AJEE
ACCESS TO JUSTICE IN EASTERN EUROPE
Peer-reviewed Journal

Access to Justice in Eastern Europe
ISSN 2663-0575 (Print)
ISSN 2663-0583 (Online)
Journal homepage http://ajee-journal.com

Research Article

THE RESPONSIBILITY FOR ENVIRONMENTAL DAMAGES DURING ARMED CONFLICTS: THE CASE OF THE WAR BETWEEN RUSSIA AND UKRAINE

Mohamad Albakjaji

Submitted on 23 Oct 2022 / Revised 05 Nov 2022 / Approved **15 Nov 2022**
Published: **15 Dec 2022**

Keywords: *Environment, damage, responsibility, international law, customary law, Russia, Ukraine.*

ABSTRACT

Background: *There is no war without catastrophic impacts, not only on humans and states but also on the environment and nature. As with all wars, the question is raised as to whether an invasion or aggression is legitimate according to international law. This research aims to discuss an emerging issue at the international level, which is the responsibility of the aggressor state for*

Mohamad Albakjaji
PhD (Law), Assistant Professor at the College of law at Prince Sultan University, Saudi Arabia mabkjaji@psu.edu.sa https://orcid.org/0000-0001-5160-0530?lang=en **Corresponding author**, solely responsible for writing and research. **Competing interests:** Any competing interests were declared by the author. **Disclaimer:** The author declares that his opinion and views expressed in this manuscript are free of any impact of any organizations.
Funding: The authors would like to thank Prince Sultan University for supporting this publication. Special acknowledgement is given to the Governance and Policy Design Research Lab (GPDRL) at Prince Sultan University (PSU) for their academic support to conduct this research and publish it in a reputable journal.
Managing editor – Dr. Serhii Kravtsov. **English Editor** – Dr. Sarah White.

How to cite: M Albakjaji 'The Responsibility for Environmental Damages During Armed Conflicts: The Case of the War between Russia and Ukraine' 2022 4-2 (17) Special Issue Access to Justice in Eastern Europe 82-101. https://doi.org/10.33327/AJEE-18- 5.4-a000444

the environmental damages incurred by the victim state. This paper discusses the possibility of establishing Russia's responsibility for the environmental damages incurred in Ukraine. It will also shed light on the possible ways Ukraine may raise Russia's responsibility, internationally speaking. The novelty of this study stems from its originality – it is the first on this topic in the field of international relations and international law.

Methods: *In this research, the author used a case study to provide an in-depth perspective on the responsibility of the invading state for the environmental damages caused to the victim state. Here, the author used a historical and statistical framework to shed light on the impacts of the Russian aggression against Ukraine on the environment. Moreover, analytical and structural methods were deployed to explain the methods by which Ukraine and the international community might establish Russian responsibility for the environmental damages caused by the invasion. To support the ideas discussed in this paper, the author uses legal texts, international conventions, and official reports issued from national and international institutions.*

Results and Conclusions: *The author found that the Russian aggression against the Ukrainian territory has caused severe environmental damages, which cannot go unpunished. Although traditional international law may be insufficient to punish Russia, customary law, warfare law, and international environmental law include rules that may be used to raise the Russian responsibility for these damages.*

1 INTRODUCTION

Since the first day of the Russian aggression, Ukraine has suffered catastrophic environmental losses, and as time has passed and the war has continued, the environmental damages have increased and become more serious. In the months since Russia invaded, many pieces of research have been conducted, shedding light on issues of the legitimacy of this invasion and the attitudes of countries and international law towards such an aggressive attack. Yet, the gap in the previous legal literature is that the question of the environmental damages of the attack and Russia's responsibility for such losses have not yet been discussed. Therefore, the present research will attempt to answer the following two questions:

- What are the most important environmental damages caused by the Russian attack on Ukraine?
- What are the possible ways in which Ukraine can raise the issue of the responsibility of Russia for environmental damages?

To answer these questions, the first section will discuss the most important environmental effects of the Russian invasion of Ukraine from the perspective of international law, environmental law, and international custom. The second section will discuss the effectiveness of these legal frameworks in raising the issue of the responsibility of Russia.

2 OVERVIEW OF THE SOURCES

Green and Kirsch have both discussed the humanitarian consequences of the Russian assaults, as well as its impacts on the globe, nations, and people.[1] Green outlined the

1 JA Green, C Henderson, T Ruys, 'Russia's attack on Ukraine and the jus ad bellum' (2022) 9(1) Journal on the Use of Force and International Law 4-30 Krisch N, 'After hegemony: the law on the use of force and the Ukraine crisis' (EJIL:Talk!, 2 March 2022) <www.ejiltalk.org/after-hegemony-the-law-on-the-use-of-force-and-the-ukraine-crisis> accessed 20 July 2022.

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ISSN 2663-0575 (Print) ISSN 2663-0583 (Online)
Journal homepage http://ajee-journal.com

impacts of the invasion on the international level, arguing that the invasion would have implications not only for Ukrainian territory but for the whole world. Sanger focused on the reasons behind this invasion, explaining that Russia claimed that the main reason for the invasion was that Ukraine wanted to create its own nuclear weapons in cooperation with the USA.[2] Other scholars have discussed the issue of enhancing military justice during wartime. They argued that during the Russian invasion, most of the courts were completely paralysed, so Ukraine had to establish military justice during the war.[3] Prytyka et al. discussed the impacts of the martial law regime imposed in Ukraine following the Russian aggression. They highlighted the impacts of this new regime on other areas, such as the realisation of property rights, the administration of justice, the enforcement of court decisions, and labour relations, where a new legal framework is needed to reorganise these issues during wartime.[4] Further, Kaluzhna et al. tried to establish the Russian responsibility for this invasion, arguing that this invasion counts as a war crime – which is a type of international crime. They alerted the Ukrainian legislature to the necessity of adopting new amendments in many important areas, such as amending the Criminal Procedure Code (CPC) to verify sources of evidence.[5]

Regarding environmental protection, many studies and publications have emerged on the impacts of the Russian invasion of Ukraine, such as the work of De Ferrer (2022) and the report of WWWF on the environmental impact of Russia's war in Ukraine.[6] Although the literature discussed the Russian invasion of Ukraine from various perspectives, the impacts of the invasion on the environment and the Russian responsibility for environmental damages have not yet been raised in the literature. This is the basis for the originality of the current research, which makes this study a reference point for both academics and practitioners. Hence, the next section will elaborate on the impacts of the Russian aggression on Ukrainian green spaces and the environment and the best ways for Ukraine to raise the Russian responsibility for the environmental damages.

