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**PROTECTION OF THE ENVIRONMENT IN ARMED CONFLICT:
ECOCIDE IN GAZA**

MAHAM NAWEED

PEROOZI ASIF DURRANI

Executive Summary

The environmental situation in Gaza has deteriorated significantly as a result of recurrent armed conflicts. Gaza has experienced extensive damage to its natural resources, environment and infrastructure. Key environmental issues include the destruction of agricultural lands, contamination of water sources and severe degradation of the urban and natural landscapes, among others. While there is no convention that specifically governs the protection of the environment in armed conflict, there are certain provisions found throughout the general body of international law. These will be analysed to understand the prevalent infrastructure protecting the environment.

Policy Recommendations

- **Diplomatic and Legal Actions**

Pakistan, as a member of the international community, can advocate for stronger enforcement of existing international environmental protection laws and push for the inclusion of environmental protections in future legal frameworks.

- **Support for Environmental Recovery**

The international community should prioritize support for environmental recovery in Gaza, including funding and expertise for rebuilding damaged infrastructure, restoring contaminated water sources, and rehabilitating agricultural lands.

- **Advocacy and Awareness**

Pakistan and other concerned states can play a crucial role in raising awareness about the environmental impacts of armed conflict and advocating for stronger international legal protections.

INTRODUCTION

In the first month of its war in Gaza, Israel dropped hundreds of massive bombs, many of them capable of killing or wounding people more than 1,000 feet away. Satellite imagery from those early days of the war reveals more than 500 impact craters over 12 meters (40 feet) in diameter, consistent with those left behind by 2,000-pound bombs.

The extensive use of heavy munitions, such as the 2,000-pound bomb, is responsible for the soaring death toll. The population of Gaza is packed together much more tightly than almost anywhere else on earth, so the use of such heavy munitions has a profound effect on the population and the environment.

On June 12, the United Nations Human Rights Council’s “Independent International Commission of Inquiry on the Occupied Palestinian Territory, including East Jerusalem, and Israel” released a report examining “violations of international human rights law (IHRL), international humanitarian law (IHL) and possible international crimes committed by all parties” involved in the attack on Israel and the Gaza conflict from Oct. 7 through Dec. 31, 2023. The commission found that Israel’s operations in Gaza constitute “war crimes, crimes against humanity, and violations of IHL and IHRL.”

Crimes committed in Gaza have included destruction of the environment, which is a violation of IHL in itself. The International Committee of the Red Cross defines environment as,

“The natural environment under IHL is considered to constitute the natural world together with the system of inextricable interrelations between living organisms and their inanimate environment, in the widest sense possible. It includes everything that exists or occurs naturally, such as the general hydrosphere, biosphere, geosphere, and atmosphere, as well as natural elements that are or may be the product of human intervention, such as foodstuffs, agricultural areas, drinking water and livestock.”¹

DESTRUCTION OF THE ENVIRONMENT IN GAZA

The United Nations Environment Programme has reported,

¹ ICRC, “Environment” <https://casebook.icrc.org/a_to_z/glossary/environment>

“Not only are the people of Gaza dealing with untold suffering from the ongoing war, the significant and growing environmental damage in Gaza risks locking its people into a painful, long recovery. While many questions remain regarding the exact type and quantity of contaminants affecting the environment in Gaza, people are already living with the consequences of conflict-related damage to environmental management systems and pollution today. Water and sanitation have collapsed. Critical infrastructure continues to be decimated. Coastal areas, soil and ecosystems have been severely impacted. All of this is deeply harming people's health, food security and Gaza's resilience.”

The extensive bombing of Gaza has not only adversely impacted the civilian population but also the environment. Under international law, protecting the environment from the direct and reverberating effects of explosive weapons is a vital component of civilian protection. The environment is an important, integral, and inseparable part of populated areas, and it is difficult to draw a strong dividing line between the “natural” and populated environments. The health, well-being, and very survival of civilians in populated areas depend on having access to functioning sanitation, quality water supplies, clean air, and land that is fit-for-use. Ensuring safe and consistent access to these resources in turn depends on key infrastructure like electricity supplies, water and sewage treatment plants – infrastructure that often falls victim to the use of explosive weapons during conflict.

