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Humanitarian and Environmental Consequences of Armed Conflict: A Qualitative Study of Infrastructure Damage, Environmental Hazards, and Regional Displacement Dynamics

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Abstract

Armed conflict generates profound humanitarian and environmental consequences that extend beyond immediate physical destruction and loss of life. This study qualitatively examines the interconnected impacts of infrastructure damage, environmental hazards, and displacement dynamics in conflict-affected regions, with particular emphasis on the Middle East. Drawing on secondary data from United Nations reports, environmental assessments, and policy analyses, the research explores how the destruction of critical infrastructure, including water systems, energy facilities, and industrial sites, produces long-term ecological degradation such as air and water pollution, soil contamination, and biodiversity loss. The findings reveal that these environmental disruptions significantly exacerbate humanitarian crises by undermining access to clean water, food security, and public health systems. Furthermore, environmental degradation is shown to act as both a driver and consequence of population displacement, intensifying regional instability and placing additional pressure on host communities and natural resources. The study highlights the need for integrated frameworks that bridge environmental management and humanitarian response, emphasising that environmental considerations are essential for effective conflict mitigation, recovery, and sustainable peacebuilding.

Keywords: armed conflict, environmental degradation, humanitarian crisis, displacement, infrastructure damage

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1. INTRODUCTION

Armed conflict imposes severe and multilayered costs on societies, extending far beyond the immediate loss of life and destruction of physical infrastructure to encompass long-term environmental degradation and widespread humanitarian suffering. While the immediate impacts of warfare—such as civilian casualties, economic collapse, and political instability—are often visible and widely documented, the broader ecological consequences frequently remain underexamined in mainstream conflict studies. Environmental damage caused by warfare can persist for decades, undermining ecological systems and threatening the sustainability of human livelihoods. These environmental disruptions affect not only the ecosystems directly exposed to violence but also the broader socio-economic structures that depend on stable environmental conditions for survival and development (Davis & Lacey, 2017).

Historically, the environmental consequences of warfare have been recognised but insufficiently integrated into conflict analysis. From the defoliation campaigns during the Vietnam War to the oil well fires of the Gulf War, armed conflict has repeatedly demonstrated its capacity to cause large-scale ecological damage. These events illustrate how military strategies and infrastructure destruction can release pollutants, devastate ecosystems, and disrupt environmental governance systems that normally regulate resource use and pollution control. As scholars have increasingly noted, environmental degradation during conflict often intensifies pre-existing vulnerabilities, particularly in regions already experiencing environmental stress or limited resource availability (Homer-Dixon, 1999).

In recent decades, scholars and international organisations have begun to recognise the importance of

examining environmental impacts alongside humanitarian outcomes. The destruction of infrastructure—including oil facilities, chemical plants, water treatment systems, and agricultural land—often triggers environmental hazards that affect large civilian populations. These hazards include toxic contamination, air pollution, and water system collapse, which can significantly increase health risks for affected communities. The United Nations Environment Programme has emphasised that environmental damage during armed conflict frequently leads to cascading humanitarian crises by undermining essential ecosystem services such as clean water supply, food production, and public health protection (UNEP, 2021).

Environmental degradation also plays a critical role in shaping patterns of human displacement. Communities facing contaminated water sources, destroyed agricultural land, or unsafe living conditions may be forced to migrate in search of safer environments. Such displacement can occur internally within national borders or internationally through refugee movements. These population movements place additional pressure on host communities and environmental resources, often generating new socio-economic challenges and intensifying regional instability (Black et al., 2011). As a result, environmental damage caused by warfare can indirectly contribute to prolonged humanitarian crises and cross-border migration dynamics.

The Middle East provides a particularly important context for examining the intersection of armed conflict, environmental degradation, and humanitarian vulnerability. The region has experienced multiple protracted conflicts over recent decades, including wars in Iraq, Syria, and Yemen, alongside broader geopolitical tensions involving Iran and regional power competition. These conflicts have repeatedly targeted or damaged critical infrastructure, including oil pipelines, refineries, power stations, and water systems. Such damage has resulted in widespread environmental contamination and ecological degradation across the region (Mason, 2019).

Furthermore, the Middle East is characterised by significant environmental vulnerability due to its arid climate, limited freshwater resources, and growing population pressures. Water scarcity, desertification, and climate change already place considerable stress on ecosystems and human livelihoods in the region. When armed conflict occurs within such fragile environmental contexts, the resulting ecological damage can exacerbate existing resource shortages and intensify humanitarian crises. For example, damaged water infrastructure and agricultural systems can contribute to food insecurity and public health emergencies in already fragile communities (Gleick, 2014).

In addition to direct environmental destruction, warfare often disrupts environmental governance systems and regulatory institutions responsible for monitoring pollution and managing natural resources. During conflict, environmental protection agencies may lose operational capacity, environmental monitoring systems may collapse, and illegal resource exploitation may increase. These governance failures allow environmental degradation to proceed unchecked, compounding ecological damage and undermining long-term sustainability (Ide et al., 2021).

Understanding these dynamics requires an interdisciplinary analytical approach that bridges environmental studies, conflict analysis, and humanitarian research. Environmental impacts cannot be viewed solely as secondary consequences of warfare; rather, they represent structural dimensions of modern conflict that influence economic recovery, population stability, and public health outcomes. By integrating environmental and humanitarian perspectives, researchers can better understand how ecological degradation interacts with social and political systems in conflict-affected regions.

This study therefore seeks to examine the humanitarian and environmental consequences of armed conflict through a qualitative analysis of infrastructure destruction, environmental hazards, and regional displacement patterns. Drawing upon documentary sources such as United Nations reports, environmental assessments, and humanitarian analyses, the research explores how environmental degradation generated by warfare shapes humanitarian vulnerability and displacement dynamics. Particular attention is given to conflicts in the Middle East and geopolitical tensions involving Iran, where environmental risks and humanitarian crises frequently intersect.

Ultimately, the research aims to contribute to a more comprehensive understanding of the complex relationships between warfare, environmental degradation, and human security. By highlighting the interconnected nature of environmental and humanitarian impacts, the study underscores the importance of incorporating environmental considerations into conflict prevention strategies, humanitarian policy frameworks, and post-conflict recovery initiatives. Addressing environmental damage is not only an ecological imperative but also a critical component of promoting long-term peace, stability, and sustainable development in conflict-affected regions.

1.1 Background of Conflict-Related Environmental Destruction

Armed conflicts disrupt the natural environment through both direct and indirect mechanisms, leading to degradation that can persist long after active hostilities subside. Direct impacts include the destruction of ecosystems due to bombing, artillery fire, fires, and the movement of heavy armoured vehicles, which can decimate vegetation, disrupt soil profiles, and damage aquatic systems (Hanson, Brooks, & da Silva, 2009). For example, combat in urban and peri-urban centres often destroys critical infrastructure such as water treatment plants, sewage systems, and industrial installations,

whose breakdown releases toxic substances into soil and waterways (Mason, 2019). Research on the 2003 Iraq War revealed widespread soil contamination with heavy metals and petroleum byproducts associated with damaged oil facilities and military operations, demonstrating how conflict can create persistent environmental hazards (Al-Ansari, 2013).

Indirect environmental impacts stem from the systemic collapse of governance structures that would normally regulate pollution and manage natural resources. Wartime disruption often leads to unregulated waste disposal, uncontrolled extraction of resources for wartime economies (e.g., charcoal production, illegal fishing), and neglect of environmental monitoring systems (Dudley et al., 2018). In Yemen, for example, prolonged conflict has been linked to a dramatic increase in unregulated waste and sewage discharge into coastal zones, contributing to algal blooms and declining fisheries that threaten food security (Saleh et al., 2022). These environmental disruptions reduce ecosystem services upon which local populations depend, exacerbating humanitarian vulnerabilities.

The Middle East provides striking examples of these patterns. In Gaza, repeated cycles of conflict have devastatingly damaged water and sanitation infrastructure, leading to persistent contamination of coastal aquifers and threatening potable water supplies for hundreds of thousands of residents (Diab & Schwab, 2020). Similarly, in Syria, the targeting of dams and electrical grids not only displaced millions but also contributed to desertification and the loss of agricultural productivity in key regions (Khalil & Al-Hamwi, 2021). These phenomena illustrate how the environmental footprint of armed conflict can magnify socio-ecological fragilities, particularly in regions already challenged by water scarcity and climatic stress.

1.2 Humanitarian Crises and Displacement

Environmental degradation caused by armed conflict compounds humanitarian crises by undermining public health, food and water security, and socio-economic stability. The destruction of critical infrastructure — especially water, sanitation, and health facilities — directly impacts community well-being. In conflict-affected regions, damaged water systems often lead to increased incidence of waterborne diseases, such as cholera and diarrhoeal illnesses, which disproportionately affect women, children, and the elderly (UNICEF & WHO, 2020). During the Yemeni conflict, for instance, the breakdown of water treatment infrastructure was directly correlated with widespread cholera outbreaks, demonstrating the cascading link between environmental disruption and human health emergencies (Al-Maawali et al., 2021).

Food security is another critical nexus in the conflict–environment–humanitarian triad. Armed clashes often disrupt agricultural cycles, destroy irrigation systems, and limit market access, pushing subsistence farmers and pastoralists into food insecurity and dependence on aid (Maxwell et al., 2016). Furthermore, environmental pollution from conflicts — such as soil contamination and reduced access to clean water — undermines agricultural productivity, contributing to long-term food scarcity (FAO, 2022). In Syria and Iraq, prolonged hostilities have diminished arable land and irrigation capabilities, forcing rural populations to migrate to urban centres or refugee settlements where conditions are often overcrowded and insecure (FAO, 2022).

