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Evaluating Environmental Conflict Resolution: Theoretical and Empirical Perspectives From the Arab Region



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تقييم نهج حل النزاعات البيئية: مقاربات نظرية وتطبيقية من المنطقة العربية

آية بدر

كلية الاقتصاد والعلوم السياسية، جامعة القاهرة، جمهورية مصر العربية

Aya Badr

Faculty of Economics and Political Science, Cairo University, Arab Republic of Egypt

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Abstract

This study examines the growing importance of the environmental dimension in security variables, within the framework of the correlation between environment and security, particularly in the Arab region, where armed conflicts are often driven by competition over resources such as water, oil, and gold. When these environmental issues are weaponized, they hinder conflict resolution efforts and pose serious threats to both national security and human security in its broadest sense.

The study also explores the effectiveness of the Environmental Conflict Resolution (ECR) approach, which falls within the broader framework of environmental peacebuilding. It employs a qualitative case study methodology that analyzes secondary sources, policy documents, and UN resolutions.

Case studies, such as the conflict between Sudan and South Sudan and the Arab-Israeli conflict over water resources, demonstrate how ECR frameworks have been applied to promote cooperation in resource sharing and environmental management. The study also explores the links between environmental threats and security implications for fragile states, emphasizing the importance

المستخلص

تناولت هذه الدراسة الأهمية المتزايدة للبُعد البيئي في متغيرات الأمن، في إطار العلاقة الارتباطية بين البيئة والأمن، ولا سيما في المنطقة العربية؛ حيث غالبًا ما تكون النزاعات المسلحة مدفوعة بالتنافس على الموارد مثل: المياه والنفط والذهب. وعندما تُستغل هذه القضايا البيئية كسلاح، فإنها تعرقل جهود حل النزاعات، وتشكل تهديدات خطيرة للأمن القومي والأمن الإنساني بمعناه الأوسع على حد سواء.

كما تناولت فاعلية نهج حل النزاعات البيئية (ECR) الذي يندرج ضمن الإطار الأوسع لبناء السلام البيئي. باستخدام منهجية دراسة الحالة النوعية التي تحلل المصادر الثانوية ووثائق السياسات وقرارات الأمم المتحدة.

وتوضح دراسات الحالة، مثل: النزاع بين السودان وجنوب السودان والصراع العربي الإسرائيلي حول الموارد المائية، كيف تم تطبيق أطر عمل حل النزاعات البيئية؛ لتعزيز التعاون في تقاسم الموارد والإدارة البيئية. كما تستكشف الدراسة الروابط بين التهديدات البيئية والآثار الأمنية على الدول الهشة، مؤكدة أهمية تبني إستراتيجيات حل النزاعات المتكاملة التي تشمل الإدارة البيئية.

Keywords: security studies, environmental conflict resolution (ECR), environmental conflicts, environmental peacebuilding, environment-security nexus, natural resource governance

الكلمات المفتاحية: الدراسات الأمنية، حل النزاعات البيئية، الصراعات البيئية، بناء السلام البيئي، ترابط البيئة والأمن، حوكمة الموارد الطبيعية



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* Corresponding Author: Aya Badr

Email: aya.alaiwa2013@feps.edu.egdoi: [10.26735/LTCW6001](https://doi.org/10.26735/LTCW6001)

of adopting integrated conflict resolution strategies that incorporate environmental management.

Empirical evidence drawn from the cases of Sudan and South Sudan and the Arab-Israeli conflict highlights the limited effectiveness of the ECR approach in the absence of factors and conditions conducive to its success. Therefore, an environmental conflict resolution approach is necessary, but not sufficient, to achieve long-term peace; it should be integrated into comprehensive peacebuilding strategies to address the underlying political, economic, and other factors that fuel and complicate conflict.

1. Introduction

In contemporary security studies, the environmental security nexus amid the evolving global security landscape is widely debated, as environmental factors are elevated from peripheral concerns to central determinants of conflict and stability. Over the past three decades, a substantial body of empirical evidence has demonstrated that environmental degradation, resource scarcity, and ecological shocks are not mere byproducts of development, but fundamental catalysts for state fragility, armed violence, and protracted insecurity (McDonald, 2013; Gelot & Krampe, 2020; United Nations Department of (Political Affairs & United Nations Environment Programme, 2015). This reconceptualization of the environment-security nexus marks a paradigm shift in both academic and policy discourse, foregrounding how natural systems and resource governance shape the dynamics of complex security crises and modern conflicts.

The academic debate on this nexus has been shaped by two competing but ultimately complementary perspectives. The first, rooted in the scarcity thesis, argues that the degradation of renewable resources and the shrinking availability of water, arable land, and other ecological commons generate grievances, weaken livelihoods, and intensify inter-group competition, increasing the

وأقلت الأدلة التجريبية المستمدة من حالي السودان وجنوب السودان والصراع العربي الإسرائيلي الضوء على محدودية فاعلية نهج حل النزاعات البيئية في ظل غياب العوامل والظروف المعززة لنجاحها. ومن ثم، فإن نهج حل النزاعات البيئية ضروري، ولكنه غير كافٍ لتحقيق السلام على المدى الطويل؛ وينبغي دمجها في إستراتيجيات شاملة لبناء السلام لمعالجة القضايا والأبعاد السياسية والاقتصادية والمسببات الكامنة التي تؤجج الصراع وتزيده تعقيداً.

likelihood of violent conflict (Homer-Dixon, 1999). The second, grounded in the political economy of war, contends that it is not scarcity alone but the structure of resource dependence, the lootability of non-renewable resources, and the conflictuality of extractive political economies that most powerfully drive armed conflict — as demonstrated by the role of oil, diamonds, and minerals in sustaining civil wars across sub-Saharan Africa and the Middle East (Le Billon, 2001; Collier & Hoeffler, 2004). Together, these perspectives establish that environmental conflict is a multidimensional phenomenon: it encompasses both conflicts driven by ecological scarcity and those fueled by the political economy of resource wealth, and it operates across local, national, and transboundary scales. Therefore, the growing number of environmental conflicts and wars is expected to reshape international politics. (Angelica Faotto, 2019)

The Arab region provides a particularly acute illustration of this nexus. Ongoing armed conflicts across the region cannot be adequately understood without accounting for the central role of natural resources — water, oil, and gold — as both triggers of violence and obstacles to conflict settlement. The weaponization of water infrastructure, the contestation of oil revenues, and the exploitation of mineral wealth have not only triggered the



escalation of conflict but also systematically undermined peace negotiations and post-conflict recovery, constituting what the literature identifies as a resource-conflict trap (Le Billon, 2001; United States Institute of Peace, 2013). The region's acute climate vulnerability further compounds this dynamic: the Arab world contains some of the most ecologically threatened and least resilient states globally, where the compounding effects of water scarcity, food insecurity, population pressure, and governance failure create structural conditions for protracted environmental conflict (Institute for Economics and Peace, 2025).