The environmental situation in Gaza has deteriorated significantly as a result of recurrent armed conflicts. Following Hamas’ attack in October 2023, Israel retaliated by dropping approximately 70,000 tonnes of explosives on the Gaza Strip between October 2023 and April 2024.² The area now riddled with conflict, which was already grappling with severe socio-economic challenges, has experienced extensive damage to its natural resources, environment and infrastructure.

The aspects of the environment that have been impacted the worst include the destruction of agricultural lands, contamination of water sources and severe degradation of the urban and natural landscapes, among others.³

² Al Jazeera, “200 days of Israel’s War on Gaza” <<https://www.aljazeera.com/gallery/2024/4/23/photos-200-days-of-israels-war-on-gaza>>

³ United Nations Environment Programme, “Environmental Impact of the Conflict in Gaza: Preliminary Assessment of Environmental Impacts” <<https://www.unep.org/resources/report/environmental-impact-conflict-gaza-preliminary-assessment-environmental-impacts>>

Food Insecurity

A main issue which directly stems from the destruction of the environment is food security. Since December 2023, according to the Independent Commission, over 90 percent of the Gaza population “has faced high acute food insecurity.” Many reports show that air, soil, and water pollution, as well as biodiversity loss and other potential ecological damages, are irreversible and irreparable consequences of the ongoing war, exacerbating Gaza’s vulnerability to food insecurity.

The relentless bombardment and ground incursions in Gaza have led to devastating consequences for food security, exacerbating the already existing acute insecurity caused by years of blockade and previous military attacks. One of the most significant consequences of the war has been the widespread destruction of essential food facilities, including bakeries and food factories. These facilities play a crucial role in producing and distributing food items that are essential for daily sustenance. The massive use of weapons and missiles has destroyed food production facilities and farmland, leaving many families with no choice but to resort to desperate measures, such as consuming animal feed and weeds, to stave off hunger. Targeting such infrastructure has disrupted the food supply chain, resulting in food shortages and price increases for basic food items.

Destruction of Agricultural Lands

The frequent bombings and military operations have led to substantial destruction of agricultural fields, which are crucial for Gaza’s food security.⁴ Bomb craters, unexploded ordnance and damage from ground operations have rendered approximately 65% arable land unusable as of July 2024.⁵ This has exacerbated food shortages and economic instability in a region heavily dependent on agriculture. As a consequence, 96% of the population in Gaza is subject to acute food insecurity. This goes beyond the crisis level categorized as Category 3+ in the Integrated Food Security Phase Classification. As a result, nearly half a million people are suffering from “catastrophic conditions” i.e. famine, under the classification.⁶

⁴ United Nations Satellite Centre (UNOSAT), FAO Gaza Strip Cropland Damage Assessment – July 2024
<<https://unosat.org/products/3905>>

⁵ Ibid.

⁶ Integrated Food Security Phase Classification, Gaza Strip: Acute Food Insecurity Situation

Contamination of Water Sources

Water infrastructure in Gaza has suffered severe damage due to military actions. The Coastal Aquifer Basin, which stretches from Egypt through Gaza and into Israel, along the eastern Mediterranean coast, provides Gaza 90% of its water supply. However, the destruction of water and sanitation facilities have either been damaged or destroyed. As a result, sewage has contaminated both portable water and agricultural irrigation systems, leaving less than 5% of available water safe for human consumption.⁷ The resulting pollution has severe implications for public health, increasing the risk of waterborne diseases and reducing the availability of clean water for the available population.⁸

Urban and Environmental Degradation

Urban areas in Gaza have also been negatively impacted by the destruction of buildings, roads and other infrastructure. Satellite imagery analysis has identified a total of 156,409 structures that have either been destroyed or damaged along with a total of 215,137 housing units suffering the same fate.⁹ This has led to increased waste and debris, which further contaminates the soil and water. Additionally, the loss of green spaces and natural habitats has reduced biodiversity and negatively impacted the local ecosystem.¹⁰

INTERNATIONAL LAW ON THE PROTECTION OF THE ENVIRONMENT

While there is no convention that specifically governs the protection of the environment in armed conflict, there are certain provisions found throughout the general body of international law that can be drawn from to understand the prevalent infrastructure protecting the environment. For instance, the Geneva Conventions and their Additional Protocols, which can be read in conjunction with the International Committee of the Red Cross (ICRC) Customary IHL Study¹¹ (ICRC Study) for better perspective, have dedicated provisions to ensure the protection of the environment.

