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تغير المناخ وتأثيره على الأمن في العالم العربي

Climate Change and Its Impact on Security in the Arab World

Key Outcomes

- **Climate change is a threat multiplier that intensifies existing security risks in the Middle East.**

  Rising temperatures, declining water resources, and frequent extreme weather events exacerbate existing vulnerabilities and contribute to social unrest, displacement, and cross-border tensions—particularly in fragile and conflict-affected states.

- **The impacts of climate change are uneven across the region and risk deepening geopolitical inequalities.**

  While some resource-rich states may have the capacity to adapt, others with limited institutional resilience face greater exposure to food and water insecurity, fueling competition and amplifying regional instability.

- **Integrated climate-security strategies are urgently needed to build resilience and prevent conflict.**

  Policymakers should prioritize climate adaptation and mitigation within national security planning, strengthen regional cooperation, and invest in sustainable resource management to address the growing risks posed by climate change.

Abstract

The Middle East stands at the crossroads of a climate-security crisis. Its arid environment, reliance on shared natural resources, and history of political instability make it particularly vulnerable to the cascading effects of climate change. From resource scarcity fueling social unrest to geopolitical tensions over water and land, the region offers a stark illustration of how environmental stressors can exacerbate existing vulnerabilities. This paper examines the interconnectedness between climate change and security. It also explores how climate-induced challenges have amplified existing security challenges and geopolitical tensions and conflicts in key Middle Eastern countries, drawing connections to the broader implications for regional stability.

المستخلص

تقف منطقة الشرق الأوسط على حافة أزمة متعلقة بكل من المناخ والأمن. حيث تساهم بيئتها الجافة، واعتمادها على مصادر طبيعية مشتركة، علاوة على ما مر بها من أحداث تسببت في حالة من عدم الاستقرار السياسي في جعلها منطقة هشة على وجه الخصوص في مواجهة التأثيرات المتتالية لتغير المناخ. فنظرًا لندرة الموارد التي تتسبب في إشعال الاضطرابات الاجتماعية والتوترات الجيوسياسية المتعلقة بالمياه واليابسة، أصبحت منطقة الشرق الأوسط مثالاً واضحًا بكل ما تعنيه الكلمة لمدى تسبب عوامل الإجهاد البيئي في تفاقم عوامل الهشاشة القائمة. لذا، تدرس هذه الورقة البحثية العلاقة بين تغير المناخ والأمن، كما تستكشف مدى تسبب التحديات المتأثرة بالمناخ في تفاقم التحديات الأمنية والتوترات الجيوسياسية والنزاعات القائمة في بلدان محورية في منطقة الشرق الأوسط، مع بيان ارتباطها بالانعكاسات الأوسع نطاقًا على الاستقرار الإقليمي.

Introduction

Some countries in the Middle East are already grappling with tension and regional insecurity. Climate change, with decreased precipitation, increased temperatures and more frequent extreme events, is acting as a threat multiplier, amplifying existing security challenges or creating new ones that can be felt within countries' borders or at transboundary levels. As water becomes scarer and food security becomes more fragile, compounded by weak institutions, people compete over resources, fueling disputes, conflict, and forced displacement to move to places for better living conditions.

Scientific reports, such as the UN's Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report, have been equivocal in showing that human-induced climate change has caused more than 1°C of heating compared to pre-industrial levels, and reaching 1.5°C of heating is likely to happen within the next two decades. Extreme weather events - like heatwaves, floods, and droughts - have become more

frequent and more intense since the 1950s (Delmotte & Others, 2021).

Science also shows that the impacts of climate change are not uniform across different regions around the world. The Middle East region is one of the most vulnerable to the impacts of climate change. The Middle East is characterized by a hot, arid, and semi-arid climate, and when compounded by climate change, the region is heating up at double the rate of rest of the world. Climate change presents a threat multiplier to already existing natural challenges of water scarcity, food security, sea level rise and extreme weather events, mainly sandstorms and tropical cyclones. The effects of climate change are felt across sectors, from agriculture to energy and urban infrastructure.

