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THE WEAPONISATION OF THE ENVIRONMENT IN THE WAR IN UKRAINE



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Introduction

“Armed conflicts have contributed to environmental degradation for thousands of years” (Palczewska, 2022, p. 100). The war in Ukraine is no exception; the conflict already has an immense impact on the soil, water and air quality as well as the biodiversity of the largest European country. Wars have had from the outset an impact on the environment. The latter has also frequently been weaponised by warring parties. Accordingly, “from the time homo-sapiens first harnessed fire, the environment has served subsequent civilisations as an arsenal” (Travis, 2023, p. 157). Though it is not a new development, the environmental consequences of armed conflicts are higher nowadays. The introduction of new technologies in the armies has caused greater damage.

Since February 2022, the war has caused major environmental degradation in Ukraine. It is an inevitable consequence of the conflict. As we will see in this paper, the environment has also been actively used as a tactical and strategic tool of war. In the end, nature can be considered “the silent victim” of the conflict (Watts, 2023; Gardashuk, 2022). This directly impacts the population as the damage has repercussions on health, the economy and food security.

With this background, the aim of this paper is therefore to review how the conflict in Ukraine has impacted the environment. What are the ecological consequences of the war? How does the weaponisation of the environment aggravate the harms caused by the violence? What are the implications for future actions once the war is over?

Degradation of the Environment

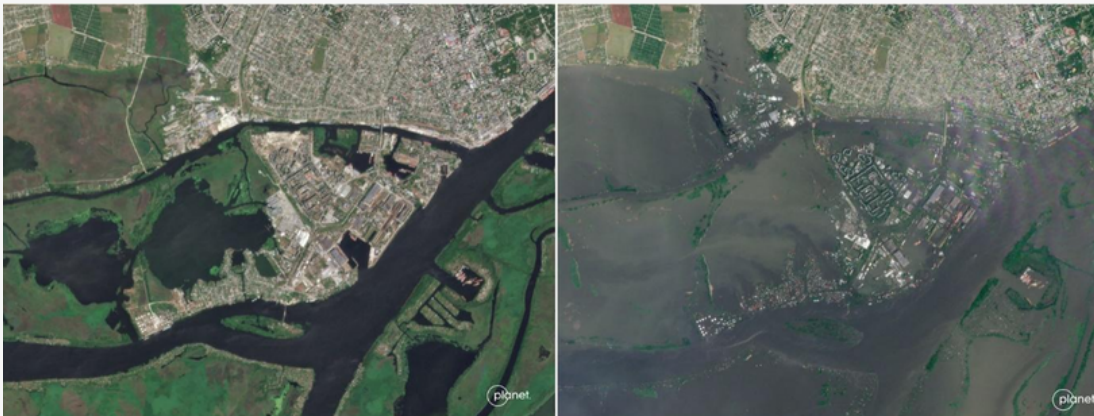
“Relations between environment and war stem from an ancient lineage” (Travis, 2023, p. 182). Using the environment as a tool to gain an advantage in war is a strategy as old as humanity. It is not a specificity of the Ukrainian war; “all wars entail environmental damage, often significant and sometimes irreversible” (Feuer, 2023, p. 533). However, environmental degradation in Ukraine is particularly serious, with Ukraine and Russia both sharing responsibility. However, Russian actions are more disruptive and damaging.

The first concerning examples of these environmental impacts are the Ukrainian nuclear plants, caught in the crossfire between Russia and Ukraine, where “Russian forces deliberately and unprecedentedly occupy and target nuclear power and research facilities” (Gardashuk, 2022, p. 3). Russians have notably occupied the nuclear power plants in Zaporizhzhia, the largest in Europe, and in Chernobyl, where Russian forces have unearthed radioactive soil (Reuters, 2022). This unprecedented occupation of nuclear facilities dangerously heightens radiation risks (Conflict and Environmental Observatory [CEO], 2023). These actions pose important security threats, not only to Ukraine but also to neighbouring countries, particularly in Eastern and Central Europe.

