opportunities for compensation for environmental damage and restoration of violated environmental rights. Crimes against the environment during this war should be recognized as a component of

Table 1 The most serious environmental effects of the war in Ukraine.

Event	Location	Ecological damage
Temporary occupation of the Chornobyl NPP	Chornobyl, Kyiv Oblast, Ukraine	Russian soldiers damaged a power line, resulting in the plant losing power. Consequently, the cooling systems responsible for preventing the overheating of spent nuclear fuel in storage pools ceased functioning. This situation posed the risk of nuclear waste and pool water overheating, potentially leading to evaporation and subsequent release of radioactive materials into the environment.
Temporary occupation of the Zaporizhzhia NPP	Enerhodar, Zaporizhzhia Oblast, Ukraine	Zaporizhzhia NPP remains under Russian occupation, posing continuous threats to global nuclear safety. Since the start of the occupation, numerous incidents have occurred at this facility, including fires, explosions of Russian ammunition and damage to power lines caused by the Russians.
Attack on the Kakhovka Dam	Nova Kakhovka, Kherson Oblast, Ukraine	77 settlements were inundated with 19.9 billion cubic meters of water, affecting over 100,000 hectares of agricultural land and nature parks. This resulted in the loss of over 50 lives and the destruction in the area of the 2023 harvest. Rare flora and fauna, including approximately 20,000 species, were killed due to the flooding of nature parks (for example, Oleshky Sands). The Dnipro River was contaminated by over 150 tons of machine oil and significant volumes of organic waste. Unique ecosystems were destroyed.
Extensive pollution by explosives	All the areas affected by the hostilities	30% of the territory of Ukraine is mined. Unexploded bombs and rockets can lead to the release of soot, carbon, and lead into the air. The remnants of ammunition can also result in immediate and long-term health effects due to the presence of iron, carbon, sulphur, and copper. When these substances seep into the soil, they contaminate water sources and poison people and animals.
Askania-Nova	Kherson Oblast, Ukraine	Under Russian occupation, a biosphere preserve has experienced a shortage of resources to maintain the dozens of species from all around the world.
Bombing of oil refining factory	Lysychansk, Luhansk Oblast, Ukraine	Blazes occurring at oil storage facilities result in the discharge of detrimental substances such as soot, sulphur dioxide, nitrogen oxides, heavy metals, carbon dioxide and various other pollutants into the atmosphere. The combustion byproducts pose risks to human health and contaminate soil, thereby jeopardizing surface and groundwater. Furthermore, these fires have the potential to trigger acid rain due to the interaction of sulphur dioxide and nitrogen oxide with water vapour, resulting in the formation of sulphuric and nitric acids.
Bombing of the Sumy-KhimProm chemical plant	Sumy, Ukraine	As a result of the Russian bombing of the city of Sumy, an ammonia leak occurred at the SumyKhimProm chemical plant, leading to contamination of the neighbouring village of Novoselytsia.
Destruction of the Azov Sea and Black Sea marine ecosystems	Azov Sea and Black Sea, Ukraine	The presence of naval mines, sunken wrecks, damage to coastal infrastructure have resulted in chemical contamination of seawater by oil-based pollutants, which is adversely affecting biodiversity in the Azov and Black Seas.
Mass death of dolphins in the Black Sea	Black Sea, Ukraine	The sonar used by the Russian fleet emit very strong and low-frequency signals that affect the inner ear of dolphins, their organ of navigation and hearing. Because of this, they cannot orientate, find food and die from hunger.

Source: Ratushna (2022), Rubryka (2023), Hryhorczuk et al. (2024).

genocide or enshrined in international law as a separate type of international crime. Today, the Rome Statute of the International Criminal Court and other international legal acts do not consider ecocide a separate type of crime. Consequently, there is no legal basis for combating ecocide. This situation in the current technocracy and economic development of mankind is unacceptable, as there is no mechanism to bring international environmental criminals to justice, which are the officials who make decisions and give orders that result in environmental damage.

