Mitigating environmental harm by implementing the EWIPA declaration

Joint policy brief for the Second International Conference of the Political Declaration on EWIPA, San José, Costa Rica

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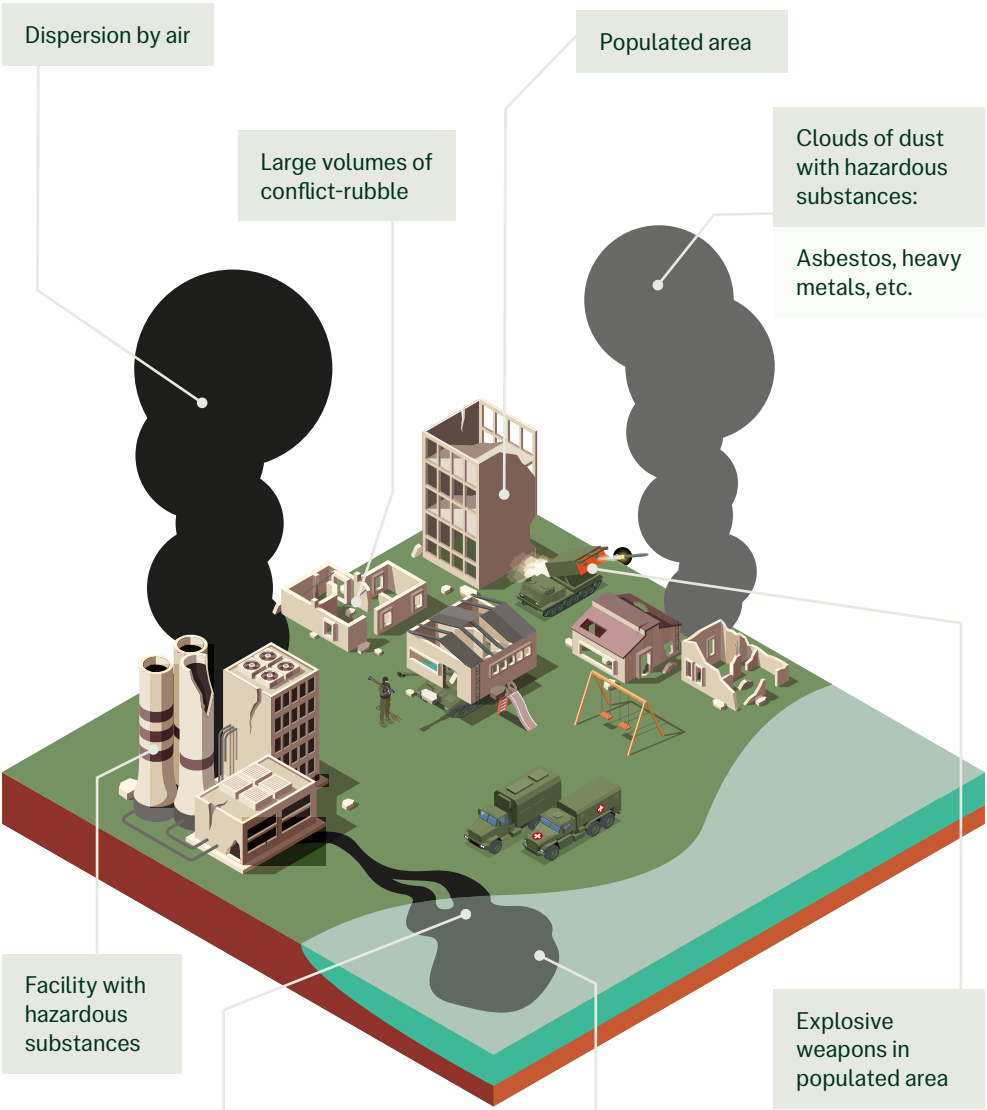
Introduction

The use of explosive weapons in populated areas inflicts not only immediate humanitarian devastation but also acute and long-term environmental damage, endangering civilian lives and undermining livelihoods.[1] Recognising these interlinkages,[2] the *2022 Political Declaration on Strengthening the Protection of Civilians from the Humanitarian Consequences Arising from the Use of Explosive Weapons in Populated Areas* (EWIPA Declaration) provides an important opportunity to reduce both humanitarian and environmental harm from urban warfare. With 89 endorsing states to date, it sets out commitments to review national policy and practice to better protect civilians and civilian objects, such as the environment.