In a second instance, the June 2023 collapse of the Kakhovka dam illustrates well how “damaging the water supply system of the enemy has been a known warfare strategy for ages” (Rawtani et al., 2022, p. 2). The human and ecological consequences are severe, and it can be considered “Ukraine’s worst ecological disaster since Chernobyl” (Watts, 2023). The collapse has directly provoked important floods, as seen in the first picture below. The yellow colour in the image (see below) represents the normal water level of the Dnieper River and the blue the water level after the dam burst. This endangers the natural habitats surrounding the river, spreads vast amounts of debris and compromises water supplies in the region. Thousands of people had to evacuate and millions more are in danger of seeing their available drinking water diminish at critical rates. Additionally, the nuclear power plant of Zaporizhzhia is also threatened in the long-term. Furthermore, chemical products could be introduced into the Black Sea, which could impact on bordering countries (Watts, 2023).



Floods following the Kakhovka dam collapse. [The Washington Post](#).



Before-and-after images from Maxar Technologies satellites. Planet Labs PBC. [The Washington Post](#).

Russia has also targeted “industrial and commercial infrastructure[s]” (Rawtani et al., 2022, p. 1). Industrial sites store vast amounts of chemicals and dangerous substances (Kaplan et al., 2021, 1514), which, once released, can have a severe impact on the environment, especially water quality. This is particularly the case in eastern Ukraine, the main industrial region, where infrastructure has been affected by the Russian strikes (Rawtani et al., 2022). As a direct consequence, “water shortages and deteriorating sanitary conditions are already evident at many places which will result in various food and water-borne diseases” (Rawtani et al., 2022, p. 2). Chemical munitions waste and detritus from artillery damage also risk going “to the bottom of the seas and oceans” (Palczewska, 2022, p. 103) and causing significant water pollution.

Thirdly, “the deployment and movement of troops and military hardware have caused large-scale deforestation and wildfires” (Rawtani et al., 2022, p. 3). The latter can be an indirect consequence of the use of rockets and missiles against urban areas, natural parks and woodland areas. Deliberate fire-setting can destroy assets and cover area, while deforestation can help troop movements (Rawtani et al., 2022). Overall, compared to 2021, the area of forest fires has increased 45-fold in Ukraine (Rawtani et al., 2022, p. 4).

More generally, the war has a significant impact on natural areas, as 44% of them are considered to be in a war zone (Rawtani et al., 2022). Accordingly, “about a third of the territory of the nature reserve fund of Ukraine [is] under threat of destruction” (Gardashuk, 2022, p. 3). The destruction of protected areas by bombs has a negative effect on biodiversity in Ukraine. For instance, “some indigenous species’ distinctive habitats may vanish as a result of the war” (Rawtani et al., 2022, p. 3). In addition to directly damaging natural habitats, Russian actions in Ukraine have disrupted environmental activities and monitoring (CEO, 2023; Gardashuk, 2022). This further increases the risk of biodiversity loss and natural areas destruction, as protected areas are not protected anymore.

Fourthly, armed conflicts, such as the war in Ukraine, leave significant scars in and on the soil. More specifically, remains of missiles contaminate the soil due to their heavy metal components (Palczewska, 2022, p. 103). Debris in urban areas devastated by the explosions is dangerous and pollutes the ground for many years (Palczewska, 2022; Rawtani et al., 2022). Furthermore, agricultural lands have been heavily damaged by the fighting (CEO, 2023). Many fields have been mined, rendering them inoperable, which also degrades the soil’s quality, and complicates any kind of cultivation during and after the war.

Lastly, military operations significantly affect air pollution. The defence sector is already recognised as one of the most polluting, and the biggest consumer of energy in Europe (Fiott, 2014). Accordingly, military machines, vehicles and weapon systems emit high levels of gas and toxic substances into the atmosphere (Gardashuk, 2022, p. 2). Fires resulting from combat also release a significant level of CO₂, while targeting of industrial areas storing chemical substances unleashes harmful materials in the air. As a result, “the baseline air quality in Ukraine is already among the worst in Europe” (Rawtani et al., 2022, p. 2). Moreover, the conflict has a significant impact on climate change in the long-term, increasing the emission of greenhouse gases of Ukraine and Russia (Rawtani et al., 2022).