Discussion

Environmental protection is part of national security, as any local damage to the environment can eventually cause irreversible consequences and large-scale destruction of the whole country, even beyond its borders. However, this analysis shows that international and national environmental law do not meet the challenges posed by Russia's war against Ukraine. Current legal provisions do not ensure the inevitability of punishment for crimes against the environment because of legal uncertainty. Therefore, compensation for environmental damage caused by military operations is a complex legal issue. Unfortunately, it is at the cost of Ukrainians' lives and well-being that a new international and national system for the protection and restoration of environmental rights and the creation of a mechanism for compensation for environmental damage must be developed.

The national legislation of Ukraine, namely Article 441 of Section XX of the Criminal Code, which provides for criminal offenses against peace, security, humanity and international law and order, has implemented the crime of ecocide and defined its characteristics. The concept of ecocide should be understood as "mass destruction of flora or fauna, poisoning of the atmosphere or water resources, as well as other actions that may cause an environmental disaster".

Accordingly, it is appropriate to consider and characterize each element of the crime of ecocide. Thus, the object of ecocide should be understood as "the safety of nature as a human habitat". In this regard, environmental safety can be defined as "a state of the environment when prevention of deterioration of the ecological situation and human health is guaranteed". The subject is flora, fauna, atmosphere, water resources, land, subsoil, other components of the ecosystem and outer space (Hnedina and Nagorny 2022).

The disposition of Article 441 covers the objective side in such forms as mass destruction of flora or fauna; poisoning of the atmosphere or water resources; committing other actions that may cause an environmental disaster. Mass destruction of flora or fauna means their complete or partial extermination and poisoning of the atmosphere or water resources involves the dispersal of

a high number of toxic substances of biological, radioactive, or chemical origin in the air, rivers, lakes, seas, oceans and other water bodies, which can cause severe forms of illness and even the death of people. An environmental catastrophe is fairly rapid damage to the natural environment and humanity within a certain region on Earth or the entire planet. To define it in each case, it is appropriate to refer to such criteria as "a large area of the territory where adverse environmental changes have occurred; significant restriction or exclusion of human life or plant or animal life in a certain area; duration of adverse environmental changes or their inevitability; significant negative changes in the ecological system".

However, it should be noted that the current legislation does not provide an exhaustive list of acts that can be classified as ecocide. This position of the legislator is correct because we live in a rapidly developing environment, which both opens up new opportunities for solving environmental problems of mankind and can create new challenges in the form of unexplored or poorly studied environmental pollution problems, such as the use of genetically modified organisms, new pesticides and fertilizers, the effect of various kinds of radiation on living organisms and the environment, the development of nanotechnology in biotechnology, energy, medicine, etc. (Kirin 2022). Nevertheless, it turns out that enshrining this criminal offence in law is not enough because there are currently no decisions in Ukraine under Article 441 of the Criminal Code "Ecocide" (Verkhovna Rada of Ukraine 2001). In support of this, the following statistics can be cited. As of September 15, 2021, law enforcement agencies have opened 19 criminal proceedings under the relevant article, of which 4 have already been closed and others are under pre-trial investigation. In addition, the Office of the Prosecutor General of Ukraine opened criminal proceedings under Article 441 "Ecocide" due to Russia's actions at the Rivne oil depot, Chornobyl and Zaporizhzhia NPP since such actions pose a threat to nuclear safety.

One of the main problems in implementing the concept of ecocide are the shortcomings in its regulation. It is extremely difficult to prove guilt because having fixed the forms of the objective side, the legislator did not provide for their interpretation. In particular, the Criminal Code of Ukraine or any other regulatory legal act of environmental legislation does not define the concepts of mass destruction, poisoning or environmental disaster, which raises questions about the qualification of a particular act under the above article. In addition, it is difficult to prove the perpetrator's intent because ecocide is distinguished by the fact that it is subjectively a crime in which the mental attitude to the act and its consequences is characterized by guilt in the form of direct intent, while in practice, there are quite primitive intentions, such as, saving on equipping enterprises up to environmental standards or, conversely, enrichment by illegal logging, etc.

Furthermore, Article 35, paragraph 3, of the Protocol Additional to the Geneva Convention Relative to

the Protection of Victims of International Armed Conflicts (Protocol I) (Verkhovna Rada of the Ukrainian SSR 1949) prohibits the use of methods or means of warfare that are intended to cause or will cause widespread, long-term, and severe damage to the natural environment. Moreover, Article 55 of the same Protocol requires that in the conduct of hostilities, care shall be taken to protect the natural environment from widespread, prolonged, and severe damage. It also prohibits environmental damage as a reprisal (coercive measures used by one state in response to the illegal actions of another state to force it to stop these actions and accept the demands it made) (Barabash et al. 2020; Zaveryuha 2022).