The central analytical tension this study seeks to address is whether and how the environment, having functioned as a driver of conflict, can be transformed into a foundation for peace. The environmental peacebuilding literature argues that this transformation is not only possible but has been empirically achieved in specific contexts, where shared ecological vulnerabilities and the necessity of cooperative resource governance have created incentives for dialogue, confidence-building, and durable agreement (Ide et al., 2021; Dresse et al., 2019). Environmental Conflict Resolution (ECR) is the operational framework through which this transformation is pursued — a holistic approach that integrates environmental diplomacy, shared natural resource management, and structured mediation into conflict prevention and peacebuilding processes (Swain & Öjendal, 2018; EcoPeace Middle East, 2024). Nevertheless, the literature also cautions that environmental peacebuilding carries inherent risks, including the depoliticization of conflicts, the reinforcement of power imbalances, and the subordination of social justice to environmental objectives (Ide, 2020). These tensions make the

critical evaluation of ECR not merely an academic exercise but a policy imperative.

Accordingly, the current study addresses the following research question: To what extent can Environmental Conflict Resolution effectively mitigate national security threats and support peacebuilding processes in the context of environmental conflicts in the Arab region? To answer this question, the study employs a qualitative case study methodology, drawing on secondary sources, policy documents, and UN resolutions, and applies the ECR framework to two contrasting cases from the MENA region: the Sudan–South Sudan conflict over oil and water, and the Arab–Israeli conflict over shared water resources. Through these cases, the study evaluates the conditions under which ECR has been or could be effectively operationalized, and derives evidence-based policy recommendations for integrating environmental considerations into conflict prevention and peacebuilding frameworks in the Arab region and beyond.

2. Methods

2.1. Research Design and Methodology

This study uses a document-based comparative case study approach, relying on secondary sources to evaluate the effectiveness of Environmental Conflict Resolution (ECR) as a peacebuilding method in the Arab region. This approach enables a thorough, systematic analysis of how ECR frameworks are conceptualized and applied across various conflict situations, without the need to collect primary data.

The study uses three types of secondary sources: peer-reviewed literature on environmental conflict, resource wars, security, and peacebuilding; reports from international organizations like UNEP, UNDP, and



the World Bank, and the Institute for Economics and Peace; and primary policy documents such as UN Security Council resolutions, peace agreements, and treaties related to the case studies. These sources show how environmental and resource governance have been integrated or ignored throughout the conflict cycle.

The study used a systematic documentary analysis to identify how environmental and resource factors contributed to conflict escalation, influenced peace negotiations, and affected post-conflict recovery. It also employed a comparative analytical framework to evaluate both cases against the ECR theoretical framework, examining how well ECR mechanisms were implemented, the results they achieved, and the structural limitations that hindered their effectiveness.

For case selection, two cases from the Arab region were chosen through purposive theoretical sampling, based on two main criteria: each case had to involve a conflict where environmental factors and natural resources were documented as primary drivers of armed violence, and each had to show evidence of ECR mechanisms, whether successful, partial, or failed, allowing for evaluative rather than just descriptive analysis. Importantly, the two cases were picked to represent the main levels at which environmental conflicts occur in the Arab region: the national and intrastate level, and the regional transboundary level.

The Sudan–South Sudan conflict was chosen as a case at the national level. It exemplifies an intrastate environmental conflict in which climate-related ecological stresses, such as water shortages, droughts, and desertification, especially in Darfur, combine with violent disputes over oil revenues among different political groups.

This combination fueled a prolonged civil war and ultimately led to the country's division. After separation, the conflict took on an interstate aspect, with the two new sovereign states continuing to fight over shared oil infrastructure and transboundary water resources. This case provides an opportunity to assess environmental conflict resolution (ECR) mechanisms used both within the state and at the emerging interstate level, including those outlined in the 2005 Comprehensive Peace Agreement and the 2012 Agreement on Oil and Related Economic Matters.

The Arab–Israeli water conflict was chosen as a regional transboundary example. It illustrates a long-standing interstate and sub-state dispute in which shared water sources, notably the Jordan River basin and West Bank aquifers, have served as catalysts for militarized conflict, tools of strategic pressure, and venues for environmental diplomacy. This case provides an opportunity to assess hydro-diplomacy as a specific form of ECR, highlighting its successes, such as the Jordan–Israel Peace Treaty (1994) and the Oslo Accords (1993), as well as its significant limitations in situations marked by power imbalance and hydro-hegemony.

Together, these two cases encompass the entire range of environmental conflict scales in the Arab region, from intrastate to interstate to transboundary, enabling them to provide transferable analytical insights into how ECR can effectively support conflict prevention and peacebuilding, as well as the limitations of that approach.

3. Conceptual Framework

The literature has shed light on the contentious interlinkage among ecological and environmental issues and security. According to some



perspectives, this interlinkage relates to the role of natural resources in armed conflict, including arguments about the resource curse, whether under conditions of resource scarcity or wealth, as both can be potential triggers of armed conflict and war. However, the impact of strength can vary depending on the type of natural resource. Other studies have shed light on the relationship between natural resources and the risk of civil war, instability, violence, and even full-scale interstate and intrastate wars (Vesco et al., 2020; Notten & Saisana, 2014; Koubi et al., 2014; Lujala, 2009).

In addition, the resource-conflict nexus concerns the implications of environmental factors, such as climate change and environmental shocks. It is argued that climate change and environmental degradation could intensify competition over scarce resources, exacerbating triggers of disputes, wars, and armed conflicts (United Nations Department of Political Affairs & United Nations Environment Programme, 2015; Nilsson, 2023). Climate change is considered a security risk that can directly and indirectly influence violence and conflict, especially in fragile and conflict-affected countries (Gelot & Krampe, 2020). Furthermore, the term ecological security was coined to reflect the significant impact of ecological and environmental factors on global peace and security, particularly the repercussions of climate change and other ecological threats on human security. This term underscores the importance of considering ecosystems as a fundamental pillar of international, national, and local security systems (McDonald, 2013, 2018, 2021).

Another key concept is the political ecology of war, which provides a detailed framework for understanding how natural resources become part of armed conflict dynamics. Instead of attributing

conflicts to simple environmental causes, whether of scarcity or abundance, this approach views conflicts as shaped by three interconnected factors: resource dependence, resource conflictuality, and resource looting potential. Resource dependence, mainly a result of colonial histories and extractive political economies, weakens government institutions through corruption, patronage, and the removal of incentives for responsible governance, thereby making society more vulnerable to armed conflict. Resource conflictuality refers to the inherently political process by which natural resources are transformed into tradable commodities, a process that frequently generates violence when exclusion is structured. Resource looting potential refers to the geographic and material features of resources — their proximity to centers of power and their spatial concentration — which influence the types of conflict they cause. This ranges from coups and secessions with concentrated point resources like oil and minerals to warlordism and rebellion involving diffuse resources like land and water. Importantly, resource wealth can actually hinder peace processes, since those involved in conflict often gain economic and political benefits that peace would eliminate. Therefore, reaching agreements on resource-sharing is a vital prerequisite for lasting peace (Le Billon, 2001). This perspective directly supports the present study's analysis of environmental conflict resolution, emphasizing that addressing the political economy of natural resources is not secondary but central to peacebuilding.