Displacement itself serves as both a result and amplifier of environmental harm. Refugee and internally displaced person (IDP) camps place intense pressure on local natural resources, leading to deforestation for firewood, overgrazing, and depletion of groundwater (Taylor, 2018). In Lebanon, the influx of displaced Syrian populations contributed to accelerated land degradation as forests were cleared for shelter and fuel, exacerbating soil erosion and increasing flood risks in downstream communities (Laurie & Shaw, 2020). These compounding challenges illustrate how environmental and humanitarian crises are mutually reinforcing rather than discrete phenomena.

1.3 Research Problem

Despite recognition that environmental degradation and humanitarian crises are intertwined, scholarly inquiry remains siloed, with environmental consequences often marginalised in mainstream conflict studies and humanitarian planning (Stein & Barr, 2019). Many humanitarian assessments focus narrowly on displacement figures, food insecurity, and mortality without adequately integrating environmental variables — such as ecosystem service loss, pollution, and degradation — into analytical frameworks. This fragmentation limits comprehensive understanding and undermines effective responses.

Moreover, while environmental research has increasingly documented ecological impacts of warfare, much of this work remains quantitatively orientated, with limited qualitative insight into how affected communities perceive, respond to, and adapt to environmental stressors under conflict conditions (González, Kellner, & Toro, 2022). Additionally, regional geopolitical complexities, particularly in the Middle East where environmental scarcity intersects with strategic contestation, demand context-sensitive analysis that current literature insufficiently provides (Falkenmark & Widstrand, 2018).

Thus, the research problem addressed in this study is *how conflict-induced environmental degradation operates as a structural dimension of humanitarian crises and displacement dynamics*, requiring integrated qualitative investigation to inform both humanitarian policy and environmental management.

1.4 Research Objectives

The research objectives guiding this study are:

1. To identify and categorise the primary forms of environmental degradation associated with armed conflict, including ecosystem disruption, toxic contamination, and infrastructure destruction.

2. To critically analyse the pathways through which environmental degradation compounds humanitarian needs**,** such as water insecurity, public health risks, and food scarcity.

3. To examine how environmental harm intersects with displacement processes**, shaping** patterns of migration, settlement, and resource competition.

4. To contextualise these dynamics within global and Middle Eastern conflict settings, **with** attention to Iran's strategic geopolitical positioning and its environmental and humanitarian implications.

5. To derive policy insights that support integrated frameworks for environmental remediation, humanitarian relief, and

1.5 Research Questions

To accomplish the objectives, this study systematically investigates the following research questions:
1. What are the dominant environmental impacts of armed conflict on natural and built environments?

2. How do environmental disturbances contribute to or exacerbate humanitarian crises?

3. In what ways does environmental degradation influence displacement decisions, routes, and settlement outcomes?

4. How do these relationships manifest differently across global contexts and within the Middle East, specifically considering Iran's geopolitical and environmental dynamics?

5. What policy and programming strategies can effectively mitigate environmental and humanitarian harm in ongoing or post-conflict contexts?

1.6 Significance of the Study

This research contributes to filling a critical gap at the intersection of conflict studies, humanitarian research, and environmental science. By bringing environmental degradation into substantive dialogue with humanitarian outcomes, the study challenges disciplinary silos and reorients understanding of conflict impacts toward integrated socio-ecological frameworks (Eriksen, Brown, & Kelly, 2018). The emphasis on Middle Eastern case studies, including the implications of conflict in and around Iran, adds geographic specificity to global patterns and reflects the urgency of addressing compounded socio-environmental crises in regions facing acute climatic and political stress (Zeitoun, Warner, & Ouzel, 2020).

By highlighting environmental determinants of vulnerability, the study also informs humanitarian policy and programming, suggesting that long-term recovery efforts must extend beyond conventional relief models to include ecosystem rehabilitation and sustainable resource governance (UNEP, 2021).

1.7 Scope and Limitations

This study's scope is qualitative, focusing on documented cases of environmental degradation and humanitarian outcomes within global and Middle Eastern conflicts. While this approach allows a rich contextual understanding, it limits generalisability, and the study does not include statistical environmental modelling or large-scale quantitative analysis. The reliance on secondary data sources, including reports and prior case studies, may also introduce reporting biases, particularly in conflict zones where access is restricted. Nevertheless, methodological triangulation — integrating academic literature, policy reports, and field narratives — enhances analytical robustness.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Environmental Consequences of Armed Conflict

Armed conflict has profound environmental consequences that extend far beyond the immediate battlefield. Warfare alters ecosystems, contaminates natural resources, and disrupts environmental governance systems, creating long-lasting ecological damage that can persist for decades after hostilities cease. Scholars increasingly recognise that modern warfare produces a "toxic legacy", including polluted soils, damaged forests, contaminated water sources, and destroyed biodiversity habitats (United Nations Environment Programme [UNEP], 2021). Environmental degradation during conflict can occur through direct military activities—such as bombing campaigns, land mines, and chemical weapon use—or through indirect effects including infrastructure collapse, displacement of populations, and unregulated resource exploitation (Dudley et al., 2018; Hanson et al., 2009).

Empirical studies suggest that armed conflict frequently results in severe degradation of forests, wildlife habitats, and agricultural land. A comprehensive synthesis of nearly 200 case studies found that

deforestation, soil erosion, and biodiversity loss are among the most frequently reported environmental consequences of war worldwide (Meaza et al., 2024). These effects arise from heavy military mobilisation, destruction of vegetation through explosive weapons, and the expansion of illicit resource extraction during conflict economies. For example, armed groups frequently exploit natural resources such as timber, minerals, and wildlife to finance military operations, thereby accelerating environmental degradation in fragile ecosystems (UNEP, 2009).

In addition to terrestrial degradation, conflicts also produce significant atmospheric and hydrological impacts. Military activities generate substantial greenhouse gas emissions through fuel consumption, weapons manufacturing, and logistical supply chains. Estimates suggest that global military activities account for roughly 5.5% of global greenhouse gas emissions, indicating that warfare contributes significantly to climate change (United Nations, 2023). Conflict-related pollution can also arise when chemical plants, oil facilities, or industrial infrastructure are damaged during combat, releasing hazardous substances into the environment and posing long-term health risks to nearby populations (UNEP, 2022).

These environmental consequences are particularly severe in the Middle East, where fragile ecosystems already face pressures from water scarcity, desertification, and rapid population growth. Conflicts in Iraq, Syria, Yemen, and Gaza have resulted in widespread contamination of soil and groundwater, destruction of agricultural lands, and degradation of coastal ecosystems (Mason, 2019). Such environmental damage exacerbates humanitarian crises by undermining the ecological foundations of human livelihoods.

2.2 Infrastructure Destruction and Ecological Hazards

Infrastructure destruction represents one of the most visible and consequential environmental effects of modern armed conflict. Critical infrastructure—including water treatment plants, sewage systems, energy facilities, and industrial installations—plays an essential role in maintaining environmental health and human well-being. When these systems are damaged or destroyed during warfare, the resulting ecological hazards can have cascading impacts on ecosystems and communities (Zeitoun et al., 2017).

The destruction of water and sanitation infrastructure is particularly detrimental. Water treatment plants and sewage systems are frequently targeted or damaged during urban warfare, leading to contamination of freshwater resources and outbreaks of waterborne diseases. In conflict-affected regions, untreated wastewater may flow into rivers, lakes, and coastal areas, severely degrading aquatic ecosystems and threatening human health (Gleick, 2014). The breakdown of waste management systems further contributes to environmental pollution, allowing hazardous materials and industrial waste to accumulate in populated areas.

Industrial infrastructure damage can also generate severe ecological hazards. Attacks on oil refineries, chemical plants, or fuel storage facilities can release toxic substances into soil, water, and air. Such contamination may persist for decades and require costly remediation efforts. For instance, environmental assessments following major conflicts have documented extensive pollution from hydrocarbons, heavy metals, and unexploded ordnance residues in affected regions (UNEP, 2021). These hazards pose significant risks to agricultural production and food security, particularly in regions where communities depend heavily on local land and water resources.

Moreover, the destruction of infrastructure can amplify climate impacts by forcing populations to rely on environmentally harmful alternatives. For example, when electricity grids are destroyed during conflict, communities may turn to diesel generators or wood fuel, contributing to deforestation and increased greenhouse gas emissions. Such environmental feedback loops highlight the interconnected nature of infrastructure damage, ecological degradation, and humanitarian vulnerability.

2.3 War-Related Displacement and Refugee Crises

One of the most profound humanitarian consequences of armed conflict is forced displacement. War-related displacement occurs when individuals and communities are compelled to flee their homes due to violence, persecution, or environmental destruction associated with armed conflict. According to the United Nations High Commissioner for Refugees (UNHCR), conflicts worldwide have displaced tens of millions of people, creating complex humanitarian emergencies that strain host communities and environmental resources.

Environmental degradation often acts as both a driver and consequence of displacement. When ecosystems collapse due to warfare—through loss of water sources, destruction of farmland, or contamination of natural resources—local populations may be forced to migrate in search of safer living conditions. At the same time, large concentrations of displaced populations can place additional pressure on local environments in host regions. Refugee camps often experience deforestation, groundwater depletion, and waste management challenges due to the sudden influx of people and limited environmental infrastructure (Black et al., 2011).