This briefing is intended to help guide states in their implementation of the EWIPA Declaration, highlighting how its operationalisation can reduce environmental risks to civilians, and harm to the environment itself. It outlines the pathways through which explosive weapons cause environmental harm, illustrates these through recent case studies, and provides recommendations for integrating environmental considerations into national implementation and international cooperation.

Conflict-pollution sources from explosive weapons

PAX (2023)



Direct threats to people and the environment

Explosive weapons cause severe damage to civilian, energy, commercial and industrial infrastructure, resulting in the contamination of air, soil and water resources. Blast damage can result in the release of pollutants from facilities, pulverise building materials such as asbestos allowing their dispersal as particulate matter, and trigger fires and the generation of toxic combustion products. Many of the constituents of explosive weapons, including energetic materials, propellants and heavy metals, are also environmentally problematic.[3] People can be exposed to these materials through inhalation, and through the consumption of contaminated water. Pollutants deposited on soils may render them unfit for cultivation or leach into watercourses and groundwater. Soils, surface and groundwaters can also be polluted by wastewater discharges from damaged treatment facilities and networks, also posing risks to public health.

Research on pollutant levels and compositions resulting from the use of explosive weapons in populated areas is limited but is likely to be highly variable. Similarly, little research has been undertaken on the human health risks of exposure to these pollutant mixtures in conflict settings, particularly on vulnerable groups or those with pre-existing health problems. Nevertheless we know that exposure to the kinds of substances associated with these settings have the potential to contribute to cancers, respiratory illnesses and reproductive disorders.[4]

Finally, studies from conflict-affected areas suggest that the military-origin heavy metal pollution and wider contamination from affected WASH infrastructure can act as a driver of antimicrobial resistance.[5]


Photo: Mohammed Zaanoun

Refugees return home to northern Gaza where all buildings are in ruins (2025)

Gaza: Environmental devastation from EWIPA

Gaza has endured the most intensive use of explosive weapons in a populated area since WWII; 83% of all buildings and 86% of all agricultural land has been damaged or destroyed by thousands of tonnes of explosive munitions.[6] UN estimates suggest that 61 million tonnes of debris have been generated, often containing asbestos, hazardous waste and heavy metals from photovoltaic installations.

In addition to conflict debris, solid waste management systems have collapsed. PAX documented this reverberating environmental impact using Very High Resolution imagery and open source tracking of hundreds of informal solid waste dumps. These were estimated to contain more than 300,000 tonnes of garbage, posing acute and long-term environmental health risks.[7]

The targeting of water infrastructure has destroyed more than 85% of wells and pipelines and has left people without access to clean water, leading to outbreaks of communicable diseases.[8] Gaza's already polluted aquifer has been placed at further risk from informal boreholes used for latrines, while raw sewage has been discharged to the coastal environment.[9] Restoring access to water in Gaza is an urgent task but faces huge challenges, increasing the severity of the humanitarian crisis.[10]

Fire after a glide bomb strike in Lyman, Donetsk Oblast, Ukraine

Ukraine: Documenting environmental risks from EWIPA through holistic research

The intensive use of explosive weapons in Ukraine has taken a heavy toll on people, livelihoods and ecosystems. Many cities, towns and villages have been completely obliterated, while around 15% of the country's total housing stock has been damaged or destroyed. Around 100 million tonnes of conflict debris is estimated to have been generated, often mixed with asbestos and other hazardous materials from facilities such as power plants, factories, and oil storage tanks located in or near urban areas.

