INTERNATIONAL HUMANITARIAN LAW AND ECOCIDE: THE WAR IN UKRAINE AS A CASE STUDY

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ABSTRACT

Ecocide, an illegal act that causes serious damage to the environment, has become one of the greatest threats to the planet. Ukraine, which has recently been exposed to ecocide, strives to bring the perpetrators to justice by applying to international judicial bodies and creating mechanisms for collecting evidence. Ecocide should be included in the list of crimes against humanity and properly regulated at the international level, which will contribute to the preservation of the environment and human security. The purpose of this article is to define the crime of ecocide under international humanitarian law, apply it to the conflict in Ukraine, and discuss possible international mechanisms for bringing to justice those who have committed ecocide. This paper showcases Ukraine's legal and factual basis for holding Russia accountable for ecocide, which includes the destruction of natural resources, water and air pollution and actions that could result in environmental catastrophes. This paper emphasizes the importance of filing lawsuits with international bodies, international cooperation, public engagement, and resource mobilization for effective prosecution. Ukraine's commitment to environmental protection through the pursuit of ecocide accountability is of global significance for the preservation of the planet and well-being of future generations.

Keywords: crime of ecocide; ecocide; environmental safety; international legal responsibility; international mechanism

Introduction

One of the main problems facing humanity today is the need to address the issues of world-wide environmental security and preservation of biodiversity that are under threat due to intense pollution and environmental degradation caused by various economic, military, and political factors and, above all, deliberate actions. Ecocide is one of the most serious offences in this regard, which gives grounds for considering it as a crime against the security of humanity and the environment.

Ecocide is the commission of any deliberate unlawful act that causes serious, irreversible, and long-term damage to the environment. This term comes from Greek, meaning killing or destroying one's home. Ecocide, a negative human effect on the environment, being committed deliberately or due to lack of responsibility, causes massive destruction of entire ecosystems that sustain all life on Earth in the long term. One example is the Chornobyl disaster in 1986 when an explosion released toxic radioactive substances into the atmosphere (even more than the atomic bombing of Hiroshima). Currently, Russia's actions have caused fires to break out in the Chornobyl forest exclusion zone in Ukraine. In addition, the Kakhovka hydroelectric power plant was blown up resulting in severe and irreversible damage to the environment in the south of the country.

From the first days of the war, Ukraine established an Operational Headquarters at the State Environmental Inspectorate of Ukraine to compile a list of all environmental violations and bring Russia to justice. To collect data on environmental crimes, an app was created that allows anyone to record information about the environmental damage caused by the aggressor state. Thus, the ongoing Russian-Ukrainian war led to changes in climate in Ukraine and other countries, including Russia and Belarus, which are now committing these crimes, will also suffer from pollution. Currently, hundreds of thousands of square kilometers of soil have been degraded and land severely disturbed, forests burnt, large quantities of toxic substances emitted into the atmosphere, animals killed and due to the hostilities changes in bird migration routes have been recorded in Ukraine. The Ministry of Environmental Protection and Natural Resources collects information on such crimes against Ukraine committed by the Russian Federation to file lawsuits in international courts.

An urgent problem for civilization is the creation of a mechanism to ensure environmental safety. Environmental lawyers actively discuss and attempt to include ecocide in the list of crimes against humanity, such as war, genocide, etc. This, in turn, would criminalize ecocide at the international level and trigger the mechanism of international legal liability. Thus, the purpose of this article

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is to define the crime of ecocide under international humanitarian law, apply it to the conflict in Ukraine and discuss possible international mechanisms for bringing to justice those who have committed ecocide.

To achieve this, numerous methods and approaches were used. For example, a literature review provided a theoretical basis for understanding and analyzing the key ecocide concepts, principles, and international documents, including the Rome Statute of the International Criminal Court. This made it possible to determine the rules of international humanitarian law applicable to environmental crimes committed in armed conflicts. National legislation and policy documents related to the war in Ukraine were studied to assess its effect on the environment and identify legal frameworks for accountability. International mechanisms for prosecuting perpetrators of ecocide, including the International Criminal Court, were analyzed.

The method of synthesis and analysis ensured a comprehensive understanding of the interconnection between ecocide, humanitarian law, and the war in Ukraine. Induction was used to draw general conclusions and helped establish cause-effect relationships between ecocide and liability. Analogical reasoning made it possible to compare cases of ecocide in Ukraine with those in other countries or conflicts and by abstraction key concepts and rules of humanitarian law were highlighted.

Thus, based on analytical research and the literature review, this article formulates a definition of the crime of ecocide under international humanitarian law, considers its application to the conflict in Ukraine and discusses possible international mechanisms for bringing to justice those who commit ecocide.