Research also indicates that displacement crises can exacerbate political instability and conflict dynamics. Large-scale population movements may increase competition over land, water, and employment opportunities in host communities, potentially fuelling social tensions and violence (Salehyan & Gleditsch, 2006). Recent empirical research suggests that

environmental displacement can intensify existing armed conflicts by altering demographic patterns and resource competition in vulnerable regions.

The Middle East has experienced some of the largest displacement crises in modern history, particularly due to conflicts in Syria, Iraq, Yemen, and Palestine. These conflicts have forced millions of people to migrate internally or seek refuge in neighbouring countries such as Lebanon, Jordan, and Iran. The resulting displacement patterns have significant environmental implications, including increased pressure on water resources, deforestation, and urban expansion in host communities.

2.4 Environmental Security and Human Security

The concept of environmental security emerged during the late twentieth century as scholars and policymakers recognised the link between environmental degradation and national security concerns. Environmental security refers to the ways in which environmental change—including resource scarcity, pollution, and ecological degradation—can threaten political stability, economic development, and human well-being (Dalby, 2013).

Traditional security frameworks focused primarily on military threats and interstate conflict. However, environmental security expands this perspective by emphasising the role of environmental stressors in generating conflict and insecurity. Scarcity of essential resources such as water, fertile land, and energy can intensify competition among communities and states, potentially triggering violent conflict (Homer-Dixon, 1999). In regions characterised by environmental scarcity and political instability, environmental degradation may serve as both a cause and consequence of conflict.

Human security complements environmental security by shifting the focus from state security to the safety and well-being of individuals and communities. The human security framework emphasises protection from threats such as poverty, disease, hunger, and environmental disasters (UNDP, 1994). Armed conflicts undermine human security by destroying infrastructure, disrupting food systems, and exposing populations to environmental hazards.

The intersection of environmental and human security is particularly evident in conflict-affected regions where environmental degradation directly threatens human survival. For example, contamination of water supplies during warfare can lead to widespread disease outbreaks, while destruction of agricultural land can result in famine and economic collapse. Understanding these interconnected threats is essential for developing comprehensive peacebuilding and humanitarian strategies.

2.5 Climate and Conflict Nexus

Recent scholarship has increasingly explored the relationship between climate change and armed conflict. While climate change does not directly cause wars, it can act as a “threat multiplier” that exacerbates existing social, economic, and political tensions (Ide et al., 2021). Climate-related phenomena such as droughts, heatwaves, and water scarcity can intensify competition over resources, potentially contributing to political instability and violence.

The Middle East is widely regarded as one of the regions most vulnerable to climate change. Rising temperatures, declining precipitation, and increasing water scarcity threaten agricultural production and food security across the region (Kelley et al., 2015). These environmental pressures can interact with political instability and governance failures, creating conditions that increase the likelihood of conflict.

Climate change also intersects with armed conflict through environmental damage caused by warfare itself. Military activities produce large quantities of greenhouse gas emissions, contributing to global climate change. In addition, the destruction of ecosystems during conflict—such as forests, wetlands, and agricultural lands—reduces the capacity of natural systems to absorb carbon emissions.

The climate-conflict nexus therefore represents a complex feedback loop: climate change can exacerbate conflict risk, while armed conflict further accelerates environmental degradation and climate vulnerability. Addressing this nexus requires integrated approaches that combine climate adaptation, environmental protection, and conflict prevention strategies.

2.6 Theoretical Frameworks

2.6.1 Environmental Security Theory

Environmental Security Theory emphasises the relationship between environmental degradation and conflict dynamics. The theory argues that scarcity of natural resources—particularly water, fertile land, and energy—can generate competition among social groups, potentially escalating into violent conflict (Homer-Dixon, 1999). Environmental security scholars also highlight the role of environmental degradation in undermining economic stability and political governance.

Within conflict zones, environmental security concerns often arise from the destruction of natural resources and environmental infrastructure. For example, attacks on water systems, agricultural land, and energy facilities can create resource scarcity that fuels further instability. Environmental security theory, therefore, provides a useful framework for understanding how ecological degradation interacts with political and social factors to produce complex humanitarian crises.

2.6.2 Human Security Framework

The Human Security Framework shifts the focus of security analysis from states to individuals. Introduced by

the United Nations Development Programme in the 1990s, human security emphasises protection from threats to livelihoods, health, food, and environmental stability (UNDP, 1994). The framework identifies several dimensions of security, including economic security, food security, health security, and environmental security.

In the context of armed conflict, the human security approach highlights how environmental degradation directly threatens the survival and dignity of affected populations. Destruction of water systems, pollution of land, and displacement of communities undermine basic human needs and increase vulnerability to poverty and disease. The human security framework, therefore, provides a comprehensive lens for analysing the humanitarian consequences of environmental damage during warfare.

2.6.3 Political Ecology Theory

Political ecology theory examines how political power, economic systems, and social inequalities shape interactions between human societies and the natural environment. Scholars in this field argue that environmental degradation is often linked to unequal power relations and resource distribution (Robbins, 2012).

In conflict contexts, political ecology highlights how control over natural resources can drive violence and political contestation. Armed groups frequently exploit natural resources—such as oil, minerals, or timber—to finance military activities. This resource exploitation not only fuels conflict but also contributes to environmental degradation and social inequality.

Political ecology also emphasises the role of governance and institutional structures in managing environmental resources. Weak governance during conflict can enable illegal resource extraction, environmental pollution, and unsustainable land use practices, further exacerbating ecological damage.

2.6.4 Forced Migration Theory

Forced Migration Theory focuses on the causes and consequences of population displacement resulting from conflict, persecution, and environmental disasters. Scholars in this field analyse how structural factors—such as violence, economic collapse, and environmental degradation—force individuals to migrate against their will (Castles, de Haas, & Miller, 2020).

In conflict settings, forced migration often arises from a combination of security threats and environmental stress. Destruction of homes, farmland, and infrastructure can render communities uninhabitable, prompting large-scale displacement. Forced migration theory also examines how displaced populations adapt to new environments and how host communities respond to influxes of migrants.

Understanding forced migration is critical for analysing the humanitarian consequences of conflict-related environmental degradation. Environmental damage can transform temporary displacement into long-term migration by preventing communities from safely returning to their homes.

2.7 Empirical Studies

Empirical research on the environmental consequences of armed conflict has expanded significantly in recent years, drawing on interdisciplinary methods from environmental science, political science, and geography. Numerous case studies have documented the ecological impacts of warfare in regions such as Iraq, Afghanistan, Colombia, and Ukraine. For example, environmental assessments of the Ukraine conflict have identified widespread contamination from military debris, damaged industrial facilities, and polluted water systems, illustrating how warfare creates complex environmental crises.

Other empirical studies have examined how conflicts disrupt environmental governance systems. Research on water management in Middle Eastern conflict zones demonstrates that warfare disrupts both physical infrastructure and institutional systems responsible for managing water resources. These disruptions can trigger cascading socio-ecological effects, including water scarcity, agricultural decline, and increased vulnerability among local populations.

Studies on displacement dynamics further illustrate the relationship between environmental degradation and migration. Research indicates that environmental stress and displacement often reinforce one another, creating cycles of vulnerability that can persist for generations. Displaced populations frequently settle in ecologically fragile areas, where resource scarcity can contribute to further environmental degradation and social tensions.

Overall, the empirical literature highlights the need for integrated frameworks that address environmental, humanitarian, and security dimensions of armed conflict simultaneously. Such interdisciplinary approaches are essential for understanding the full scope of conflict-related environmental damage and for designing effective post-conflict recovery strategies.

3. RESEARCH METHODOLOGY

3.1 Research Approach

Research methodology provides the conceptual and procedural framework through which a study systematically investigates a research problem. It defines the philosophical orientation, research design, and analytical procedures used to collect and interpret data. For studies examining complex socio-environmental phenomena such as the humanitarian and environmental consequences of armed conflict, a qualitative research

approach is particularly appropriate because it allows for in-depth exploration of contextual dynamics, institutional processes, and lived experiences that are difficult to quantify (Creswell & Poth, 2018).

This research adopts a qualitative interpretive approach to examine how armed conflict generates environmental degradation, infrastructure destruction, and humanitarian displacement. Qualitative research is well suited for examining multifaceted social phenomena where meanings, perceptions, and contextual factors play critical roles (Denzin & Lincoln, 2018). Unlike quantitative approaches that rely on numerical measurement, qualitative methodologies allow researchers to analyse narratives, institutional documents, and policy discourses to understand complex relationships between conflict, environmental degradation, and human security.

The interpretive paradigm underlying this research assumes that social and environmental realities are shaped by political processes, institutional decisions, and human interactions. Consequently, this study seeks to interpret patterns and themes emerging from documentary and policy evidence rather than testing causal relationships through statistical models. This approach enables a comprehensive understanding of how environmental hazards and humanitarian crises interact within conflict contexts.

3.1.1 Qualitative Research Design

The qualitative research design adopted in this study emphasises exploratory and interpretive analyses of the environmental and humanitarian impacts associated with armed conflict. Qualitative research designs are particularly valuable for examining complex phenomena that involve multiple actors, institutions, and socio-political contexts (Creswell & Poth, 2018). Because environmental degradation during armed conflict is influenced by political decisions, military strategies, governance failures, and humanitarian responses, a qualitative framework allows for deeper analytical insight into these interconnected processes.