These elements of a war crime against the environment in international law have legally undefined criteria. In most cases, this will make it impossible to compensate for environmental damage. After all, the criteria of extent, duration and seriousness are not legally enshrined. Therefore, there is a high risk of not receiving compensation for environmental damage caused by the military actions of the Russian Federation. Natural resources and the environment are an invaluable heritage of Ukrainians that we must preserve for our descendants. Therefore, a legal definition of the criteria for a war crime against the environment it is necessary to ensure compensation (Chizh et. al. 2022).

Article 441 of the Criminal Code of Ukraine provides for criminal responsibility for ecocide. This article is used to start criminal proceedings for environmental damage caused by Russia. At the same time, national legislation does not define the term “environmental disaster” and does not establish criteria for the massive destruction of flora and fauna and the degree of poisoning of the atmosphere and water resources that trigger criminal responsibility.

Thus, this provision of the Criminal Code of Ukraine, as well as the provisions of international legal acts protecting the environment, lack legal certainty. Accordingly, the absence of clear criteria that should form the corpus delicti under Article 441 of the Criminal Code creates the basis for corruption during the investigation and sentencing. The legal uncertainty of the concepts of environmental catastrophe and mass destruction makes Article 441 of the Criminal Code declarative both in peacetime and during military aggression against Ukraine. The opening of criminal proceedings under this article in wartime will not ensure that the offenders are brought to justice and, accordingly, that the damage to the environment is remediable. However, the investigation within the framework of criminal proceedings under Article 441 of the Criminal Code of Ukraine will ensure the collection of evidence (interrogation of witnesses, attachment of photographic and video evidence, conducting examinations, obtaining expert opinions) of crimes against the environment, which in turn can become the evidence for applying to the International Criminal Court (Khaletska and Sydorenko 2019).

At the same time, according to Article II of the Convention on the Prevention and Punishment of the Crime of Genocide, which is the deliberate creation of living conditions for a group that is intended to lead to the physical destruction of the group in whole or in part. The Russian attacks on hydraulic structures and thermal power plants, chemical plants, oil refineries, seizure of nuclear facilities and their shelling, use of chemical weapons and other war crimes aimed at the physical destruction of Ukrainians are considered to be acts of genocide (Nigreeva 2021).

To solve these problems, it is necessary to amend the legislation and provide a common interpretation of the terms specified in the disposition of the article that establishes the criminal offence of ecocide. In 2000, Ukraine signed the Rome Statute of the International Criminal Court which has yet to be ratified. The ratification of the Rome Statute is also required by the Association Amendment with the European Union. Meanwhile, Ukraine recognized the jurisdiction of the International Criminal Court under Articles 6, 7 and 8. Thus, on May 4, 2015, the Verkhovna Rada of Ukraine adopted a resolution approving the Statement of the Verkhovna Rada of Ukraine “On Ukraine’s recognition of the jurisdiction of the International Criminal Court over crimes against humanity and war crimes committed by senior officials of the Russian Federation and leaders of the DPR and LPR terrorist organizations, which led to particularly grave consequences and mass murder of Ukrainian citizens” (Verkhovna Rada of Ukraine 2015).

In addition, the Order of the Prosecutor General’s Office of August 2, 2021, established the Specialized Environmental Prosecutor’s Office. This is an independent structural unit that organizes and procedurally manages pre-trial investigations, resolves other issues in criminal proceedings by the law and supports public prosecution in criminal proceedings for criminal offences in the field of environmental protection.

Furthermore, on June 2, 2022, an interview with the Minister of Justice of Ukraine Denys Maliuska was published on the Radio Liberty website, in which he explained the impossibility of Ukraine ratifying the Rome Statute while at war. In his opinion, the reason for this is the lack of proper communication with the Ukrainian military, which has led to a misconception that ratification would be harmful to Ukrainian defenders. Therefore, in the opinion of the Minister of Justice of Ukraine, it is not time to amend national legislation and ratify the Rome Statute of the International Criminal Court (Gerashimenko 2020).