Encompassing a variety of environmental, economic and political landscapes, ranging from states and occupied territories plagued by war and instability to emerging economies and resource-rich countries with significant oil and gas reserves, the effects of climate change are likely to widen the disparities between resource rich and poor countries in the region, amplifying geopolitical tensions and insecurity.

This paper aims to examine the link between climate change and security challenges in the Middle East. By providing evidence-based perspectives on climate-induced security risks, the study aims to generate insights that support crafting strategies to mitigate such risks.

Understanding Climate-Security Nexus

Climate change is emerging as a potent threat to global peace and security. The intensifying impacts of climate change, including rising temperatures, shifts in precipitation, rising sea levels, ocean warming, and more frequent and intense extreme weather events — not only aggravate existing vulnerabilities such as food, water, and livelihood insecurity, but also lead to heightened competition over diminishing natural resources, widespread displacement, increased tensions, and conflict. Understanding climate-induced security challenges is crucial, particularly for countries most exposed to climate change impacts, such as those in the Middle East.

While science has been unequivocal about the physical impacts of climate change, studies of its link to security risks have not been consistent. Some argue that the evidence for a direct causal connection is insufficient, making the debate on climate change and security far from settled. The Intergovernmental Panel on Climate Change (IPCC), in its most recent Assessment Report, acknowledges this uncertainty. It concludes that while climate change exerts a weaker influence on security challenges, such as conflict, compared to non-climatic factors, its effects can exacerbate insecurity in contexts already marked by social tensions and weak governance (Gilmore & Others, 2022).

That is, even though the causal linkage between climate change and security remains tenuous, there is much clearer

evidence of the reverse: societies trapped in instability and conflict struggle to address climate change. These challenges include reducing emissions, adapting to extreme weather events, and protecting vulnerable populations. Paradoxically, this critical aspect of the climate-security relationship often receives less attention in program development, climate finance allocation, and aid policies. There has also been less attention given to this aspect of security–climate interaction in terms of programme development, allocation of climate finance, and aid policies (Schaar, 2024).

Regardless, policymakers have only started to discuss the climate-security in the mid-2000s. The United Kingdom was one of the first countries to initiate the debate around climate change and its interlinkages with international peace and security at the UN Security Council in 2007. A similar attempt was made by Germany in 2011 (Gong, 2022).

In the Middle East, there have been proactive Arab efforts to bring climate security to the forefront. These include the announcement by the United Arab Emirates in March 2023, alongside Malta, Mozambique, and Switzerland, of a set of commitments to strengthen the global response to climate, peace, and security issues at the United Nations Security Council (2023). It also hosted the 20th session of the United Nations Climate Change Conference in December 2023, which issued a declaration on climate, relief, recovery, and peace.

Since there is no universal definition of climate security, this paper follows the definition of the Pacific Northwest National Laboratory: "climate security represents the physical, economic, or societal impacts associated with climate change that substantially alter political stability, human security, or national security infrastructure. It could also pose geopolitical and socioeconomic stressors like population displacement, terrorism, economic stagnation, impacts to infrastructure, and social unrest" (PNNL).

Climate Change and Security in the Middle East: A Vicious Circle

For decades, the Middle East has been a hotspot of volatility due to domestic disputes,and competition at both regional and international levels, such as the conflicts in Syria (2011–2024), Yemen (2014–present), and Sudan (April 2023–present).

Although climate change is not directly linked to security, it indirectly amplifies those existing socioeconomic and human security challenges while also playing a hidden role in creating new ones. The Middle East, characterized by arid and semi-arid climates and rapid population growth, is already grappling with severe resource scarcity, including limited water supplies, shrinking arable land, and declining green cover. Climate change intensifies these pressures through rising temperatures, shifting precipitation patterns, rising sea levels, ocean warming, and more frequent and severe extreme weather events.