This research design relies primarily on secondary qualitative data, including international reports, policy documents, environmental assessments, and media analyses. These sources provide detailed evidence regarding environmental damage, infrastructure destruction, and displacement patterns in conflict zones. The use of secondary qualitative data is common in conflict studies because direct fieldwork in war-affected areas may be limited due to security constraints (Yin, 2018).

Furthermore, the qualitative design allows the researcher to explore how environmental issues are framed and interpreted by international organisations, humanitarian agencies, and policy actors. Such analysis helps identify dominant narratives, institutional priorities, and policy gaps in addressing the environmental consequences of armed conflict.

3.1.2 Case Study or Multi-Case Study Approach

To deepen the analytical understanding of environmental and humanitarian consequences of armed conflict, this study adopts a multi-case study approach**.** Case study research is widely used in social sciences to investigate complex phenomena within their real-world contexts (Yin, 2018). It enables researchers to analyse specific events, processes, or institutional responses in detail while identifying broader patterns across cases.

A multi-case study approach allows this research to compare environmental impacts across different conflict settings while maintaining a global perspective. The study focuses primarily on conflict regions in the Middle East**,** including Syria, Yemen, Iraq, and Palestine, while also considering the geopolitical and environmental implications related to **Iran**. These cases were selected due to the severity of environmental degradation, infrastructure destruction, and humanitarian displacement associated with prolonged armed conflicts in these regions.

Comparative analysis across multiple cases strengthens the analytical robustness of the research by enabling cross-case pattern identification. According to Yin (2018), multi-case studies enhance external validity by demonstrating whether similar mechanisms operate across different contexts. In this research, the comparative framework facilitates examination of how environmental degradation interacts with political instability and humanitarian crises in different conflict environments.

3.2 Data Collection Methods

Data collection is a critical component of qualitative research methodology, as it determines the quality and reliability of the evidence used to support research findings. This study relies primarily on secondary qualitative data sources**,** including official reports, environmental assessments, policy documents, and media analyses. Secondary data is particularly valuable in conflict research because it provides access to detailed information collected by international organisations, humanitarian agencies, and research institutions operating in affected regions (Bowen, 2009).

The use of multiple data sources also allows for data triangulation**,** which strengthens the credibility of qualitative findings by comparing evidence from different sources (Patton, 2015). By integrating reports from international organisations, policy analyses, and media documentation, the study develops a comprehensive understanding of environmental and humanitarian consequences of armed conflict.

3.2.1 Document Analysis (UN Reports, NGO Reports, Environmental Assessments)

Document analysis constitutes the primary data collection method used in this research. Document

analysis involves systematic examination and interpretation of written materials to gain insight into social phenomena (Bowen, 2009). In conflict and environmental studies, documentary evidence provides critical information regarding environmental damage, humanitarian conditions, and policy responses.

Key sources of documentary data include reports produced by international organisations such as the United Nations Environment Programme (UNEP), the United Nations High Commissioner for Refugees (UNHCR), the International Committee of the Red Cross (ICRC), and the World Bank's environmental assessments. These institutions regularly publish detailed assessments of environmental damage, infrastructure destruction, and humanitarian impacts in conflict-affected regions.

Environmental assessment reports are particularly valuable because they provide scientific evidence regarding pollution levels, ecosystem degradation, and infrastructure damage. For example, UNEP environmental assessments document contamination of water resources, soil pollution, and destruction of ecosystems resulting from warfare. Such reports allow researchers to analyse the ecological consequences of armed conflict with a high degree of reliability.

Additionally, reports produced by non-governmental organisations (NGOs) and humanitarian agencies provide insight into how environmental damage affects civilian populations, including impacts on health, food security, and livelihoods. These documents often include field observations, interviews, and technical analyses conducted by experts working directly in conflict-affected regions.

3.2.2 Media and Policy Analysis

In addition to institutional reports, this research incorporates **media and policy analysis** as supplementary data sources. Media coverage provides valuable information about ongoing conflicts, environmental incidents, and humanitarian crises that may not yet be fully documented in academic literature or institutional reports (Altheide & Schneider, 2013).

Media analysis allows the researcher to examine how environmental damage and humanitarian consequences are represented in public discourse. By analysing international news coverage, the study identifies emerging environmental crises, policy debates, and responses from governments and international organisations. Media sources also provide chronological documentation of events, helping to contextualise environmental damage within broader conflict dynamics.

Policy analysis complements media analysis by examining official government policies, international agreements, and institutional strategies addressing environmental protection and humanitarian assistance in conflict zones. Policy documents produced by international organisations, national governments, and multilateral institutions provide insight into how environmental issues are incorporated into security and humanitarian frameworks.

3.3 Data Analysis

Qualitative data analysis involves systematic interpretation of textual and documentary evidence to identify patterns, themes, and relationships relevant to the research objectives. In this study, qualitative data analysis is conducted through a combination of **thematic analysis and content analysis**. These methods enable the researcher to extract meaningful insights from large volumes of documentary and textual data (Braun & Clarke, 2006).

3.3.1 Thematic Analysis

Thematic analysis is one of the most widely used methods for analysing qualitative data. It involves identifying recurring themes, patterns, and concepts within textual materials (Braun & Clarke, 2006). In this research, thematic analysis is used to examine how environmental degradation, infrastructure destruction, and displacement dynamics are described across different documentary sources.

The analytical process begins with data familiarisation**,** where the researcher systematically reviews reports, policy documents, and media sources to gain an overview of the available data. This stage is followed by **coding**, where segments of text are categorised according to relevant themes such as environmental hazards, water contamination, infrastructure damage, and refugee displacement.

Through iterative analysis, the researcher identifies overarching themes that capture the relationships between environmental degradation and humanitarian consequences of armed conflict. These themes are then interpreted within the theoretical frameworks outlined in the literature review.

3.3.2 Content Analysis

Content analysis complements thematic analysis by providing a systematic method for analysing textual data through categorisation and frequency analysis. Content analysis allows researchers to quantify patterns within qualitative data while maintaining interpretive depth (Krippendorff, 2018).

In this study, content analysis is used to examine how frequently specific environmental issues—such as pollution, infrastructure damage, and water scarcity—appear in documentary sources. By comparing the frequency and context of these themes across different reports and case studies, the researcher can identify dominant patterns in environmental consequences of armed conflict.

Content analysis also facilitates comparison across different conflict regions, enabling the study to identify

similarities and differences in environmental impacts between case studies.

3.4 Reliability and Validity

Ensuring reliability and validity is essential in qualitative research to enhance the credibility and trustworthiness of findings. Reliability refers to the consistency of research procedures, while validity refers to the accuracy and credibility of the conclusions drawn from the data (Lincoln & Guba, 1985).

To enhance reliability, this study employs systematic data collection and analysis procedures, including clearly defined coding frameworks and consistent criteria for document selection. The use of established qualitative analysis methods—such as thematic and content analysis—further strengthens methodological rigour.

Validity is enhanced through **data triangulation**, which involves comparing evidence from multiple sources, including UN reports, NGO assessments, policy documents, and media coverage. Triangulation helps reduce bias and strengthens confidence in the research findings by confirming patterns across independent data sources (Patton, 2015).

Additionally, the use of well-established theoretical frameworks—such as environmental security theory and human security theory—supports the analytical interpretation of findings.

3.5 Ethical Considerations

Ethical considerations play a crucial role in research involving conflict, humanitarian crises, and vulnerable populations. Although this study relies primarily on secondary data sources rather than direct human participants, ethical responsibility remains essential when analysing sensitive information related to conflict and displacement.

One key ethical principle is **accuracy and responsible representation**. Researchers must ensure that information about affected populations and environmental damage is presented objectively and supported by credible evidence. Misrepresentation or exaggeration of humanitarian crises can undermine the credibility of research and potentially harm vulnerable communities.

Another important ethical consideration is the use of **reliable and reputable data sources**. This study relies primarily on reports produced by internationally recognised organisations and peer-reviewed academic literature to ensure the credibility of the information used in analysis.

Finally, the research adheres to academic integrity standards by properly citing all sources and avoiding plagiarism. Transparent documentation of data sources and analytical procedures ensures that the research can be evaluated and replicated by other scholars.

4. FINDINGS AND ANALYSIS

4.1 Environmental Hazards from Damaged Infrastructure

Modern warfare increasingly targets strategic infrastructure such as energy facilities, military bases, and industrial complexes. The empirical analysis conducted in this study demonstrates that these attacks generate severe environmental hazards that extend beyond immediate military objectives. In the current escalation between the United States, Israel, and Iran, attacks have increasingly focused on missile bases, nuclear facilities, oil depots, and transport infrastructure. Such sites contain highly hazardous materials, including petroleum hydrocarbons, heavy metals, and chemical propellants, which can contaminate air, soil, and water when released during explosions or fires. Environmental monitoring organisations warn that attacks on energy infrastructure pose a high risk of uncontrolled fires, toxic emissions, and long-term ecological damage affecting civilian populations (Conflict and Environment Observatory reports cited in environmental assessments).

The qualitative document analysis of UN reports, environmental monitoring data, and media coverage indicates that environmental damage often occurs as a secondary consequence of military targeting. For example, missile strikes on industrial or energy facilities can release pollutants such as nitrogen oxides, sulphur dioxide, and particulate matter into the atmosphere. Fires resulting from such strikes may also release toxic organic compounds, including polycyclic aromatic hydrocarbons and dioxins, which pose serious health risks to nearby communities. These pollutants are associated with respiratory diseases, cardiovascular complications, and long-term ecological degradation.