3 THE ENVIRONMENTAL IMPACTS OF THE RUSSIAN INVASION

Ukraine is a country that aspires to open up to Europe and become part of the EU confederation. It was previously part of the Soviet Union, from which it inherited an outdated industrial and energy infrastructure that has impacted the ecosystem. As a result of this inheritance, Ukraine's CO2 intensity and air pollution are the highest in Europe. With the dramatic increases in pollution in Ukraine, the rates of diseases and deaths have become

2 DE Sanger, 'Putin Spins a Conspiracy Theory That Ukraine Is on a Path to Nuclear Weapons' (New York Times, 23 February 2022) <https://www.nytimes.com/2022/02/23/us/politics/putin-ukraine-nuclear_weapons.html)> Accessed 4 August 2022.

3 O Kaplina, S Kravtsov, O Leyba, 'Military Justice in Ukraine: Renaissance During Wartime' (2022) 3(15) Access to Justice in Eastern Europe 120-136.

4 Yu Prytyka, I Izarova, L Maliarchuk, O Terekh, 'Legal Challenges for Ukraine under Martial Law: Protection of Civil, Property and Labour Rights, Right to a Fair Trial, and Enforcement of Decisions' 2022 3(15) Access to Justice in Eastern Europe 219-238.

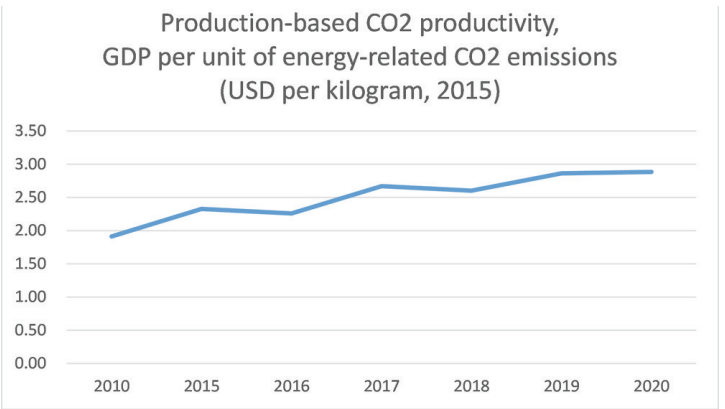
5 O Kaluzhna, K Shunevych, 'Liability Mechanisms for War Crimes Committed as a Result of Russia's Invasion of Ukraine in February 2022: Types, Chronicle of the First Steps, and Problems' 2022 3(15) Access to Justice in Eastern Europe 178-193.

6 M de Ferrer , 'Radiation levels at Chernobyl are rising: The environmental impact of Russia's war in Ukraine' (Euro News, 25 February 2022) <https://www.euronews.com/green/2022/02/25/radiation-levels-at-chernobyl-are-rising-the-environmental-impact-of-russia-s-war-in-ukrai> accessed 28 July 2022. See also 'Assessing the Environmental Impacts of the War in Ukraine' (World Wildlife Fund (WWF), 13 June 2022) <https://wwfcee.org/news/assessing-the-environmental-impacts-of-the-war-in-ukraine> accessed 6 August 2022.

the highest among the Organization for Economic Cooperation and Development (OECD) countries. Again, green spaces and water resources have dramatically decreased as a result. This will leave the region with a toxic legacy for future generations.[7]

Following the revolution of dignity and the initiative to join the EU by signing the agreement in 2014, Ukraine has adopted its plan to transition into a low-carbon, green economy. Major steps have been taken in this regard, such as the 'Strategy of the State and Environmental Policy of Ukraine for the Period till 2030', with its action plan to reduce pollution by 2025.[8] The national plan to end coal mining and the national system to implement new and effective environmental policies have been established as well. A legal reform has also been established in line with the UN association agreement. Regarding institutional reform, the 2030 plan aims to integrate ministries and businesses into the green economy transition. To implement the EU green deal, an inter-ministerial body has been established, which is supervised by the Deputy Prime Minister. These inspiring initiatives have been supported by Ukraine's international partners, such as the OECD.

Chart 1 clearly shows the tangible results of these reforms in terms of CO2 emissions.



Source: OECD.stat, EU4Environment (2022), 'Towards the green transformation of Ukraine: State of Play in 2021 Monitoring progress based on the OECD green growth indicators'.[9]

According to the chart, these reforms brought impressive and tangible results. The OECD has noted that the emission of CO2 has clearly been reduced, and the use of renewable energy sources has increased compared to previous years. In addition, the rate of water usage and sewage networks doubled to 64% of the population. Additionally, the green spaces and protected areas have increased, so that they cover nearly 7% of the country.

Unfortunately, all hopes for environmental progress and transition into sustainability in Ukraine have vanished after the Russian invasion of Ukraine, which has caused devastating

7 'Economic cost of the health impact of air pollution in Europe – clean air, health and wealth' (World Health Organization Regional Office for Europe) <https://www.euro.who.int/__data/assets/pdf_file/0004/276772/Economic-cost-health-impact-air-pollution-en.pdf> accessed 4 August 2022.

8 D Saha, P Bilek, E Cherviachenko, M von Mettenheim, R Stubbe, 'Economic reasons for a green reconstruction programme for Ukraine' (Berlin, April 2022) 1-16 <https://www.lowcarbonukraine.com/wp-content/uploads/PB_03_2022_en_Green-reconstruction.pdf> accessed 4 August 2022.

9 'Towards green transformation of Ukraine: State of Play in 2021 Monitoring progress based on the OECD green growth indicators' (EU4Environment, 2022 forthcoming) <https://www.eu4environment.org/app/uploads/2021/05/Ukraine-country-profile-2020-21-second-edition.pdf> accessed 4 August 2022.

