

The Environmental Dimension of the Israeli-Hamas War in the Gaza Strip: a Political Ecological Analysis



ABSTRACT

While the conflict between Israel and Palestine occurs in what is referred to as the occupied Palestinian territories (OPT), this study focuses on Gaza, which is the site of the deadly war between the Israeli Defense Forces (IDF) and Hamas, which was triggered by the deadly attacks of the latter on October 7, 2023. The paper goes beyond framing the Israeli-Hamas conflict in the context of territorial dispute aggravated by ethnic discord, and provides a political-ecological lens through which the war can be analyzed. This study focuses on the structural conditions within which resource scarcity has engendered and enabled political violence. Resource deprivation in Gaza was in stark contrast to how Israel was able to turn relatively arid lands into arable farms through the use of modern technology. This led to an imbalance in agricultural productivity and economic wealth between Gaza and Israel, and a Gaza economy that was very much dependent on Israel. This was aggravated by defeat in previous wars. Resource scarcity in Gaza led to cross-border ethnic and cultural skirmishes, and the ensuing political violence was both symbolic and physical. Relative deprivation felt by the Palestinians in Gaza may have been partly driven by their adverse resource endowments, but the resource degradation was aggravated by the sequestration by Israel as an occupying force of vital environmental management services which made Gaza both deprived and dependent. The current conflict has further impaired the ecological health of Gaza, even as international law may be faced with challenges in holding Israel accountable for ecological damages.

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Keywords: *environment and violent conflict, environmental impacts of Israeli-Hamas war, environmental causes of Israeli-Hamas war, political ecology of violence, international law*

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INTRODUCTION

The connection between environmental degradation and violent conflict is a fertile ground for inquiry, and the situation in Gaza, particularly in the war between Israeli Defense Forces (IDF) and Hamas sets the stage for a re-examination of the prevailing theories that have been used to explain the connections. The connection between environment and conflict has been grounded on the prevalence of scarcity and resource degradation, with the premise that not all conflicts involving natural resources can be considered as environmental in nature. It is also given that not all conflicts could have environmental causes, even if they may have environmental consequences.

This study looks into the environmental dimensions of the conflict between Israel and the Palestinians. While the conflict includes both the Gaza Strip and the West Bank, comprising what is referred to as the occupied

Palestinian territories (OPT), this study focuses on Gaza, which is the site of the war between Israel and Hamas, which was triggered by the deadly attacks by the latter on October 7, 2023 and the ensuing retaliation by the former that has killed tens of thousands, and has serious environmental consequences. These include soil infertility (*FP Explainer 2023*), air contamination due to use of white phosphorous (*Faqir 2023*) and excessive carbon emissions (*Neimark et al. 2024*), all of which threaten not only environmental but human health (*Soulaiman 2023*).

It is however argued that the current conflict is predicated on a long history of hostility between Israel and the Palestinians. Thus, the paper includes both the environmental impacts of the preceding events associated with the occupation by Israel of Palestinian lands as well as the current war between Israel and Hamas.

MATERIALS AND METHODS

The framework of the paper is political ecology, which is both a theory and a method of analysis. Political ecology focuses on power relations, and their role in contestations over environmental resources. Political ecological analysis is premised on the claim that ecological transformations can only be understood in the context of the interplay between economic and political structures and institutions. Recent scholarship in political ecology has included inquiries into human and environmental security, and the political and economic forces that are at play in situations of violence and conflict. Political ecology employs an eclectic range of methodologies, from the field-based to the discursive.

This paper employs the discursive approach by using narratives drawn from published secondary data. In addition, the paper relies on the prevailing scholarship in environment, conflict and political violence. Admittedly, the materials available in the literature are diverse, and have their own limitations. However, this paper does not dwell on an extended critical analysis of these theories, and uses as reference point the theoretical framework developed by *Homer-Dixon (1999)* as engaged, and even critiqued, by other scholars. This is the focus of the next section, where prevailing literature in the causes, nature and type of, and the role of climate change in, environmental conflicts are discussed. This is followed by a discussion in the third section of the environmental impacts of the conflict, both in terms of the impacts of Israel's occupation of Palestinian territories, and after the October 2023 attacks.

