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## THE ECOLOGY OF CONFLICT

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### ABSTRACT

This research explores the anthropogenic consequences armed conflicts impose on our ecosystem by examining the intricate interplay between warfare and the environment. Encompassing atmospheric alterations, biodiversity impacts, and the ecocide of terrestrial and aquatic environments, the study reveals how environmental degradation inevitably emerges as a byproduct of warfare. Importantly, it elucidates how this degradation strategically serves as an indicator of destruction, fulfilling crucial military strategies. Historical records extensively detail instances of environmental devastation, seen in well-known cases such as Hiroshima, Nagasaki, and the deployment of Agent Orange during the Vietnam War. Despite this, modern warfare, exemplified in conflicts like the Russia-Ukraine war and the United States' invasion of Iraq, have continued to yield profound environmental consequences. The persistent occurrence of ecological destruction in modern conflict scenarios underscores the necessity for ongoing scholarly inquiry. This is particularly crucial given the realpolitik system of governance, reducing nature to a property of destruction rather than something that can be protected. The environmental toll of warfare is further compounded by technological advancements, extensive militarization, and sophisticated weaponry, largely driven by corporate engagement in war profiteering. These developments may precipitate even more severe ecological ruination compared to preceding conflicts, demanding a comprehensive exploration of the environmental reverberations associated with contemporary warfare. This research also delves into the heightened human crises resulting from environmental upheaval. Displaced refugees, dehumanized and often alienated from their natural environments, grapple with the loss of a crucial symbol of their identity. The paper critically evaluates the applicability and efficacy of international laws in addressing and preventing ecocide during armed conflicts. By dissecting existing legal frameworks, the research aims to delineate potential pathways for mitigating the environmental toll of warfare while acknowledging the current geopolitical realities shaping the relationship between warfare and nature.

**Keywords:** Contemporary Warfare, Ecocide, Militarisation, International Laws

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## ANCIENT WARFARE

Throughout the course of history, humanity has been confronted with the enduring presence of war, which has evolved from traditional battles fought with swords and shields to contemporary conflicts fueled by advanced technology and divergent agendas.

In ancient epochs, the deliberate devastation of ecosystems, constituted a strategic military approach independent of its contemporary connotations primarily associated with the aftermath of warfare. Unlike the modern era, marked by the omnipresence of weapons of mass destruction, early conflicts lacked such advanced technological mechanisms. Henceforth, it was commonplace for them to resort to the destruction of their adversaries' means of sustenance, often practised by utilizing natural forces as weapons in themselves.

Perhaps one of the most primal and potent elements harnessed by early humans, fire stands as a testament to humanity's ingenuity and capacity for destruction in the realm of warfare. The Romans used fire in siege battles, launching fire rounds from ballistae and catapults. Greek fire, introduced in 672 AD, was a petroleum-based liquid ignitable on water and was proved effective until the 13th century. The Roman sailors threw grenades filled with Greek fire or sprayed it from tubes, while Byzantines used specialized dromon ships to deploy the fire, equipped with heating systems and pressurized nozzles. During the first century BC, historical records document a substantial conflagration attributed to Germanic Barbarian tribes, as reported by a Roman military leader. This extensive forest fire, meticulously described, consumed all ground cover and inflicted severe scorching upon the soil, reaching down to the depths of the tree roots.<sup>2</sup> At the culmination of the Third Punic War in 146 B.C., Roman legions dismantled the fortifications encircling Carthage and deliberately desolated the agricultural lands of the Carthaginians through the process of salting, aiming to render them infertile.<sup>3</sup> Much like fire, water has served not only its role as a vital resource, but has historically been employed as a tool of warfare and a key aspect of military strategy. An illustrative instance occurred circa 590 B.C. during the First Sacred War in Greece, where the Athenians and their allies strategically contaminated the water supply of the besieged city of Kirrha with hellebore, a toxic plant prevalent in the