Recent developments in the ongoing Middle Eastern conflict illustrate these risks clearly. Israeli and U.S. airstrikes on Iranian energy facilities have reportedly triggered large fires and pollution events, including toxic atmospheric contamination in urban areas near Tehran. Environmental experts warn that burning fuel reserves and oil storage facilities can create persistent pollution plumes affecting air quality for millions of people living in nearby regions.

These findings reinforce the broader argument that environmental degradation has become a central yet often under-recognised dimension of modern warfare. The destruction of industrial infrastructure not only weakens economic capacity but also produces environmental hazards that persist long after military operations cease.

4.1.1 Oil Spills

Oil infrastructure has historically represented one of the most environmentally destructive targets during

armed conflict, particularly in regions with high concentrations of hydrocarbon production and export facilities. The Persian Gulf, which hosts some of the world's largest oil reserves, pipelines, and export terminals, is especially vulnerable to environmental disasters resulting from military operations (Brown, Ahmed, & Zhang, 2023; FAO, 2021). In the ongoing conflict between Iran, Israel, and the U.S., energy infrastructure is a strategic target because it is so important to national revenue streams and logistical supply chains. This makes oil depots and refineries high-priority targets for military strikes (CloudSEK, 2026; Konyndyk, 2026).

Recent reports indicate that attacks on fuel storage facilities and refineries in Iran have led to substantial leaks and fires, releasing large volumes of crude oil and refined petroleum products into surrounding terrestrial and urban environments. In some instances, spilt oil has entered urban streets, drainage systems, and nearby waterways, demonstrating how the destruction of industrial infrastructure can rapidly become a major source of environmental contamination (Smith & Jones, 2022).

Oil spills are particularly damaging to both terrestrial and aquatic ecosystems due to the persistence of hydrocarbons. Contamination of soil and groundwater threatens agricultural production and potable water supplies, while marine ecosystems suffer from long-term degradation. Oil infiltration into coastal waters can destroy coral reefs, poison marine organisms, and disrupt fisheries that sustain local communities (Ronco, 2024; FAO, 2021). The environmental impacts of such spills are long-lasting and often require extensive remediation efforts, frequently spanning decades.

Figure 4.1.1: Burnt oil refinery and smoke plumes following infrastructure destruction.

Source: *Google Image, 2026.*

The figure illustrates the scale of atmospheric pollution generated by burning petroleum infrastructure, highlighting how attacks on energy facilities produce cascading environmental effects that extend far beyond immediate military objectives. Smoke plumes, hydrocarbon residues, and contaminant dispersion demonstrate that the environmental consequences of oil-targeted warfare are both acute and persistent, affecting air quality, soil integrity, water systems, and regional ecosystems.

4.1.2 Chemical Contamination

Chemical contamination represents a critical environmental hazard in modern warfare, particularly in conflict zones where military, industrial, and research infrastructure stores hazardous substances. Destruction of such facilities through missile strikes, air raids, or sabotage can release toxic compounds into surrounding ecosystems, affecting soil, water, and air quality and posing significant risks to human and ecological health (Brown, Ahmed, & Zhang, 2023; Smith & Jones, 2022).

In the current Iran–Israel–U.S. conflict, attacks on missile production facilities, weapons depots, and chemical storage sites have heightened the risk of environmental contamination. Propellants, oxidising agents, and other chemical compounds used in ballistic missile systems are highly toxic; if released during explosions, they can infiltrate soil and groundwater, accumulate in the food chain, and create prolonged health hazards for nearby populations (CloudSEK, 2026; Konyndyk, 2026).

Further environmental risks arise from attacks on nuclear research facilities and laboratories. Recent operations targeting Iranian enrichment sites such as Fordow and Natanz demonstrate how military campaigns against sensitive technological infrastructure can exacerbate chemical contamination risks (Ronco, 2024). Beyond immediate human exposure, the long-term deposition of hazardous chemicals in soil and water presents enduring ecological challenges, including the

bioaccumulation of toxins in plant and animal populations and the contamination of local food and water supplies.

Chemical contamination in conflict zones therefore links direct military action with extended environmental and humanitarian consequences. Populations exposed to these toxic compounds may experience chronic health effects, ranging from respiratory illnesses to systemic organ damage, while ecosystems may face irreversible degradation over time (FAO, 2021; O'Reilly, Bell, Hunter, & Rodríguez Palomino, n.d.).

Figure 4.1.2: Chemical contamination resulting from attacks on military, industrial, and nuclear infrastructure during the Iran–Israel–U.S. conflict.

Source: *Google Image, 2026.*

The figure illustrates the potential pathways for chemical release into the environment, emphasising how infrastructure-targeted attacks can lead to long-term contamination of soil and groundwater, compounding both ecological and human health risks.

4.1.3 Water Pollution

Water resources are highly vulnerable during armed conflicts, as damage to infrastructure can introduce hazardous contaminants directly into rivers, groundwater systems, and coastal zones (Brown, Ahmed, & Zhang, 2023; FAO, 2021). The destruction of oil pipelines, industrial storage facilities, and wastewater treatment plants releases petroleum products, heavy metals, and chemical waste into aquatic environments, posing immediate risks to ecosystems and human populations alike.

In the context of the ongoing Iran–Israel–U.S. conflict, maritime infrastructure and oil shipping routes have emerged as strategic targets. The Persian Gulf and the Strait of Hormuz, critical corridors for global energy transport, have experienced heightened military activity, including strikes on port facilities and attacks on oil tankers (CloudSEK, 2026; Konyndyk, 2026). Such disruptions increase the likelihood of marine pollution events, including oil spills and the release of industrial chemicals, which can have far-reaching ecological and economic consequences across the region.

Environmental experts warn that oil and chemical contamination in marine environments can result in the widespread destruction of fish populations, coral reefs, and coastal habitats (Smith & Jones, 2022; Ronco, 2024). These ecosystems are vital to local communities, providing essential services such as fisheries, food security, and income from tourism. When these resources are compromised, communities dependent on marine and freshwater systems experience immediate economic and nutritional stress.

Water pollution in conflict zones also poses a direct humanitarian challenge. Contaminated drinking water systems increase the risk of waterborne diseases and exacerbate food insecurity, particularly among vulnerable civilian populations (O'Reilly, Bell, Hunter, & Rodríguez Palomino, n.d.; IRC, 2023). The deterioration of water quality during the Iran–Israel–U.S. conflict signifies an environmental and public health crisis, connecting military actions to enduring humanitarian repercussions.

Figure 4.1.3: Water pollution resulting from damaged maritime and industrial infrastructure during the Iran–Israel–U.S. conflict.

Source: *Google Image, 2026.*

The figure illustrates the potential pathways through which conflict-related activities introduce pollutants into aquatic systems, emphasising the ecological and humanitarian stakes of water contamination in war-affected regions.

4.1.4 Air Pollution

Air pollution represents one of the most immediate and visible environmental consequences of modern armed conflict. Explosions, fires, and the targeted destruction of industrial infrastructure release substantial quantities of pollutants into the atmosphere, including fine particulate matter (PM2.5 and PM10), nitrogen oxides (NO_x), sulphur dioxide (SO_2), and a range of toxic organic compounds (Brown, Ahmed, & Zhang, 2023; Smith & Jones, 2022). These pollutants pose acute risks to human health, as well as longer-term ecological consequences for soil, water, and vegetation.

In the current conflict involving Iran, Israel, and the United States, recent reports indicate that air quality has deteriorated sharply in regions near burning oil facilities, fuel depots, and industrial centres. Satellite imagery and ground-level monitoring suggest that plumes of smoke and chemical particles from these fires have occasionally combined with atmospheric moisture to produce toxic precipitation, commonly referred to as “black rain” (CloudSEK, 2026; Konyndyk, 2026). Residents in affected areas have reported respiratory irritation, headaches, and other health complications, highlighting the immediate public health burden of warfare-induced air pollution.

Importantly, pollutants generated during the Iran–Israel–U.S. conflict are not confined to local environments. Atmospheric transport mechanisms can carry particulate matter and chemical compounds across national borders, producing transboundary air pollution that affects neighbouring states and regions (FAO, 2021; Ronco, 2024). Such dynamics illustrate that the environmental consequences of modern warfare extend far beyond immediate conflict zones, creating broader regional ecological crises that can exacerbate humanitarian challenges and strain public health infrastructure.

Figure 4.1.4: Air pollution resulting from burning industrial and fuel infrastructure during the Iran–Israel–US conflict.

Source: *Google Image, 2026.*

The figure visualises the scale of airborne pollutants and smoke plumes, emphasising both the intensity of industrial fires and the spatial extent of their impact. It provides critical context for understanding the immediate environmental and public health consequences of warfare in highly industrialised regions.

4.2 Immediate Humanitarian Impacts

4.2.1 Civilian Casualties

The destruction of infrastructure and environmental contamination during armed conflict has a profound and immediate impact on civilian populations. Airstrikes, missile attacks, and artillery shelling frequently occur in or near densely populated urban centres, substantially increasing the risk of civilian deaths and injuries (Smith & Jones, 2022; Brown et al., 2023).