Results

The concept of ecocide in international legal literature: the problem of definition

Attention to environmental pollution is fully justified since human activity, industrial processes, and wars destroy the ecology of the planet, thereby causing irreversible damage and bringing humanity closer to an environmental catastrophe. Such actions are defined as ecocide, which, in turn, is a partially criminalized act under both international and national criminal law in many countries.

The term ecocide was first used in 1972 after the United Nations Conference on the Human Environment considered environmental destruction caused by bombing, herbicide use and large-scale construction in natural areas. The problem of ecocide as an independent type of international crime became more relevant during the Vietnam War when the United States used chemical weapons, which destroyed a significant part of the forests. A special place in the theoretical development of the concept of ecocide as an international crime and the methods of its commission in the context of an aggressive war was initiated by Vietnamese lawyers.

In international legal literature, ecocide is defined as the use of geophysical, meteorological, and other means to alter the dynamics, composition, or structure of the Earth (its biosphere, lithosphere, hydrosphere, and atmosphere) and outer space, which may or has led to a massive loss of flora or fauna, poisoning of the atmosphere, water resources or other serious consequences (Baranenko and Rusin 2023). For example, Article 1 of the Convention on Environmental Impact Assessment in a Transboundary Context prohibits resorting to any means of affecting the environment "that cause its widespread, long-term or severe damage when attempting to injure or destroy health or territory of any other State Party" (United Nations Economic Commission for Europe 2004).

According to the position of the International Criminal Court (ICC), ecocide can be considered one of the crimes against humanity and may fall under its jurisdiction in the future. The act of ecocide was first officially enshrined at the international legal level in 1991. Thus, Article 26 of the Code of Crimes against the Peace and Security of Mankind (International Law Commission 1991) stipulates that "a person who intentionally causes or orders damage to the environment shall, upon conviction, be punished." However, after many legal discussions, Article 26 was excluded in 1995, and it became impossible to bring individual actors to international legal responsibility under the article on ecocide (Hasler 2022).

The next attempt to criminalize ecocide was an indirect mention in the Rome Statute of the International Criminal Court (United Nations General Assembly 1998a) in 2002. However, no separate article enshrined this crime, but it was mentioned in the context of war crimes, armed conflicts, or crimes against humanity, which include the destruction of the natural environment resulting from attacks on the population of a region. There is no direct definition of ecocide at the level of international legal documents, although global lawyers actively discuss this issue. Thus, a group of experts on international law, with the support of the Stop the Ecocide Foundation, tried to develop a clear definition of ecocide in 2021. This, with the support of Swedish parliamentarians, was launched in November 2020 on the 75th anniversary of the opening of the Nuremberg War Crimes Trials of Nazi leaders in 1945. The coordinators were Philip Sands of University College, London and Florence Mumba, a former judge of the International Criminal Court. The Stop Ecocide Foundation hoped governments and the International Criminal Court would consider their work when investigating crimes involving the environment (Mynkovich-Slobodianyk 2023).

Even though ecocide is not defined and codified in international law, there are many definitions of this term in legal literature. Thus, it is advisable to formulate the authors' definition of ecocide. Ecocide encompasses

deliberate and unlawful actions resulting in systematic and large-scale damage to the environment or its constituent components, as a subject of international law. This includes various actions, such as deforestation, excessive discharge of toxic substances, pollution of water bodies, as well as other types of crimes that lead to a serious disruption of the ecology in an area. Ecocide has severe consequences for biodiversity, climate, and human health. The term is defined not only by the execution of actions but also by their systematic and intentional nature. As a result of ecocide, there may be a need for legal mechanisms for determining liability, compensation for damage and measures for restoring and protecting nature. This term emphasizes the need to take measures to prevent and punish serious environmental violations.

Legal frameworks for prosecuting ecocide: international agreements and mechanisms

International agreements on environmental protection are crucial elements and effective mechanisms of cooperation between states and international organizations to prevent damage to the environment and human health. Therefore, the existence of a variety of international environmental treaties is quite reasonable. First of all, it is necessary to consider the following statutory acts: the World Charter for Nature (United Nations General Assembly 1982), the Rio Declaration on Environment and Development (United Nations General Assembly 1992), the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (United Nations General Assembly 1998b), the Johannesburg Declaration on Sustainable Development (United Nations Department of Public Information 2002), etc. Equally important is the work of various international intergovernmental and non-governmental organizations dealing with environmental issues, including the UN, IAEA, UNESCO, IMO, FAO, etc. All of them pay great attention to the issue of ecocide.