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<sup>2</sup> JOSEPH P. HUPY, *The Environment Footprint of War*, 14, ENVIRONEMNT AND HISTORY, 405-421, (2008)

<sup>3</sup> Environmental consequences of war, 79 Eos, 302, 302 (1998)

Mediterranean.<sup>4</sup>

As evidenced, pre modern warfare hinged upon the implementation of strategies designed to cripple the resources of the enemies. Strategies also included the deliberate destruction of agricultural lands to render them infertile, thereby starving populations of critical resources and the manipulation of watercourses to induce flooding within enemy territories. Notably absent, however, was the pervasive threat posed by the release of highly toxic chemicals capable of inflicting irreparable harm on the environment and its inhabitants. Despite the loss of flora and fauna during these historical conflicts, ecosystems exhibited resilience, facilitating the recovery of life and the sustenance of flourishing environments devoid of life-threatening diseases associated with hazardous nuclear and chemical weapons.

### **MODERN WARFARE**

The U.S. Civil War of 1861-1865 exemplified the environmental hazards inherent in industrialized warfare. The South experienced extensive devastation of crops and fodder as a result of deliberate military destruction by Northern forces. Their dominance in manpower, economic resources, and industrial capacity ultimately emerged victorious. Concurrently, in Europe during this era, Germany leveraged industrialization to mobilize its military, achieving swift triumphs over the Austro-Hungarian Empire and France between 1870 and 1871.<sup>5</sup>

The turn of the 20th century marked a pivotal moment in the evolution of warfare, as technological advancements propelled the industrial capacity for conflict to unprecedented heights. By 1914, Europe found itself immersed in a landscape where warfare was no longer confined to the traditional realms of infantry and cavalry. The advent of railways and wheeled vehicles facilitated swift mobilization and deployment of troops, while the emergence of nascent air forces heralded a new era of aerial combat. Initially, artillery served as a supplementary arm, providing direct support to infantry maneuvers. However, as the brutal reality of the First World War unfolded, a profound shift occurred in military

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<sup>4</sup> Mohamed H.M. Al-Agamy, *Tools of Biological Warfare*, 6 Research Journal of Microbiology 193, 200 (2010)

<sup>5</sup> Simo Laakkonen, Richard Tucker, *War and Natural Resources in History: Introduction*, 8 Global Environment 8,11 (2012)

doctrine. Commanders came to realize the decisive role that artillery played in shaping the course of battle, encapsulated by the maxim, "*Artillery conquers and infantry occupies.*" Before the war, artillery units attached to armies were usually allotted, at most, several hundred rounds per day for combat operations. By the end of the war, artillery units were assigned several hundred rounds per hour. This transformative progression acted as a pivotal precursor to the onset of the Second World War, highlighting the indispensable role played by technological advancements and reaffirming the enduring pertinence of firepower in shaping subsequent military stratagems and conflicts.

Twenty years following the cessation of hostilities in World War One, Europe found itself embroiled in another cycle of warfare, this time exhibiting a level of destructiveness unparalleled in previous conflicts. The subsequent conflict saw a shift in military strategy, emphasizing mobile armor and optimized road networks. Unlike the static trench warfare of World War One, this era featured fluid front lines, reducing landscape devastation. Mobile armor, supported by infantry, facilitated rapid advancements and exploited enemy defenses. Artillery advancements minimized collateral damage with surface-detonating shells. These changes marked a new approach to warfare, maximizing battlefield effectiveness.

During World War II, Japan and Vietnam became emblematic of the environmental devastation wrought by modern warfare, particularly due to the deployment of atomic weapons by the United States.