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ISSN 2663-0575 (Print) ISSN 2663-0583 (Online)
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effects on the land and also led to the displacement and killing of thousands of people. Also, the shelling of land, forests, energy infrastructure, water, and ecosystems has caused immediate and long-term damage to the whole country.[10] Many of these issues, such as air and water pollution and the leakage of toxic substances, could be considered cross-border environmental damages, which will not be limited to the Ukrainian territories but will impact the whole European area or even further.[11] Also, because of military operations, the amount of waste has increased, such as medical waste, uncollected household waste, and shell fragments. These types of waste require special treatment, which is costly and exceeds the capabilities of Ukrainian finance.[12]

Although the environmental damages have increased over time, these damages are usually unreported. This is because the national monitoring systems have been disrupted or destroyed. However, some governmental efforts have been put in place to document the environmental damages, such as the EcoZagroza system, which includes a dashboard with data on the environmental damages resulting from the war. In addition, special governmental bodies have been established to record the environmental impacts of the war. These bodies could record more than 1,200 cases of environmental damage caused by the aggression.[13]

The UN Environmental Program (UNEP) and the environmental authority within the UN system are supporting the Government of Ukraine on a remote environmental impact monitoring basis. They are preparing to undertake field-level impact assessments, which are expected to be a colossal task, given the scale and geographical spread of reported incidents. As an international reaction to this invasion, the UNEP has prepared a program in cooperation with the Ukrainian government to monitor the environmental impacts of the Russian invasion. This supporting program is very important for UNEP, as it helps the UN review the environmental state, globally speaking. However, this task seems very difficult, as the environmental incidents are spread over a large geographical area.[14]

The UNEP has conducted many impact assessments in different areas of the conflict around the world, such as Sudan, South Sudan, Somalia, Afghanistan, the occupied Palestinian territories, Lebanon, Colombia, Kosovo and the Western Balkans, Iraq, and Congo. As mentioned by the UNEP Executive Director Inger Andersen: 'war is literally toxic'.[15] Lubrani, the UN's Resident Coordinator in Ukraine, also mentioned the tragedy of the displaced Ukrainians who need a clean environment to encourage them to return.[16]

10 Ibid.

11 'Briefing on the environmental damage caused by the Russian invasion of Ukraine' (Ministry of Energy and Environment Protection of Ukraine, April 2022) <https://mepr.gov.ua/en/news/39144.html> accessed 4 August 2022.

12 Ibid.

13 'Environmental impacts of the war in Ukraine and prospects for a green reconstruction' (OCED 2022) <https://www.oecd.org/ukraine-hub/policy-responses/environmental-impacts-of-the-war-in-ukraine-and-prospects-for-a-green-reconstruction-9e86d691/> accessed 4 August 2022.

14 The report of the UN environment programme (4 July 2022) <https://www.unep.org/news-and-stories/press-release/un-warns-toxic-environmental-legacy-ukraine-region> accessed 4 August 2022.

15 She added that 'The mapping and initial screening of environmental hazards only serves to confirm that war is quite literally toxic,' 'The first priority is for this senseless destruction to end now. The environment is about people: it's about livelihoods, public health, clean air and water, and basic food systems. It's about a safe future for Ukrainians and their neighbors, and further damage must not be done.' UN warns of toxic environmental legacy for Ukraine, region. 'Ukraine will then need huge international support to assess, mitigate and remediate the damage across the country, and alleviate risks to the wider region,' she added. The report of the UN environment programme (n 15).

16 He stated that 'Millions of displaced Ukrainians need a safe and healthy environment to come home to if they are expected to be able to pick up their lives. As soon as the fighting ends, and it must end soon, a colossal clean-up operation must be supported'. See The report of the UN environment programme (n 15).

The next section will outline the main damages or impacts of the Russian invasion on the Ukrainian environment, elaborating on different aspects of these environmental damages.

3.1 Impacts on Energy and Infrastructure

According to the UNEP, the conflict has caused damage in many fields, such as energy infrastructure and nuclear power sites, as well as mines and industrial sites. Many industrial sites have been damaged, some of which were storing dangerous substances, such as solvents, ammonia, and plastics. Dangerous substances have been released from explosions in agro-industrial sites, including fertiliser and nitric acid sites. Also, reports stated that livestock farms have been targeted, and the bombings have caused the death of a large number of animals. Therefore, the livestock carcasses will be a further risk to public health and the environment.

The cleaning process and removing the destroyed housing debris will be challenging as well, especially where this debris is already mixed with toxic substances, especially asbestos. Also, there are risks and threats coming from military operations and the use of weapons that leave military waste and asbestos. This will make the cleaning process challenging in urban areas. Thus, the military invasion will have a long-term impact on public health and poses a threat, such as cancer and respiratory conditions.[17]

3.2 Impacts on Natural and Protected Areas

Regarding the strategic location of the country, the CBD Fifth National Report (2013) clearly described the importance of this, stating that:

> *Ukraine has a high diversity of habitats and species. It is part of a broader region stretching across Central and Eastern Europe sometimes referred to as the "Green Heart of Europe". This includes rare steppe ecosystems, coastal wetlands, alpine meadows, ancient beech forests, and extensive peatlands. The country shares a part of the Danube Delta, the second-largest river delta of continental Europe and the largest reed-bed in the world. It includes vast pine, oak, and birch forests and peat bogs in the Polyssia region of northern Ukraine. The Carpathian Mountains in the western part of the country are home to ancient beech forests and alpine meadows. Importantly, rare steppe ecosystems survive in the central and eastern parts of Ukraine.[18] Ukraine takes up 35% of Europe's biodiversity, there are over 70,000 rare and endemic flora and fauna. This could unfortunately be destroyed during this war. 16% of Ukraine's land area is covered by forests.[19]*

According to the Ukrainian Ministry of Environment and Natural Resources, more than 900 natural sites covering 30% of the protected sites in Ukraine have been affected by

17 'How has the war impacted Ukraine's environment?' Report of the Word Economy Forum. 21. March. 2022. https://www.weforum.org/videos/the-environmental-cost-of-russia-s-war-in-ukraine?collection=popular-video-51fa76d387. Accessed on 25 July 2022.

18 'Assessing the Environmental' (n 7)

19 They also stated that: 'The territory of Ukraine contains habitats that are home to 35% of Europe's biodiversity, including 70,000 plant and animal species, many of them rare, relict, and endemic. They include European bison and brown bears, lynx, and wolves as well as sturgeon, the world's most threatened group of species'. See 'Fifth National Report of Ukraine to the Convention on Biological Diversity' (CBD Fifth National Report, 2013) <https://www.cbd.int/doc/world/ua/ua-nr-05-en.pdf> accessed 25 July 2022.