While there is no single international law covering ecocide, some tools and procedures can be used to bring perpetrators to justice. Here are some examples of international mechanisms used for this purpose (Heidary and Vaezi 2020). Articles 35 and 55 of the Additional Protocol (AP) I to the Geneva Conventions of 12 August 1949 contain provisions directly aimed at protecting the environment during international armed conflicts (High Contracting Parties 1977). Paragraph 3 of Article 35 prohibits the use of methods or means of warfare intended or expected to cause widespread, prolonged, and severe damage to the natural environment. Article 55 stipulates that care should be taken to protect the natural environment from widespread, prolonged, and severe damage during hostilities. Such protection involves prohibiting the use of methods or means of warfare that are intended or expected to cause such damage to the natural environment and thereby endanger the health or survival of the population. Damage to the natural environment as a form of reprisal is prohibited.

These articles differ in that, firstly, Art. 35 prohibits the intentional use of methods and means of warfare that may cause damage to the environment, while Art. 55 imposes on states the duty of care to protect the environment during armed conflicts. Secondly, Art. 35 is aimed at specifically protecting the environment, because of its importance and intrinsic value, and Article 55 is aimed at protecting the environment to the extent necessary for the protection and defense of victims of war, the civilian population (Mynkovich-Slobodyanyk 2023). To be held liable for violations of the environmental protection requirements of AP I, the damage must be extensive, long-term, and severe (all three conditions should be met simultaneously). However, the concepts of "large, long-term and severe damage" are not defined in the AP I. The preparatory documents of the AP I used for its interpretation and doctrinal opinions make it clear that damage is considered extensive if it covers an area of about 20 thousand square kilometers. Damage is specified as long-term, if it lasts for several decades and is classified as severe if it also causes damage to the health or survival of the population.

It is controversial whether damage caused by war involving conventional weapons falls within the scope of Article 35(3) or Article 55 of the AP I: the impossibility of their further use is due to the danger associated with the explosives. The narrow interpretation of Article 35(3) and Article 55 can be considered outdated since "large, long-term and severe damage" is not legally defined in the Protocol; thus, the nature of the latter is relative and subject to change depending on the assessment of the qualifying authority (Panigaj and Bernikova 2023).

Even though the consequences of an attack fall outside the definition of "large, long-term and severe damage," it does not mean they are lawful. These consequences may violate other principles of International Humanitarian Law (proportionality, distinction, humanity, military necessity). The International Criminal Court has jurisdiction over war crimes, among which Article 8.2.b.iv of the 1998 Rome Statute distinguishes the intentional commission of an attack that causes damage to civilian objects or extensive, long-term, and severe damage to the natural environment if it is manifestly disproportionate to the specific and directly anticipated overall military advantage. In addition to the need to meet the cumulative standard, the offense requires proof of intent to commit an attack. Furthermore, the awareness of the significant destructive consequences of such an attack should be proved. Finally, the damage should be recognized as disproportionate in terms of the anticipated overall military advantage.

The cumulative standard is complemented by a requirement to apply a proportionality and military necessity test. Article 8 qualifies "crimes against the environment" as war crimes in section (b) instead of section

(a), which, in turn, defines grave breaches of the Geneva Convention. In addition, the provision of this article applies exclusively to international armed conflicts. However, crimes against the environment may constitute a material element of other crimes, such as genocide, crimes against humanity and other war crimes. In the 2009 Prosecutor v. Omar Al-Bashir decision, the International Criminal Court did not deny a link between environmental degradation and genocide (Borshchevska 2023).

The provisions of the main treaties on liability for environmental damage caused by armed conflict (AP I, the Environmental Modification Convention, and the Rome Statute) were not developed according to the logic of international environmental law but international humanitarian law. This is evident, firstly, in the subject matter of their regulation. Thus, one can find "hostile use of means of influence" in the Environmental Modification Convention, "methods and means of warfare", in AP I, and "attack" in the Rome Statute. Secondly, the prevailing doctrinal view is that IHL rules are *lex specialis* about international environmental law. However, the recommendations of international environmental law also contain provisions prohibiting damage to the environment. The World Charter for Nature stipulates, "Nature shall be protected from pillage because of war or other hostilities. Military actions which cause damage to nature should be refrained from."

Prosecution for environmental damage caused in times of war is more problematic than in peacetime. International liability under international criminal law may be incurred both for the state and state officials. At the same time, no international tribunal or criminal court has yet ruled on criminal liability for purely "environmental" crimes committed during an armed conflict (Hotz 2021). The International Tribunal for the Law of the Sea (ITLOS) is one of the international mechanisms for resolving disputes related to the United Nations Law of the Sea (UNCLOS) (United Nations 1982). ITLOS deals with disputes arising out of the application or interpretation of the UNCLOS, including those relating to the marine environment and environmental issues. ITLOS resolves disputes over the establishment of maritime boundaries and exclusive economic zones as per the requirements of the UNCLOS. ITLOS has jurisdiction over cases for protecting and preserving the marine environment. This involves prosecuting activities that cause damage to the marine environment, such as marine pollution, violation of the law of the sea, loss of biodiversity, etc. The ITLOS can resolve disputes related to compensation for environmental damage, in particular the determination of the liability of states or entities for violations of the law of the sea and determine the amount of compensation (Killean 2021).