Consequently, conflict resolution and sustaining peace require considering environmental factors and agreeing on the sharing and governance of natural resources, since bargaining failure in this area is a significant cause of conflict. Environmental



peacebuilding is an approach that addresses the nexus of the environment, conflict, peace, and security. It aims to transform environmental issues, natural resources, and climate change from sources of dispute and conflict to motivators of peace and cooperation, and to address the environmental consequences of wars and conflicts. Through this approach, rival relationships can transform into cooperation and partnership. This can be achieved by developing sustainable management of natural resources, promoting disaster risk reduction (DRR), and fostering mutual dialogue and cooperation among disputing parties to reach win-win situations by focusing on less sensitive issues, such as the environment, through mediation and conflict resolution (Ide et al., 2021; Dresse et al., 2019; United Nations Department of Political Affairs & United Nations Environment Programme, 2015). However, environmental peacebuilding has potential drawbacks for both the environment and peacebuilding processes, including risks of depoliticizing conflicts, reinforcing power imbalances, and prioritizing environmental goals over social justice (Ide, 2020).

Environmental peacebuilding is considered the broader framework; it encompasses conflict sensitivity and the integration of natural resource management into conflict resolution and post-conflict recovery efforts to prevent violence, foster cooperation, and advance environmental sustainability. Its objective is to cultivate peace through the collaborative management of shared resources such as water, land, and minerals, thereby mitigating climate-related risks and addressing the fundamental causes of conflict. Eventually, it reinforces the peace with nature approach for the sake of both humans and the environment. (Sylvester & Castro Nunez, 2024) In addition, it

connects with environmental security, which focuses on safeguarding ecosystems and natural resources to promote human well-being and prevent conflicts. This perspective recognizes that the environment is a crucial aspect of both national and global security. (Political Science Institute, n.d.)

In this context, Environmental Conflict Resolution (ECR) is a part of environmental peacebuilding; it involves a set of techniques, processes, and roles that help parties in an environmental dispute reach an agreement. It focuses on a participatory and multilevel approach through direct dialogue, adaptable processes, and efforts to build consensus, aiming to manage conflicts related to environmental quality and natural resource management. Through these diplomatic and domestic frameworks, cooperation on environmental issues and shared natural resource management could support transformations in conflict dynamics toward peace for any type of conflict, including legal disputes, not just armed conflicts. (Bakhtiari, 2025; Fisher, 2014)

Accordingly, this study is centered on four interconnected core concepts: environmental security, environmental conflict, national security, and environmental peacebuilding. The relationships among these concepts form the analytical foundation of the research. Understanding how these concepts interact is crucial for assessing the effectiveness of Environmental Conflict Resolution (ECR) as a peacebuilding approach.

The first conceptual relationship suggests that environmental degradation and resource scarcity, key aspects of environmental security, act as independent variables that increase grievances, boost inter-group competition, and weaken state capacity. These dynamics create the structural conditions for environmental conflict, which is the dependent



variable in this part of the causal chain. Environmental conflict is not seen as a single, uniform phenomenon but as a spectrum ranging from localized resource disputes to full-scale armed conflicts, depending on factors such as resource weaponization, governance failure, and social-political instability (Vesco et al., 2020; Koubi et al., 2014).

The second conceptual relationship connects environmental conflict to national security threats. When environmental issues are weaponized or when resource competition intersects with weak governance, the resulting instability threatens to extend beyond the ecological realm, affecting human security, state stability, and regional peace. This relationship emphasizes that national security depends on both environmental conditions and conflict dynamics, as the ecology-security nexus literature shows (McDonald, 2013, 2018, 2021; Gelot & Krampe, 2020).

The third and central conceptual relationship positions Environmental Conflict Resolution (ECR)—as operationalized within the broader framework of environmental peacebuilding—as the key independent variable influencing the conflict-security nexus. ECR includes mechanisms such as environmental diplomacy, shared natural resource management, cross-border ecological cooperation, and structured mediation. Its purpose is to break the cycle of escalation between environmental degradation and conflict, turning shared ecological vulnerabilities from sources of rivalry into opportunities for cooperation. Therefore, peacebuilding outcomes are the ultimate dependent variable in the study's analytical model (Ide et al., 2021; Dresse et al., 2019; United Nations Department of Political Affairs & United Nations Environment Programme, 2015).

3.1. Environment-Security Nexus

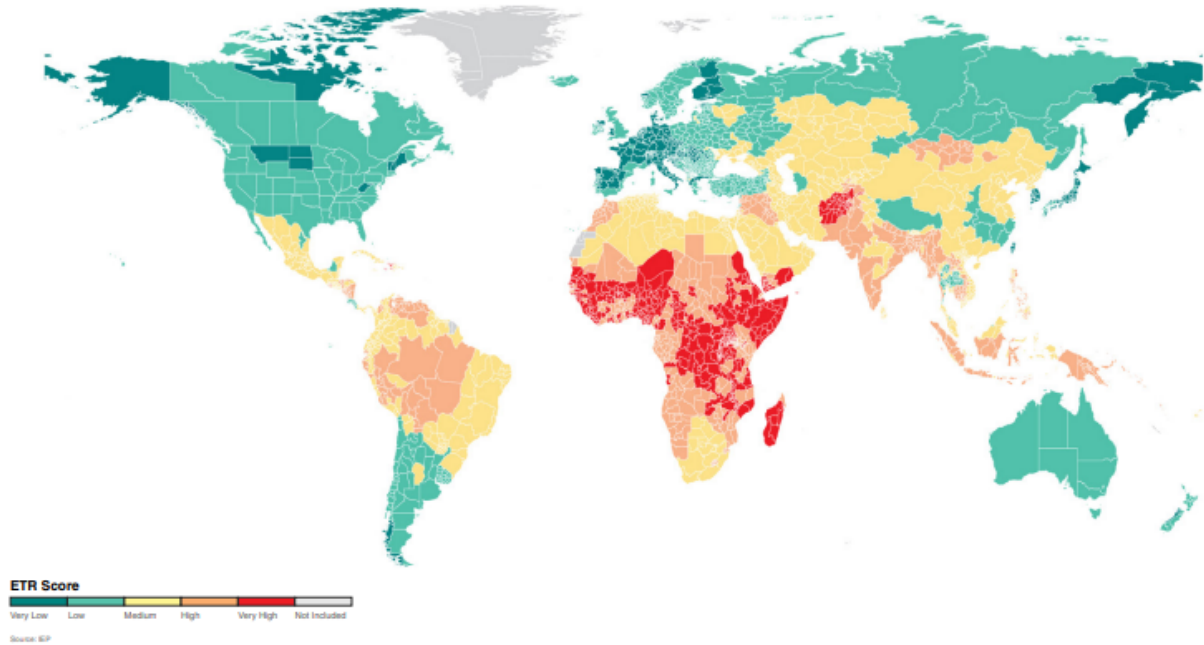
The relationship between ecological conditions and security outcomes, though widely debated in academic circles, receives its strongest analytical support when grounded in empirical evidence. The environment-security link is not just an abstract idea proposed by environmental security experts; it is a tangible, data-driven reality evident in the distribution of conflicts, the vulnerability profiles of fragile states, and the statistical links between ecological decline and political instability across regions and over time. This section provides empirical support for that link, using quantitative indicators, global threat assessments, and documented patterns of socio-environmental conflict to show that ecological stress and security breakdown are closely connected processes rather than coincidental.

