

# International Humanitarian Law and Environmental Protection in Armed Conflict: An Evaluation of Effectiveness

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## Abstract

The continuous need to safeguard human beings and protect the conditions necessary for their survival is the core driving force behind this study. Human life depends on security, dignity, and the enjoyment of fundamental freedoms at all times, including during war. As the concept of human rights has expanded, its influence has increasingly shaped the rules of international humanitarian law (IHL), a central branch of public international law that deals with the conduct of hostilities and the protection of war victims.

Modern armed conflicts not only threaten human life but also cause extensive and long-term damage to the natural environment. This paper examines the extent to which IHL contributes to the protection of the environment in situations of armed conflict. It does so by reviewing relevant literature, international conferences, treaties, and conventions that address environmental protection within the framework of IHL, and by analyzing the legal mechanisms that regulate environmental harm in both international and non-international armed conflicts.

**Keywords:** *International humanitarian law, environmental protection, armed conflicts, human rights, nuclear weapons.*

## 1. Introduction

Contemporary international relations oscillate between periods of peace, tension, and open conflict—whether political, ideological, social, military, or geopolitical. In such a context, legal rules are essential to frame and limit the conduct of hostilities and to set boundaries designed to minimize destruction. These rules also establish mechanisms for accountability when parties violate agreed standards (Dale, 2001).

Over the past century, international humanitarian law has evolved significantly. It has moved from focusing mainly on the conduct of hostilities to placing increasing emphasis on the protection of individuals who are not—or are no longer—participating in combat. This includes civilians, the wounded and sick, and prisoners of war (Koskeniemi, 2014).

Although law cannot prevent war outright, armed conflict remains a recurring reality. Given this, it became necessary to develop legal norms that mitigate the consequences of war for both human beings and their environment. Armed conflicts leave deep scars on soil, water, air, vegetation, and ecosystems. For example, soil degradation and loss of fertility can trigger food insecurity, famine, poverty, and disease.

The advent of nuclear technology has introduced a new dimension of risk. Since the mid-20th century, humanity has confronted the long-term hazards of nuclear weapons and radioactive contamination. The atomic bombings

of Hiroshima and Nagasaki in 1945 marked a turning point in awareness of the catastrophic environmental and human consequences of nuclear warfare (Ghoneim, 2011).

Over time, the international community has developed rules, practices, and institutions to limit environmental damage in armed conflict, particularly in relation to nuclear tests, radioactive waste disposal, and other forms of severe pollution (Afriansyah, 2010).

This paper therefore focuses on how international humanitarian law addresses environmental harm, and to what degree it offers effective protection in areas affected by armed conflict.

## **2. Significance of the Study**

Protecting the environment from the consequences of war—especially from nuclear weapons and other weapons of mass destruction—is not only a policy concern but also a human right. Every person has a legitimate interest in living in a safe and healthy environment, irrespective of geography or political boundaries.

The significance of this study is twofold:

### **1. Humanitarian Significance:**

It highlights the growing threats to the global environment stemming from armed conflicts and the use of highly destructive technologies. By drawing attention to these risks, the research encourages preventive action to avoid contamination of land, air, and water.

### **2. Legal Significance:**

The study reviews international and regional legal instruments, along with humanitarian principles applicable in peace and war. It focuses on how international humanitarian law contributes to environmental protection and how political realities and power relations influence the effectiveness of these legal norms.

By doing so, the paper engages with a relatively modern legal issue: the intersection between the law of armed conflict and international environmental law.

## **3. Objectives of the Study**

The overarching objective of this paper is:

To assess the effectiveness of international humanitarian law in protecting the natural environment in areas affected by armed conflict.

This central aim is supported by three specific objectives:

1. To determine whether and how the provisions of IHL contribute to the protection of the natural environment.
2. To examine the degree of international interest in environmental protection within the framework of international conventions and organizations.
3. To analyze both the substantive and institutional dimensions of environmental protection under IHL.

## **4. Research Questions**

The study is guided by the following key questions:

1. Do the rules and principles of international humanitarian law provide meaningful protection for the natural environment in armed conflict?
2. How has the international community addressed environmental concerns through treaties, conventions, and international organizations?

3. What are the substantive legal provisions and regulatory mechanisms within IHL that relate to environmental protection?

## 5. Environmental Consequences of War

Armed conflicts have always brought widespread human casualties and material destruction, but their environmental consequences are equally profound. Damage can be intentional—where the environment is targeted as a strategic objective—or incidental, as a by-product of military operations.

Examples include:

- Accidental or unintended releases:

During World War II, Germany sank a ship loaded with a vast quantity of mustard gas. The resulting leakage caused long-term contamination of surrounding waters, with estimated environmental impacts lasting centuries (Austin & Bruch, 2000).

- Sunken ships and oil spills:

In the Pacific Ocean, many vessels—including those carrying fuel and supplies—were sunk during the war between Allied forces and Japan. Decades later, storms have disturbed these wrecks, releasing pollutants and affecting vital fishing areas (Birnie, Boyle & Redgwell, 2009).