The fourth section focuses on the applicability of the different political-ecological theories, including the conversations that exist among them, in analyzing the conflict. Finally, and in the context of the ecological outcome, the last part of the study uses a legal lens in assessing the possible remedies under international law that may be availed of in order to hold relevant parties accountable for the environmental damages caused by the war.

RESULTS AND DISCUSSION

Theoretical and Analytical Framework: Political Ecology of the Violence

The Causes of Environmental Conflicts. *Homer-Dixon (1999)* theorized the link between environment and violent conflict, by looking at environmental scarcity as the key variable. He offered three types of environmental

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scarcity. There are scarcities which emanate from the decline in available renewable resources which results from overconsumption and resource degradation, which he termed as supply-induced scarcity. On the other hand, there is also a type of scarcity that is induced by increasing demand brought about by increases in population and the resulting increase in consumption per capita. Finally, scarcity can also result from the structured inequality of access to resources.

Homer-Dixon (1999) focused on population growth, resource degradation, and inequality in access to resources. Using these three variables, he posited that population growth is always an independent causal variable, and where the nature of the ensuing conflict that emerges from the social processes associated with environmental scarcity would largely depend on which between inequality or resource degradation would be the independent or the dependent variable. When resource depletion interacts with population growth, the outcome would be that political elites would mobilize their power to sequester or capture whatever benefits can be generated from the resource. This is what *Homer-Dixon* referred to as "resource capture," a process that can disenable institutions to properly allocate the benefits fairly, and can lead to conflict.

On the other hand, resource degradation can intensify when inequality in resource access interacts with increasing population. *Homer-Dixon (1999)* called this process as "ecological marginalization," and argued that in this situation, social groups tend to migrate away from areas that are relatively resource-scarce to areas which they perceive as less resource-scarce, but are also facing scarcity issues. This scarcity-induced migration or mobility tend to increase the possibility of political violence between the native populations and the migrants.

Other scholars like *Baechler (1998)* and *Klare (2001)* agreed with *Homer-Dixon* in pushing for the neo-Malthusian theory that there is a linkage between resource scarcity and violent conflict. This is a view that was disputed by scholars like *Deudney (1990)* who propounded that instead of necessarily leading to conflict, the more rational response to scarcity include conservation, trade and substitution. There are even scholars like *Collier and Hoeffler (2002)* and *de Soysa (2002)* who argued that there are certain social conditions where it is not scarcity, but the presence of an abundance of resources that can lead to violent conflict. It is also important to mention that while scarcity can lead to conflict, humans may deploy technological innovations, appropriate market mechanisms and enabling institutional designs that

may negate the possibility of scarcity-induced conflict. This is what is referred to as the the Cornucopian view (*Kahn and Simon 1996*).

Nature and Types of Environmental Conflicts.

Homer-Dixon (1999) posited that resource capture and ecological marginalization lead to decreases in agricultural production, a general decline in the economic well-being of the affected population, the disruption of social institutions and relations, and the displacement of the population. He further identified three types of environmental conflict. There are those that emerge resulting from simple scarcity. A second type is identity-based conflict that occurs between different ethnic and cultural groups that can be aggravated by resource deprivation and stress. And the third are those that result from relative deprivation, which can be associated with the intensification of social discontent that widens the rift between different social categories and can be further aggravated by the economic impacts of resource and environmental degradation.

Savelli et al. (2023) offered four distinct pathways for violent conflict to emerge due to population mobility. In addition to the classic mobility pathway already identified by *Homer-Dixon (1999)*, where scarcity-related mobility can induce violent conflict, they suggest that climate-related displacement can also result to conflict. A third pathway is when population movement which can result to conflict between natives and migrants is triggered more by pull factors of abundance in the destination region, instead of the push factors of scarcity or climate-related disaster in the source region. There are also conflicts that are already existing in a given territory, that are further exacerbated by migration, climate change and/or variability.