The World Bank (WB) estimates reflect a strong correlation among climate change, environmental degradation, and conflict. Between 2014 and 2018, natural resources were a source of contention in almost 25% of global crises and conflicts, and also contributed to about 40% of all intrastate conflicts in the era 1946-2006. Moreover, conflict-environment linkages are affecting fragile countries and their vulnerable people, as these countries account for almost 70% of the world's most climate-vulnerable countries (World Bank, 2023). According to the Ecological Threat Report (ETR), the security implications of ecological risks are expected to worsen due to the growing threat of climate change and the lack of necessary international action and conflict-prevention measures to address this nexus. Climate change could be a threat multiplier, escalating tensions among groups and countries over limited resources, especially amid low resilience and severe climate events such as fires, floods, and



Figure 1

Map of Levels of Ecological Threat in 2025 Globally



Note. From Ecological Threat Report 2025: Analysing Ecological Threats, Resilience & Peace

<https://www.economicsandpeace.org/wp-content/uploads/2025/10/Ecological-Threat-Report-2025.pdf>

drought. These environmental catastrophes could lead to widespread migration and displacement due to a lack of human security.

Figure 1 shows global ecological threat levels in 2025, indicating that about 54 countries face high or very high risks. Among these, 30 are hotspot countries—regions where significant ecological threats coincide with low societal resilience. These areas are at extreme risk due to rainfall seasonality, which concentrates annual rainfall into fewer months and greatly contributes to conflict. This has caused more than a 50% increase in fatalities in affected transboundary basins. Furthermore, ecological threats intensify when multiple shocks occur simultaneously, such as conflict, governance failures, and extreme water stress. The most vulnerable countries are clustered in sub-Saharan Africa, South Asia, and the Middle East and North

Africa. These regions are also among the least peaceful, as measured by the Global Peace Index (GPI), and face the highest risk of water being weaponized as a tactical tool of war. (Institute for Economics and Peace, 2025).

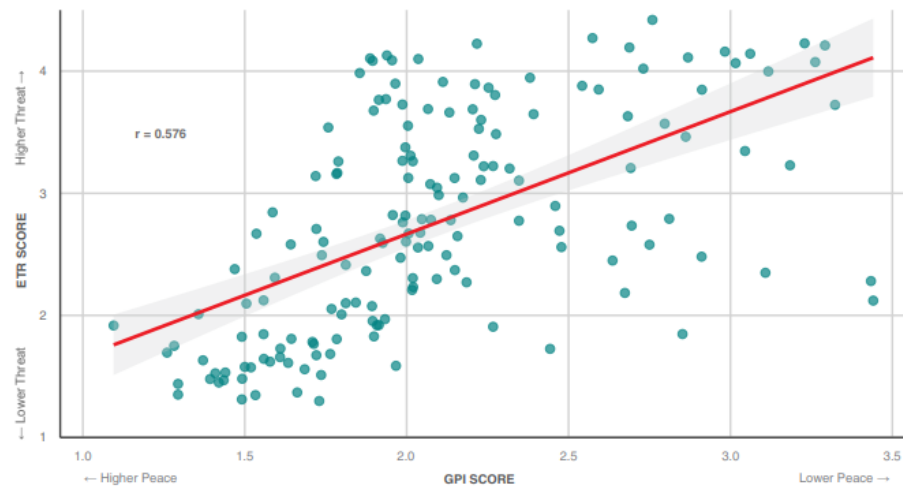
A notable connection exists between ecological threats and peacefulness. As shown in Figure 2, there is a correlation coefficient of $r=0.58$ between the GPI—a measure of peacefulness at the national level—and the overall ETR score. This correlation becomes stronger within the GPI's Safety and Security domain. Generally, less peaceful countries tend to experience more ecological threats, particularly related to food insecurity and water stress.

According to historical data and UNEP estimates, environmental conflicts have deep historical roots globally, especially water wars among countries, as shown in Figure 3. These environmental conflicts



Figure 2

Correlation Between Global Peace Index Scores and Environmental Threat Scores

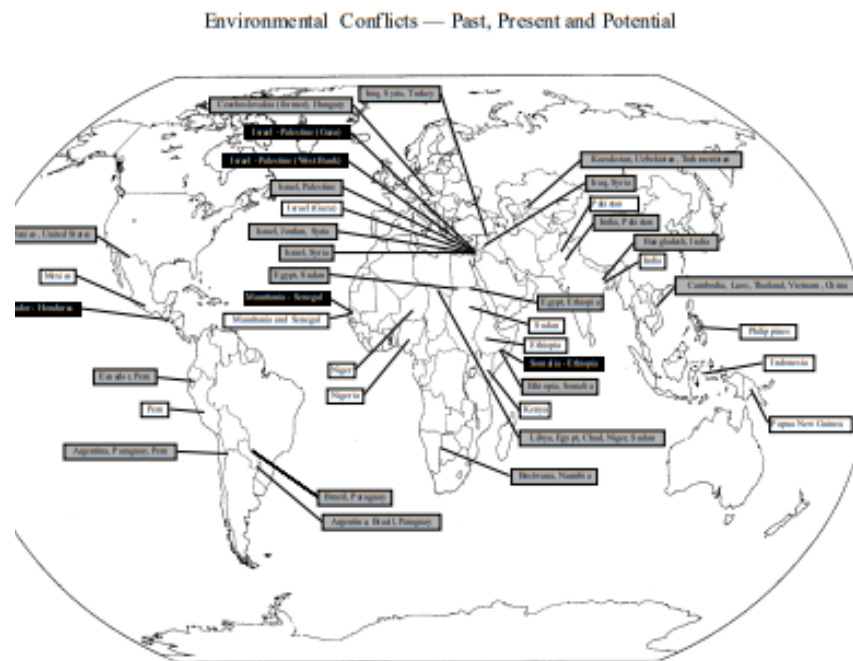


Note. From Ecological Threat Report 2025: Analysing Ecological Threats, Resilience & Peace, by Institute for Economics & Peace, 2025.

<https://www.economicsandpeace.org/wp-content/uploads/2025/10/Ecological-Threat-Report-2025.pdf>

Figure 3

Classification of Recorded and Potential Environmental Conflicts Globally



Note. Adapted from The Role of Natural Resources in Conflict and Peacebuilding (p. 10), by United Nations Environment Programme, 2023 (<https://na.unep.net/siouxfalls/publications/Conflicts.pdf>).



Figure 4

Overall Ecological Threat Scores in Selected Arab Countries, 2024



Note. Adapted from Ecological Threat Report 2025: Analysing Ecological Threats, Resilience & Peace (p. 10), by Institute for Economics & Peace, 2025 (<https://www.economicsandpeace.org/wp-content/uploads/2025/10/Ecological-Threat-Report-2025.pdf>)

have occurred or could occur due to the combination of key environmental, social, and economic factors (United Nations Environment Programme, 2023).