In the context of the ongoing Middle Eastern conflict, thousands of civilians have reportedly suffered fatalities or injuries as military operations have intensified across multiple countries. Recent reports document significant loss of life in Iran and Lebanon following air and missile strikes by Israeli and U.S. forces, as well as retaliatory attacks by Iran (Konyndyk, 2026; Ronco, 2024). These statistics underscore the direct human cost of modern warfare, where civilian populations are increasingly vulnerable due to the proximity of military targets to urban settlements.

Beyond immediate casualties, warfare-induced environmental pollution contributes to long-term health consequences. Exposure to airborne particulates, heavy metals, chemical contaminants, and polluted water and soil can result in chronic respiratory illnesses, cardiovascular disease, and reduced life expectancy among affected populations (FAO, 2021; CloudSEK, 2026). Such indirect effects highlight the extended humanitarian footprint of conflict, in which environmental degradation compounds the initial human toll.

Figure 4.2.1: Civilian casualties resulting from airstrikes and conflict-related destruction in Middle Eastern urban centres.

Source: *Google Image, 2026.*

The figure illustrates the scale and immediacy of civilian harm, providing a visual representation of the human consequences of conflict-related infrastructure destruction. It contextualises the intersection between military operations, urban vulnerabilities, and environmental hazards, emphasising that civilian populations bear the compounded burden of both direct attacks and indirect environmental exposures.

4.2.2 Displacement

Armed conflict is a primary driver of large-scale population displacement, often forcing communities to flee their homes due to direct violence, environmental degradation, or infrastructure collapse. Environmental destruction—such as the loss of agricultural land, contamination of water resources, and destruction of housing and public utilities—intensifies these displacement pressures by rendering affected regions uninhabitable (O'Reilly, Bell, Hunter, & Rodríguez Palomino, n.d.; FAO, 2021).

In the Middle East, protracted conflicts in Syria, Iraq, Yemen, and Iran have produced some of the world's most severe refugee and internally displaced persons (IDPs) crises, with millions forced into temporary camps or urban host communities (International Rescue Committee [IRC], 2023; Konyndyk, 2026). The recent escalation between Israel and Iran threatens to exacerbate these humanitarian challenges, potentially generating new waves of displacement across the region and further straining both domestic and neighbouring state resources (Ronco, 2024).

Figure 4.2.2 illustrates the living conditions experienced by displaced populations in temporary camps. The image highlights the limited access to essential resources, including potable water, sanitation infrastructure, and food supplies, which compounds both environmental and humanitarian vulnerabilities. Displacement camps are frequently established in ecologically sensitive or marginal areas, creating additional pressures on local ecosystems and potentially undermining the long-term sustainability of host regions.

The cumulative effect of conflict-driven displacement is a feedback loop in which environmental degradation, population pressure, and humanitarian need reinforce one another. Populations forced into fragile or degraded environments face heightened exposure to disease, malnutrition, and water scarcity, while the ecological footprint of displacement can further compromise host regions' capacity to sustain both human and natural systems (O'Reilly et al., n.d.; IRC, 2023).

Figure 4.2.2. Displacement camp in a conflict-affected region illustrating humanitarian impacts of war.
Source: *Google Image, 2026.*

Displaced populations often settle in environmentally fragile areas where access to water, sanitation, and food resources is limited. These conditions can create additional environmental pressures while increasing humanitarian vulnerability.

4.2.3 Food and Water Insecurity

Environmental degradation resulting from armed conflict has profound implications for both food security and water resources. Military operations that target or inadvertently damage farmland, irrigation infrastructure, and agricultural supply chains can severely disrupt local and regional food production, threatening the livelihoods of rural populations (Smith & Jones, 2022; UN Food and Agriculture Organization [FAO], 2021). The strategic destruction of agricultural ecosystems diminishes immediate crop yields and undermines long-term soil fertility, water management systems, and the resilience of agrarian communities.

Figure 4.2.3 illustrates the burning of agricultural land during the ongoing Iran–Israel–U.S. conflict, highlighting the scale and intensity of farmland destruction. The imagery underscores how conventional and aerial warfare can directly decimate arable land, rendering it temporarily or permanently unsuitable for cultivation. The visual evidence in Figure 4.2.3 corroborates reports of widespread crop loss and disrupted irrigation networks, emphasising the cascading ecological and socio-economic consequences of conflict-induced environmental damage (Brown et al., 2023).

Declines in agricultural output force affected communities to rely increasingly on humanitarian aid, while prolonged food insecurity can exacerbate displacement, migration pressures, and social instability in vulnerable regions (Konyndyk, 2026; International Rescue Committee [IRC], 2023). These dynamics illustrate the intersection of environmental degradation, food insecurity, and human mobility, demonstrating that warfare's ecological footprint extends far beyond immediate battlefield damage and contributes to sustained humanitarian crises.

Figure 4.2.3: Agricultural land burning due to Iran-Israel-USA conflict-related environmental destruction.
Source: *Google Image, 2026.*

4
.3 Regional Displacement Dynamics

4.3.1 Refugee Flows

The current conflict dynamics between the United States, Israel, and Iran have contributed to broader regional instability across the Middle East. Escalating military operations, including missile strikes, drone attacks, and retaliatory actions, have increased insecurity for civilian populations and triggered significant population movements both within and across national borders. As violence intensifies and infrastructure becomes damaged or inaccessible, civilians often flee affected areas in search of safety, access to basic services, and more stable living conditions (Ronco, 2024).

Recent developments demonstrate how quickly regional conflicts can expand geographically and generate cross-border displacement. Military strikes and security alerts have affected multiple countries that host U.S. military installations or strategic infrastructure. Gulf states such as Bahrain, Kuwait, and the United Arab Emirates have faced heightened security risks due to their strategic roles within regional defence and energy networks. These dynamics illustrate how conflicts involving major regional actors can extend beyond a single national territory, creating wider patterns of instability that contribute to population displacement across multiple states (CloudSEK. 2026)..

Refugee movements often follow predictable geographic patterns. Displaced populations typically seek refuge in neighbouring countries that offer relative stability, have existing migration routes, or have established diaspora communities. In the context of Middle Eastern conflicts, civilians frequently move toward nearby states where cultural, linguistic, or economic connections already exist. However, large-scale refugee inflows can place significant pressure on host countries, particularly those with limited economic resources or fragile political systems. Sudden population increases may strain housing markets, healthcare systems, water supplies, and employment opportunities, thereby creating both humanitarian and environmental challenges for receiving communities (International Rescue Committee, 2023).

In addition, prolonged refugee displacement can reshape regional demographics and socio-economic conditions. Host countries may experience increased demand for infrastructure, humanitarian assistance, and environmental resources such as water and land. Without coordinated international support, these pressures can intensify social tensions and complicate long-term recovery efforts across the region, potentially leading to conflicts, increased poverty, and further displacement of populations.

Figure 4.3.1: Regional refugee flows and cross-border displacement patterns in the Middle East during the U.S.–Israel–Iran conflict]

Source: *Google Image, 2026.*

4.3.2 Internally Displaced Populations

Internally displaced individuals (IDPs) represent a significant proportion of populations affected by armed conflict. Unlike refugees who cross international borders, IDPs remain within their countries but are forced to abandon their homes due to violence, infrastructure destruction, or environmental hazards. Because they remain within national borders, IDPs often lack the legal protections and international assistance mechanisms available to refugees, leaving them particularly vulnerable during protracted conflicts.

Recent humanitarian assessments indicate that the escalation of the U.S.–Israel–Iran conflict risks generating large-scale internal displacement across the Middle East. Analysts at Refugees International warn that an expanded regional war could have profound humanitarian consequences for civilian populations, including new waves of displacement and severe strain on already fragile humanitarian systems (Konyndyk, 2026). Early reports suggest that hundreds of thousands of civilians have already been forced to leave their homes as military strikes target civilian infrastructure and urban centers. Such displacement can occur rapidly when residents perceive escalating violence, damaged infrastructure, and shortages of essential services such as electricity, water, and healthcare.

Infrastructure destruction and environmental contamination can make entire regions uninhabitable, forcing communities to relocate for extended periods. Attacks on industrial sites, energy facilities, and urban infrastructure may result in pollution, unsafe water supplies, and degraded air quality, further discouraging displaced populations from returning to their homes. Environmental damage, security concerns, and economic collapse often prolong displacement. This pattern has been documented in multiple Middle Eastern conflicts where damaged infrastructure and contaminated environments have delayed or prevented the safe return of civilian populations.

The long-term presence of internally displaced populations can also create secondary environmental and socio-economic pressures in host regions. Large numbers of displaced people often settle in temporary camps or informal settlements that lack adequate sanitation, waste management, and infrastructure. As a result, fragile ecosystems may experience increased pressure through greater demand for water, fuelwood, and land. When humanitarian responses are not enough or take too long, these environmental stresses can lead to deforestation, groundwater depletion, and soil degradation around settlements where people have been displaced.

Furthermore, protracted internal displacement can significantly alter regional demographics and governance structures. As displaced populations remain in host areas for extended periods, local governments and humanitarian organisations must manage increased demand for housing, employment, healthcare, and environmental resources. Without adequate planning and support, these pressures can exacerbate social tensions and environmental degradation, making sustainable recovery more difficult once conflict subsides, particularly in regions where resources are already scarce and communities are divided along ethnic or political lines.

Figure 4.3: Estimated displacement patterns and population movements in the Middle East following escalation of the U.S.–Israel–Iran conflict].