The Role of Climate Change. The role of climate change in causing environmental conflict has produced a large body of literature dominated by what has been referred to as “climate change causes conflict” (CCCC) discourse (*Messer 2010*). The backbone of this discourse largely rests on the premise outlined by *Homer-Dixon (1999)* and identified by *Savelli et al. (2023)* as the second pathway for conflict to emerge as a result of climate-related displacement. The argument is that adverse weather and climate events would lead to large-scale population migration away from adversely affected areas into agricultural zones which are relatively still water-sufficient but are also threatened by climate change. This would greatly increase the probability for conflict and political violence (*Messer 2010*).

However, *Messer (2010)* criticized the CCCC as misleading, in that it offers a simplistic causality between climate change and conflict, considering that there is no general consensus. At best, research can only establish that climate change is associated with conflict. It is here that *Libiszewski (1992)* has offered a useful lens to look at the linkage between environment and conflict. He argued that environmental conflicts have social, political, economic, ethnic, religious, ideological, territorial and resource manifestations. However, what renders them as environmental is the fact that they are induced by environmental degradation. For *Libiszewski (1992)*, the word “induced” implies that environmental factors could either directly or indirectly lead to conflict. In this framework, causality should not be seen in the context of a stimulus-response relationship, but as enabling contexts that may or may not lead to a particular expected outcome.

Messer (2010) succinctly captured this dynamic when she reframed the question and shifted the focus on the political context that shapes the emergence of the conflict. She summarized the emerging consensus when she said that “many experts attest that it is inaccurate to conclude that water scarcity, drought, desertification, or climate change cause political instability and rebellions; in their opinion, it is the political context that shapes such conflicts and natural resource degradation.”

Violent Conflict, Wars and the Environment. There were scholars who argued that violent conflict and war could lead to environmental destruction. This is what *Westing (1972; 1976)* argued as what happened in Vietnam (*Feshbach 1995*) in the former Soviet Union resulting from the Cold War, and as a result of the Gulf War (*El-Baz and Makharita 1994*). However, there are also those who posited that there is no evidence to suggest that this causality is almost certain. In fact, *McNeely (2000)* who worked for IUCN argued that there are cases where war might even prove to be less destructive to the environment, considering that much environmental destruction also happen in areas that do not experience violent conflict.

There are also those who challenge the neo-Malthusian premise that demographic characteristics such as population increase and the presence of a high proportion of relatively younger men are the principal drivers of conflict. Some scholars like *Matthew et al. (2004)* argue that the consumption patterns that directly influences the carbon footprint, as well as social inequity are also important influencing variables.

The Environmental Impact of the Conflict

Impacts of Israeli Occupation of Palestinian Territories (OPT). The environmental transformation of what is now referred to as the Occupied Palestinian Territories (OPT), which include West Bank and the Gaza Strip is primarily characterized as a form of environmental degradation. Lands, which in the past were described in the literature, both biblical and scientific, as “flowing with milk and honey” with thickets, forests, grasslands and fresh water resources, are no longer living up to this characterization. What now predominates the landscape are barren hills, deserts and signs of urban decay seen in sewage now polluting the Jordan River. The famous Dead Sea is now losing water, and appears as literally two separate seas, and the water level is further dropping due to climate change. *Isaac and Ghanyem (2014)* pointed out that while environmental degradation was a result of environmental mismanagement and neglect over the years, this has worsened during the Israel occupation. Social consequences of this to the Palestinians living in the OPT is referred to by the Institute for Middle East Understanding (*IMEU 2022*) as a form of environmental apartheid. Israel is seen as systematically exploiting the environment not only in Israel but in the OPT by installing discriminatory practices that lead to dispossession of the Palestinians of their land, water and other natural resources. The latter is disproportionately suffering the impacts of these environmental damage caused by Israel, a process that can be considered as a form of environmental injustice.