The atomic bombings of Hiroshima and Nagasaki by the United States in August 1945 resulted in catastrophic immediate casualties and long-term environmental repercussions. Based on interviews conducted in Hiroshima following the atomic bomb detonation, prevalent rumors surfaced immediately, reflecting survivors' profound concerns regarding the fragility of their environment. Among these rumors, one of the most enduring and disconcerting notions posited that Hiroshima's landscape would forever remain barren, incapable of supporting vegetation due to the bomb's radioactive contamination. This speculation implied a sense of desolation extending beyond human casualties, encompassing the very essence of life and vitality in the city. Another speculation suggested that Hiroshima would remain uninhabitable for a duration of seventy-five years, or even indefinitely, implying that no individuals would be able to reside there. This notion

conveyed the belief that the city, as the shared habitat of its inhabitants, had been so severely contaminated that it surpassed the threshold for sustaining human existence. A pervasive sense of uncertainty arose regarding the extent to which human survival relied upon the stability and support of the natural environment.<sup>6</sup> Before the Manhattan Project, knowledge of radioactive particle dispersion was limited. Radioactive fallout from nuclear tests encircled the globe, with strontium-90, a hazardous isotope, contaminating the environment and entering the food chain. The 1954 Bravo test at Bikini Atoll highlighted fallout's harmful effects on human health and the environment. Over 7,100 Hiroshima-sized bombs were detonated, resulting in widespread destruction of wildlife and ecosystems. Some atoll rats survived these tests and were studied as proxies for human resilience, while the global population unwittingly faced radiation exposure as subjects of experimentation.<sup>7</sup>

During the Vietnam War, the extensive use of chemical herbicides, notably Agent Orange, by the U.S. military inflicted profound and enduring damage upon Vietnam's environment. Agent Orange, containing the toxic compound dioxin, was deployed to defoliate jungles and eliminate enemy cover, leading to widespread contamination of soil, water sources, and vegetation. During the conflict, the regions of Vietnam, Cambodia, and Laos were subjected to extensive herbicide exposure, estimated at over 77 million liters, covering approximately 2,600 million hectares of land. Over the past several decades, numerous studies have sought to assess the environmental damage resulting from these events and to understand their long-term repercussions. It has become evident that the defoliation of the landscape led to immediate mortality of trees and shrubs, as well as the local extinction of numerous large mammal species including ungulates, carnivores, and elephants. Furthermore, the application of concentrated herbicides has induced significant alterations in local community structures, notably transforming forested and mangrove-dominated habitats into scrubby grasslands, thereby substantially modifying community assemblages.<sup>8</sup>

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<sup>6</sup> Robert Jay Lifton, *Hiroshima and the Climate Threat Have in Common [Excerpt]*, Scientific American (October 16, 2017) <https://blogs.scientificamerican.com/observations/twins-of-the-apocalypse-what-hiroshima-and-the-climate-threat-have-in-common-excerpt/#:~:text=Because%20of%20the%20bomb's%20%E2%80%9Cpoison.death%20but%20went%20beyond%20it.>

<sup>7</sup> Matthew Wills, *How Nuclear Tests Spawned Environmentalism*, JSTOR (February 15, 2018) <https://daily.jstor.org/nuclear-tests-environmentalism/>

<sup>8</sup> Michael J. Lawrence, Holly L.J. Stemberger, et. al, *The effects of modern war and military activities on biodiversity and the environment*, 23 Environmental Reviews 443, 450 (2015)

## EVALUATING THE ECOCIDE OF PRESENT DAY CONFLICT ZONES

To embark upon an academic exploration of the environmental toll inflicted by war crimes, it is imperative to delve into the intricate nexus between armed conflict and ecological devastation. Contemporary warfare ensnares civilians as victims of war crimes, marked by heavy militarization and weaponization, resulting in catastrophic ecological collapse and civilian casualties. The withdrawal of civilians exacerbates environmental devastation, rendering war-stricken zones barren for years due to prolonged military presence.