Another example is the International Convention for the Conservation and Use of the Marine Environment of the Atlantic Ocean (OSPAR) (1998), which also provides mechanisms for the regulation and protection of the marine environment. The Convention is aimed at conserving and restoring marine biodiversity in the region, in particular, ensuring the sustainability of ecosystems and maintaining species in their natural environment. The Convention defines measures to prevent, reduce and control marine pollution by limiting emissions and discharges of hazardous substances. OSPAR provides a forum for cooperation between countries so that they can jointly develop and implement measures to protect the marine environment. On the legal side, the OSPAR Convention contains legal obligations for participants to implement measures to ensure the protection and sustainable use of the marine environment. In cases of violation of the Convention's provisions, it provides for the possibility of bringing a complaint by people or other participating states to people or other participating states before arbitration or the International Court of Justice. OSPAR is an important tool for regulating and controlling human activities in the marine environment and ensuring its sustainable use. Both mechanisms, ITLOS under UNCLOS and conventions such as OSPAR, establish a legal framework for handling cases related to environmental damage and provide opportunities for judicial resolution of issues related to marine environmental conservation (Artamonova et al. 2022).

If the ICC finds a person guilty of a war crime, in particular, environmental destruction under Article 8(2)(b)(iv) of the Rome Statute, possible consequences include imprisonment for the convicted person. ITLOS is responsible for resolving disputes between states regarding the establishment of maritime boundaries, decisions on environmental issues and the obligation of states to comply with the tribunal's decisions. The OSPAR Convention aims to protect and preserve the marine environment and determine mechanisms for compensating for the damage caused. States may be obliged to stop or reduce certain activities that cause damage and to compensate for the damage caused. Both mechanisms, the ICC and ITLOS/OSPAR, play a crucial role in establishing liability and ensuring the protection of the marine environment. However, their consequences are considered at different levels, namely, individual criminal liability or the collective responsibility of states (Moribe et al. 2023).

Environmental devastation caused by Russian military aggression in Ukraine

It is worth noting that the ICC already criminalizes environmental destruction during wartime or armed conflict under Article 8(2)(b)(iv) as a war crime. This provision places a significant emphasis on the protection of the natural environment in times of war, recognizing the importance of avoiding the unintended environmental consequences of hostilities. Article 8(2)(b)(iv) demonstrates that the ICC recognizes the importance of protecting the environment as a component of the general welfare in times of war. This provision is designed to prevent unforeseen environmental consequences of hostilities.

Article 8(2)(b)(iv) establishes legal responsibility for war crimes involving the environment and provides a mechanism for investigation and prosecution. When a case of environmental degradation is brought to the ICC, it can pave the way for a trial where an objective investigation and conviction for these crimes during war can be carried out. The general purpose of Article 8(2)(b)(iv) is to establish responsibility for protecting the environment in wartime and to create a legal mechanism for the protection of ecosystems in times of military conflict (Branch and Minkova 2023).

Even though environmental reparations are an exception in the ICC's history, they mean that the aggressor country must pay for such damage. The issue related to the fact of reparations is the proven amount of damage caused by the actions of the Russian army. According to the Ministry of Ecology of Ukraine, Russia is responsible for numerous natural disasters, such as large-scale explosions, ammonia storage explosions and attacks on nature reserves. There are also indirect consequences, such as dangerous amounts of greenhouse gases, carbon dioxide, or methane emissions into the atmosphere, which harm human health in the long term. Russian aggression against Ukraine has led to numerous local disasters; therefore, Ukraine's legal position on damage to the environment in claims against Russia should focus on documenting direct, hidden, and long-term damage from Russia's post-invasion actions (Rybachek 2022b). Although the environmental dimension will be presented as part of the broader genocide proceedings, it is possible to maximize the punishment for damage to the environment committed by the Russian Federation.