The *IMEU (2022)* reported that since 1967 Israel has appropriated large areas of Palestinian lands in the OPT to establish Jewish settlements, and this expropriation has severely limited the access of Palestinians to lands within OPT. Israel has also systematically denied Palestinians in the OPT, and even those living inside Israel access to clean and safe drinking water. The Israeli government is further imposing restrictions on Palestinians to drill water wells and install water pumps. Meanwhile, *IMEU* has accused Israel of over-extracting water within the OPT, which lead to adverse environmental consequences seen in the dropping of the water table, and the distortion in the natural groundwater flow. This rendered the Palestinians more vulnerable to floods and droughts, even as it further degraded freshwater quality. It was reported that 10,117.14 ha of natural wetlands were cut, and Lake Hula was drained to make room for the establishment of Israeli farming settlements. The building of settlements has inflicted serious environmental damages, some of which are unintentional like the release of dangerous pollutants into the environment of the Palestinian communities,

The Environmental Dimensions of the Israel-Hamas War while others appeared to be deliberate like targeted destruction of Palestinian olive groves to force them out of their lands.

The blockade imposed by Israel on Gaza Strip has catastrophic impacts on environmental and human health. *IMEU (2022)* reported that around 96% of water in Gaza has been rendered unpotable, leading to a high incidence of mortality among young children and infants that are linked to poor water quality and sanitation. It is also reported that there is an increase in kidney problems. In addition, the coastal wetlands and natural aquifer in Gaza has been significantly degraded. The Wadi Gaza, which used to be an important wetland, is now overused and polluted, which further contributed to the decline in clean water supply.

Impacts of the Current Israeli-Hamas War: Initial Assessment. One month after the commencement of the Israeli-Hamas war, which was triggered by the bloody Hamas’s terrorist attack in areas bordering Gaza Strip on October 7, 2023 Israel’s Defense Forces (IDF) has dropped approximately over 25,000 tons of explosives in Gaza (*Reliefweb 2023*). Environmentalists believe that this will cause widescale soil infertility in the future (*FP Explainer 2023*). It is also widely believed that Israel is using white phosphorous weapons that have deadly effects not only on civilians (*Human Rights Watch 2023*) but is expected to linger in the air for years to come (*Faqir 2023*).

These massive bombings have forced Palestinians to evacuate to enclaves that have become so crowded, leading to environmental health hazards caused by overflowing sewage now surrounding areas of human habitation. Environmental work by Palestinian agencies have been halted with the Israeli blockade and bombardment. Making it worse is that the bombings have also polluted the soil and water sources. Makeshift landfills are overflowing with dead bodies, even as those buried under the rubble, combined with medical waste, and the ensuing shutdown of treatment and desalination plants have further aggravated the environmental and public health disaster caused by the conflict (*Soulaiman 2023*).

A study conducted by *Neimark et al. (2024)* revealed that the projected emissions for the first 60 days of the conflict was estimated to be more than the annual emissions of 20 countries and territories. These emissions were mainly Scope 1 “tailpipe emissions,” and some, but very limited, Scopes 2 and 3 (manufacturing of bombs and rockets) emissions due to the hundreds of Israeli

bombing raids, and emissions from tanks and other vehicles, cargo flights, and patrol flights by other aircraft as well as the estimated munitions used by Israel on Gaza. Also included within the 60-days timeframe of the study were the climate impacts of Qassam rockets initially fired by Hamas into Israel. The impact becomes even higher and rises to emission levels of more than 33 countries and territories if those caused by the war infrastructure that was built by both sides such as the tunnel network in Gaza and the “iron wall” in Israel would be included. The study further estimated that the carbon costs for reconstructing and rebuilding Gaza would generate total annual emissions that would top those of more than 130 countries.

Analysis of the Applicability of Theories to the Conflict in the Gaza Strip: Causes and Impacts

Isaac and Ghanyem (2014) has characterized as a form of organic relationship the environmental impacts of the political conflict between Israel and the Palestinians in the occupied territories even before the recent eruption of conflict triggered by the October 7, 2023 terrorist attacks by Hamas on Israeli territory. The premise of their argument is that the ability of the Palestinian authority to regulate and manage the environment has been undermined by their lack of full sovereignty over their own natural resources. They posit that denied the full authority to regulate land use, the Palestinian authority failed to fully maintain its natural ecosystems, monitor the status of the environment, and implement

environmental protection. *Isaac and Ghanyem (2014)* presented in a schematic diagram of the environmental effects of the Israeli occupation practices (**Figure 1**).