Incentives to Environmental Destruction

The environment is often weaponised in armed conflicts for various reasons, such as “gaining a strategic advantage over the enemy, intimidating the local population, suppressing resistance, or simply feeding the soldiers” (Palczewska, 2022, 100). Accordingly, “environmental sabotage is a weapon unique in its potential to inflict long-term and devastating effects on civilian populations” (Feuer, 2023, p. 534). Overall, the main objective is to gain strategic or tactical advantages.

At a strategic level, environmental destruction can undermine an enemy's assets. The main objective is to “destroy anything that might be of use to the enemy during troop advances or withdrawals” (Feuer, 2023, p. 538). Damaging water supplies and mining agricultural lands are two notable examples. These strategies can hinder military movements, by depriving access to food and water in a particular region. This creates logistical problems and slows down troop movements. Forest fires and deforestation also have a strategic advantage in that they reduce the enemy's ability to hide in forests (Feuer, 2023).

At a tactical level, damage to the environment can help “inhibiting enemy advances” (Feuer, 2023, p. 539). The Kakhovka dam collapse illustrates this. Although responsibility for the burst is still unclear at this stage of the war, it surely is an advantage for Russian forces as the floods reduce the capacity of the Ukrainian army to act in the region.

Another reason that could motivate environmental destruction is political, in this case, “controlling and punishing civilians” (Feuer, 2023; p. 540). The damages have an impact on the morale of the population. Media reports of the dam burst in Ukraine show how it affects local populations, forcing them to leave their homes and terrorising them. The same can be analysed from the mining of fields. Food production is reduced, directly impacting people in occupied territories, which are more dependent on the occupation forces. Environmental damages can force civilians into loyalty and deter rebellions (Feuer, 2023).

The last motivation is the symbolism of environmental destruction (Feuer, 2023). The most noticeable instance of this in the Ukrainian war is the occupation of nuclear plants. Weaponisation of nuclear power is a serious act, due to its severe implications. Its aim is not only to frighten the local population and the Ukrainian government, but also to dissuade other countries from helping Ukraine, as the consequences would be significant for Europe as a continent. The occupation of the Chernobyl plant and the removal of radioactive soil, for example, shocked audiences beyond Ukraine's borders.

Consequences for Environmental and Human Security

Environmental degradations have major implications for human security, “affecting public health, ecosystems, food security and the climate” (CEO, 2023). Water and air pollution directly impacts the health of the local population. In the short term, damages to water facilities cause an “acute shortage of water” (Rawtani et al., 2022, p. 5). Water pollution increases the risk of spreading infectious diseases due to poor sanitary conditions. Air pollution also increases the risk of respiratory difficulties like asthma (Rawtani et al., 2022).

In addition, the Ukrainian health care system is “overwhelmed and disrupted” (Rawtani et al., 2022, 4) by the conflict, which complicates access to it, further increasing health issues. Vaccinations are also critically low (Rawtani et al., 2022). To put it simply, “wartime environmental devastation not only destroys biodiversity, but can also cause disease, starvation, and massive loss of life” (Leebaw, 2014, p. 770). In the long-term, healthcare issues resulting from the war are expected to subsequently reduce Ukrainians' life expectancy (Rawtani et al., 2022, 5). For instance, respiratory difficulties can turn into chronic diseases (Rawtani et al., 2022).

Soil quality is another major issue. “Across Ukraine, natural and agricultural landscapes have been damaged by the fighting, including some of Ukraine’s richest soils, with serious implications for regional and global food security” (CEO, 2023). The degradation of agricultural lands impoverishes it, preventing any future agricultural activity in the worst-affected regions (Palczewska, 2022, p. 100). This directly puts lives at risk, and not only in Ukraine. The country used to produce a significant amount of agricultural goods, which were sold to other countries that depended on it. The war has therefore important geopolitical and economic implications, especially concerning food security.