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ISSN 2663-0575 (Print) ISSN 2663-0583 (Online)
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military operations.[20] Satellite data from the European Forest Fire Information System indicates that the invasion has destroyed over 100,000 hectares of natural ecosystems.[21] Moreover, the Emerald Network is under threat – more than a fifth of the Emerald Networks sites, which are protected under the Bern Convention, have been destroyed because of the military invasion. As troops concentrate along the Siverskyi Donets River, dense forests have been degraded by military shelling.[22] Also, military operations pose a threat to more than 14% of the Ramsar sites and wetland sites, which are internationally recognised by the Ramsar Convention on Wetlands. In addition to the destruction of natural sites, military operations pose a threat to wildlife, as these operations occur in spring, which is the reproductive season for animals.[23]

As indirect impacts, most natural site activities have been suspended, especially in the regions of Donetsk, Luhansk, Zaporizia, Kherson, Mykolaiv, Kharkiv, Sumy, Chernihiv, Kyiv, and Crimea, where it has been reported that the troops have withdrawn, and the rangers and other staff in these sites have been called to join the army and territorial defence. So, these sites have been left unattended and without any care. Many of them have been damaged and need to be restored. Also, many of these sites have been affected by significant numbers of refugees, as the facilities and resources have been greatly damaged. Synevir National Park and the Carpathian Biosphere Reserve have provided a refuge for more than 15,000 refugees. Displacing the staff of environmental enforcement forces or having them join the army has increased the risk of illegal logging. Also, the treatment facilities in the conflict areas, such as Severodonetsk, Lysychansk, Rubizhne, and Popasna, have been damaged as well and are spewing wastewater into the environment.[24] On 21 March, an attack targeting a chemical plant near Sumy led to the emission of ammonia. In addition, the explosion of an acid tank led to the forming of a toxic cloud of nitrogen acid near Rubizhne. Moreover, increasing military operations in the region will inevitably increase GHG emissions at a time when all the efforts aim to reduce such emissions.[25]

3.3 Economic Impacts and Opportunity Costs

As mentioned earlier, the longstanding heritage of the Soviet Union has posed a significant threat to Ukraine in contemporary times. Energy, oil, mining, and industrial sites have become a source of threat because of the indiscriminate Russian bombing of these facilities, which has caused a release of toxic acid and hazardous materials that have negative impacts on the air, ecosystem, freshwater resources, and soil. Heavy metals and other substances may permeate underground and affect the soil and the quality of the underground water, which will not be suitable for use. This is exactly what happened in the eastern area. The treatment facilities were threatened, as were Severodonetsk, Lysychansk, Rubizhne, and Popasna. These sites have started spewing wastewater into the soil. As a result, this has caused the pollution of the water sources.

Undoubtedly, the war has had economic impacts that affect the environment. Many plans, strategies, and investments have been either cancelled or delayed because of military operations. Ukraine has a plan, and there are strategies and other engagements, such as the

20 'How has the war impacted Ukraine's environment?' (n 18).
21 'Assessing the Environmental' (n 7).
22 Ibid.
23 Ibid.
24 Ibid.
25 Ibid.

Nationally Determined Contribution (NDC), which was adopted by the Paris Agreement in June 2021.[26] According to this agreement, Ukraine is committed to reducing greenhouse gas emissions by 65% by 2030.[27] However, these strategies and plans have currently been cancelled. So, the environment has lost many green opportunities.

Unfortunately, most renewable energy sources are located in the south and east of the country, where many of these sites have been dramatically destroyed by military operations. In losing such activities, Ukraine lost many golden opportunities for investments that could have helped the country fulfill its environmental obligations and engagements. Conservation activities have been cancelled as well. Many projects funded and run by WWF-Ukraine and other international and European organisations have been negatively affected.[28]

3.4 Nuclear Risks

Immediately after the first day of the Russian invasion, a risk of radiation was reported equivalent to approximately 28 times the annual limit.[29] According to the Environmental Performance Index, Ukraine has a low-performance indicator in many areas, such as air and ecosystem protection. The war makes the situation worse than ever.[30]

The military operation in the vicinity of the Zaporizhzhya nuclear power plant, which has six reactors, may increase the risk of radiation crises that will spread to Europe.[31] As mentioned by de Ferrer in the report on radiation levels at Chornobyl, Ukraine runs more than 15 nuclear sites. So, any damage to one of these by military operations will have catastrophic impacts on the environment and people. The report raised the issue that the pollution and leakage from these sites will affect not only Ukraine's territory but the whole European region as well and cause severe health problems, such as cancer.[32]

26 In order to achieve the long-term temperature goal set out in Art 2, parties must reach a global peak of greenhouse gas emissions as soon as possible, recognising that peaking will take longer for developing country parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty. See the website of the United State. Climate change. Paris Agreement. https://unfccc.int/sites/default/files/english_paris_agreement.pdf > Accessed on 25 July 2022.

27 EU4Environment (n 10).

28 The report of the World Wildlife Organization stated that: 'The outbreak of war has frustrated plans to translocate European bison from Poland to the Chornobyl Biosphere Reserve in Ukraine – part of a multi-year effort to create the largest free-roaming herd of bison in Europe on over 200,000 hectares of protected areas stretching from Ukraine to Belarus. Investments in improving the management of protected areas have also been suspended, including investment in park facilities and infrastructure. The process of granting official protection to over 10,000 hectares of virgin forest, which had been expected in 2022, is on hold'. See 'Assessing the Environmental' (n 7).

29 'Ukraine invasion: rapid overview of environmental issues' (Conflict and Environment Observatory, 25 February 2022) <https://ceobs.org/ukraine-invasion-rapid-overview-of-environmental-issues/> accessed 28 July 2022.

30 Wolf MJ, Emerson JW, Esty DC, de Sherbinin A, Wendling ZA, et al, *2022 Environmental Performance Index* (Yale Center for Environmental Law & Policy 2022).

31 de Ferrer (n 7).

32 Ibid. In addition, after Russia occupied the territory, Ukraine blocked off the North Crimean Canal, which was used to divert water from the Dnieper River to irrigate cropland and supply chemical industries, including the 'Crimean Titan' – the largest producer of titanium dioxide in Europe, which saw a major environmental incident in 2018. See de Ferrer (n 7).

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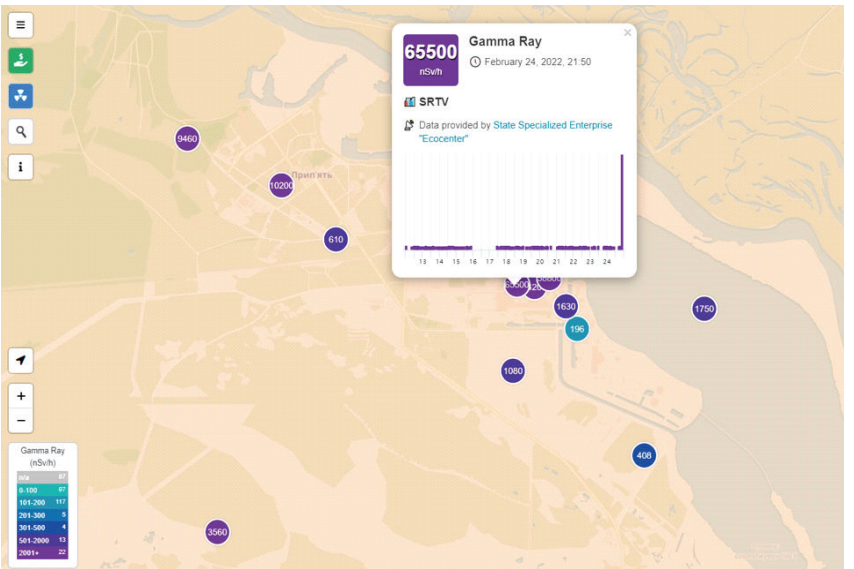

Screenshot from the State Agency of Ukraine on the Exclusion Zone Management online portal showing a spike in gamma radiation from the evening of 24 February. See also 'Ukraine invasion' (n 30).