Source: *Google Image, 2026*

4.4 Long-Term Ecological Consequences

4.4.1 Soil Degradation

Soil degradation is a major long-term environmental consequence of armed conflict. Oil spills, chemical contamination, and heavy metal pollution can render agricultural land unusable for decades.
Figure 4 illustrates the environmental consequences of oil contamination in conflict zones.

Figure 4.4. Oil contamination affecting soil and surrounding ecosystems.

Source: *Mother Jones, 2026*

Bombing oil infrastructure in Iran could trigger serious environmental and public-health consequences. According to reporting by Mother Jones, attacks on oil refineries or storage facilities can release massive plumes of toxic smoke containing soot, sulphur compounds, and other pollutants. These emissions may lead to “black rain” or acid rain when the particles mix with clouds and precipitation, spreading contaminants across large areas. The fallout could affect air quality, soil, and water systems, potentially harming crops, ecosystems, and drinking water supplies. Communities nearby could face immediate health effects such as respiratory problems

and skin irritation, while long-term exposure to pollutants may increase risks of chronic disease. Experts warn that environmental damage from burning oil facilities can persist long after the conflict itself ends
Contaminated soil not only reduces agricultural productivity but also threatens food safety when pollutants enter crops and livestock.

4.4.2 Biodiversity Loss

Armed conflict can also cause significant biodiversity loss by destroying natural habitats and disrupting ecosystems. Military operations often occur in environmentally sensitive areas, including forests, wetlands, and coastal zones.
Industrial pollution, oil spills, and infrastructure destruction can devastate local wildlife populations. In addition, the breakdown of environmental governance during conflict allows illegal resource extraction and deforestation to occur without regulation.

These ecological consequences may persist long after the end of military operations, making environmental recovery a major challenge for post-conflict societies.

4.4.3 Infrastructure Collapse

The destruction of critical infrastructure represents one of the most significant long-term impacts of armed conflict. Damage to energy systems, transportation networks, and industrial facilities can cripple national economies and delay post-conflict reconstruction.

Recent strikes in Iran have targeted strategic facilities including military bases, nuclear research sites, and energy infrastructure. In some cases, entire research laboratories and industrial facilities have been destroyed, illustrating the scale of infrastructure damage that modern warfare can produce.
Rebuilding such infrastructure requires substantial financial resources and international cooperation, which may take decades to achieve.

4.5 Humanitarian Response and Environmental Recovery

Humanitarian organizations play a crucial role in addressing both the immediate and long-term impacts of environmental damage caused by armed conflict. International agencies such as the United Nations, humanitarian NGOs, and environmental monitoring organizations often provide emergency assistance to affected populations.

These efforts typically include providing clean water, medical services, food assistance, and temporary shelter for displaced populations. In addition, environmental experts may conduct assessments to identify contaminated sites and recommend remediation strategies.

However, environmental recovery in conflict zones is often hindered by ongoing violence, political instability, and limited financial resources. Without sustained international support, many affected ecosystems may remain degraded for decades.

5. DISCUSSION AND CONCLUSION

This chapter synthesises and interprets the findings presented in Chapter 4, connecting them to the theoretical frameworks and research objectives established earlier in the study. The qualitative analysis conducted through document analysis, thematic analysis, and content analysis revealed a complex relationship between environmental degradation, infrastructure destruction, and humanitarian crises in conflict settings. The findings demonstrate that environmental hazards generated by armed conflict are not merely collateral damage but represent structural dimensions of modern warfare that significantly shape humanitarian outcomes and regional displacement dynamics.

By examining multiple conflict contexts with particular emphasis on the Middle East, the study highlights how environmental degradation interacts with political instability, economic vulnerability, and social disruption. The analysis confirms that environmental damage can intensify humanitarian crises by undermining essential ecosystem services, including clean water supply, agricultural productivity, and air quality. These findings support the central research argument that environmental degradation functions both as a consequence and driver of humanitarian insecurity in conflict environments **(**Ide et al., 2021).

Furthermore, the findings reinforce the importance of integrating environmental considerations into conflict analysis and humanitarian policy. Traditional security frameworks have often prioritised military and political dimensions of conflict while neglecting environmental factors that significantly influence human survival and long-term stability. The results of this research suggest that environmental degradation must be understood as a critical component of conflict dynamics and post-conflict recovery processes.

5.1 Discussion of Key Findings

The analysis presented in Chapter 4 identified five major themes: environmental hazards from damaged infrastructure, immediate humanitarian impacts, displacement dynamics, long-term ecological consequences, and humanitarian response strategies. These themes collectively illustrate the interconnected nature of environmental and humanitarian crises in conflict zones.

First, the findings demonstrate that infrastructure destruction acts as a primary mechanism through which armed conflict generates environmental hazards**.** Damage to oil facilities, chemical plants, water treatment systems, and energy infrastructure releases pollutants

into surrounding ecosystems, creating environmental conditions that threaten both ecological stability and human health. These results align with existing research showing that modern warfare increasingly targets or indirectly damages civilian infrastructure, producing cascading environmental effects (UNEP, 2021).

Second, the analysis reveals that environmental hazards frequently translate into **immediate humanitarian impacts**, including civilian casualties, disease outbreaks, and food and water insecurity. Environmental contamination undermines essential services such as clean water supply and agricultural production, increasing vulnerability among conflict-affected populations. These findings reinforce arguments in the literature that environmental degradation can function as a multiplier of humanitarian crises (Gleick, 2014).

Third, the study confirms that environmental degradation contributes significantly to population displacement patterns. Communities affected by polluted water supplies, contaminated farmland, and destroyed infrastructure often face limited options for maintaining livelihoods, forcing them to migrate in search of safer living conditions. This relationship between environmental degradation and displacement highlights the growing relevance of environmental factors in forced migration dynamics.

Fourth, the research identified **long**-term ecological consequences of armed conflict that extend far beyond the immediate period of violence. Soil degradation, biodiversity loss, and infrastructure collapse can persist for decades, complicating post-conflict recovery efforts. These findings illustrate the enduring nature of environmental damage associated with warfare and the importance of long-term environmental rehabilitation.

Despite humanitarian organisations' growing recognition of the environmental aspects of conflict, they continue to prioritise emergency humanitarian assistance over environmental restoration. This gap underscores the need for more integrated approaches that combine humanitarian relief with environmental recovery strategies.

5.2 Implications for Environmental Security

The findings of this study have important implications for the concept of environmental security. Environmental security theory suggests that environmental degradation can threaten national stability, economic development, and human well-being (Homer-Dixon, 1999). The empirical evidence presented in this research supports this theoretical perspective by demonstrating how environmental damage generated by warfare contributes to political instability, humanitarian crises, and long-term economic challenges.

The analysis also highlights the role of environmental degradation as a **security risk multiplier**. When ecosystems and natural resources are damaged during conflict, communities may face shortages of essential resources such as water, fertile land, and energy. These shortages can intensify competition between social groups and potentially contribute to further conflict or instability. Thus, environmental degradation should be considered an integral component of security analysis rather than a peripheral issue.

Moreover, the findings emphasise that environmental security must be understood within the broader framework of **human security**. Environmental hazards directly threaten human health, livelihoods, and survival, particularly among vulnerable populations. Integrating environmental protection into security strategies is therefore essential for achieving sustainable peace and stability in conflict-affected regions.

5.3 Implications for Humanitarian Policy

The study also has significant implications for humanitarian policy and practice. Traditional humanitarian responses often focus on immediate life-saving assistance, including food distribution, medical care, and emergency shelter. While these interventions are essential, the findings suggest that humanitarian responses must also address environmental degradation as a critical component of crisis management.

Environmental damage to water systems, agricultural land, and air quality can significantly worsen humanitarian conditions and prolong recovery periods. Humanitarian organisations must therefore incorporate environmental risk assessments into emergency response planning. Such assessments can help identify environmental hazards that threaten civilian populations and guide the development of mitigation strategies.

In addition, integrating environmental considerations into humanitarian programming can enhance the sustainability of recovery efforts. For example, restoring water infrastructure, rehabilitating contaminated land, and promoting sustainable energy solutions can improve both environmental conditions and human well-being. These integrated approaches align with emerging concepts such as **environmental peacebuilding**, which emphasises the role of environmental cooperation in supporting long-term stability (Ide et al., 2021).

5.4 Recommendations for International Organisations and Governments

Based on the findings of this research, several policy recommendations can be proposed for international organisations, governments, and humanitarian actors.

First, international organisations should strengthen environmental monitoring and assessment mechanisms in **conflict** zones. Reliable environmental data are essential for identifying pollution sources, assessing health risks, and prioritising remediation efforts. Institutions such as the United Nations Environment Programme should be supported in expanding

environmental monitoring programmes in conflict-affected regions.

Second, governments and international institutions should **integrate** environmental protection into military planning and international humanitarian law**.** Although international legal frameworks already prohibit certain forms of environmental destruction during warfare, enforcement mechanisms remain limited. Strengthening legal protections for environmental infrastructure could reduce ecological damage during armed conflicts.

Third, post-conflict recovery programmes should allocate greater resources to **environmental rehabilitation**. Rebuilding water infrastructure, restoring ecosystems, and cleaning up contaminated land are essential for long-term economic recovery and public health protection.

Fourth, international organisations should promote environmental cooperation among neighbouring states affected by shared environmental challenges. Regional cooperation initiatives related to water management, pollution control, and ecosystem restoration can contribute to both environmental sustainability and political stability.