⁷ WB, EU & UN 2024, “Gaza Strip: Interim Damage Assessment” <<https://www.worldbank.org/en/news/press-release/2024/04/02/joint-world-bank-un-report-assesses-damage-to-gaza-s-infrastructure>>

⁸ Ibid.

⁹ UNOSAT, Gaza Strip 8th Comprehensive Damage Assessment <<https://unosat.org/products/3904>>

¹⁰ UNEP, Press Release, 18 June 2024 <<https://www.unep.org/news-and-stories/press-release/damage-gaza-causing-new-risks-human-health-and-long-term-recovery>>

¹¹ The ICRC conducted a study which identified 161 rules of customary IHL and compiled relevant national and international practice. The aim of the Customary IHL Project is to provide a view into current national and

Restriction on Methods and Means of Warfare

The Additional Protocol to the 1949 Geneva Conventions, relating to the Protecting of Victims of International Armed Conflict (Protocol I) is referred to for the methods and means of warfare. The relevant provisions are Article 35-basic rules and Article 55-protection of the natural environment, and rule 45 of the ICRC Study.

While the term “natural environment” has not been explicitly defined in the Convention or its Protocols, the ICRC Study construes it to mean the general atmosphere, biosphere, hydrosphere and geosphere, including living organisms and their inanimate environment.¹² The relevant provisions read as follows:

Article 35(3)- Protocol I

“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.”

Article 55 (1)- Protocol I

“Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population.”

Rule 45- ICRC Study

“The use of methods or means of warfare that are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment is prohibited. Destruction of the natural environment may not be used as a weapon.”

These provisions clearly establish that the destruction of the natural environment is prohibited, provided it is “widespread, long-term and severe”. The recorded evidence may prove that the excessive bombing in and around Gaza has caused “widespread, long-term and

international practice on matters of IHL. This database provides rapid access to the rules of customary IHL and enables users to examine practice from around the world. It is updated regularly with new national and international practice.

¹² Yoram Dinstein, Protection of the Environment in International Armed Conflict <https://www.mpil.de/files/pdf1/mpunyb_dinstein_5.pdf>

severe” damage. Over 60% of Gaza’s cultivable land has been damaged, majority of the trees have been destroyed and irreparable damage has been caused to water treatment and waste management facilities.¹³

Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD)

ENMOD was adopted by the United Nations in December 1976, with only 96 states in favour and 8 against with 30 abstentions. The scope of the Convention is set out in Article I which states:

“Each State Party to this Convention undertakes not to engage in military or other hostile use of environmental modification techniques having widespread, long-lasting, or severe effects as the means of destruction, damage, or injury to any other State Party.”

ENMOD addresses the potential of military actions to deliberately alter the natural environment in an attempt to cause harm or disadvantage to adversaries. This includes manipulating weather patterns, triggering natural disasters, or causing other ecological damage. By prohibiting the use of environmental modification techniques for hostile purposes, the Convention seeks to safeguard ecosystems and prevent long-term damage that could have far-reaching consequences. Articles within the Convention emphasize that the environment should not be targeted or used as a means of warfare, reflecting a broader commitment to maintaining ecological integrity and prioritizing human health.

Reading ENMOD in light of the Palestine-Israel conflict, the launch of countless airstrikes and military operations has inadvertently lead to pollution, destruction of natural habitats, and contamination of water sources. It is pivotal to understand that for ENMOD to be applicable, the destruction has to be a consequence of intentional modification of the environment and not merely collateral damage from conventional military actions.

It can be argued that the destruction in Gaza is a violation of ENMOD. It has to be demonstrated that environmental modification was used as a method of warfare. Additionally, the International Criminal Court (ICC) could potentially address these violations under its war

¹³ UNOSAT, Gaza Strip 8th Comprehensive Damage Assessment <<https://unosat.org/products/3904>>

crimes framework, although this would require establishing individual criminal responsibility for the environmental damage caused.