3.5 Impacts on Water

It is undeniable that the conflict has had an impact on water where pumping stations, purification plants, and sewage facilities have been bombed.[33] For example, the water supply infrastructures have been reduced as a result of the severe shelling near sources of drinking water in the country. This has had a horrible impact on citizens, and about 1.4 million people have no access to the water.[34] The shelling has affected the water supplies from the Dnipro River to the city of Mykolaiv, which was damaged. This has also affected the access to drinking water for people who were supplied drinking water in the neighbouring regions.[35]

Also, the leakage of toxic substances has impacted both superficial and groundwater quality. The forests and green spaces have been negatively affected by military operations. Another event that has affected the sources of water in Ukraine is the damage to dams, especially the hydropower dams, where the shelling of these sites caused catastrophic impacts.[36]

33 'UN warns of toxic environmental legacy for Ukraine, region' (UN Environment Programme, 4 July 2022) <https://www.unep.org/news-and-stories/press-release/un-warns-toxic-environmental-legacy-ukraine-region> accessed 28 July 2022.

34 'Direct damage caused to Ukraine's infrastructure during the war has reached over $105.5 billion (Kyiv School of Economics, 2022) <https://kse.ua/about-the-school/news/direct-damage-caused-to-ukraine-s-infrastructure-during-the-war-has-reached-over-105-5-billion/> accessed 28 July 2022.

35 Ibid.

36 For example, if the Kyiv hydropower dam was breached, it would create a devastating flood as well as spread radioactive sediments from the Pripyat River, which flows through Chornobyl, that have accumulated behind the dam, potentially contaminating the river down to the Black Sea. A dam on the Siverskyi Donets River in the Donetsk region has already been damaged, impacting water quality. 'Assessing the Environmental' (n 7).

Having covered the environmental impacts of the Russian invasion, this paper will now elaborate on the international law perspective and the ways in which the international community and Ukrainian government can establish the responsibility of Russia for the environmental damages.

4 THE ENVIRONMENTAL DAMAGES AND THE LEGAL RESPONSIBILITY FROM AN INTERNATIONAL PERSPECTIVE

Regarding environmental damages during wartime, international law has dealt with this issue regarding two aspects. The first is international warfare law, which deals with all impacts resulting from war, including environmental issues. The second is international environmental law, which is a branch of international warfare law that focuses on environmental issues during conflicts. Both laws are divided into conventional law and customary law. Conventional law consists of agreements and is voluntarily incorporated into national legal frameworks, whereas customary law is derived from the practice of the states.

4.1 International Environmental Law

According to the American Bar Association, international environmental law is a set of agreements and principles that reflect the world's collective effort to manage our transition to the Anthropocene by resolving our most serious environmental problems, including climate change, ozone depletion, and the mass extinction of wildlife.[37]

The first issue the international committee was concerned with was the pollution of the sea. This concern stems from the impacts of the second world war, which caused horrible damage and harm to the sea ecosystem. The first international convention on this field is the International Convention for the Prevention of Pollution of the Sea, which was adopted in 1952 and has been signed by 72 states so far. This treaty was updated in 1962 (OILPOL 62), 1969 (OILPOL 69), and 1971 (OILPOL 71). Russia is not a party to this convention.

Also, concerns about affecting cultural and natural heritage have been addressed by the international committee in the Convention on the Protection of the World Cultural and Natural Heritage, which was adopted in 1972. Russia ratified this convention on 12 October 1988. However, Russia does not respect its obligations to protect regional, international, cultural, and natural heritage. By invading Ukraine, Russia has posed a threat to the international and regional green space in Ukraine.

The UNES Convention and the Protocol on Water and Health are considered the first international conventions. This convention is a unique legal framework that aims to ensure the sustainable use and protection of transboundary water resources. Russia is a party to this convention. Art. 1 clearly stipulates that:

> The Parties shall take all appropriate measures to prevent, control and reduce any transboundary impact.

37 D Hunter International Environmental Law International treaties and principles protect the environment and guard against climate change, Article, January 05, 2021. See the website of the American Bar Association: David Hunter International Environmental Law. International treaties and principles protect the environment and guard against climate change <https://www.americanbar.org/groups/public_education/publications/insights-on-law-and-society/volume-19/insights-vol--19---issue-1/international-environmental-law/> accessed on 4 August 2022.

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ISSN 2663-0575 (Print) ISSN 2663-0583 (Online)
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2. The Parties shall, in particular, take all appropriate measures:

(a) To prevent, control and reduce pollution of waters causing or likely to cause transboundary impact;

(b) To ensure that transboundary waters are used with the aim of ecologically sound and rational water management, conservation of water resources and environmental protection;

(c) To ensure that transboundary waters are used in a reasonable and equitable way, taking into particular account their transboundary character, in the case of activities which cause or are likely to cause transboundary impact;

(d) To ensure conservation and, where necessary, restoration of ecosystems.

Regarding responsibility and liability, Art. 7 provides that:

> The Parties shall support appropriate international efforts to elaborate rules, criteria and procedures in the field of responsibility and liability.

In practice, Russia has not achieved or respected this. An example of this is the city of Kryvyi Rih, which is the largest city in central Ukraine, with an estimated population of 650,000 people, which is still suffering from floods after the local dam was subject to Russian missile strikes. The city's water pumping station was targeted by Russian cruise missiles, which led to the collapse of the dam and river water flowing toward the streets and nearby buildings.