- Soil contamination:

The use of explosives, chemical agents, and heavy metals in warfare contaminates soil, reduces fertility, kills vegetation, and disrupts agricultural production. This can lead to long-term food shortages, malnutrition, and poverty (Koppe, 2008).

- Water pollution:

Naval warfare, underwater explosions, and dumping of hazardous substances contaminate water bodies with chemicals and radioactive materials, creating significant health risks for human populations dependent on those resources (Gleditsch, 1996).

- Air pollution:

Explosions, fires, and the use of certain weapons emit toxic gases and particulates into the atmosphere, contributing to climate disruption and health problems. Large-scale fires—such as oil well fires—can alter temperature patterns and reduce air quality over vast regions (Koppe, 2008; VICE News, 2015).

Another major long-term threat arises from landmines. Mines can remain buried for decades after the end of hostilities, causing casualties among civilians and animals, destroying agricultural land, and perpetuating fear and underdevelopment (Draulans & Van Krunkelsven, 2002).

Hazardous waste from arms production and disposal is another severe problem. Military industries generate toxic by-products that are difficult and costly to manage. In the past, such wastes were sometimes exported—legally or illegally—to poorer countries or dumped at sea, contributing to global environmental injustice. The Basel Convention of 1989 sought to curb this practice by regulating transboundary movement of hazardous waste (Walsh, 1992; Kummer, 1999).

Industrial accidents in military facilities, such as the explosion at the Joliet Army Ammunition Plant (JOAAP) in Illinois in 1942, illustrate how weapons production can cause short-term disasters and long-term pollution, with substantial economic and environmental costs.

The cumulative effect of these activities has contributed to climate disruptions, erratic weather patterns, severe storms, floods in some regions, and drought in others—demonstrating that environmental harm from war is rarely confined to the battlefield.

## **6. Environmental Protection in International Conventions**

The international community has adopted numerous legal instruments dealing with environmental issues. Since the early 20th century, more than 200 international treaties and agreements have been concluded in the field of environmental protection (Juma, 1994).

Some key examples include:

- London Convention (1923): On the preservation of animals and plants in their natural state.
- International Convention for the Prevention of Pollution of the Sea by Oil (1954).
- Partial Test Ban Treaty (1963): Prohibiting nuclear tests in the atmosphere, outer space, and underwater (Journal on Environmental Policy and Law, 1995).
- Barcelona Convention (1976/1979): For the protection of the Mediterranean Sea against pollution.
- Bonn Convention (1979): On the Conservation of Migratory Species of Wild Animals (Al-Rashidi, 1992).
- UN Convention on the Law of the Sea (1982): Imposes obligations on States to prevent and control marine pollution (Al-Rashidi, 1992).
- Vienna Convention for the Protection of the Ozone Layer (1985).
- CITES (1973): Convention on International Trade in Endangered Species.
- Convention on Biological Diversity (1992) and the Convention to Combat Desertification (1994) (Arab Organization for Agricultural Development, 1999).

The increased attention to environmental issues globally is linked to the realization that environmental degradation can become a source of political instability, economic disruption, and security threats. Environmental problems such as ozone depletion, global warming, and biodiversity loss transcend national borders and require coordinated international responses (Aderson, 1992; Fadlallah, 2001).

Furthermore, the understanding of human rights has expanded to include the right to live in a healthy environment, reinforcing the need for international cooperation to reconcile development objectives with environmental sustainability.

## **7. Sources and Legal Nature of International Humanitarian Law**

Historically, rules governing the conduct of war emerged from customs, religious beliefs, and the practices of ancient civilizations. These norms gradually shaped what we now call international humanitarian law, especially rules distinguishing combatants from non-combatants and protecting persons hors de combat (Savage, 2013).

### **7.1 Customary Law**

Customary rules—based on consistent state practice accompanied by a sense of legal obligation (*opinio juris*)—constitute one of the oldest and most important sources of IHL. They emerged from the instructions and codes that military commanders gave to their troops, which later crystallized into general “laws and customs of war” (Sorour, 2003).

## 7.2 Treaty Law

From the mid-19th century onward, States began to codify customary rules into multilateral treaties. Examples include:

- The Lieber Code (1863), issued by President Abraham Lincoln to regulate the conduct of Union forces during the American Civil War, which influenced later codifications (The New York Times, 2013).
- The Geneva Conventions of 1864, 1906, 1929, and especially 1949, which regulate the protection of the wounded and sick, prisoners of war, and civilians.
- The Hague Conventions of 1899 and 1907, which set limits on certain weapons and methods of warfare and laid down rules on the conduct of hostilities (Carnahan, 1984; Toman, 2017).

Other sources, such as United Nations resolutions, judicial decisions, and the writings of publicists, play a complementary role in interpreting and developing IHL.