The Arab region represents one of the most acute manifestations of the ecology-security nexus globally, due to severe climate change-induced environmental impacts, resource stress, and security challenges in the Arab States. Regionally, there are up to 13 of the world's most water-stressed countries that consume natural resources at twice their biocapacity. It also includes several cases of fragile and conflict-affected countries, such as Yemen, Somalia, Syria, Sudan, and Libya. The circular interaction between climate change, subsequent environmental impacts, and insecurity trigger risk multiplier. (UNDP, 2023) Figure 4 shows the complexity of this nexus in the Arab region according to ESCWA. Therefore, this convergence of ecological fragility, resource weaponization, and institutional weakness creates a self-reinforcing cycle in which environmental degradation drives conflict, and conflict in turn destroys the ecological foundations upon which recovery depends.

The Ecological Threat Report bands overall scores into five levels of ecological threat: very low (below 1.6), low (1.6–2.2), medium (2.2–3), high (3–3.8), and very high (above 3.8). Applying these bands to the Arab states yields the classification set out below (Institute for Economics & Peace [IEP], 2025). Figure 1 shows the Arab countries categorized at high and very high threat levels: Iraq, Morocco, Mauritania, Somalia, Sudan, and Yemen. It is noted that not all fragile and conflict-affected Arab countries face higher levels of ecological threats; for example, Palestine is at a medium threat level (overall score 2.791), and Libya is at an overall score of 2.349.

To sum up, the evidence presented here shows that the ecology-security connection is a real, well-documented fact rather than just a theory. Ecological stress, resource competition, and environmental degradation are central to conflict dynamics, not merely minor factors, as they create a cycle in which environmental decline fuels insecurity, and insecurity worsens ecological problems. This relationship is especially intense in the Arab region, where severe water shortages, weak institutions,



and ongoing conflict have created conditions that neither traditional security methods nor typical development strategies can address alone. Therefore, solving this issue requires integrated approaches that see environmental management and conflict resolution as linked, which is the core idea behind Environmental Conflict Resolution.

3.2. Environmental Conflict Resolution Approach

Due to the interlinkage between environment and security, a paradigm shift has emerged to tackle this nexus, not just to recognize and address its implications, but also to leverage it for peacebuilding and conflict resolution. In this regard, the environmental peacebuilding approach has developed solutions to transform the role of the environment from a trigger of conflict to a fundamental for peacebuilding and conflict prevention, as discussed in this section.

Theoretically, the environmentalist approach and its role in shaping interactions among actors are debatable, particularly in the International Relations (IR) literature. Realism could clarify why states compete over natural resources, leading to rivalry and war, while liberal institutionalism could explain how international regimes, rules, and organizations could enable states to cooperate over shared environmental resources. According to constructivism, norms, ideas, and shared knowledge shape states' behaviors toward environmental governance and cooperation. While Green Theory provides the overarching critical framework for environmental peacebuilding, its arguments challenge mainstream liberal political and economic assumptions and take planetary ecology as a starting point, offering an alternative

framework for analyzing the environmental-related dynamics. (Faotto, 2019)

National security threats and the nature of modern warfare and conflicts have undergone fundamental changes due to the growing role of environmental factors and natural resources. Ecologies have been politicized and weaponized. (Simlai, 2015) Consequently, peacebuilding and conflict resolution have become intertwined with efforts to prevent the militarization of ecological crises and the exploitation and deterioration of the environment and natural resources at all stages of wars and armed conflicts (Büscher & Fletcher, 2018).

It is also important to understand the key features of environmental conflicts when tackling them. These conflicts are triggered, directly or indirectly, by environmental factors and natural resources, stemming from disagreements among actors over how to address environmental issues and from the sharing of scarce resources amid conflicting needs and interests. These conflicts could escalate due to degradation in environmental quality and the availability and accessibility of resources for specific groups; they could vary in level and pattern and be affected by socio-political and ecological complexity. The complexity of these conflicts could pose a challenge for environmental conflict resolution (Fisher, 2014).

Environmental conflict resolution is a holistic approach that aims to balance political interests, economic recovery, and the sustainable use of natural resources. It focuses on shifting the role of the environment and natural resources from a driver of escalating conflicts and wars to a trigger for cooperation, confidence-building, conflict prevention, and sustained peace. This approach was derived from arguments in liberal and democratic peacebuilding, which consider environmental issues and procedures for natural resource sharing,



management, and protection, and integrate them into political agreements and the peacebuilding process. So, this approach moves beyond resolving violent conflicts to sustaining peace and long-term sustainable development, as its main objective is to promote human and environmental security, not just state-centric traditional security, for the sake of human development (Swain & Ojendal, 2018; EcoPeace Middle East, 2024; Cabot, 2017).

The literature identifies various intervention patterns and tools within the environmental conflict resolution approach, including environmental mediation, facilitated negotiation, joint fact-finding, policy dialogues for all groups and stakeholders, early neutral evaluation, conflict assessment, and community-based natural resource planning and management, to promote shared responsibility, build trust, and develop social capital. These tools aim to help competing actors reach common ground and agreements that create win-win outcomes concerning the environment and natural resources, rather than zero-sum games that could escalate conflicts (Fisher, 2014).

One of the most prominent approaches to settling civil wars and fostering environmental conflict resolution is local engagement in post-conflict peacebuilding, as it extends beyond the environment and natural resources and can also help emphasize state-society relations (Johnson, 2021). In addition, the UN has developed its mediation approach to account for environmental factors and climate change in peacemaking efforts, to avoid the escalation of new and different types of conflict through climate-informed mediation (United Nations Department of Political Affairs, 2024).

Environmental conflict resolution is part of the diplomatic path to settling conflicts and tackling environmental and climate issues. So, it could be

included within different related types of diplomacies such as climate diplomacy and green diplomacy which could contribute in promoting environmental conflict resolution across the political processes and foreign policy's framework of tackling climate change and international security as it could pave the way for fostering development cooperation, conflict prevention, and humanitarian assistance, and climate change adaptation and mitigation, especially in the most vulnerable contexts in fragile and conflict affected countries (Tänzler, 2017).

Due to the critical impact of the environment-security nexus, the slogan "COP of Peace" has been raised in order to address the climate conflict linkage instead of focusing on fundraising as a mandate of climate diplomacy, by working on reducing the climate vulnerability in fragile and conflict-affected countries and making it a priority on the global peace agenda (Climate and Environment Observatory, 2024).

That paradigm shift has been adopted across the UN and its entities to tackle the environment-peace and security nexus through a more systematic, cross-sectoral approach. So, the Climate Security Mechanism (CSM) was established in 2018 to strengthen the UN's capacity to analyze and address this nexus (International Food Policy Research Institute, 2023). Also, the United Nations Environment Program (UNEP) has adopted post-conflict environmental assessments in fragile and conflict-affected countries since 1999 to provide an emergent response to related disasters and risks and to address the environmental consequences of conflicts during the reconstruction era, in coordination with the World Bank and other UN entities. UNEP also promotes environmental cooperation, builds the capacity of targeted



governments for environmental management and protection, and addresses environmental crises after conflicts have been settled (United Nations Environment Programme, n.d.; Haavisto, 2003). In addition, the United Nations Security Council (UNSC) has focused on the interlinkage between the environment and peace and security through its mandate and resolutions since the end of the cold war, by considering the natural resources and environmental factors as multiplier threats for international peace and security that goes beyond the military aspects, reflecting this mandate on the approach of addressing the ongoing wars and armed conflicts to cope with the changing dynamics of their natures. So, an increasing number of resolutions have mentioned and considered the natural resources and environmental factors, leading to adopting a variety of measures to address this nexus through sanctions, embargoes, peacekeeping missions' protective role during conflicts, and their role to stop related illicit flows and organized crimes, in addition to assistance in the post-conflict era to overcome the environmental harms and damages (Aldinger et al., 2018).