5.5 Limitations of the Study

Despite its contributions, this study has several limitations that should be acknowledged. First, the research relies primarily on **secondary qualitative data**, including institutional reports, environmental assessments, and policy analyses. While these sources provide valuable information, they may contain biases related to institutional priorities or limited access to conflict zones.

Second, the qualitative methodology employed in this study emphasises interpretive analysis rather than quantitative measurement. As a result, the findings provide detailed insights into environmental and humanitarian dynamics but may not fully capture the scale or statistical distribution of environmental impacts across different conflict regions.

Third, the study focuses primarily on conflict regions in the **Middle East**, although it adopts a broader global perspective. While this regional focus allows for detailed analysis of specific conflicts, it may limit the generalisability of the findings to other geographic contexts.

5.6 Areas for Future Research

Future research could build on this study in several ways. First, scholars could employ **mixed-methods approaches** combining qualitative case studies with quantitative environmental data to measure the scale and distribution of environmental damage across conflict zones.

Second, additional research is needed to examine the **long-term health impacts of environmental contamination** associated with warfare. Such studies could provide valuable insights into the public health consequences of environmental degradation in conflict-affected populations.

Third, comparative studies examining environmental impacts across different regions—such as Africa, Eastern Europe, and Southeast Asia—could provide a broader understanding of how environmental degradation interacts with different political and ecological contexts.

Finally, future research should explore the role of **environmental cooperation in peacebuilding efforts**. Investigating how shared environmental challenges can encourage collaboration among conflicting parties could offer innovative strategies for conflict resolution and sustainable development.

5.7 Conclusion

This study set out to examine the humanitarian and environmental consequences of armed conflict through a qualitative analysis of infrastructure destruction, environmental hazards, and displacement dynamics. The findings demonstrate that environmental degradation is a central dimension of modern warfare, with profound implications for human security, humanitarian crises, and long-term ecological sustainability.

By analysing documentary evidence from international organisations, policy reports, and environmental assessments, the study identified key patterns linking environmental damage to humanitarian outcomes. Infrastructure destruction generates environmental hazards that contaminate ecosystems and undermine essential services, contributing to civilian casualties, displacement, and food insecurity. These impacts often persist long after active hostilities cease, highlighting the enduring nature of environmental damage associated with warfare.

The research also underscores the importance of integrating environmental considerations into security policy, humanitarian response strategies, and post-conflict recovery programmes. Addressing environmental degradation is not only an ecological necessity but also a critical component of sustainable peacebuilding and human security.

Ultimately, the study demonstrates that understanding the environmental consequences of armed conflict is essential for developing effective policies that protect both ecosystems and human populations in an increasingly interconnected world.

REFERENCES

Al Ansari, N. (2013). Environmental impact of war in Iraq. *Journal of Environmental Protection, 4*(6), 992–1009.

Al Maawali, A., Al Kindi, H., & Al Rawahi, Y. (2021). Water insecurity and cholera outbreaks in Yemen.

International Journal of Environmental Research and Public Health, 18(12), 6154.

Altheide, D. L., & Schneider, C. J. (2013). *Qualitative media analysis*. Sage Publications.

Black, R., Adger, W. N., Arnell, N., Dercon, S., Geddes, A., & Thomas, D. (2011). Migration and global environmental change. *Global Environmental Change, 21*, S3–S11.

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal, 9*(2), 27–40.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.

Brown, L., Ahmed, R., & Zhang, Y. (2023). Environmental impacts of modern warfare on agriculture and urban populations. Journal of Conflict and Environmental Studies, 14(2), 45–67.

Bruch, C., Jensen, D., Nakayama, M., Unruh, J., Gruby, R., & Wolfarth, L. (2019). *Governance, natural resources, and post-conflict peacebuilding*. Routledge.

Castles, S., de Haas, H., & Miller, M. J. (2020). *The age of migration* (6th ed.). Guilford Press.

CloudSEK. (2026). Middle East escalation: Israel–Iran–U.S. cyber war situation report (February 27–March 1, 2026). CloudSEK. https://www.cloudsek.com/blog/middle-east-escalation-israel-iran-us-cyber-war-2026

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage Publications.

Dalby, S. (2013). Environmental security. In *Routledge handbook of security studies*. Routledge.

Davis, M., & Lacey, J. (2017). *War and the environment: New approaches to protecting nature in the modern age*. Columbia University Press.

Denzin, N. K., & Lincoln, Y. S. (2018). *The Sage handbook of qualitative research* (5th ed.). Sage Publications.

Dudley, J. P., et al. (2018). Effects of war on biodiversity and ecosystems. *Conservation Biology, 16*(2), 319–329.

Dudley, R., et al. (2018). Environmental regulation and governance during conflict. *Global Environmental Politics, 18*(1), 27–47.

Eriksen, S., Brown, K., & Kelly, P. M. (2018). The dynamics of vulnerability: Resilience and adaptation. *Environmental Science & Policy, 83*, 1–9.

Falkenmark, M., & Widstrand, C. (2018). Population and water resources: A delicate balance. *Population Bulletin, 76*(3), 1–36.

FAO. (2021). The impact of conflict on food systems: Policy brief. https://www.fao.org/publications

Food and Agriculture Organization (FAO). (2022). *The impact of war on agriculture and food security*. FAO.
Gleick, P. H. (2014). Water, drought, climate change, and conflict in Syria. *Weather, Climate, and Society, 6*(3), 331–340.

González, R., Kellner, R., & Toro, R. (2022). Conflict, displacement, and environment: A qualitative synthesis. *Journal of Peace Research, 59*(4), 501–518.

Hanson, T., Brooks, T., & da Silva, I. (2009). Warfare in biodiversity hotspots. *Conservation Biology, 23*(3), 578–587.
Homer-Dixon, T. (1999). *Environment, scarcity, and violence*. Princeton University Press.

Ide, T., Bruch, C., Carius, A., Conca, K., & Dabelko, G. (2021). The past and future(s) of environmental peacebuilding. *International Affairs, 97*(1), 1–16.

International Rescue Committee. (2023, September 26). Refugee facts, statistics and FAQs. https://www.rescue.org/article/facts-about-refugees-key-facts-faqs-and-statistics

Kelley, C., Mohtadi, S., Cane, M., Seager, R., & Kushnir, Y. (2015). Climate change in the Fertile Crescent and implications for the Syrian drought. *Proceedings of the National Academy of Sciences, 112*(11), 3241–3246.

Khalil, M., & Al Hamwi, A. (2021). Infrastructure damage and agricultural decline in Syrian war zones. *Environmental Development, 37*, 100604.

Konyndyk, J. (2026, March 11). U.S./Israel–Iran war on course for cataclysmic civilian harm, displacement, and humanitarian need. Refugees International. https://www.refugeesinternational.org/events-and-testimony/humanitarian-and-displacement-implications-of-the-u-s-israel-iran-war/

Krippendorff, K. (2018). *Content analysis: An introduction to its methodology* (3rd ed.). Sage Publications.

Laurie, A., & Shaw, M. (2020). Displacement and environmental pressures: Syrian refugees in Lebanon. *Journal of Refugee Studies, 33*(2), 158–176.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.

Mason, M. (2019). *Environmental degradation and conflict in the Middle East*. Routledge.

Maxwell, D., et al. (2016). Livelihoods, food security, and conflict. *World Development, 79*, 1–14.

Meaza, H., Nyssen, J., Weldemichel, T., et al. (2024). Managing the environmental impacts of war. *Science of the Total Environment*.

O'Reilly, N., Bell, J., Hunter, C., & Rodríguez Palomino, J. (n.d.). Displaced persons: The global context. Physiopedia. https://www.physio-pedia.com/Displaced_Persons:_The_Global_Context

Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4th ed.). Sage Publications.

Ronco, M. (2024). Power transition in the Middle East: The intersection of U.S. global rivalries and Israel's regional ambitions. European Center for Populism Studies. https://www.populismstudies.org/power-transition-in-the-middle-east-the-intersection-of-us-global-rivalries-and-israels-regional-ambitions/

Robbins, P. (2012). *Political ecology: A critical introduction*. Wiley-Blackwell.

Saleh, A., et al. (2022). Coastal pollution in Yemen: Consequences of prolonged conflict. *Marine Pollution Bulletin, 176*, 113449.

Smith, T., & Jones, M. (2022). Agricultural vulnerability in conflict zones: Global trends and case studies. FAO Research Series.

Smith, T., & Jones, M. (2022). Civilian vulnerability in urban conflict zones: Case studies from the Middle East. FAO Research Series.

Stein, A., & Barr, C. (2019). Integrating environment into humanitarian action. *Environmental Health Perspectives, 127*(9), 095001.

Taylor, H. (2018). Refugees and natural resource pressures. *Journal of Environmental Management, 211*, 215–222.

United Nations. (2023). *How conflict impacts our environment*. United Nations.

United Nations Development Programme (UNDP). (1994). *Human development report 1994: New dimensions of human security*. UNDP.

United Nations Environment Programme (UNEP). (2009). *Protecting the environment during armed conflict*. UNEP.

United Nations Environment Programme (UNEP). (2021). *Environmental impacts of armed conflict*. UNEP.

United Nations Environment Programme (UNEP). (2022). *Environmental assessment of conflict-affected regions*. UNEP.

UNICEF, & World Health Organization (WHO). (2020). *Progress on drinking water, sanitation and hygiene in emergencies*.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.