Currently, Russian troops harm the environment in Ukraine both intentionally, for military and political reasons, and indirectly. The short list of threats posed by Russian military aggression involving the environment in Ukraine includes forest fires caused by shelling, military equipment, missiles, ammunition, oil products poisoning soil and water resources, chemical emissions from shelled industrial enterprises, and risk of radiation accidents. According to the State Environmental Inspectorate, Russian aggression has caused more than UAH 1 trillion 743 billion worth of damage to the environment over eleven months of the war. Damage due to soil and land pollution amounted to over UAH 688 billion, air pollution to UAH 998 billion, and water pollution and contamination over UAH 56 million. Furthermore, over 6,000,000 farm animals and about 50,000 dolphins have been killed so far during this war. Despite the existence of a criminal article, it was only in 2022 that the Prosecutor Geiseral's Office reported suspicions of ecocide for the first time in Ukraine's history. The main reason for this was the results of the State Environmental Inspectorate's control measures conducted from 2015 to 2022. It took experts seven years to create an evidence base for pollution of rivers, which led to irreversible changes in the ecosystem (UKRAINFORM 2023).

The enemy troops are trying to do as much damage to the environment, infrastructure, and the economy of Ukraine as possible. The invaders deliberately degrade or even destroy Ukrainian nature. The first cases of deliberate arson by Russian troops began in early March 2022 in the Chornobyl Exclusion Zone. The fire destroyed 15,000 hectares of forests (including those contaminated with radiation) in the area from Irpin to Chornobyl. Equally large-scale fires raged in the Kherson region (in the Black Sea Biosphere Reserve, Sviatoslav's Biloberezhzhia National Nature Park) and the Donetsk region in the Holy Mountains National Nature Park. This includes the so-called Sarmatian forests, the sodden pine forests on the left bank of the Siverskyi Donets River in Kharkiv, Donetsk and Luhansk oblasts (UKRAINFORM 2023).

According to experts, it is impossible to restore Ukrainian forests under current conditions. In Kherson, the occupiers set fire to the Dnipro floodplains that are part of the Emerald Network on the Lower Dnipro. Such actions lead to a decrease in biodiversity, environmental pollution and damage or destruction of valuable habitats. More than 1,000 square kilometers of the Black Sea surface are polluted by oil from Russian military aircraft and ships, killing about 50,000 Black Sea dolphins.

The list of Russia's crimes against the environment also includes the following: the bombing of fuel and lubricant warehouses, oil product storage facilities and enterprises that may use hazardous and (or) chemical substances in production; damage, destruction, or suspension of the operation of wastewater treatment facilities; destruction of filtration field dams and leakage of waste onto the terrain; destruction of treatment or hydraulic structures; ignition (burning, smoldering) of landfills; degradation of soil and deforestation (Shamsutdinov 2023). The movement of heavy military equipment, explosions and fires contaminate natural and agroecosystems and degrade soil. The latter is due to mixing and over-compaction of soil horizons, disturbance of the upper fertile layer, chemical degradation, burnt soil, contamination with explosives, remnants of munitions, or various military equipment. Significant damage is caused to the air, soil, and water because of missile strikes on infrastructure facilities.

Russia has exposed Ukraine and the world to nuclear danger by resorting to international terrorism at nuclear facilities. This involves seizure, damage and affecting their functioning, which could lead to global accidents. The cost of the damage caused by Russian troops at the Chornobyl Nuclear Power Plant is at least UAH 2.5 billion. The level of nuclear threat remains high at Zaporizhzhia Nuclear Power Plant. Russian troops regularly shell the plant, deploy heavy weapons close by and do not allow Ukrainian experts and IAEA representatives to carry out repairs. The exclusion zone around the Zaporizhzhia Nuclear Power Plant in the event of a potential nuclear explosion could be up to 30,000 square kilometers (Rybacek 2023). The blowing-up of the Kakhovka hydroelectric power plant by Russian troops has already

had many catastrophic consequences and will have even more in the long term. The consequences of such actions are the flooding of dozens of settlements and civilian casualties, the erosion of minefields and waste dumps, the unavailability of water for irrigation, the killing of Red Book species and the threat to the operation of the Zaporizhzhia Nuclear Power Plant.

Russia must be held accountable for its crimes against the environment. To this end, the Operational Headquarters of the State Environmental Inspectorate of Ukraine was established to compile a list of all violations involving the environment, record ecocide and bring Russia to justice. On the initiative of the Verkhovna Rada Committee on Environmental Policy and Nature Management, the Ministry of Environmental Protection and Natural Resources, the State Environmental Inspectorate of Ukraine, NGOs and eco-warriors, information on Russia's crimes involving the environment is being collected. To collect data on these crimes, it was agreed to allow anyone to record information about damage caused to the environment by an aggressor state. In addition, the Ministry of Environmental Protection and Natural Resources of Ukraine, with the support of the Ministry of Digital Transformation of Ukraine and other partners, created EcoThreat, a separate official resource on the national online platform EcoSystem, for collecting and recording information on threats to the environment in real-time.