It is interesting to note that the relationship between environmental degradation and political conflict is presented not as a unilinear causation. Political conflict between Israel and the Palestinians led to the occupation of Palestinian Territories by Israel, as the outcome of the latter's series of victories. These led Israel to expand its presence by building by-pass roads, establishing settlements and industries, sequestering water resources, and closing-off areas to access by Palestinians. Land confiscation was necessary to build roads and settlements, which eventually led to land fragmentation. The establishment of settlements and industries led to water, air and land pollution. Land fragmentation, pollution and water depletion all played a role in environmental degradation, which together with water depletion led to losses in agricultural productivity. Environmental degradation and agricultural decline were further aggravated by closures and denial of access by Israel to Palestinians over their traditional lands, which led to the aggravation of health, social and economic problems, which now serve as the principal driver for further political conflict.

The general premise in this diagram is that the Israeli-Palestinian conflict has environmental dimensions, and that resource degradation plays an important role in the

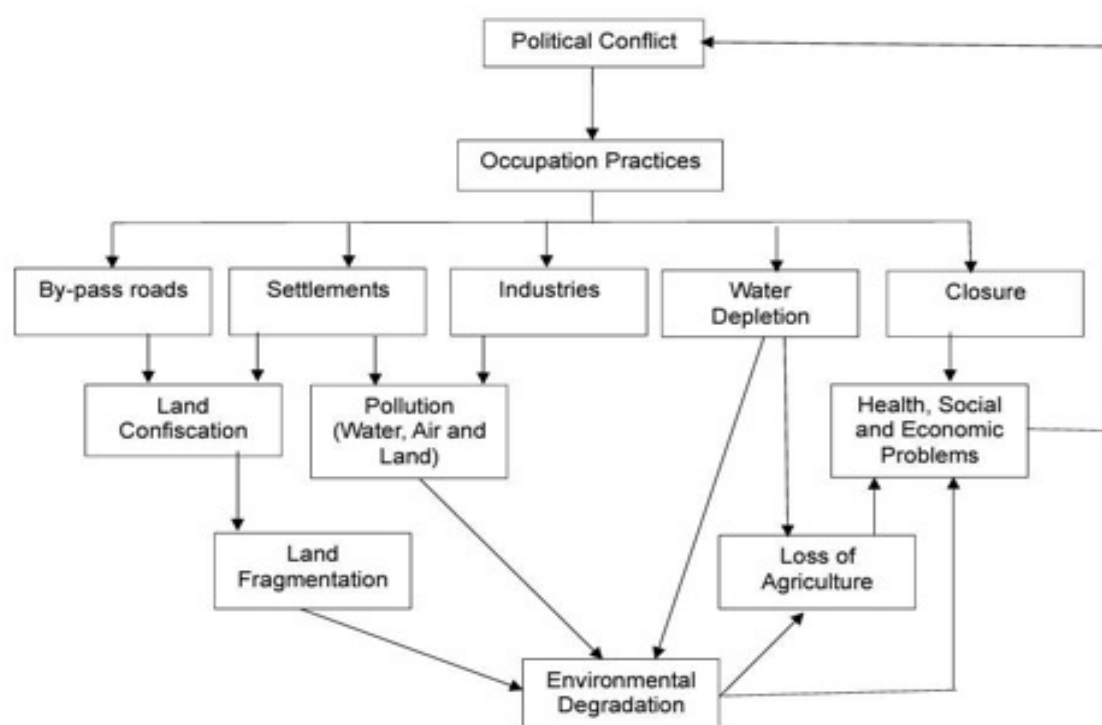


Figure 1. The effects of Israeli occupation practices on the Palestinian environment (*Isaac and Ghanyem 2014*).

dynamics. It indicates that environmental degradation is an outcome of the conflict, now expressed in the form of land occupation by Israel as an invading force that deployed settler colonialism as its main battering ram. In the framework of *Homer-Dixon (1999)*, this can be characterized as a form of ecological marginalization, where population growth articulated with inequality to resource access, as enabled by the land sequestration by Israelis of the resources that used to be accessible to Palestinians, led to resource degradation. In its strict definition, therefore, this phase in the history of the conflict could not be truly considered as an environmental conflict, considering that a conflict can only be strictly labeled as environmental, and not just territorial or political, if it is enabled by scarcity of resources that is caused by resource degradation.