In this regard, some of the key UNSCRs related to environmental conflict resolution could be discussed, which aim to maintain international peace and security, through considering the environmental aspects and drivers of conflicts, as summarized in Figure 5, such as:

- **Resolution 2349 (2017):** It has recognized the negative impacts of climate change and ecological changes, among other factors, on the stability of the region in Central Africa and the lack of Chad Basin, to mention but a few of these impacts: water scarcity, drought, desertification, land degradation,

and food insecurity. So, peacebuilding and countering terrorism in this vulnerable region require governments and the United Nations to conduct adequate risk assessments and implement effective management strategies to tackle the climate-security nexus (United Nations Security Council, 2017).

- **Resolution 2429 (2018):** The resolution addresses the role of environmental degradation and resource scarcity in fueling conflict in Darfur, mainly due to desertification and violent competition over resources. This resolution outlines measures to address environmental conflicts and reduce negative environmental and resource impacts associated with escalating conflicts, including sustainable land-use measures, water-access projects, and environmental initiatives within the peacebuilding process (United Nations, 2018).
- **Resolution 2467 (2019):** that resolution has recognized some impacts of the environment-security nexus, through illustrating the link between sexual violence in conflict and post-conflict situations and the illicit trade in natural resources, or what is so-called "conflict minerals", through countering possible funds for sexual violence in conflict and post-conflict situations (United Nations, 2019).
- **Draft Resolution S/2021/990 (2021):** That draft has focused on the security implementations of the environment and climate change, it has referred to the approach of tackling these threats for the sake of sustaining peace and preventing armed conflicts through adopting measures to manage and address climate-related security risks, early warning systems, together with



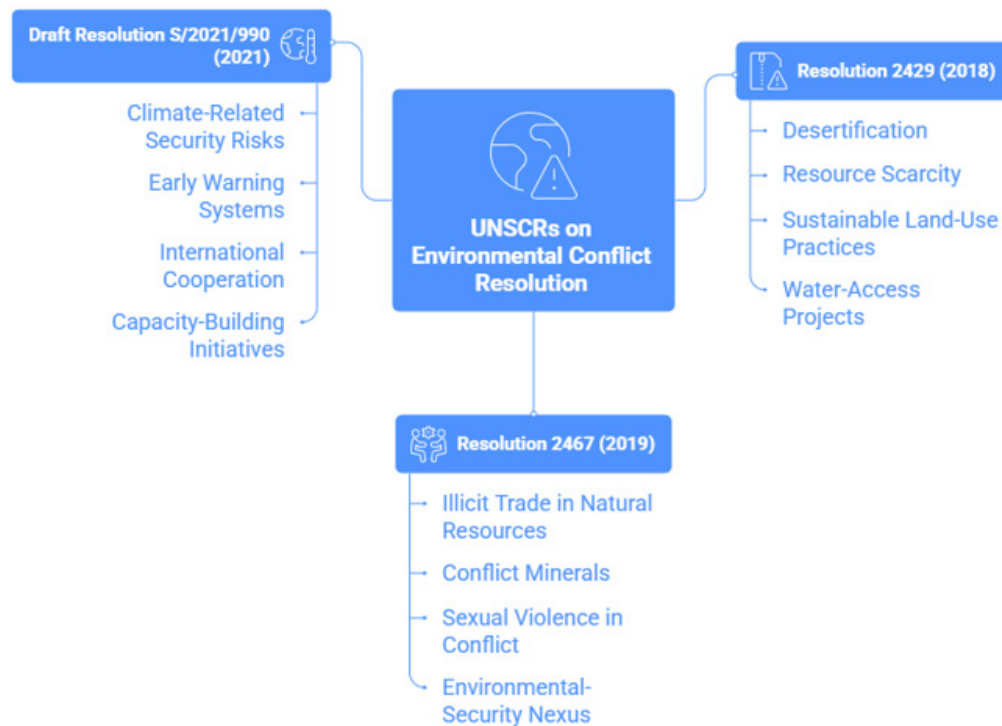
sustained international cooperation and capacity-building, obliging all parties to armed conflict to commit to international humanitarian law especially articles related to natural environment, considering the interlinkage between peace and security, humanitarian assistance, sustainable development, and tackling climate change and environmental risks especially in most vulnerable countries. However, this draft was not adopted by the UNSC due to Russian and Indian vetoes (United Nations Security Council, 2021a, 2021b).

In addition, militarism could be a critical factor in the deteriorating environment- security nexus. However, it could also help promote environmental security, environmental conflict resolution, and peacebuilding. So, peacekeeping efforts have witnessed some changes due to the environment-

conflict nexus. Some literature has examined the “green warriors” concept, which refers to the security sector’s consideration of environmental factors in its military operations during the post-conflict era (Lamb, 2005; Climate and Environment Observatory, 2018). UN peace operations have focused on their environmental footprint. There have long been concerns about the environmental footprint of their operations, and they have sought to ensure their responsibility towards the environment and natural resources by achieving “maximum efficiency in their use of natural resources and operate at minimum risk to people, societies and ecosystems; contributing to a positive impact on these wherever possible”. In addition, since 2021, these peace missions have shifted towards using renewable energy technologies to enhance safety and security and to address sustainability (United Nations Security Council, 2022).

Figure 5

UNSCRs on Environmental Conflict Resolution



Even the developmental actors, including the World Bank, have considered the environmental perspective in their programs and interventions. It has focused on natural resource management as an approach for defusing conflicts and peacebuilding in fragile and conflict-affected countries, by investing in the environment, natural resource management, and climate change, and by facilitating the integration of a conflict-sensitive lens into their operations and programs while addressing natural resource degradation and climate change (World Bank, 2021).

Furthermore, this approach could be adopted by governments to resolve local, non-armed environmental conflicts among citizens and stakeholders, arising from disagreements over the distribution and use of natural resources and environmental preservation policies, with implications ranging from policy debates to political violence. So, governments could rely on various forms of engagement to respond to and manage local and national disputes, even in stable contexts, not just in fragile and conflict-affected countries (Demchuk et al., 2022).

Overall, environmental conflict resolution is a holistic approach rich in tools and methods of intervention, and it could have positive implications beyond the environment; it could help overcome fragility, promote state building, and sustain positive peace.

