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War-induced environmental crises: A reality too critical to ignore

The ripple effects of the Russia-Ukraine war and the Israel-Palestine conflict have worsened environmental crises, writes **Gilles Paché**

Since 2022, two major geopolitical crises have shaken the world. First, Russia attacked Ukrainian territory as part of a ‘special military operation’ with the aim of demilitarising it and defending Russian-speaking regions. In October 2023, the Middle East experienced a new dramatic episode in its history owing to the Israeli-Palestinian conflict. In both cases, violent fighting is causing humanitarian crises – crises that are overshadowing a quiet chaos that is brewing rapidly: major environmental degradation.

From the very onset of the current year, we can see that the world is reeling from these two major armed conflicts, with dramatic consequences for the populations directly in the line of fire. The two may have vastly different geopolitical dimensions, but they converge on one point: the environmental damage they cause, as I pointed out in a recent article published in the *Technium Social Sciences Journal*.

Since the start of 2022, the Ukrainian Government has recorded several thousand environmental crimes, one of the most emblematic of which is the destruction of the Kakhovka dam in June 2023 by Russian armed forces. Following a bloody terrorist attack, Israel launched a war against Hamas that has resulted in extensive destruction in the Gaza Strip and the use of white phosphorus, a toxic gas that has detrimental effects on both human health and the environment, not to mention the fires that ravaged hundreds of hectares of forests and olive groves in southern Lebanon after a series of bombings.

The Israeli-Palestinian and Russian-Ukrainian armed conflicts could persist for several more months or even years; it is difficult to quantify the long-term environmental effects today. On the other hand, it is possible to get an idea from similar events that have already taken place in the past. For instance, the Israeli army launched Operation Cast Lead in the Gaza Strip on December 27, 2008, with the intention of hitting Hamas infrastructure and rocket launching sites. Following a unilateral ceasefire declaration by Israel on January 18, 2009, and Hamas 12 hours later, the operation came to an end. The United Nations Environment Programme published a report in September 2009 outlining all the environmental harm that the bombings and ground fighting has caused, including the destruction of or serious damage to 2,692 buildings and 186 greenhouses. This destruction generated 600,000 tonnes of debris and rubble, and the presence of asbestos was massive. Due

to combustion particles and the toxicity of the debris, air pollution was intense.

The environmental effect of warfare is now being increasingly questioned at the international level, even though it was already present during and after the Vietnam War, particularly between 1965 and 1971. Ecological awareness is undoubtedly changing the situation and raising awareness of the major effects of military action in terms of the destruction of ecosystems and massive soil pollution, particularly through the presence of hazardous waste. While each armed conflict has its own ecological history, all armed conflicts result in the direct and indirect collateral damage of the environment. What is more, at Cop28 in Dubai in December 2023, a significant and strong link between wars and climate change was highlighted. In short, over and above the humanitarian issues associated with current armed conflicts, humanity is facing a spectrum of major environmental crises.

Everlasting dread

Any war involves the use of weapons containing heavy metals, which are harmful to health and likely to seep into groundwater and contaminate human and animal food chains, as well as massively polluting the air. As early as February 2022, the Conflict and Environment Observatory in the UK noted that, as Ukraine is a highly industrialised country with numerous chemical and metallurgical plants, the Russian attack had caused significant damage in terms of air pollution, notably with the release of toxic gas and heavy metal particles. Several briefings published by the Conflict and Environment Observatory during the year 2023 confirmed this situation. Bombings also caused buildings to collapse, releasing large quantities of asbestos into the air. According to *The Washington Post*, the Israeli army’s intervention in the Gaza Strip resulted in the destruction of more than 100,000 buildings by the end of December 2023, giving an approximate idea of the level of pollution that the locals experienced.

The destruction of buildings is not the only environmental effect of the current war. The munitions and chemicals used will also lead to major and lasting environmental disasters. For example, the materials used in shells and casings are not harmless. The cast-iron and steel alloys used in shells contain lead, sulphur, and copper, contaminating soil and water resources. The consequences



A policeman besides a destroyed residential building in Kyiv

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of WWI are still being felt in Europe, more than a century after the end of the armed conflict. In France, Belgium, Italy and Croatia, recurrent heavy metal pollution of both soil and groundwater can be observed; according to specialists, this pollution was directly caused by the degradation of munitions containing lead and mercury. Geological research conducted by Simon Pirc and Tomaz Budkovi confirms the same, based on rigorous sampling in several European countries.

Chemicals can also pollute ecosystems during armed conflicts, whether intentionally or unintentionally. The most famous example is Agent Orange (or TCDD). Used in Vietnam by the American army in the 1960s, this ultra-toxic herbicide destroyed vegetation and made it easier to spot Viet Cong forces. However, Agent Orange is so powerful that it destroyed all the forests in 20 per cent of South Vietnam and continues to contaminate the environment and populations through the food chain. Since the Russian attack, the situation in Ukraine has become less dramatic. However, a major risk persists in attacks on energy and industrial infrastructure. Once bombed, these sites can cause massive air, soil, and water pollution.