Currently, Ukrainian government agencies (the Verkhovna Rada, the Committee on Environmental Policy and Nature Management, the Ministry of Environmental Protection and Natural Resources and the State Environmental Inspectorate of Ukraine), volunteers, eco-warriors and citizens are actively working to record and document ecocide caused by Russia's military activity in Ukraine. This information will form the basis for determining the extent and cost of damage caused by military aggression, which the International Criminal Court needs, if it is to investigate war crimes against humanity and damage to the environment committed in Ukraine (Syvodyed 2022).

Legal framework and challenges in prosecuting ecocide

Responsibility for ecocide is stipulated in Article 441 of the Criminal Code of Ukraine (CCU) (Verkhovna Rada of Ukraine 1998). The legislator defines this crime 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." According to Article 12(6) of the CCU, the punishment for acts of ecocide is imprisonment for a term of 8 to 15 years, which indicates ecocide is a very serious crime. Similar provisions are provided for in the criminal laws of some other countries, including Australia, England, Estonia, Canada, Germany, Finland, Croatia, Slovenia, Serbia, and Montenegro. The generic object of this offense is public relations to ensure peace, human security, and international law and order.

The crime of ecocide is included in Chapter 20 of the CCU, "Criminal Offences against Peace, Human Security and International Law and Order." However, the CCU has Chapter 8, "Criminal Offences against the Environment." Therefore, ecocide is a more global and widespread crime. The disposition of Art. 441 of the CCU contains many evaluative concepts. What do "mass destruction," "poisoning," and "environmental catastrophe" mean? What is the difference between "illegal logging" (punishable under Article 246 of the CCU) and "mass destruction of flora" (Article 441 of the CCU)?

The subject of ecocide is a person of sound mind who is 16 years of age or older. The subjective side of ecocide is criminal intent. It should be noted that direct intent is more typical for this crime. Such a criminal offence is committed when any of the acts specified in Article 441 of the CCU could have caused an environmental disaster. An act is classified as a criminal offence, when its consequences are mass destruction of flora or fauna or poisoning of the atmosphere or water resources. For example, marine pollution that causes mass deaths of flora and fauna or other grave consequences is classified under Part 2 of Article 243 of the CCU (Prodan et al. 2023).

However, Russian troops are not the only perpetrators of ecocide. Furthermore, this crime can be committed not only in wartime. Currently, the Specialized Environmental Prosecutor's Office of the Prosecutor General's Office is working on a case against employees of a cardboard and paper mill in Khmelnytskyi Oblast. For several years, this company discharged contaminated water into the small Khomora River. As a result, several kilometers of the river were damaged to the extent that it is almost impossible to restore nature. This case qualifies as ecocide (McIntyre-Mills 2021).

Under Section 11.4 of the draft CCU, one of the manifestations of war crimes is the knowledge that a directed attack will, among other things, cause large, long-term, and severe damage to the environment, which is disproportionate to the specific and directly anticipated overall military advantage. Thus, liability is established for an environmental effect, which is when a prohibited means of warfare is used. However, as provided for in the current CCU, ecocide (on a par with genocide) should be recognized as an independent international crime. The draft CCU does not provide for a separate article on liability for such actions as an element of crimes against international law and order, which needs to be amended. It is important not only to punish Russia for all crimes of ecocide committed in Ukraine since 2014, but also to force the terrorist state to compensate for all the environmental damage caused (Mynkovich-Slobodyanyk 2023).

Currently, the priority task for Ukraine is to estimate the ecosystem services lost by the Ukrainian people and include this in the total reparation to be paid by the Russian Federation. However, the current methods of calculating environmental damage discussed above do not fully consider the damage caused by the loss of ecosystem

services. Ecosystem services are all the useful resources and benefits obtained from nature. Ecosystem services are crucial for satisfying fundamental human needs for habitat and food and directly affect our standard of living. The loss of ecosystem services has quite devastating consequences. Thus, the destruction and damage of forests will lead to large-scale wind erosion and desertification of entire regions in the future.

All ecosystem services are free, but some of them should be monetized, i.e., valued in monetary terms. Such monetization is necessary to include the value of the ecosystem services lost in the reparation to be paid by Russia to Ukraine. When creating a compensation mechanism, it is crucial to consider the international practice of compensation for environmental damage caused by military operations, particularly the practice of the International Court of Justice. For example, the concept of ecosystem services was used in the case of Costa Rica v. Nicaragua. Costa Rica used the "ecosystem services approach" to determine the amount of environmental damage, according to which the value of the environment was assessed through the services and goods it could provide and which might or might not be sold on the market (Borshchevska 2023). It is necessary to consider the direct and indirect use value of ecosystem services and goods as it allows the assessing of the full and potentially long-term damage caused to the environment.