Protection of Civilian Objects against Effects of Hostilities

Under international law, civilian objects refer to any and all objects that “are not military objectives”.¹⁴ The relevant international law is the Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protecting of Victims of International Armed Conflict (Protocol I), 8 June 1977. It reads as follows:

Article 52(2)- Protocol I

“Attacks shall be limited strictly to military objectives. In so far as objects are concerned, military objectives are limited to those objects which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage.”

The Protocol makes it clear that any damage to objects that go beyond a state’s military objectives is strictly prohibited. The Israeli Government retaliated against the Hamas attack on 7 October 2023, vowing to eradicate the entire organization at any cost. As a result, they bombarded the whole of Gaza Strip, killing almost 40,000 persons since October, including children.¹⁵ The carpet-bombing campaign has demolished almost all the buildings on the Gaza strip, leaving it in a pile of rubble and dead bodies.

Protection of Objects Indispensable to the Survival of the Civilian Population

As per Article 54 of the Additional Protocol I and Article 14 Additional Protocol II of the Geneva Conventions, along with Rule 54 of ICRC Study, it is prohibited to use starvation as a method of warfare. States that are party to an armed conflict are under a duty to ensure that their conflict does not interfere or deprive civilians of “objects indispensable to [their] survival”, i.e., food, livestock, drinking water, agricultural areas, supplies and irrigation works, etc.

Article 54(2)- Protocol I

¹⁴ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protecting of Victims of International Armed Conflict (Protocol I), 8 June 1977.

¹⁵ Rasha Khatib, “Courting the dead in Gaza: difficult but essential”, The Lancet Volume 404, Issue 10449, 237-238.

“It is prohibited to attack, destroy, remove or render useless 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, for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse Party, whatever the motive, whether in order to starve out civilians, to cause them to move away, or for any other motive.”

Article 14- Protocol II

“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.”

Rule 54- ICRC Study

“Attacking, destroying, removing or rendering useless objects indispensable to the survival of the civilian population is prohibited.”

Human Rights Watch and Oxfam International have reported that Israel has been using starvation as a weapon of war against civilians in Gaza in an act of collective punishment. This is partially being done through the destruction of cultivable land, ensuring that the local population does not have access to agricultural land or water to meet their domestic food requirement.

INTERNATIONAL COURTS ON THE PROTECTION OF THE ENVIRONMENT

International Court of Justice (ICJ)

The ICJ has not directly addressed environmental destruction in the context of armed conflict in its decisions. However, it has emphasized the importance of environmental protection through its advisory opinions and judgments on other matters. The ICJ has recognized the right to a healthy environment as part of international human rights law, which indirectly underscores the importance of environmental safeguards during conflicts.

In the case of *Costa Rica v. Nicaragua*, the ICJ considered environmental harm in the context of activities carried out by Nicaragua, including the impact on natural resources and the environment in disputed border areas. The ICJ ruled that Nicaragua had violated international law by carrying out unauthorized dredging and other activities that harmed the territory of Costa Rica and, thereby, ordered Nicaragua to pay damages.¹⁶

International Criminal Court (ICC)

The ICC does not have specific provisions for environmental crimes in its statute, but it does address war crimes that may encompass environmental destruction. For instance, Article 8(2)(b)(iv) of the Rome Statute criminalizes the intentional destruction of property not justified by military necessity, which can be interpreted to include environmental damage.¹⁷ However, the ICC's focus is primarily on individual criminal responsibility rather than broad environmental protection.

In the case of *The Prosecutor v. Bosco Ntaganda*, the Court addressed a range of war crimes and crimes against humanity in the Democratic Republic of Congo, including the destruction of civilian property and resources. The ICC's judgment highlighted the broader impact of these crimes and Mr. Ntaganda was found guilty on 18 counts of war crimes and crimes against humanity, which included environmental damage as part of the destruction of property and resources.¹⁸

Other International Tribunals

Other international tribunals, such as the International Criminal Tribunal for the former Yugoslavia (ICTY), have addressed environmental damage as part of broader war crimes investigations. Following the NATO bombing of the Federal Republic of Yugoslavia, the ICTY submitted the Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign against the Federal Republic of Yugoslavia. It acknowledged that the bombing campaign had resulted in environmental damage, for example, from the attacks on industrial facilities and the resultant release of pollutants. The Report quoted Article 35(3) and Article 55 of Additional Protocol I, but it was unclear whether the practical damage