Apart from that, the issue of international legal protection of the environment during a military conflict is regulated by international law, which falls under the jurisdiction of the International Criminal Court. Therefore, Ukraine recognizes the jurisdiction of the International Criminal Court under Articles 6, 7 and 8 of the Rome Statute or have started the procedure for its ratification. This

must be done to ensure compensation for crimes against the environment to be paid as environmental damage.

Investigating the war crimes of the Russian Federation under the Rome Statute will allow for the involvement of the international law on criminals, raise the standards of investigation, and ensure that the evidence collected is adequate for the consideration of criminal cases in the International Criminal Court. Another step to ensure compensation for environmental damage should be to legislate the concept of environmental damage. According to national legislation, in particular Article 22 of the Civil Code, damage is divided into real and lost profits (Haltsova et al. 2021; Vedkal 2021). Therefore, environmental damages should include the costs incurred by the state in connection with the damage to the environment and the costs that the state must incur to restore the environment; the income that the state could receive under normal circumstances if there had been no damage to the environment and compensation when it is not possible to restore the environment.

Moreover, the responsibility for violation of the Protocol Additional to the Geneva Convention of August 12, 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I) of June 8, 1997, is provided for in Article 91 of this Protocol (Verkhovna Rada of the Ukrainian SSR 1949). This provision stipulates that a party to a conflict that violates these documents must compensate for all damage if there are grounds for doing so. This party is also responsible for all actions committed by persons who are members of its armed forces. Such a formulation of responsibility for war crimes does not always correspond to modern methods and means of warfare, which are developed and used by the Russian aggressor. For example, the Russian occupier widely uses methods of hybrid warfare during its aggression against Ukraine (irregular armed units “Kadyrovites”, “Wagnerites”, etc.). Consequently, there are high risks of manipulation by Russia to avoid responsibility for war crimes, including those against the environment. Therefore, Ukraine could initiate amendments to this provision of the Additional Protocol to the Geneva Convention and extend its application to irregular armed units (Yelaev 2021).

Conclusions

Environmental security and biodiversity are among the most important issues facing humanity. Russia’s full-scale invasion of Ukraine has resulted in serious destruction and pollution of natural resources. As a crime against humanity and the environment, ecocide has become an alarming phenomenon in the context of Russian aggression. International treaties and environmental organizations play an important role in ensuring environmental safety. However, the implementation of these agreements and bringing perpetrators to justice for ecocide are

insufficient. In this regard, more attention needs to be paid to the regulation of ecocide in international law and to ensure its effective prevention and detection to protect the environment for future generations.

The explosion at the Kakhovka hydroelectric power plant carried out by Russian forces has serious consequences that are constantly escalating and will have long-term effects. This includes the flooding of many settlements, civilian casualties, destruction of minefields and waste dumps, loss of access to water for irrigation of agricultural land, destruction of Red Book species and cultural monuments, and a threat to the safety of the Zaporizhzhia NPP.

The international and national legal systems do not meet the challenges posed by Russia’s war against Ukraine. The legal provisions protecting the environment do not ensure the inevitability of punishment for environmental crimes and cause legal uncertainty. Accordingly, compensation for environmental damage caused by military operations has become a complex legal issue. To ensure justice, crimes against the environment during the war should be recognized as a component of genocide or a separate international crime. The concept of ecocide should be enshrined in international law, with clear legal criteria for crimes against the environment being established. Thus, national legislation should define the term “ecological catastrophe” and the criteria for the massive destruction of biodiversity and the degree of environmental poisoning. Obtaining compensation and bringing war criminals to justice is important to preserve natural resources and the environment for future generations.

In addition, Ukraine should recognize the jurisdiction of the International Criminal Court under Articles 6, 7, and 8 of the Rome Statute or start the procedure for its ratification. The recognition of the jurisdiction of the International Criminal Court will allow the involvement international criminalists, improve the standards of investigation, and ensure the adequacy of the evidence collected. In addition, Ukraine should initiate the recognition of the concept of ecocide as one of the most serious crimes under the Rome Statute. This will allow for compensation for crimes against the environment and strengthen the international protection mechanisms.

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