In practice, current international environmental law is insufficient to compensate the victims of Russia's environmental attack on Ukraine's territory for many reasons. Firstly, Russia will use its right to veto any resolution that might be taken by the security council aiming to compensate the victims. Secondly, personal culpability is not provided for by current international environmental law. However, Russia may be liable according to many international conventions and customary law sources. Russia is a member state of many international environmental conventions and agreements. Examples of these conventions are the following:

Convention / Treatment	Threat
UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes	The shelling of the reactor unit and the seizure of the Zaporizhzhya NPP by Russian militants have posed a threat to the world's nuclear and radiation safety.
Convention on International Trade in Endangered Species of Wild Fauna and Flora	As a result of the invasion, the natural heritage is suffering irreparable damage.
Convention on Biological Diversity	The conflict has posed a threat to biodiversity. As mentioned earlier, the invasion has destroyed over 100,000 hectares of natural ecosystems.
Vienna Convention for the Protection of the Ozone Layer	The shelling of the reactor unit and the seizure of the Zaporizhzhya NPP by Russian militants have posed a threat to the world's nuclear and radiation safety.
UN Convention to Combat Desertification	Ukraine makes up 35% of Europe's biodiversity, and there are over 70,000 rare and endemic flora and fauna. This could unfortunately be destroyed during this war. 16% of Ukraine's land area is covered by forests.
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	The Russian invasion of the Exclusion Zone has led to a loss of control over the Chornobyl Shelter, damaged nuclear fuel storage facilities and radioactive waste disposal sites, and threatened international environmental security as a whole.

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	The Russian invasion of the Exclusion Zone has led to a loss of control over the Chornobyl Shelter, damaged nuclear fuel storage facilities and radioactive waste disposal sites, and threatened international environmental security as a whole.
Convention on Wetlands of International Importance, especially as Waterfowl Habitats	In Ukraine, which is called the 'Green Heart of Europe', there is significant species diversity.
Convention for the Protection of the Black Sea against Pollution	More than half of the Ramsar sites in Ukraine are used by the Russian army during hostilities against the Ukrainian people. This is primarily land on the coasts of the Azov and Black Seas and in the lower reaches of the Danube and Dnipro.
Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques	
UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage	As a result of the invasion, the natural heritage is suffering irreparable damage.
UN Framework Convention on Climate Change and Suspension of Membership in the International Coordinating Council of the UNESCO Man and Biosphere Program	

Source: Ministry of Ecology and Natural Resources, <https://www.kmu.gov.ua/en/news/mindovkillya-ukrayina-vimagaye-viklyuchiti-rosiyu-z-mizhnarodnih-prirodozahisnih-organiv-ta-ugod> accessed 4 August 2022.

Under these international agreements, Russia should abide by its obligations to protect the environment and respect the sovereignty of other members and their independence. However, by invading Ukraine, Russia grossly violated the main principles of international environmental law, human rights, global peace, and nuclear security, as mentioned in Table 1. As a reaction to this illegal invasion, Ukraine requested the UN terminate and suspend the membership of Russia in international environmental organisations.

Russia is supposed to respect the principles of customary law adopted by the Stockholm declaration and the World Charter for Nature. Russia should abide by the principles of customary international rules adopted in international cases, such as the cases of *Trail Smelter* and *the Corfu Channel*. However, such rules only raise the liability for civil damages and include vague terms. For example, in *Trail Smelter*, the court held that state liability is raised for environmental damage of 'serious consequence' proven with 'clear and convincing' evidence.[38]

So, the terms of serious consequences limit the power of the victim state that suffers from damages of non-serious consequences that may have impacts on environmental resources. It would be better to include the list of damages resulting from serious consequences rather than making it an open term that might exclude some damages that do not have serious consequences. Creating a term that is subject to the discretion of the court is not a good solution. Undoubtedly, the Russian invasion has caused substantial damage to the Ukrainian and EU environment, which includes serious and non-serious consequences. Ukraine may face significant consequences, such as the shelling of water filtration plants, which has caused

38 Reports of International Arbitral Awards Recueil des Sentences Arbitrales, *Trail Smelter Case* (United States, Canada) <https://legal.un.org/riaa/cases/vol_III/1905-1982.pdf> accessed August 2022.

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damage to the citizens and soil as well. While this damage is not considered damage with serious consequences, the shelling of the Zaporizhzhya nuclear site might very well be considered as such. Russia will be released from its liability, as much of the damage will not be compensated because there are no 'serious consequences'. So, it would be better to stop limiting the damages to only those of that sort. The term 'damage' should be the basic term that determines the responsibility of the state. Also, the term 'clear and convincing' evidence denotes expensive, difficult work, especially for countries that do not have substantial economic and financial capabilities that qualify them to prepare such evidence during conflicts.

By applying these rules to the case at hand, it is clear that the casualties Ukraine is suffering have serious and disastrous consequences. In this case, it is undisputed that the environmental effects on the region are disastrous. Also, it will be easy to provide clear and convincing evidence because the environmental damages are direct results of Russian actions. So, Russia should shoulder the responsibility for the clean-up costs, which will eventually total over several billion dollars.

The term 'past damages' limits the right of the state to file a legal suit against Russia for future casualties. As is common in conflicts, the environmental damages may not be clear in the short term – it could appear ten years later or even more. A good example is Kuwait, which is still suffering from the effects of the Iraqi invasion in August 1991. So, if we limit the liability of the state to past damages, this will release Russia from its responsibility for any expected future damages, which may be more significant, disastrous, and of more serious consequences than the current or past damages.

In addition, Russia also breached the Stockholm Declaration. According to Principle 21,

> States have the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.[39]

Russia's actions and invasion have clearly resulted in environmental damage to Ukraine and other neighbours, such as the EU zone. Furthermore, Russia has breached the World Charter for Nature, in particular, sections II and III, by causing destruction to large spaces of irreplaceable natural resources in Ukraine without any military justification.

Assuming that Russia is able to pay compensation for environmental damages (although reports indicate that Russia has been suffering from financial crises even before the invasion), the current law does not raise the possibility of personal liability. It could be nearly impossible to bring individuals (such as leaders and presidents) who are still in power to the international court of law because the current international legal framework only raises the civil responsibility of the state for the environmental damages resulting from its actions. Therefore, it seems difficult to claim for the future damages that will most likely happen.

4.2 International Warfare Laws

Many international instruments have been created to protect nature and the environment. The Convention on the prohibition of military or any other hostile use of environmental modification techniques is one of the most important international agreements in this field, to which Russia is a party.[40] Art. 1 states that

39 The Audiovisual Library of International Law/Declaration of the United Nations Conference on the Human Environment Stockholm, 16 June 1972 <https://legal.un.org/avl/ha/dunche/dunche.html> accessed 4 August 2022.

40 Russia signed this convention on 18 May 1977 and ratified it on 30 May 1978.

> States parties undertake not to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to another State party- quotation.