4. From Theory to Applications: Key Insights From Case Studies

In this section, Environmental Conflict Resolution will be analyzed through two case studies from the MENA region. Regarding the selection method, the paper would analyze a case involving the settlement of a civil war related to the environment

and natural resources, and another case involving the settlement of an intrastate and regional conflict, depending on whether ECR is included in the peace agreement. In this regard, Sudan would be selected as a case of domestic environmental conflict, and the Arab–Israeli conflict as a case of regional environmental conflict, particularly the conflict over scarce water.

4.1. Sudan–South Sudan Armed Conflict

Examining the Sudanese context reveals how the country witnessed one of the first civil wars globally, driven by environmental degradation and climate change. Water scarcity and changes in rainfall patterns led to the escalation of violent conflict and civil war in Darfur in 2004, driven by famine and the decline of agriculture and pastoralism. Environmental factors contributed to triggering ethnic conflicts between Arab and African communities. As a result of drought-conflict cycles, the Sudanese context is shaped by the ethno-religious and environmental roots of violent conflict and rebellion (World Food Program USA, 2023).

Accordingly, restoring peace and stability and settling the ongoing armed conflict in Sudan could not be achieved without adopting a holistic peacebuilding approach which including environmental conflict resolution in the peace agreement and the principles of “the Responsibility to Prepare, Prevent, and Protect (R2PPP)” to guarantee tackling the embedded roots of environment- conflict that could lead to the re-escalation of armed conflicts on ethnical and religious bases especially in Darfur (Sakr, 2023; Accord, 2024).

Meanwhile, peace in Sudan is not threatened only by climate change and environmental degradation, but also by the absence of an acceptable game of



critical resources' sharing among different parties and groups, which has severe implications for the national statehood, due to the rise of socio-economic injustice for the ethnicities and groups that suffered from historical deprivation and exclusion. In fact, natural resources had played a key role in the partition of Sudan into two states. (Elmakki, 2024; Sefa-Nyarko, 2016).

The historical power struggle among competing parties in Sudan had encompassed a conflict over oil revenue, to the extent that this resource was politicized and weaponized, especially in Southern Sudanese oil fields, as the Southern people were deprived of the revenues. Accordingly, the lack of a just share of resources and oil revenue, in line with an acceptable arrangement among the Northern and Southern actors, has significantly contributed to the escalation of conflict between the two Sudans and, eventually, to separation. (SARR, 2022; Billon & Savage, 2016)

Despite the destructive effects of the oil curse on peace and security in both North and South Sudan, the two countries have sought to include environmental conflict-resolution measures in their post-separation agreements to reach common ground on oil. The first step was the signing of the **“Comprehensive Peace Agreement (CPA)”** in 2005. The main point was the share of oil revenue; under this agreement, Southern Sudan was supposed to receive half of the revenue from the southern oil fields, since most of the producing fields are located in the South. However, this agreement failed to end the oil–conflict nexus due to a lack of cooperation and coordination (United States Institute of Peace, 2024; Sabr et al., 2024; Human Rights Watch, 2006).

In 2012, the **“Agreement between Sudan**

and South Sudan on Oil and Related Economic Matters” was signed by the two countries. It included several cooperative procedures to tackle the role of oil as a trigger of conflict, such as:

- Promoting cooperation in the petroleum sector.
- Establishing a joint committee for the coordination of oil, concerning technical and fiscal issues
- Cooperation on production, trade, and transfer, and mutual coordination concerning oil companies.
- Joint discussions and notifications concerning cross-border discoveries, and pre- notifications and coordination in case of any force majeure events (United Nations, 2024).

That mutual coordination framework could help promote peace by turning the role of oil from a trigger of conflict into an opportunity for cooperation and by fostering mutual gains through the oil industry's interdependence between the two countries (Austrian Institute for European and Security Policy, 2013). However, that desired peace was fragile due to the weakness of confidence-building measures, as most of Sudan's oil fields lie along the border. Hence, the risks of conflict reescalation remain (United States Institute of Peace, 2013; Johnson, 2012).

In addition, the ongoing civil war in Sudan, which escalated in April 2023, negatively affects the ECR framework and cooperation with South Sudan, due to the disruption of the oil export infrastructure as the military operation causes damage to the pipelines and facilities, which could lead to the shutdown of oil industry facilities in Port Sudan. It also indicated that the ECR might be weaponized amid the dynamics of the civil war in Sudan, between the Sudanese Armed Forces (SAF) and the Rapid Support Forces



(RSF), by trading off the fees for exporting oil collected from South Sudan for resuming oil exports. According to some arguments, the Sudanese army might use South Sudan to cut off all contact with the RSF. Hence, South Sudan could become a proxy war arena for the Northern civil warring actors. On the other hand, the persistence of fragility in the ECR framework could cause a re-escalation of the civil war and a deterioration in the humanitarian situation in South Sudan, due to the economic vulnerability stemming from oil export revenues. (International Crisis Group, 2024; Al Jazeera, 2025)

4.2. Hydro-Diplomacy in the Arab-Israeli Conflict

The Arab Israeli conflict is one of the most protracted and complex regional conflicts. It has various aspects and different roots, but conflict over critical resources, especially water, is a significant facet.

The main case in this regard is the conflict over the Jordan River, which has witnessed waves of water wars since the historical outbreak of the Arab Israeli conflict. The literature cites control over the Jordan River as the latent reason for the 6-day war (Seo, 2005). So, this could explain some of the reasons for the Israeli occupation of the West Bank and the Golan Heights during the 1967 War, and the security zone in southern Lebanon during the 1978 invasion of Lebanon (Amery, 1997; Seliktar, 2005). In other words, water scarcity was a fundamental threat to the establishment and continuation of the emerging Israeli state to the extent that Israel has adopted hydro-hegemony as a core principle of its policies towards the Jordan River (Ahmad, 2019).

On the other hand, fresh water is also a core aspect in the Palestinian-Israeli conflict, as water

scarcity is a primary trigger of conflict, mainly due to the Israeli expansion of settlements inside the West Bank and their claims to seize the Palestinian lands, which sheds light on the land- water nexus. According to the literature, the Israeli perspective in this regard can be explained by the *“Water / hydraulic imperative”* as a core principle of Israeli doctrine (Elmusa, 1996).

It is also indicated that water is a fundamental pillar in the Zionist project, which was reflected in all its political and military actions towards the whole Arab region (Hagopian, 2016).

During the ongoing battles in Gaza, Israel has systematically weaponized fresh water by using it as a collective punishment technique, raising concerns about human rights violations and conducting war crimes violating the International Humanitarian Law (IHL). The Israeli military operations have deliberately destroyed fresh water infrastructure, water wells, brackish water desalination, and seawater desalination plants, putting almost all of them out of service. According to Oxfam, the Israeli policies towards the Palestinians in Gaza since October 7th, 2023 have led to a sharp decline in the rate of the availability of water per person per day by 94%, as each person could only have 4.74 liters per day, compared to the minimum international standard for basic survival in emergencies which is about 15 liters per person per day (Oxfam, 2024).