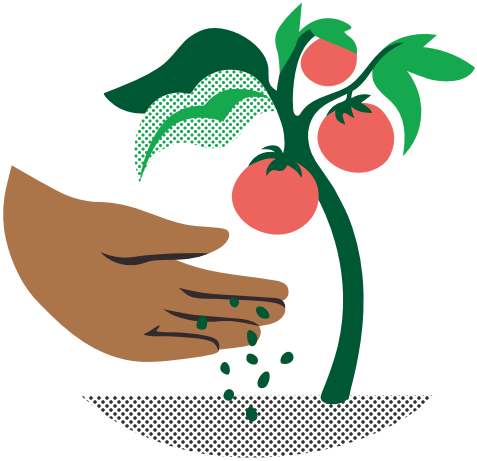
Novel research methods are helping to monitor environmental risks from the use of EWIPA, in both accessible and inaccessible areas of Ukraine. For example, a study by Norwegian People's Aid and the Conflict and Environment Observatory used remote sensing, sampling of soil and water pollution, and surveys to gather data on the interconnected and reverberating effects of explosive weapons' use, including the destruction of critical infrastructure, as well as impacts on local livelihoods, land use and habitats.[11] Meanwhile a PAX study utilised innovative approaches combining freely available radar imagery for damage detection with open source analysis of hazardous facilities to demonstrate the acute impacts and wider environmental footprint of EWIPA.[12] These approaches can be upscaled and applied in other conflicts for rapid mapping and analysis.

Indirect threats to people and the environment

Blast damage from explosive weapons can generate vast volumes of debris, much of which may be contaminated by the materials present in properties at the time of damage, as well as with residues from the weapons themselves. Materials like cement can also contain contaminants such as chromium and thallium, which can be mobilised when they are pulverised.[13]

The environmentally sound management of debris in conflict settings is hugely challenging, workers and residents face exposures from remobilised pollutants, appropriate disposal sites are rarely available and informal dumping is commonplace. Informal dumpsites can generate soil and water pollution and obstruct watercourses and drainage patterns. Dumping often takes place on land with the lowest financial value, which in many cases are areas of high biodiversity value. Where huge volumes of debris need removing this can translate into tens of thousands of kilometres in truck movements, dispersing particulate matter and generating greenhouse gas (GHG) emissions through fuel use. Air quality can also be affected by civilian coping strategies, for example, damaged energy networks lead to the increased use of household generators, while increased use of fuelwood and charcoal can also drive deforestation.

Reconstruction increases pressure on resources locally, including forests and stone and sand quarries, with associated harm to the environment. While a proportion of debris can be recycled, providing there is sufficient financial and technical support to facilitate this, in most conflict-affected areas the overwhelming majority is dumped. Research on the carbon footprint of the conflicts in Gaza and Ukraine suggests that the carbon cost of reconstruction can be more than half of the total GHG emissions by source for conflicts affecting urban areas because of the embodied carbon in concrete and cement.[14]



Committing to reduce harm

Several of the EWIPA declaration's commitments could help reduce risks to people and the environment. Endorsers commit to *'review, develop or improve national policy and practice with regard to the protection of civilians during armed conflict involving the use of explosive weapons in populated areas'* (clause 3.1). Whereas their armed forces should ensure that they *'take into account the direct and indirect effects on civilians and civilian objects which can reasonably be foreseen in the planning of military operations and the execution of attacks in populated areas, and conduct damage assessments, to the degree feasible, and identify lessons learned'* (clause 3.4).

Importantly, given the considerable data gaps on the environmental consequences of explosive weapons use, and their impact on public health, endorsers should *'collect, share, and make publicly available disaggregated data on the direct and indirect effects on civilians and civilian objects of military operations involving the use of explosive weapons in populated areas, where feasible and appropriate'* (clause 4.2). Supporting research that takes a holistic approach to the environmental, health and socio-economic legacies of explosive weapons use should therefore form part of states' implementation of the EWIPA Declaration. Such data not only allows us to understand patterns of harm from the use of explosive weapons but can also inform response and recovery planning.

Given the close relationship between environmental harm and the protection of civilians, it is vital that states implementing the declaration look beyond the immediate harms from explosive weapons use to also address those associated with environmental degradation. These should encompass immediate and reverberating consequences, and be clearly articulated in policies and practice, including military guidelines and policies informing response and recovery in populated areas impacted by the use of explosive weapons.

Photo: XINHUA/World Food Program/NTB

Collaborating to protect water resources from explosive weapons

Water resources, and water and sanitation infrastructure, are foundational for human survival, hygiene, food production and ecosystem health. This means that the damage and disruption caused to water systems by explosive weapons' use can be severe, with both acute and lasting effects for people and the wider environment.[15] The contamination of surface and groundwater, and the destruction of water pipelines, pumping stations, and wastewater treatment plants can leave communities without safe drinking water, trigger disease outbreaks, pollute aquifers and contribute to ecosystem degradation. Furthermore, restoring water and wastewater infrastructure during recovery imposes enormous financial and logistical burdens on affected administrations.