Also, to define the concept of an environmental modification technique, Art. 2 provides that:

> Any technique for changing – through the deliberate manipulation of natural processes – the dynamics, composition or structure of the earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space.[41]

Another aspect of environmental protection in conventional warfare law is the 1977 Protocol I to the Geneva Convention of 1949.[42] Russia signed the agreement on 12 December 1977 and ratified it with a reservation on 29 September 1989, but it withdrew its membership on 23 October 2019.[43] Art. 35 (3) provides that: 'It is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment'.[44]

It is evident that this protocol is broader than the (ENMOD) convention, as the protocol has the intention to include any means of warfare that may cause damage to the environment. The ENMOD provision is limited to environmental modification techniques. In terms of the parties concerned, the protocol is addressed to warring parties, while ENMOD governs the relations between state members.

The Geneva Convention of 1949 also addressed the importance of protecting the right to property, which is conceived as one of the main human rights. Art. 53 provides that

> Any destruction by the Occupying Power of real or personal property belonging individually or collectively to private persons, or to the State, or to other public authorities, or to social or co-operative organizations, is prohibited, except where such destruction is rendered absolutely necessary by military operations.[45]

The Hague Conventions on Land Warfare of 1899/1907, which is considered a source of conventional law, was conceived as customary internal law by the Nuremberg Tribunal. The Nuremberg Tribunal held that the LOAC principles in The Hague Conventions on Land Warfare of 1899/1907 had the force of customary law, binding even on non-signatory states.[46]

41 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD) <https://www.un.org/disarmament/enmod/> accessed 25 July 2022.

42 Adopted on 8 June 1977, Protocols I and II are international treaties that supplement the Geneva Conventions of 1949. They significantly improve the legal protection covering civilians and the wounded, and – for the first time – lay down detailed humanitarian rules that apply in civil wars. See Additional Protocols I and II additional to the Geneva Conventions <https://www.icrc.org/en/doc/resources/documents/misc/additional-protocols-1977.htm> accessed 4 August 2022.

43 See Treaties, States Parties and Commentaries. Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977. < https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/States.xsp?xp_viewStates=XPages_NORMStatesParties&xp_treatySelected=470 > accessed 4 August 2022.

44 Additional Protocol to the Geneva Conventions of 12 August 1949, Relating to the Protection of Victims of International Armed Conflicts (Protocol 1) <https://www.ohchr.org/en/instruments-mechanisms/instruments/protocol-additional-geneva-conventions-12-august-1949-and>accessed 10 August 2022.

45 Geneva Convention Relating to the Protection of Civilian Persons in Times of War of 12 August 1949 <https://www.un.org/en/genocideprevention/documents/atrocity-crimes/Doc.33_GC-IV-EN.pdf> accessed 4 August 2022.

46 BK Schafer, 'The Relationship Between the International Laws of Armed Conflict and Environmental Protection: The Need to Reevaluate What Types of Conduct Are Permissible During Hostilities' (1989) 19 CAL. W. INT'L L. REV. 287, 289.

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It is worth mentioning that The Hague Convention of 1899 was limited to the prohibition of poison and materials causing unnecessary suffering, whereas The Hague Convention of 1907 was much broader because it aimed to humanise war as much as possible.[47]

Protocol II of 1977 on the Protection of Victims of Non-International Armed Conflict is considered a source of customary international law. Art. 14, which is on the protection of objects indispensable to the survival of the civilian population, provides that:

> Starvation of civilians as a method of combat is prohibited. It is therefore prohibited to attack, destroy, remove or render useless, for that purpose, objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works.[48]

In order to raise Russia's liability, according to ENMOD, two elements should be met. First, the actions must be considered an 'environmental modification technique'.[49] The second element is related to the impact period, where the action must cause 'widespread, long-lasting or severe effects'. The first element requires the state to have 'deliberately' aimed to change the Earth's natural processes. So far, it is unclear yet whether the Russian invasion will have global impacts, such as global warming. Regarding the second element, this has already been met since it is clear that Russia's invasion will have environmental impacts on Ukraine's territory and the European region as well for a long period of time, especially serious damages proceeding from military operations near nuclear sites and chemical factories.

Although the Russian actions against Ukraine have had a negative impact on the environment, it is so difficult to prove that Russia intends to modify the environment.[50] Another source of Russian liability for environmental damages is the Geneva Convention of 1949. The convention prohibits property destruction except where such destruction is absolutely necessary for military operations. In this case, it is clear that Russia has destroyed Ukraine's property by shelling the infrastructures, factories, and energy sites, which has caused hundreds of waves of migrations of citizens.[51]

Regarding The Hague Convention of 1907, it is clear that this convention includes extremely broad preventions, which makes it difficult to determine which actions are prohibited. So, raising the Russian liability under this convention for environmental impacts will be unrealistic. However, it might be better to hold Russia liable on the grounds of liability for war crimes. As the war is considered lawless, it seems that it is governed by a set of international law tools, such as the Geneva Convention, which prohibits causing severe environmental

47 Art 55: 'The occupying State shall be regarded only as administrator and usufructuary of public buildings, real estate, forests, and agricultural estates belonging to the hostile State, and situated in the occupied country. It must safeguard the capital of these properties, and administer them in accordance with the rules of usufruct'. See the International Committee of the Red Cross. Convention (IV) respecting the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land. The Hague, 18 October 1907. < https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Article.xsp?action=openDocument&documentId=0C16200ECC1B0C3EC12563CD00516954 > accessed on 3 August 2022. See also AS Waldemar, 'Protection of Civilians Against the Effects of Hostilities under Customary International Law under Protocol I' (1986) 117 U.J. INT'L L. & POL'Y 133-34.

48 Additional Protocol to the Geneva Conventions of 12 August 1949, Relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II) <https://www.ohchr.org/en/instruments-mechanisms/instruments/protocol-additional-geneva-conventions-12-august-1949-and-0> accessed 4 August 2022.

49 ENMOD Convention, Art 1.

50 It is worth mentioning that ENMOD was applied in different contexts, such as the Vietnam war, where the US intended to modify and manipulate the rainfall process during the war. See A Roberts, R Guelff, *Documents on the Laws of War 387* (2nd edn, OUP, 1989).

51 Additional Protocol to the Geneva Conventions of 12 August 1949 (n 50).

damage to the environment. Also, in some circumstances, the International Criminal Court (ICC) considers such actions a war crime.

In the past, there were some examples of how a victim country could get compensation for the actions generated by an invading country, which caused severe environmental losses. Here, we can raise the difficulty of proving the severe loss to the environment, as sometimes the losses are not severe at the present time, though the loss will be severe in the long term. Undoubtedly, the psychological problems caused to individuals as a result of these losses, such as the loss of forests and landscapes, as well as loved ones, are beyond description. Who will compensate them? Unfortunately, current international law does not take that into consideration. An example of this is the Gulf War in 1991, where Iraqi military forces destroyed and set fire to hundreds of oil wells in Kuwait, which caused severe environmental damage in the form of tons of sulphur dioxide, causing respiratory illnesses and damaging crops.[52] As an international action, the UN ordered Iraq to pay $3 billion as compensation for the environmental damages. The challenge that Ukraine may face is demonstrating that the destruction is widespread, long-term, and severe. Usually, the international criminal court tries individuals, not states. That is why it seems difficult to file a Lawsuit against Russia. Current international law does not include concrete protection for the environment. That is why there is a call to adopt a new Geneva Convention that explicitly provides effective protection for the environment during war.