Finally, the conflict has a major impact on climate change, temporarily slowing down “the decarbonisation process” (Rawtani et al., 2022, p. 5). The war prevents Ukraine and Russia from fulfilling their duties regarding greenhouse gas emissions (Rawtani et al., 2022). Moreover, “since the war has changed the dynamics of the oil and gas trade, to fulfil immediate energy needs, investments in the fossil-fuel sector may rise” (Rawtani et al., 2022, p. 5). This further illustrates the global impact of the war.

Considerations for Future Actions

Due to the unpredictable nature of war, dealing with its environmental consequences is difficult for the time being. However, this issue will eventually become more important. The main post-war challenge will be to evaluate “the magnitude of impacts and [restore] the ecosystem” (Rawtani et al., 2022, p. 5). It is already possible to start this process by identifying, documenting and assessing the damage and how it affects public health (CEO, 2023). Gathering images and information using remote sensing technologies and satellites is of utmost importance to keep records of the degradation (Kaplan et al., 2021). This work needs however to be further supported. To this end, it is important to “maintain visibility for the environmental dimensions of the war” (CEO, 2023) and the implications for human security.

A second major challenge after the war will be to ensure that Ukraine’s reconstruction is sustainable (CEO, 2023). The post-war period will require considerable energy and resources to rebuild the country. The environment and climate change considerations will probably not be the top priority of the Ukrainian government, in contrast to a fast reconstruction, economic stability and restoration of the welfare system (Rawtani et al., 2022, p. 4). This risks adding more pollution to the one already caused by the war, worsening the environmental situation in Ukraine. To avoid such a scenario, Ukraine will require aid to implement a green and sustainable reconstruction plan. The international community will have to address the question of accountability for the destruction in Ukraine (CEO, 2023). This includes the question of repairs and who will be responsible for their costs. Some are already calling for Russia to pay the bill (Shmyhal, 2023; Nizzero, 2023).

Finally, the 1998 Rome Statute of the International Criminal Court prohibits “attacks that are intended or expected to cause long-term and severe damage to the natural environment” (Leebaw, 2014, p. 771). As a result, a case has been opened internationally for the recognition of a new kind of crime. Ecocide refers to the intentional and “significant damage to or destruction of an ecosystem to such an extent that peaceful enjoyment of a part of the planet will be substantially diminished” (Mehta & Merz, 2015, p. 5).

Ecocide is however not universally recognised at the international level. Shedding light on the environmental destruction in Ukraine and its impact on security could help build a case for its international recognition as a war crime. In this line, “there have been examples from the past when damage to the environment and natural resources due to conflicts paved the way for forming international laws and treaties to protect them” (Rawtani et al., 2022, p. 5). The war in Ukraine could set an example and raise awareness of the importance for the international community to protect the environment during armed conflicts.

Conclusion

The Russian invasion of Ukraine has a serious impact on the country's environmental security. Water supplies are severely damaged. Air and water pollution are significant and inescapable consequences of military operations on the front line. Forest fires have drastically increased since February 2022. Critical infrastructures are deliberately hit, spreading hazardous waste and substances into the atmosphere and rivers. Nuclear plants are occupied, raising concerns regarding radiation risks. Agricultural lands are severely damaged.

Overall, natural resources have been targeted and used as a tool of war. This has serious implications for human security and the health of the local population. Environmental degradation due to the war in Ukraine also has significant global consequences. It impacts food security, increases sea pollution and affects climate change. It is therefore paramount to keep track of the environmental damages in the country. This documentation will nourish needed post-war actions to restore Ukraine's ecosystems. Finally, the international community could also use the case of the war in Ukraine to strengthen environmental protection and assign responsibility for environmental degradation during armed conflicts.

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