Even if the pollution is severe, voluntary human intervention can ultimately stop it, in the same manner as the efforts made in several Western nations to stop industrial pollution. On the other hand, the situation is far more problematic for biodiversity, which is also a victim of armed conflict

Even if the pollution is severe, voluntary human intervention can ultimately stop it, in the same manner as the efforts made in several Western nations to stop industrial pollution. On the other hand, the situation is far more problematic for biodiversity, which is also a victim of armed conflict. The explosion of the Kakhovka dam in Ukraine on June 6, 2023, clearly shows that in a war, the environment is hit just as humans are. Viktor Vyshnevskiy and his colleagues reported that, even though this explosion claimed the lives of at least 45 people, it also had significant effects on the surrounding area. Thousands of hectares of farmland and nature reserves were destroyed, and the flooding of farms, villages and industrial sites led to the mixing of the dam's water with various chemicals, hydrocarbons, and wastewater. *The Washington Post* also reported on the huge scale of the disaster. More broadly, while Ukraine is home to 35 per cent of Europe's flora and fauna, by the end of 2023, a third of forest areas and a fifth of natural parks had been heavily damaged by the Russian attack.

While some observers refer to the environmental effects of war, it must be said that ecosystems and biodiversity

are unfortunately neglected or barely mentioned, with rare exceptions such as the contribution by Michael Lawrence and his colleagues. While pollution directly affects populations, in terms of water tables or agricultural land, the negative effects on flora and fauna appear to be more remote, no doubt because the vision of wars and their consequences is very anthropocentric. The war in Ukraine could, however, mark a turning point in the way the environment is considered. Although the Vietnam War was the first to raise moral awareness of armed conflicts and their ecological effects, the war in Ukraine is undoubtedly one of the best-documented armed conflicts in history in terms of environmental problems, according to the Conflict and Environment Observatory, which reports that between February 2022 and December 2023, 60,000 hectares of forest were ravaged by military fires and 280,000 hectares of trees were deforested.

However, it remains exceedingly difficult to precisely quantify the long-lasting effect of war on biodiversity. Taking again the example of the destruction of the Kakhovka dam, it is certainly possible to assess the short-term environmental effects by counting human and animal losses, but specialists have no long-term vision of the consequences for biodiversity, given the drying-up of land upstream of the dam or the risk of flooding downstream of the dam. In short, even when the armed conflict between Ukraine and Russia is over, the war will silently continue to wreak havoc on the living world, including human beings; the side effects will continue to kill insidiously. This was the case in Vietnam and will continue to be the case in Ukraine and the Gaza Strip. From this point of view, can we not speak of a veritable ecocide that calls for an awakening of the world's highest political authorities?

Recognising 'war ecocides'

During the Vietnam War protest movement, Arthur Galston proposed the idea of 'ecocide.' It refers to the destruction, damage, or almost complete loss of the ecosystem of a given territory by human action. The intention was to condemn the extensive use of Agent Orange, which severely harmed vegetation and people's health. The concept of ecocide found significant political resonance when Swedish Prime Minister Olof Palme used it for the first time in a speech to the United Nations in 1972 to describe a serious destruction of nature, calling for the issue to be addressed at the international level as soon as possible. Since then, the concept has evolved into a broader definition, referring to environmental damage with lasting and significant consequences. Initially conceived as a 'cry of alarm,' ecocide is now at the heart of debates aimed at enshrining it as a crime under international law.

It must be admitted, however, that the process is gradual and complex, particularly in legal terms. The International Criminal Court (ICC) could be led to consider ecocide as an international crime over which it would have jurisdictional power, on a par with crimes of genocide, war crimes, crimes against humanity and crimes of aggression, provided that the states joining the ICC reach a consensus on the subject.

Such recognition would imply substantial changes in the prosecution of environmental crimes, providing a robust mechanism for global accountability. Some countries have already taken steps to incorporate ecocide




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into their national legislation. France, for example, with its *Climate and Resilience Act* of August 22, 2021, has taken a decisive step by introducing the offence of ecocide into its criminal law. This political act marks a willingness to punish serious environmental damage and is a major milestone in the fight against ecological degradation.

If ecocide is taken to mean an illegal act committed in the knowledge that it is likely to cause serious, long-term damage to the environment, then wars and other armed conflicts theoretically fall within the definition. This

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is the position taken by several countries that consider themselves victims of war ecocide. At Cop28, for example, political representatives from war-torn countries such as the Gaza Strip, Yemen, and Ukraine made their voices heard, complaining about the environmental effects of the fighting. The word ecocide was even used at the Ukrainian pavilion, which was covered with posters detailing the environmental effects of the Russian attack and lamenting that the environmental reforms planned by the government could no longer be implemented.

At the same time, the International Committee of the Red Cross regretted that climate-related projects organised in the Gaza Strip had been frozen owing to the Israeli intervention. Despite this initial awareness of the effect of war on the environment, few media outlets echoed these concerns during Cop28, preferring to focus on managing the rapid phase-out of fossil fuels. It is therefore to be feared that war-related environmental crises will not be a real priority in the years to come. 

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