It is the loop back in the diagram, where political conflict is enabled by health, social and economic problems that can be traced to the environmental degradation and decline in agricultural production in occupied Palestinian lands such as Gaza that the conflict became an environmental one. In *Homer-Dixon's (1999)* framing of the dynamics, this is predicated on resource capture, where population growth articulates with a degraded landscape, even as the occupying Israeli authority has sequestered Palestinian lands and their resources.

However, it can be argued that the Neo-Malthusian argument propounded by *Homer-Dixon (1999)* does not fully explain the situation in Gaza. The assumption is that population growth, unequal access to resources, and ecological degradation are operating independently of the existing preconditions for conflict that are drawn from the ethnic tensions that was cemented with the establishment of the State of Israel, and the reaction of the Palestinians which led to the earlier war, which Israel eventually won, and has led to the current occupation of Israel of Palestinian lands.

It can be argued that the dynamics that drove these three factors are largely influenced not necessarily by resource capture alone, but also by the structural consequences of the political developments that attended the establishment of the State of Israel, including the wars that cemented its hold on its territory, and even led to the West Bank and Gaza being annexed, and its implications on the Palestinian people.

One of the key drivers of environmental conflict has been population growth. While the increase in Jewish settlements in Israel is due to in-migration from the diaspora, the growth in the Palestinian enclaves was

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later aggravated by forced migration and relocation as a consequence of partition/war. This was more true for Gaza, even as the prevalence of Jewish settlements was also a factor in the increasing population in the West Bank, albeit no longer of Palestinians, but of Jewish settlers. Thus, migration and population mobility was less induced by resource scarcity, or environmental factors, but as a political consequence of returning to an imagined homeland in the initial establishment of Israel, and of the spoils of winning wars in the form of annexation, and later of having the power to sequester Palestinian lands. For the Palestinians, population mobility was primarily a consequence of losing in those wars, and was manifested in forced migration and dislocation. These wars were basically territorial wars spawned by symbolic attachment to land as a resource, but not in the context of environmental parameters.

There is another factor that was not in the neo-Malthusian framework offered by *Homer-Dixon*, which is technology. The state of Israel was able to harness science research and development to reverse the challenges offered by landscapes that were relatively inhospitable to agricultural production, and would have offered a possible cause for future intra-conflicts within Israeli society spawned by resource scarcity in the face of increasing population. Faced with these challenges, Israel was able to transcend the limits imposed by the otherwise hostile arid and desert environment. Innovation in agricultural production became the response of Israel. This embodied the Cornucopian view that humans may avoid scarcity-induced conflict brought by degraded or inhospitable environments through the deployment of technological innovations, market mechanisms and institutional designs (*Kahn and Simon 1996*). Science research and development became part of Israel's project in state-building, to complement its modernization of its military infrastructure.

In contrast, the Palestinian people did not have the privilege of benefiting from technology. This is largely the unfortunate political price the Palestinians had to pay for waging a war against Israel. These wars have prevented them from developing their own social and political institutions. While Israel was engaged in project of state building, the Palestinians, including its political class, were preoccupied with resisting and waging wars of resistance against the state of Israel which they treated as a colonizer and land-grabber. While the society of Israel took advantage of modern technologies to industrialize and democratize, the Palestinians travelled the perilous road of spending its resources on wars that they unfortunately eventually lost. The outcome of these losses

were not only politically costly, but became the drivers of Israeli occupation, which led to the dispossession and alienation of the Palestinians from their lands and resources. Eventually, these had serious environmental consequences.