The upheaval in Afghanistan exacerbated significantly subsequent to the disorganized withdrawal of U.S. and other international forces in mid-2021, accentuated by the Taliban's ascension to power and the subsequent freezing of the Afghan government's financial resources. However, preceding the troop pullout, there had been a conspicuous lack of emphasis on formulating policies aimed at addressing climate change and environmental shifts. This oversight assumes critical significance, particularly in light of Afghanistan's predominantly rural populace, with nearly 70 percent residing in rural areas, and where approximately 80 percent of livelihoods are reliant on agriculture. The country's fiscal priorities have long been skewed towards combating security threats, rendering Afghanistan ill-equipped to contend with the ramifications of climate change. The Germanwatch Global Climate Risk Index, assessing nations' vulnerability to extreme weather events, delineated Afghanistan as the sixth-most affected country in its recent report for the year 2019.<sup>9</sup> The utilization of advanced military technologies and chemicals during conflict has led to widespread degradation and burning of forested areas and agricultural lands in Afghanistan. Approximately ten thousand villages and their surrounding ecosystems have faced destruction as a result, perpetuating ongoing environmental deterioration. Notably, Afghanistan's forest coverage remains alarmingly below the recommended threshold of 25% set by the World Bank for sustainable economic development, standing at less than 2%.<sup>10</sup>

The United States' invasion of Iraq, purportedly justified by assertions of weapons of mass

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<sup>9</sup> Nasrat Sayed Said Hashmat Sadat, *Climate Change Compounds Longstanding Displacement in Afghanistan*, MPI (June 29 2022)

<https://www.migrationpolicy.org/article/climate-change-displacement-afghanistan>

<sup>10</sup> Nafees Mohammad, Zahidullah, et. al, *Environmental Degradation due to War in Afghanistan: A Review*, Peshawar University 1,10 (2018)

destruction, elicited substantial environmental ramifications. Infrastructure demolition, notably targeting oil facilities, resulted in oil spills and soil contamination, intensifying ecological degradation. The utilization of munitions precipitated habitat destruction and ecosystem deterioration, exacerbating environmental degradation. The persistence of unexploded ordnance further perpetuated hazards, posing continuous risks to human settlements and biodiversity.

As early as 2005, the United Nations reported numerous contaminated sites across Iraq. Subsequent investigations, including one conducted by The Times, indicated that the U.S. military had left approximately 11 million pounds of hazardous waste in the country by 2010. Presently, Iraq grapples with pervasive pollution from substances such as depleted uranium and dioxin, resulting in soil and water contamination. Moreover, industries like the KAR oil refinery operate with limited transparency. Compounded by its susceptibility to climate change, Iraq faces severe water shortages and extended drought periods. In essence, Iraq epitomizes a dystopian scenario where human activities have contaminated nearly every ecosystem, giving rise to terms like “ecocide.”<sup>11</sup>

Subsequent to the Gulf War, a significant number of veterans grappled with a condition recognized today as Gulf War syndrome, which encompasses a range of chronic symptoms experienced by veterans of the 1990-1991 Gulf War, including fatigue, musculoskeletal pain, cognitive difficulties, and respiratory issues. Its etiology remains multifactorial, implicating exposure to environmental toxins, combat stress, and infectious agents. This syndrome poses diagnostic and therapeutic challenges, underscoring the complex interplay of environmental and physiological factors in military health. Despite ongoing speculation, the precise origins of the illness remain a topic of debate, with potential factors including exposure to depleted uranium, chemical weapons, and emissions from ignited oil wells. Over 200,000 veterans deployed to Iraq, Afghanistan, and other Middle Eastern regions have lodged complaints with the Department of Veterans Affairs, attributing their significant health ailments to exposure to burn pits.