## 7.3 Basic Principles of IHL

Several overarching principles guide the interpretation and application of IHL (Crowe & Weston-Scheuber, 2013; Mero, 2000):

- Humanity: Prohibits the infliction of suffering, injury, or destruction not necessary for achieving a legitimate military objective.
- Military Necessity: Allows only those measures indispensable for securing the military defeat of the enemy, subject to other rules of international law.
- Distinction: Requires parties to distinguish between combatants and civilians, and between military objectives and civilian objects.
- Proportionality: Prohibits attacks that may cause incidental loss of civilian life or damage to civilian objects that would be excessive in relation to the concrete and direct military advantage anticipated.
- Impartiality and Neutrality: Humanitarian assistance must be provided without discrimination and does not constitute interference in the conflict.

The Geneva Conventions of 1949 and their Additional Protocols of 1977 remain the cornerstone of modern IHL.

## 8. IHL and Environmental Protection in Armed Conflict

For many years, international law dealt with environmental protection primarily in peacetime. The 1972 Stockholm Conference on the Human Environment marked a turning point in global environmental awareness (MUSKIE, 1972). However, the specific issue of environmental protection during armed conflict received less attention until later.

### 8.1 Treaties and Provisions Relating to the Environment

Two key instruments explicitly address environmental protection in armed conflict:

#### 1. Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD, 1976):

Adopted in response to practices during the Vietnam War, this treaty prohibits the use of environmental modification techniques as a means of warfare when they have widespread, long-lasting, or severe effects (Westing, 1985).

#### 2. Additional Protocol I to the Geneva Conventions (1977):

- Article 35(3): Prohibits methods or means of warfare that are intended, or may be expected, to cause

widespread, long-term, and severe damage to the natural environment.

- Article 55: Requires parties to protect the natural environment against such damage and prohibits attacks against the natural environment by way of reprisals.

Other provisions, such as Article 54 (objects indispensable to the survival of the civilian population) and Article 56 (works and installations containing dangerous forces), also indirectly safeguard environmental resources (Geneva Protocol I, 1977).

## 8.2 Non-International Armed Conflicts

Additional Protocol II (1977), which applies to non-international armed conflicts, does not contain explicit provisions on environmental protection. This is a notable gap, considering that many contemporary conflicts are internal but have cross-border environmental consequences (Junod, 1983; Bothe, Partsch & Solf, 1982).

Nonetheless, Article 14 (protection of objects indispensable to the survival of the civilian population) and Article 15 (protection of works and installations containing dangerous forces) provide some indirect protection for the environment by safeguarding agricultural land, livestock, water installations, and infrastructure essential for civilian life.

## 8.3 Practice: The 1991 Gulf War

The 1991 Gulf War starkly illustrated the environmental impact of modern warfare. The large-scale bombing of infrastructure, massive oil spills, and deliberate ignition of oil wells in Kuwait created fires that burned for months, generating vast smoke plumes and releasing toxic substances into the atmosphere (MacArthur, 2004; NASA, 1991).

These events raised important questions about the adequacy of existing legal norms and spurred renewed debate about strengthening environmental protection under IHL.

# 9. Responsibility and Enforcement

Legal responsibility for environmental damage in armed conflict operates on two levels:

## 1. State Responsibility:

Under general international law and IHL, States are responsible for internationally wrongful acts committed by their organs or armed forces. Additional Protocol I recognizes the obligation of States to pay compensation for violations of the Conventions and the Protocol (Bothe, Partsch & Solf, 1982).

## 2. Individual Criminal Responsibility:

Certain serious violations of IHL—including indiscriminate attacks against civilian objects and installations containing dangerous forces—may amount to war crimes. Article 8 of the Rome Statute of the International Criminal Court includes provisions that can apply where environmental destruction is part of a war crime (Pilloud et al., 1987).

Despite these mechanisms, enforcement remains challenging. Political considerations, evidentiary difficulties, and complex causation between military activities and environmental harm often limit accountability.

# 10. Conclusion

International humanitarian law has undergone substantial development, shifting from a narrow focus on regulating hostilities to broader concern for human beings and, increasingly, the natural environment.

Fundamental principles—such as humanity, military necessity, distinction, and proportionality—support the idea that the environment should not be used as a weapon or subjected to unnecessary devastation.

However, direct and explicit protection of the environment under IHL remains limited. The major steps were taken in 1977 with Additional Protocol I and, to a lesser extent, in the ENMOD Convention. Additional Protocol II, which governs non-international conflicts, does not specifically address environmental protection, even though internal conflicts often generate extensive environmental harm.

IHL does, nonetheless, provide indirect protection through rules relating to civilian objects, property, certain types of weapons (chemical, biological, nuclear), and installations containing dangerous forces, as well as prohibitions on unnecessary suffering and superfluous injury.

For IHL to fully achieve its protective aims, especially regarding the environment, several measures are crucial:

- Strengthening and clarifying treaty provisions on environmental protection, including in non-international conflicts.
- Enhancing compliance mechanisms and accountability for serious environmental harm.
- Disseminating IHL rules widely among military personnel, policymakers, and the public to promote respect in both peace and war.

This study does not criticize the foundations of IHL; rather, it highlights both its achievements and its limitations in addressing environmental consequences of armed conflict. By emphasizing the universality of its principles and the need to expand and enforce environmental protections, it underlines the vital role of IHL as a primary legal framework for safeguarding both humanity and the natural world during war.

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