

# **Environmental peacebuilding as a key tool for conflict resolution in the Israel-Palestine war**

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## **Introduction**

1. Dr Rintoul-Hynes is a Senior Lecturer in Soil Science and Environmental Management at Canterbury Christ Church University. Her research focuses on the environmental impacts of war. She previously investigated soil degradation as a result of military activity during World War I and is currently working with colleagues at Princeton University and National Academy of the Sciences of Ukraine to quantify environmental pollution and soil fertility loss in Ukraine and other modern conflicts. Her group are also investigating opportunities for remediation of contaminated land post-war.

## **Environmental peacebuilding**

2. Environmental issues were first identified as a potential cause of violent conflict over thirty years ago in the Brundtland Report. However, environmental damage also occurs because of war – either indirectly or deliberately. The term ‘environcide’ was coined to describe the process of damaging, destroying or rendering inaccessible environmental infrastructure through violence. Despite the environment often being a cause of conflict or a victim of war, the inherent characteristics of the local environment can also act as an incentive for peace. Although environmental institutions have rarely been fully included in peace agreements or post-conflict rebuilding, that is beginning to change. Environmental peacebuilding can be particularly important for those who are disproportionately affected by environmental degradation during conflict; for example, the poorest people living in war-torn countries are often most dependant on environmental resources for their livelihoods. However, environmental degradation from conflict can also have regional or global consequences, for example by resulting in increased global food insecurity, as is the case with the ongoing Russia-Ukraine conflict.
3. The International Peace Institute published recommendations regarding the issue of conflict and the environment in 2008, suggesting that dialogue discussing the linkages between the environment and national and international security should be encouraged. This should include discussions among state, multilateral, private sector, and non-governmental actors. Conflict resolution discussions should support the United Nations effort to establish a common framework for conflict analysis and peacebuilding activity, and the United Nations Environment Programme (UNEP) effort to integrate the environment into post-conflict assessment, disaster management, and peacebuilding. Environmental peacebuilding relies on a good understanding of the environmental damage caused by conflict. Therefore, the various environmental issues associated with military activity that should be considered during environmental peacebuilding discussions are summarised below.

## **Environmental consequences of war**

### *Pollution*

4. Conflict can lead to pollution of environmental compartments (e.g. soil, water and air) because of accidental or deliberate release of contaminants. Common sources of contamination include the release of components from explosive devices, ammunition, and weapons of mass destruction, leakage of oils and lubricants used in military vehicles, and waste associated with military infrastructure. Many of these contaminant elements are known to remain in the environment for hundreds of years or more if there is no intervention, such as remediation activities. This is a particularly damaging legacy of war that is often overlooked.
5. Once released into the environment, contaminants may move through the air by being physically picked up by wind as dust particles. This can lead to dust storms, where material can be transported hundreds, or even thousands, of miles. In the Middle East, dust storms are already an issue due to the aridity of much of the landscape, where elevated particulate matter, PM<sub>2.5</sub> or PM<sub>10</sub> can lead to poor air quality. Contaminants can be immobilised in the soil depending on the chemical conditions, but there is a significant risk that soil contaminants will be transported via soil water to nearby waterways (rivers, reservoirs, groundwater, etc), where they can be further transported. Warfare often results in an increase in unvegetated land due to bombing, deforestation, a reduction in agricultural activities and movement/displacement of people, leading to a higher likelihood of soil erosion, leaching, and transportation of contaminated material.

### *Water issues*

6. Warfare can arise from water issues – so-called ‘water wars’ – but can also lead to extremes in drought or flooding because of conflict. Water shortages may be a result of mass migration by displaced people, for example to refugee camps, and the subsequent increase in demand for local water resources. In some cases, state or non-state actors may also deliberately restrict access to clean water, as is the case in Yemen for example. Similarly, flooding may arise from deliberate destruction of infrastructure, such as the Kakhovka Dam in Ukraine. Consequences of these water issues may include increased disease and reduced agricultural production.

### *Food security*

7. During war, agricultural production is often significantly reduced for several reasons: a lack of manpower to plant or harvest crops, deliberate or accidental destruction of farm infrastructure, loss of territory, increased wildfires or intentional burning of land, unsafe conditions due to the presence of unexploded ordinance (UXO) and cratering or other physical disturbance following conflict. Agricultural production shocks can lead to increased food insecurity, for example as a result of the Russia-Ukraine conflict. However, yield and movement of produce are not the only issues – food quality is also fundamental to food security and nutrition. Poor quality or contaminated produce may reduce the nutritional value of produce, or in extreme circumstances even render it toxic to humans or livestock. This is particularly problematic for nations that rely heavily on imported goods from a country experiencing conflict, especially if the nation already has issues of malnutrition. For example, in Moldova and Lebanon, 80-90% of grain was imported from Ukraine prior to the invasion. For those living in poverty in these countries, 33-42% of women and children are already anaemic.

*Habitat degradation, fragmentation or loss*

8. Trenches and other defence structures leave long-lasting damage to habitats. Studies assessing damage from historic conflict show visible scars on the landscape over 100 years after WWI using satellite imagery. Similarly, damage from bomb craters is often visible in the undulating landscape of former battlefields, and particularly densely cratered areas have been described as resembling a 'moonscape'. The damage is not just the physical trenches or craters, but the change in soil conditions and the local ecology as a result. The term 'bombturbation' refers to the process of cratering and soil mixing from explosions, creating a new type of soil with altered conditions that may impact soil organisms and vegetation in particular (i.e. via changes in water content, organic matter, pH and compaction).
9. Habitats can also become fragmented during warfare, particularly due to border fences or walls. These are commonly constructed from chain link, barbed or razor wire, steel or concrete and may also be electrified or have trenches, underground metal walls, landmines, guard dogs, armed guards or floodlights. This can lead to very different habitats on either side of a border wall, as is the case for the West Bank, where vegetation cover differs dramatically when comparing the interior and exterior landscape. The principal issue for animals is that these structures impede mobility as a literal barrier that animals cannot cross. When migratory journeys are interrupted by border fences, the migratory animals can weaken or even die due to starvation or dehydration. They can also injure or kill animals that become entangled in barbed or razor wire, get electrocuted or step on explosive devices such as landmines. Poachers may use the ready supply of barbed wire to create traps, and animal predators have been known to use these structures to trap their prey. Finally, physical borders split populations, causing genetic isolation. It is not as simple as removing these structures after conflict - they have been shown to have a deterrent effect for animals long after removal.
10. Habitats may also be degraded or destroyed from wildfires or intentional burning; these phenomena are common in war. For example, nearly 20% of Syria's forests have been lost since 2000. In turn, there has been an increase in agricultural and desert areas, and subsequently an increase in fire activity. As well as burning, deforestation is a common cause of habitat destruction, degradation or fragmentation during war. Forest areas are commonly destroyed for tactical purposes by military on the ground, to accommodate displaced people or damaged as a result of fighting. However, rather than measuring habitat loss in terms of the area of land lost, it is important to consider that the loss of native habitats often leads to reductions in associated biodiversity, and these changes may be irreparable. At the same time as some species move elsewhere due to destruction of habitats, other species move to human-made habitats that appear well-suited to their needs. For example, military compounds in Afghanistan were known to attract a wide range of wildlife, from reptiles using tarmac to bask, to migratory birds perching on wire fences along the perimeter. However, military personnel have been known to trap or kill animals on their compound.