We turn our attention to the ongoing Israel-Palestine conflict, a longstanding geopolitical issue that has persisted for decades and has now seen a devastating escalation since

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<sup>11</sup> Lynzy Billing, After the Wars in Iraq, ‘*Everything Living is Dying*’, Inside Climate News (December 9, 2021) <https://insideclimatenews.org/news/29122021/iraq-ecocide/>

October 7th, 2023. Groups such as Human Rights Watch have accused Israel of deploying white phosphorus munitions in Gaza, despite its prohibition under international law, contributing to increased air pollution. The chemical is a wax-like, toxic substance which burns at temperatures high enough to melt metal. As Gaza braces for the rainy season, concerns arise over the potential for acid rain tainted with white phosphorus. This poses a grave risk, especially for individuals resorting to collecting rainwater using plastic sheets due to a scarcity of potable water. In the initial stages of the conflict, the United Nations humanitarian agency OCHA documented a staggering rate of bombardment, with Israel reportedly dropping an average of 42 bombs per hour on Gaza.<sup>12</sup>

It is projected that the primary contributor to emissions during this conflict will be the utilization of military fuel, notably Israeli jet fuel and diesel. Furthermore, emissions from fires in urban and landscape areas, caused by either deliberate destruction or targeted attacks, are anticipated to be substantial. Additionally, the process of reconstructing Gaza is expected to generate significant carbon emissions.<sup>13</sup>

Israel's attacks on Gaza are currently widely being regarded as a scorched earth policy. This strategy entails the deliberate destruction of resources, infrastructure, and land to deprive the enemy of their utility. In the academic context, a scorched earth policy refers to a military tactic characterized by the intentional devastation of land and property by retreating forces to obstruct the enemy's advance and diminish their ability to sustain themselves. It is obvious that the primary origin of emissions in this conflict will arise from military fuel consumption, notably Israeli jet fuel and diesel, in conjunction with emissions triggered by urban and landscape fires ignited by the destruction of buildings or targeted attacks. However, it is predicted that there will also be substantial carbon emissions for reconstructing Gaza. Additional hazards encompass fires, disintegrated building materials, potentially containing hazardous elements such as asbestos, and pollutants emitted from sites housing dangerous substances. The reconstruction of conflict-ravaged regions, even from debris, precipitates substantial emissions. The production of concrete and cement for reconstruction purposes yields a significant volume of carbon dioxide, exacerbating the climate emergency. A preliminary assessment is underway to estimate the greenhouse gas

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<sup>13</sup> Indlieb Farazi Saber, *Is Israel's Gaza bombing also a war on the climate?*, AlJazeera (December 5 2023) <https://www.aljazeera.com/news/2023/12/5/is-israels-war-on-gaza-also-hurting-the-climate>

emissions stemming from the restoration of residential and non-residential structures damaged or destroyed in the initial six weeks of the conflict.

The conflict in Gaza not only brings devastation to civilians but also severs their profound ties to the environment. Gazans' deep connections to olive groves, orange orchards, picturesque landscapes, and the expansive sea make the deliberate destruction of these natural elements a particularly cruel war tactic. By alienating civilians from their habitat and depriving them of their ecosystem, aggressors aim to intensify the psychological and emotional toll of the conflict. Targeting these cherished symbols of identity and livelihood amplifies trauma, undermining Gaza's physical infrastructure and cultural heritage, perpetuating a cycle of suffering and displacement.

### **ROLE OF INTERNATIONAL LAW**

The International Court of Justice (ICJ), the principal judicial organ of the United Nations, issued a directive to Israel to undertake necessary actions for the protection of Palestinians on 26<sup>th</sup> January, 2024. However, the court refrained from mandating an immediate cessation of hostilities. Specifically, the ICJ mandated that Israel must undertake all feasible measures within its jurisdiction to prevent acts falling under the purview of the Genocide Convention.<sup>14</sup> Despite the significant levels of destruction witnessed, the directives issued by the International Court were couched in ambiguous terms, offering no clear and concrete mandates or actionable measures to address the ongoing conflict. In failing to explicitly demand an immediate cessation of Israeli attacks, but rather instructing Israel to "protect" Palestinians, the International Court's ruling inadvertently creates a pathway for further destruction and violence to unfold.