Working with militaries to prevent harm to water infrastructure and resources, and upholding and ensuring respect for International Humanitarian Law, has the potential to reduce this pattern of destruction. The Global Alliance to Spare Water from Armed Conflict (GASWAC) encourages cooperation between states, armed forces, as well as humanitarian, development and environmental practitioners to identify and map critical water infrastructure, improve operational planning, and strengthen the protection of water systems amid armed conflicts.[16] Building synergies between EWIPA implementation, and initiatives such as GASWAC, can strengthen preventive action and help mitigate civilian harm and environmental damage.

Recommendations

- States should ensure that environmental considerations are fully integrated in the planning of military operations and in determining the acceptability of actions.

- States should support international and domestic stakeholders in the collection of environmental data in populated areas affected by explosive weapons' use and use it to inform harm reduction policies.

- Implementation of the EWIPA Declaration should align with relevant environmental guidance, including UN Environment Assembly resolution 6.12 on measuring conflict-linked environmental damage.[17]

- Response and recovery processes in populated areas affected by explosive weapons' use should ensure that, wherever possible, they minimise adverse environmental impacts.

- Endorsing states are encouraged to explore synergies between the implementation of the EWIPA declaration and other policy initiatives directed at prevention and mitigation of environmental harm from armed conflict.[18]

Footnotes

[1] PAX (2020) Exploring environmental harm from explosive weapons in populated areas: https://paxforpeace.nl/news/exploring-environmental-harm-from-explosive-weapons-in-populated-areas

[2] Ewipa Declaration, Section 1.5

[3] Juhasz, A. Naidu, R. (2007) Explosives: fate, dynamics, and ecological impact in terrestrial and marine environments. Rev Environ Contam Toxicol.;191:163-215: https://link.springer.com/chapter/10.1007/978-0-387-69163-3_6

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[5] Abbara, A. Shortall, C. Sullivan, R. Zwijnenburg, W et al. (2025) Unravelling the linkages between conflict and antimicrobial resistance. npj Antimicrob Resist 3, 29: https://doi.org/10.1038/s44259-025-00099-y

[6] UNEP (2025) The Environmental Impact of the Conflict in the Gaza Strip, Second assessment report: https://www.unep.org/resources/report/environmental-impact-escalation-conflict-gaza-strip

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[11] NPA and CEOBS (2025) Assessing Environmental Degradation in Southern Ukraine: https://www.npaid.org/mine-action-and-disarmament/news/the-silent-victim-of-the-war-in-ukraine

[12] PAX (2024) After the blast: Mapping environmental risks from explosive weapons in Ukrainian towns and cities: https://paxforpeace.nl/publications/after-the-blast

[13] TRW Project (2014) Conflict rubble: a ubiquitous and under-studied toxic remnant of war: https://ceobs.org/conflict-rubble-a-ubiquitous-and-under-studied-toxic-remnant-of-war/

[14] Initiative for GHG Accounting in War (2025) Climate damage caused by russia's war in Ukraine: 24 February 2022 – 23 February 2025: https://en.ecoaction.org.ua/climate-damage-caused-by-russias-war-in-ukraine-24-february-2022-23-february-2025-full-assessment.html

[15] UNICEF (2019) Water under Fire: https://www.unicef.org/media/51286/file/Water-under-fire-2019-eng%20.pdf

[16] Geneva Water Hub (nd) Global Alliance to Spare Water from Armed Conflicts: https://www.genevawaterhub.org/GASWAC

[17] UNEP/EA.6/Res.12, (2024) Environmental assistance and recovery in areas affected by armed conflict: https://docs.un.org/en/UNEP/EA.6/RES.12

[18] Including but not limited to championing the Principles on the Protection of the environment in relation to armed conflicts, and joining initiatives such as Global Alliance to Spare Water from Armed Conflict and Global Initiative to Galvanize Political Commitment to International Humanitarian Law.

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