In developing doctrinal approaches to these issues, the historical experience of establishing special compensation bodies should be analyzed. For example, the UN established a separate body, the United Nations Compensation Commission, to compensate for environmental damage and other losses caused by Iraq during its armed aggression against Kuwait (1990–1991). The United Nations Compensation Commission was established as a temporary subsidiary body of the UN Security Council in 1991 to consider claims and payment of compensation for losses and damage caused by the illegal invasion by Iraq and occupation of Kuwait. The Compensation Commission operated for 31 years and was terminated in 2022. Iraq paid about 52.4 billion in damages as of 2022 for all claims of all categories (5.26 billion was paid to compensate for environmental damage).

Currently, it is crucial for Ukraine to actively and systematically collect evidence, record, and store environmental monitoring data, document environmental effects and assess environmental damage using standard methods and be prepared to substantiate claims against the aggressor state at the international level (Rybachek 2022a). Nevertheless, the formalization of the public danger and punishment for ecocide in no way indicates the effectiveness and proper environmental protection. Therefore, in addition to legislation, it is necessary to study the practical dimension, i.e., the Unified register of pre-trial investigations. The number of criminal proceedings, the number of verdicts and their ratio are a measure of the effectiveness of a particular law on criminal liability so that pre-trial investigation bodies, procedural managers and courts know how to "work" with this type of criminal offense.

In this context, it should be noted that problems with the enforcement of Article 441 of the Criminal Code of Ukraine existed even before the full-scale invasion. For example, against the backdrop of large-scale floods in the Carpathian region in June 2020, a coordination meeting on environmental issues was held for the first time in Ukraine since its independence. The former Prosecutor General Iryna Venediktova noted that more than four dozen laws regulated environmental protection. However, the system of liability for environmental offences and guaranteeing respect for the environment in terms of human rights remains relatively weak. For this reason, 2021 should be defined as a period of active environmental protection and effective cooperation between law enforcement agencies in this area (Pavlova 2023).

At the same coordination meeting on environmental issues, Ivan Bakanov, the former Head of the Security Service of Ukraine, reported 184 criminal proceedings for crimes involving the environment. Ivan Bakanov identified environmental issues as one of the elements of national security. This raises the question whether 2021 was the start of a period of active environmental protection and effective cooperation between law enforcement agencies in this area. The answer to this question can be found in the Unified State Register of Court Decisions (USRCD). This document reveals that there were no verdicts in the USRCD for cases of ecocide or Article 441 of the Criminal Code of Ukraine. Thus, pre-trial investigations of criminal proceedings for environmental crimes, including ecocide, conducted by the Security Service of Ukraine showed their inefficiency, as no act was convicted by a local general court (Security Service of Ukraine 2021).

Today, the issue of liability for environmental crimes has taken on new significance. Pollution of air, water and soil, forests and agricultural land and attacks on nuclear facilities are considered war crimes. People in Ukraine and beyond will feel the consequences of these actions for decades to come, as the effects will extend beyond the borders of Ukraine. The vulnerability of nature to such effects endangers ecosystems and leads to large-scale environmental problems that are not limited to the area of conflict. It is worth noting that pre-trial investigations are currently underway on more than two hundred proceedings on Russian war crimes involving the environment, including 14 acts classified as ecocide. It will take Ukraine 20 to 30 years to fully assess the damage caused by Russian aggression and calculate direct and indirect losses.

Given that ecocide is not subject to the rule set out in Part 5 of Article 49 of the CCU, it can be concluded that the perpetrator will be released from criminal liability upon the expiry of the fifteen years from the date of the criminal offence and the proceedings closed. Therefore, it is reasonable to assume that all 14 proceedings for acts classified as ecocide are unlikely to result in a verdict.

However, exemption from criminal liability due to the expiry of the statute of limitations is not exoneration. Having collected all the necessary evidence, the state still has the right to file a claim for damages in civil proceedings, but it is not possible to bring the perpetrators to criminal liability in such circumstances. Thus, there is no case law under Article 441 of the CCU. Given the consistent lack of initiative in the exercise of law enforcement functions, it can be concluded that until such a case is considered by the Criminal Court of Cassation of the Supreme Court, neither pre-trial investigation bodies nor local courts will know how to work with this article. Therefore, Article 441 of the CCU is currently only declarative and formal.

Discussion

Currently, Article 5 of the Rome Statute (United Nations General Assembly 1998a) contains only four crimes, namely genocide, crimes against humanity, war crimes and crimes of aggression. Damage to the environment is a war crime, but the wording of Article 8 does not provide a clear definition and can hardly be proved in court. In addition, the Rome Statute does not address severe damage to the environment that occurs in peacetime. The Stop Ecocide Foundation and the Swedish Parliament are currently working on amending the Rome Statute. The initiative group suggests amending Article 5 with the crime of ecocide and adding an article to the international legal act defining its elements.