Despite the complexities of water's role in the Arab-Israeli conflict, opportunities to shift it in ways that advance peacebuilding loom on the horizon. In fact, environmental conflict resolution and hydro-diplomacy have helped resolve one ongoing conflict by establishing a framework for cooperation in water management. By looking at *“The Jordan-Israel Peace Treaty of 1994 / Wadi Araba”*, it



included several environmental conflict resolution acts to promote cooperation and peaceful water management, by agreeing on sharing Jordan River water, Yarmouk River water, groundwater in Wadi Araba, in addition to cooperating on finding additional water resources, operation, maintenance, and water storage. To do so, they agreed to form a **“Joint Water Committee”** comprising 3 members from each country (King Hussein of Jordan Official Website, 1994; Madhavanur, 2022).

Settling the water dispute would not resolve the Palestinian-Israeli conflict. However, it could help de-escalate tensions, promote water security, reduce water’s role as a trigger for conflict, and alleviate Palestinian humanitarian suffering. There were some achievements in this regard, such as “the Oslo Accords” in 1993, which confirmed the Palestinian water rights in the West Bank. It had included some procedures of cooperation through transferring the control over the Palestinians’ water supply in Gaza to the Palestinian Authority (PA) instead of Israel (BESA Center for Strategic Studies, 2012). However, the collapse of this agreement prevented further peacebuilding and the peaceful resolution of environmental conflicts over water (Baker Institute for Public Policy, 2006; IE School of International Relations, 2023).

Nevertheless, calls for peaceful cooperation on transboundary water sources still mount, to guarantee having adequate cooperation over the management, utilization, and protection of water resources, building upon the successful shared water management framework in the region, as transboundary water resources require transnational cooperative frameworks, such as the arguments of Friends of the Earth Middle East (FoEME) (Environmental Peacebuilding, 2022).

Despite these optimistic visions about environmental conflict resolution and hydro-diplomacy, its role in de-escalating the Palestinian-Israeli war is challenged by Israel’s hydro-hegemony doctrine together with the far-right Israeli policies that aim to force a one-state reality and undermine all possible ways for a two-state solution, confirming the limitation of this approach within the context of occupation (Seeberg, 2024).

5. Results

This section presents the study’s empirical findings, based on case analyses of environmental conflict resolution (ECR) frameworks used in the Arab region. The results are organized to address the main research question about how effective ECR is as a diplomatic and governance method for reducing national security threats and promoting peacebuilding efforts. By systematically examining the Sudan–South Sudan conflict over oil and water, and the Arab–Israeli dispute over shared water resources, the findings highlight the mechanisms, challenges, and outcomes of ECR efforts. Special focus is given to the influence of political economy factors, institutional setups, and stakeholder involvement in shaping conflict paths and peacebuilding opportunities.

The ecology-security nexus is a measurable, data-supported structural reality, not just a theoretical idea. Global and regional data confirm that ecological stress, resource competition, and environmental degradation consistently lead to conflict, state fragility, and forced displacement. Additionally, ECR’s theoretical basis, rooted in Liberal Institutionalism and Green Theory, is backed by case study evidence, though with important caveats. The liberal institutionalist claim that international



regimes lower transaction costs and foster cooperation over shared resources is supported by both the 1994 Jordan–Israel Peace Treaty and the 2012 Sudan–South Sudan Oil Agreement, which established effective joint governance mechanisms that endured political challenges. Nevertheless, the Realist perspective, which highlights the use of resources as tools of power, is also valid: Israel’s hydro-hegemony doctrine systematically prioritized strategic goals over cooperative frameworks such as the Oslo Accords and the 1994 Treaty, while Sudan and South Sudan repeatedly used oil flows as political leverage. Green Theory’s core challenge, that human systems cannot be managed separately from ecological systems, is confirmed by these cases: the failure to incorporate resource management into fair political structures did not lead to lasting peace but instead to cycle after cycle of conflict.

Analyzing these two cases reveals a clear pattern: the effectiveness of ECR depends on three key structural factors, not just the quality of the agreement itself. First, institutional capacity matters; functional state institutions, like those in Jordan and Israel in 1994, enable ECR to produce tangible results. Conversely, in countries like post-2023 Sudan, where institutions have collapsed, even well-designed frameworks become ineffective. Second, power symmetry is crucial; ECR tends to be more successful when parties negotiate with relatively equal influence. When one side dominates, as in the Palestinian–Israeli case, the stronger party often exploits cooperative frameworks for strategic gain rather than genuine peacebuilding. Third, economic interdependence, as seen in the Sudan–South Sudan case, indicates that mutual economic vulnerability, while not guaranteeing

peace, encourages ongoing engagement even in the absence of strong political will. When all three conditions are absent, ECR mechanisms cannot operate effectively, regardless of their complexity.

This comparative finding offers a significant analytical insight beyond existing research: ECR in the Arab region functions not merely as a straightforward peacebuilding instrument but as a conditional governance mechanism. Its success is limited by the political, institutional, and economic contexts in which it is applied. Consequently, the study emphasizes that ECR should be viewed not just as a solution to environmental conflicts but as a framework for managing resource-related conflicts, while addressing the root political issues through broader processes. This distinction has practical implications for the design, sequencing, and evaluation of future peacebuilding efforts in the region.

6. Conclusion

This study demonstrates that the environment–security connection is a significant factor influencing conflict and peace in the Arab region. Far from a theoretical assumption, the intricate relationship among environmental degradation, resource shortages, and geopolitical issues shapes both the causes of and solutions to violence across contexts. The findings emphasize that Environmental Conflict Resolution (ECR), when thoughtfully designed and closely aligned with local and regional realities, offers a limited but promising set of options for reducing conflict and fostering sustainable peace, especially in areas where political consensus is difficult to attain.

The main argument here is that natural resources should not be seen only as causes or rewards of conflict, but as hidden opportunities for cooperation



and mutual benefit. Changing the environment from a source of competition to a basis for peace is both supported by theory and demonstrated in the case studies examined. However, this change is largely contingent: ECR is necessary but not sufficient for long-term peace. Its overall success depends not just on the technical quality of agreements, but also on the broader institutional, political, and power structures in which these mechanisms function.

Empirical evidences from the Sudan–South Sudan and Arab–Israeli cases highlight the limitations of ECR in the absence of supportive conditions. The collapse of cooperative frameworks, driven by factors such as unequal power, weak institutions, or deep-rooted political conflicts, demonstrates that well-designed ECR mechanisms alone cannot guarantee lasting outcomes. This underscores an essential policy point: ECR should be integrated into comprehensive peacebuilding strategies that also address the root political, economic, and governance issues fueling conflict.

In the Arab region, where issues such as water scarcity, ecological vulnerability, institutional weaknesses, and ongoing armed conflicts are interlinked, adopting a comprehensive approach is essential. The short window for preventive environmental diplomacy requires integrating ECR into early-warning systems, conflict-prevention efforts, and robust regional governance. Failing to do so will likely reduce the chances of cooperation and sustainable peace, especially as environmental and institutional pressures intensify.

This study contends that the environment in the Arab region should not be viewed solely as a victim of conflict. Rather, through foresight and inclusive governance, it can serve as a vital element in establishing long-term peace. Future research

should explore effective implementation strategies for ECR, emphasizing the political economy of natural resources, empowering marginalized stakeholders, and creating adaptable institutional frameworks capable of responding to evolving environmental and security challenges.

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