The environmental impacts of occupation, as framed in the diagram offered by *Isaac and Ghanyem (2014)*, was further aggravated by the onset of climate change. Thus, what happened was reflective of the fourth pathway identified by *Savelli et al. (2023)* where the current conflict in Gaza is a result of pre-existing tensions and migratory patterns interacting with climate change, except that the “migratory patterns” are not because of climate and environmental conditions, but because of settler colonialism by Jews, and of forced migration by the Palestinians displaced by Jewish settlements.

There is actually historical evidence of climate-induced migration in the contested areas in the past. Paleo-hydro-geologists documented the presence of long-term weather cycles that lasted around 300 years that were the likely drivers for ancient migrations. These included those that were recounted in Biblical stories and epics that told narratives involving the movements of ancient patriarchs from Mesopotamia into Canaan, then periodically down into Egypt and out again, in response to multiyear droughts episodes (*Issar 1990*). These types of climate-induced migration may have provided a safety-valve, or an avenue for ancient populations to adapt, and to likely avoid possible resource deprivation and conflict. Unfortunately, these types of migration are no longer observed in large scale, and can only perhaps be true for some migratory groups. This is the direct outcome of the establishment of State boundaries, further made complicated by the territorial geopolitics that attended the constant redrawing of boundaries due to the outcomes of the series of wars between Israel and the Arab countries surrounding it, and their Palestinian allies. The establishment of the State of Israel, and the ensuing migration restrictions, and forced relocation of the Palestinian people, has limited, if not totally abolished, the migratory movements that are induced by water scarcity.

Water management is also closely tied to politics in the region. *Messer (2010)* noted of the highly-politically charged nature of policy issues, such as when to declare a drought, or any changes in the quantity and price of water for agriculture, within the State of Israel. This is one of the drivers why Israel imposed a tight control over the tapping of water resources by Palestinians in occupied territories, which further create a cleavage that feeds into Palestinian resentments.

The sequestration by Israel of Palestinian Lands not only in Gaza but in the West Bank has intensified not only the sense of deprivation by Palestinians of resources which they see as theirs. The symbolic pain they suffer is magnified by the fact that denied access to resources, and isolated by the Israeli blockade, they also end up being dependent on Israel's mercy and permission in order for them to avail of the services, including employment opportunities inside Israel, that are normally enjoyed by free citizens of sovereign and independent states.

In the final analysis, and consistent with what *Messer (2010)* argued, and echoing *Libiszewski's (1992)* concept of causality, The author cannot say that water scarcity, drought, desertification and even climate change caused political instability in Gaza. At the very least, it would be the political consequences of war that would further shape the conditions for conflict and resource degradation to emerge.

The Ecological Outcome of the Present War in the Context of International Law

It is a well-established doctrine that there are rules even during times of war and hostilities. The Law on Armed Conflict (LOAC) has specific provisions that aim to protect the environment even during times of conflict. *Bagheri (2023)* cites Article 35(3) of Additional Protocol 1 (AP 1) to the 1949 Geneva Conventions, which states that: “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. Bagheri further cites Rule 45 of the International Committee of the Red Cross (ICRC) Customary Law Study, which states: “The use of methods of 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.”

Environmental protection during times of warfare is further regulated by Article 55(1) of AP 1, which reads: “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 prejudice the health or survival of the population.”

While Israel is not a party to the AP 1 Protocol, *Bagheri (2023)* opines that the prohibition has reached

the level of becoming customary law. However, Bagheri also expressed doubts as to whether the level of destruction would rise to the level of being “widespread,” “long-term” and “severe,” which are the parameters which should be met before Israel’s actions in Gaza could be judged as having violated the Geneva Convention. “Widespread” remains as undefined, while “severe” is taken to be primarily applicable to ecological concerns based on Rule 2 of the *ICRC (2020) Guidelines on the Protection of the Natural Environment in Armed Conflict*. It is useful to quote in detail the said rule:

“Damage to the natural environment is prohibited when it is intended, or may be expected, to be “widespread, long- term and severe”. These three conditions are cumulative, meaning that each must be present to fulfil the threshold of harm. This establishes a high threshold against which the damage intended or expected must be assessed” (*ICRC 2020*)

The bar appears steep to prove a case for ascertaining damage to the environment caused by war and conflict. ICRC took note of the case against the North American Treaty Organization for its series of bombing in Kosovo where the damage to the natural environment was ruled to not have exceeded the threshold of widespread, long-term and severe, considering that there were a dearth of alternative and corroborated sources, and that the damage was reported to have been serious and posed threat to human health but did not affect the entire Balkan Region. Also cited was the case filed by Eritrea against Ethiopia for alleged damage and destruction of flora as well as to its landscaped terraces, where the allegations fell below the required threshold.

Thus, *Bagheri (2023)* opines that unless it can be proven that the damage caused by the IDF in Gaza is cumulative, and is widespread, long term and severe, such may not rise to the level of being a violation of AP 1. To prove the contrary, evidence on the logic of targeting, and the certainty of the exact threshold of environmental damage, should be offered. However, even in the event that Israel may have not violated Article 55(1) and Rule 45, the morality of its acts will remain an issue. Even if the threshold of “widespread, long-term and severe” damage to the environment may not be reached by available evidence, *Bagheri (2023)* opined that Israeli actions can still be construed as serious violations of the laws and customs of war, and thus would fall under Article 8(2)(b)(iv) of the 1998 Rome Statute of the International Criminal Court (ICC), which states that it shall be considered as a war crime to “Intentionally [launch] an attack in the knowledge that such attack

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will cause incidental loss of life or injury to civilians or damage to civilian objects or widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated.”

While Israel is not a party to the ICC, the Palestinian Authority acceded to the Rome Statute in 2015, and the ICC ruled in 2021 that alleged war crimes committed inside the Palestinian territories, including Gaza, are covered by the ICC’s jurisdiction. In addition, Israel can be held accountable for the environmental destruction it caused in Gaza using other venues such as the International Court of Justice (ICJ). However, ICJ would require another state, or group of states, to file cases against Israel for causing environmental damage in Gaza. Parties could also utilize the United Nations Human Rights Council (UNHRC) and the United Nations Environment Programme (UNEP) to conduct fact-finding missions to investigate the extent of the environmental damage caused by Israel’s actions, which can be used as basis for filing cases in the appropriate venues.

CONCLUSION AND RECOMMENDATION

The IDF bombardment of Gaza, with its catastrophic impacts on the natural and built landscapes and environments cited above, are extraordinary environmental tragedies. While resource scarcity and degradation may be indirectly linked to the conflict between Israel and the Palestinians, in the sense that the animosity that triggered the October 7, 2023 attacks by Hamas, and the retaliatory moves by Israeli forces on Gaza were part of a complicated patchwork of causes that included ecological marginalization and resource capture, it cannot be safely said that there are direct environmental causes for the current humanitarian crisis that has since claimed thousands of lives. What is clear is that the war has serious environmental consequences, the long-term effects of which will undoubtedly have long-lasting impacts on the geopolitics of the region.

What is certain is that the emerging ecological disaster will figure out prominently not only in the efforts to rehabilitate, but in the challenges of how to ensure long-lasting peace in the area. Accountability of Israel will remain a contested issue, and will likely preoccupy many environmental and human rights activists. At the front and center of discussions would be how to ensure that environmental justice will be served, not only as part of the restitution, but even in the process of deescalating and resolving the conflict.

The two-state solution being offered will necessarily have to factor the enormous social, economic and environmental cost of restoring the landscapes and lifescapes of Gaza. Whether Israel would agree to a two-State solution or not, it will have to be held accountable to bear the burden of repairing the enormous ecological atrocity it has inflicted on Gaza. If it insists to annex Gaza in a single-state solution, its rehabilitation will now be part of its own state-building project, not to mention its possible culpability for committing not only ecological crimes, but also, and for many critics, crimes against humanity.

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