¹⁶ ICJ, Certain Activities Carried Out by Nicaragua in the Border Area (*Costa Rica v. Nicaragua*) <[¹⁷ Rome Statute of the International Criminal Court, Article 8\(2\)\(b\)\(iv\)](https://www.icj-cij.org/case/150#:~:text=In%20its%20Judgment%2C%20the%20Court,question%20in%20a%20subsequent%20procedure.></p></div><div data-bbox=)

¹⁸ International Criminal Court, *The Prosecutor v. Bosco Ntaganda*

satisfied the conditions of the Protocol.¹⁹ While the protection of the environment was not the primary focus in the case, the ICTY did discuss it at length.

RECOMMENDATIONS FOR PAKISTAN AND THE INTERNATIONAL COMMUNITY

Diplomatic and Legal Actions

Pakistan, as a member of the international community, can advocate for stronger enforcement of existing international environmental protection laws and push for the inclusion of environmental protections in future legal frameworks. Pakistan can also support and participate in international diplomatic efforts to address environmental damage in Gaza, including urging for accountability and reparations.

Support for Environmental Recovery

In the Joint World Bank and UN interim damage assessment report, it was estimated that as of January 2024 the total cost of damage sustained by Gaza was USD 18.5 billion and reconstructing it will be no less.²⁰ The international community should prioritize support for environmental recovery in Gaza, including funding and expertise for rebuilding damaged infrastructure, restoring contaminated water sources, and rehabilitating agricultural lands. This support should be coordinated through international organizations such as the United Nations Environment Programme (UNEP) and other relevant bodies.

Advocacy and Awareness

Pakistan and other concerned states can play a crucial role in raising awareness about the environmental impacts of armed conflict and advocating for stronger international legal protections. By engaging with international organizations on global platforms and fora, they can help drive the adoption of policies and measures that address environmental harm in conflict zones.

¹⁹ International Criminal Tribunal for the Former Yugoslavia, Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia.

²⁰ The World Bank & UN, Gaza Strip: Interim Damage Assessment, Summary Note March 29 2024 <<https://thedocs.worldbank.org/en/doc/14e309cd34e04e40b90eb19afa7b5d15-0280012024/original/Gaza-Interim-Damage-Assessment-032924-Final.pdf>>

Action Matrix

Options for Pakistan and the International Community

Recommendations	Pathways to Solution	Implementation of Solution	Actors Responsible	Implementation Timelines
Diplomatic and Legal Actions	Advocate for stronger enforcement of existing international environmental protection laws and push for the inclusion of environmental protections in future legal frameworks.	The creation of international treaties and conventions protecting the environment will place a positive obligation on states to protect the same during conflict and punitive damages will have to be paid for failing to do so.	<ul style="list-style-type: none"> • Ministry of Foreign Affairs • Ministry of Climate Change • Ministry of Law and Justice 	<p>3-6 Months for internal discussions amongst stakeholders in Pakistan</p> <p>Ongoing Process- Pushing for Adoption of International Treaties and Conventions</p>
Support for Environmental Recovery	The international community should prioritize support for environmental recovery in Gaza, including funding and expertise for rebuilding damaged infrastructure, restoring contaminated water sources, and rehabilitating agricultural lands.	The international community needs to establish a fund for the rehabilitation of Gaza, keeping the environment as the focus. Such a fund can be created within an international organization such as the World Bank or the UNEP.	<ul style="list-style-type: none"> • Ministry of Foreign Affairs • Ministry of Climate Change 	<p>3-6 Months for internal discussions amongst stakeholders in Pakistan</p> <p>Ongoing process of diplomatic effort to create fund and gather funds from sovereign states</p>
Advocacy and Awareness	Pakistan and other concerned states can play a crucial role in raising awareness about the environmental impacts of armed conflict and advocating for stronger international legal protections.	Highlighting the environmental aspect of the conflict is important to press for accountability of the damage done and to gather support for international frameworks for the protection of the environment.	<ul style="list-style-type: none"> • Ministry of Foreign Affairs • Ministry of Climate Change • Ministry of Information and Broadcasting 	<p>3-6 Months for internal discussions amongst stakeholders in Pakistan</p> <p>6-12 Months for advocacy and media campaign</p>