In a different way, Russian liability may be raised under Protocol II, which prohibits 'destroying' or 'rendering useless drinking water installations and supplies' during the conflicts. Under this protocol, it is clear that Russia is liable for destroying the water installations, supplies, filtration sites, and drinking water sources in eastern, southern, and eastern Ukraine, as mentioned earlier.

During armed conflicts, much damage can affect our environment. Current international norms and standards cannot provide effective protection for the environment during conflicts. Most of the international norms are ambiguous and include general points. The international law commission prepared a draft that includes new principles for protecting the environment during armed conflicts. Delegating the international commission to prepare a draft and new principles proves that the current international law is incoherent, outdated, and inadequate.

These principles are considered a mix of law and treaty that includes guidance and best practices to follow during armed conflicts. The draft of Principle 16 is very important, as it emphasises a treaty rule that prohibits the spillage of natural resources during the war. In the same sense, the draft of Principle 14 reiterates the international principles applied during conflict. Moreover, new principles have been adopted, such as cooperation in evaluating environmental damages and remedial measures, such as the obligation to remove toxic substances resulting from conflicts (DP 26). It is notable that the new principles outline the issues of remediation, cooperation, and responsibility.[53]

In addition to environmental protection during war, the protection of displaced people and refugees has been taken into consideration where the principle emphasises the necessity of protecting the environment in the areas where refugees are located. Also, the issue of human displacement has been treated widely, and this protection extends to include the environment of the areas of transit as well (D8). The new principles are not only addressed to states but to corporations as well. It requires companies to exercise their due diligence to

52 B Jones, 'The pollution from Russia's war will poison Ukraine for decades' (Vox, 2 June 2022) <https://www.vox.com/down-to-earth/2022/6/2/23143250/ukraine-russia-war-pollution-emissions-environment> accessed on 4 August 2022.

53 See also Draft 14, 16, DP, 26.

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ISSN 2663-0575 (Print) ISSN 2663-0583 (Online)
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protect the environment and displaced people, and it prohibits them from financing conflicts or participating in trading and exploiting natural resources in areas of conflict or areas of displacement (principles 10, 11). As most of these new rules are considered a reflection of customary international law, codifying such rules and incorporating them into national laws will increase the opportunity to apply them to courts and international organisations.

As mentioned earlier, customary law has included some provisions that address the protection of the environment during conflict. In the philosophy of customary law, the sources of obligations do not come from agreements. It may be driven by the practice of states adopting a specific approach to an issue. Also, international conventions and declarations may be addressed to every state, even if a particular state is not a party to them. Moreover, international case law may be a source of obligations for non-state parties. This is attested to by the universal acceptance of these declarations and principles by the international community members.

Regarding international declarations and conventions, the Stockholm Declaration of 1972, parts of the Law of the Sea Convention of 1982, and the World Charter for Nature of 1985 are considered examples of international instruments that may be binding on all states (including non-state members). Principle 6 of the Stockholm Declaration of 1972 states that:

> the discharge of toxic substances or of other substances and the release of heat, in such quantities or concentrations as to exceed the capacity of the environment to render them harmless, must be halted ...

in addition, Principle 7 stipulates that:

> States shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life ... In terms of liability and responsibility, Principle 21 states that: 'responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States.

Principle 22 provides that 'States shall co-operate to develop further the international law'.[54]

In the same way, following the Stockholm Declaration, the UN passed the World Charter for Nature on 28 Oct 1985, which clearly included a part on the impacts of war and conflict on the environment. Principle 5 provides that:

> nature shall be secured against degradation caused by warfare or other hostile activities.

In an explicit and clear way, the charter provides that:

> natural resources shall not be wasted, and that military activities damaging to nature shall be avoided.

The UN also passed the United Nations Convention on the Law of the Sea on 10 December 1982, which was mainly adopted in order to protect the sea against pollution. Although Russia signed the convention with a reservation, this convention, which is considered part of customary law, is a binding agreement on states that do not sign this convention. So, the customary law and the general approach of the states' practice will make it a source of obligation. Art. 194 a, 1 states that:

> States shall take, individually or jointly as appropriate, all measures consistent with this Convention that are necessary to prevent, reduce and control pollution

54 Stockholm Declaration, at principle 22.

> of the marine environment from any source, using for this purpose the best practicable means at their disposal and in accordance with their capabilities, and they shall endeavor to harmonize their policies in this connection.

Moreover, some principles of customary law are derived from international cases. The *Trail Smelter* case is an example that includes principles that are considered customary law. The Tribunal concluded, with respect to future harm, that:

> no State has the right to use or permit to use its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.

Another example is the case of the *Corfu Channel*. The international court considered the possibility of raising the Albanian responsibility based on knowledge of the minefield. The international court held that 'every State's obligation not to knowingly allow its territory to be used for acts contrary to rights of other States'.

5 CONCLUSIONS

The Russian invasion has highlighted that international law is not sufficient to protect the environment against harm and damages resulting from war and that the current international legal framework cannot bring a nation such as Russia to justice.[55] International law is very narrow when covering environmental issues and lacks effective mechanisms to make it binding. Here, the author suggests some recommendations that could be taken into consideration.

Firstly, Russia's responsibility can be established based on customary law and the provisions of international environmental law. Secondly, as Russia is a member of some international environmental agreements, it can be prosecuted for violating the provisions of these agreements. Also, given that international customary law has become firmly established, as it reflects the practices of states, Russia can be held accountable based on the provisions of international customary law related to the environment. Finally, based on this, the author found that implementing the new Geneva Convention that includes more provisions on military activities with fewer exceptions and prosecuting leaders who cause the destruction and considering them as war criminals for the environmental damages resulting from their actions are the best ways to establish Russian responsibility for the environmental damages resulting from the invasion.

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55 As Wuerth states, international law is not strong enough to do everything well. In this respect, the international community should focus on enhancing the norms, raising the liability for violating these norms, and investigating the reasons behinds this violation. I Wuerth, 'International Law and the Russian Invasion of Ukraine' (Lawfare, 25 February 2022) <https://www.lawfareblog.com/international-law-and-russian-invasion-ukraine> accessed 23 June 2022.

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