According to the proposed Article 8, ecocide means unlawful or unjustified acts committed with the knowledge that there is a substantial likelihood that such acts will cause severe and widespread or long-term damage to the environment. Experts have also developed a clear definition of the terms used in this proposed article. In particular, unreasonable means reckless disregard for harm that would be manifestly excessive bearing in mind the expected social and economic benefits; serious means harm that involves adverse changes, disruption or damage to any element of the environment, including effects on human life or natural, cultural or economic resources; widespread means damage that spreads unrestrictedly, crosses national borders, affects entire ecosystems or individual species, or large numbers of people; long-term means damage that is irreversible or cannot be compensated for by natural recovery within a reasonable time; environment means the Earth, its biosphere, cryosphere, lithosphere, hydrosphere and atmosphere, and outer space (Negri 2022).

A very important step towards a clear standardization of the crime of ecocide was the adoption of a resolution on the negative effect of war on the environment by the Parliamentary Assembly of the Council of Europe. This happened on 25 January 2023. In it, PACE deputies stressed the importance of defining the concept of ecocide in both national legislation and international law. The resolution recognizes the need to amend the Rome Statute of the International Criminal Court and add ecocide as a new crime. If these changes are introduced, Ukraine will be able to sue Russia in the ICC for crimes involving the environment, such as, destroyed ecosystems, contaminated soil, burnt forests, etc.

The world already has a precedent for punishing an aggressor for environmental damage. In the spring of 1991, the UN Compensation Commission was established to consider all claims for compensation for losses and damages caused to Kuwait because of the Iraqi military invasion and occupation. A separate area of the Commission's work was the consideration of claims for compensation for environmental damage worth USD 80 billion. As a result of its work, the Commission partially satisfied these claims, with a payment of just over five billion dollars (Prakasa 2021).

In general, ecocide has become a recognizable crime against humanity and others. Both in Ukraine and in the world, there are active discussions about compensation for environmental damage caused by Russia. There is a high probability that the Rome Statute will be amended, and Ukraine will be able to receive full compensation through the International Criminal Court. All that remains for Ukraine to do is to record Russian war crimes carefully and meticulously.

Conclusions

Currently, there is no universally recognized definition of the crime of ecocide in international humanitarian law. Ecocide is a concept that has emerged in the context of debates on environmental damage and human rights, and its legal definition has not yet been finalized or accepted by international treaties or courts. However, recently, there has been an active discussion about the possibility of recognizing ecocide as an independent crime in international humanitarian law. The idea is to provide international legal protection for the environment and prevent serious environmental disasters by criminalizing actions aimed at systematically damaging the environment. Different organizations and groups propose different definitions of ecocide, but a specific legal definition still requires further discussion, diplomatic efforts, and possibly new international treaties.

Ukraine has entered the fight for accountability for ecocide based on international norms and instruments. The filing of lawsuits against Russia in international judicial bodies, particularly the International Court of Justice, demonstrates Ukraine's seriousness in holding the aggressor state accountable for damaging the environment during the invasion. Although the concept of ecocide does not yet have a universal definition in international law, there are initiatives and proposals to establish the international legal status of ecocide as a separate crime. Researchers and experts are already working on defining ecocide and

establishing its status as an international crime. This raises the possibility of holding the aggressor state accountable for damaging the environment, the use of prohibited methods of warfare and environmental pollution.

Filing lawsuits with the International Criminal Court and the possibility of considering environmental crimes within the framework of genocide create chances for bringing to justice those responsible for ecocide. In addition, the possible filing of a separate lawsuit with the International Tribunal for the Law of the Sea will allow us to focus on issues related to environmental crimes committed during the blockade of Ukrainian ports and toxic substances leaking into the water. Prosecution for ecocide requires not only legal measures but also international cooperation, public pressure, and mobilization of resources to collect evidence. It is important to maintain a dialogue with international partners and engage civil society organizations and activists to ensure proper investigation and prosecution of perpetrators.

Ukraine has a strong legal and factual argument to hold Russia accountable for ecocide, which includes the destruction of natural resources, water and air pollution, and other actions that could result in an environmental catastrophe. Bringing the perpetrators to justice and obtaining compensation for the damage will be important steps in protecting the environment and ensuring the vital interests of people.

By continuing to fight for accountability for ecocide, Ukraine shows its determination to ensure environmental protection and prevent future environmental crimes. International efforts and cooperation will be important factors in this process, as prosecution for ecocide is of global importance for the preservation of our planet and well-being of future generations.

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