Article 35(3) of Additional Protocol I to the Geneva Conventions of 1949 establishes a fundamental principle within international humanitarian law, proscribing the utilization of tactics or instruments of warfare with the intent or anticipation of inducing extensive, enduring, and substantial harm to the natural environment. However, the efficacy of such legal provisions can be compromised by the absence of enforceability, as states may choose not to adhere to these mandates, rendering them ineffectual in practice. Furthermore, the

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<sup>14</sup> *ICJ orders Israel to prevent genocidal acts in Gaza*, The Hindu (January 26, 2024 05:04 pm) <https://www.thehindu.com/news/international/israel-south-africa-case-verdict-international-court-of-justice-live-update-january-26-2024/article67779414.ece>

United Nations relies on funding from its member states, a dynamic that can potentially be exploited by certain governments as leverage against the organization. The United States holds the distinction of being the largest financial contributor to the United Nations, providing 22% of the regular budget and 27% of the peacekeeping budget. However, as of January 26, 2024, the U.S. halted its financial support to the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) in light of accusations implicating some of its personnel in hostile actions. This move underscores the potential for financial leverage to be wielded by influential member states within the UN framework, thereby influencing decision-making and operations within the organization.

Israel's military offensives, notably the 2006 invasion of Lebanon and subsequent assaults on Gaza in 2008-2009 and 2014, prominently featured the deployment of Lockheed Martin weaponry, including F-16 fighter jets and the Multiple-Launch Rocket System (MLRS). These conflicts resulted in significant civilian casualties, with Human Rights Watch attributing the high civilian death toll to Israel's failure to adhere to the principle of distinguishing between legitimate military targets and non-combatants as mandated by international law. Additionally, investigations by organizations like Amnesty International revealed instances of indiscriminate attacks and deliberate targeting of civilians and civilian infrastructure, implicating Lockheed Martin weapons in these violations of humanitarian norms.

The United Nations could potentially mitigate the proliferation of weapons of mass destruction by imposing stricter regulations and heavier sanctions on corporations like these, known for their involvement in the large-scale production of such armaments. By enacting more stringent laws and prohibiting these corporations from war profiteering, the UN could exert greater control over the production and distribution of arms, thereby curbing the escalation of armed conflicts and their devastating consequences.

## **CONCLUSION**

The multifaceted exploration of the historical evolution and contemporary manifestations of warfare underscores the complex interplay between armed conflict, environmental degradation, and the imperative for international legal frameworks. Throughout history, warfare has evolved from rudimentary strategies reliant on natural elements to sophisticated mechanisms driven by advanced technology and divergent geopolitical

agendas. Early conflicts employed tactics aimed at debilitating adversaries' resources, including deliberate destruction of ecosystems and agricultural lands. However, the advent of modern warfare, characterized by industrialization and technological prowess, has ushered in unprecedented levels of environmental devastation and civilian suffering.

The consequences of war crimes extend far beyond immediate casualties, encompassing enduring ecological collapse, displacement, and long-term health implications. Contemporary conflicts, exemplified by the ongoing Israel-Palestine conflict and the aftermath of U.S. military interventions in Iraq and Afghanistan, underscore the urgent need for robust international legal mechanisms to address the intersection of armed conflict and environmental degradation. The directives issued by the International Court of Justice and the provisions outlined in international humanitarian law serve as crucial instruments for accountability and justice. However, the efficacy of these measures is contingent upon their enforceability and the willingness of states to adhere to their mandates.

Furthermore, the role of influential member states within the United Nations, such as the United States, in leveraging financial support to influence decision-making underscores the inherent complexities of global governance and the need for greater transparency and accountability. By harnessing its collective influence and imposing stricter regulations on corporations involved in the production of weapons of mass destruction, the international community can mitigate the proliferation of arms and mitigate the devastating consequences of armed conflicts.

In conclusion, the intricate nexus between armed conflict, environmental degradation, and international law necessitates a concerted and multifaceted approach to address the root causes and consequences of warfare. By prioritizing diplomacy, accountability, and sustainable development, the international community can strive towards a future where peace and environmental stewardship prevail over conflict and destruction.