The region is warming at an alarming rate, with temperatures rising by 1.5°C—twice the global average increase of 0.7°C (RICCAR Arab Climate Change Assessment Report – Executive Summary, 2017). Record-breaking heatwaves, such as the 54°C recorded in Kuwait in 2016 and 53.9°C in Basra, Iraq, that same week, underscore the severity of the crisis. Rainfall patterns have become increasingly erratic, while climate disasters, including droughts, floods, and cyclones, are more frequent (Azour & Duenwald, 2022). Notable extreme weather events such as Cyclones Guno (2007), Chapala (2015), and Shaheen (2021) have caused widespread destruction, particularly in coastal areas where much of the region's population resides (Evan & Camargo, 2011; Deshpande et al., 2021; Al-Manji, Mitchell, & Ruheili, 2021).Rising sea levels, combined with ocean acidification, threaten fisheries and the resilience of these coastal communities (United Nations Economic and Social Commission for Western Asia [ESCWA] et al., 2017).

Water scarcity is perhaps the most pressing climate-related security risk in the Middle East. The region possesses just 1% of the world's renewable freshwater resources and is classified as the most water-stressed region globally. As early as 2009, Ismail Serageldin, former vice president of the World Bank, warned that "the wars of the twenty-first century will be about water unless we change the way we manage water." Transboundary water resources, which are critical for several countries in the region, present complex management challenges and are becoming significant drivers of geopolitical tension.

Lower-income, fragile, and conflict-affected countries in the Middle East are particularly vulnerable to climate security risks. These nations, plagued by political instability and low capacity for resilience, are likely to experience the most immediate and severe impacts. Competition over scarce resources, especially water and arable land, is expected to exacerbate existing tensions and create new flashpoints for conflict, which can be felt at both national and transnational levels.

In essence, climate change plays a hidden role as a major force behind migration pressures. For instance, agricultural livelihoods, particularly in rural areas where dependence on farming is high, are under threat from climatic factors such as rising temperatures, prolonged droughts and unpredictable weather patterns. As water becomes scarcer, competition over remaining resources increases, and in many cases, people are forced to move in search of stable living conditions. Such gradual environmental degradation compounds already existing economic hardships, making it a silent yet powerful catalyst for migration, particularly in regions already destabilized by conflict. Thus, climate change adds a layer of climate-induced migration to the already complex landscape of conflict-driven displacement.

Flashpoints of Climate Security in the Middle East

The Middle East stands as a stark example of the interconnectedness between climate change, resource scarcity, and conflict. From Syria and Yemen to Iraq and Jordan, environmental stressors have deepened social and geopolitical divides, threatening the region's fragile stability. While climate change is not the sole cause of unrest or tension, it acts as a force multiplier, exacerbating existing vulnerabilities and accelerating the trajectory toward conflict.

Climate-Induced Social Unrest

Syria. Syria's conflict illustrates how climate stress can intersect with Previous governance failures to spark social unrest. From 2006 to 2010, a prolonged drought devastated agricultural livelihoods, particularly in northern Syria, causing widespread crop failures and displacing rural populations. This migration to urban centers strained already overburdened cities, fueling social tensions that contributed to the 2011 uprising (Gleick, 2014). However, as Marwa Daoudy argues in The Origins of the Syrian Conflict: Climate Change and Human Security, these climatic pressures were compounded by poor governance, corruption, and resource mismanagement (Daoudy, 2020). The previous Syrian government neglected rural communities, implemented inequitable resource distribution, and fostered public distrust, amplifying the population's vulnerability to climate-induced pressures. Thus, while environmental stressors were critical, they acted as accelerants within a broader context of systemic governance failures.

Yemen. Yemen, one of the most water-scarce nations in the world, exemplifies the deep ties between resource scarcity and social instability. Even before the conflict erupted in 2009, 70% of disputes in Yemen was linked to competition over water resources. By 2009, Yemen's annual per capita water share had plummeted to 100 cubic meters, far below the global water poverty line of 1,000 cubic meters (Glass, 2010). By 2023, this figure had dropped further to just 83 cubic meters, highlighting the country's critical water crisis (Food and Agriculture Organization [FAO], 2023). Unregulated groundwater extraction and overuse have exacerbated water scarcity, threatening agricultural productivity—a sector on which 74% of Yemen's population depends for livelihoods, and which employs 54% of the local workforce (Thamer, Ali, & Al-Aghbari, 2023). Projections indicate that, even without the impacts of global warming, Yemen's groundwater could be depleted by 2040, potentially reducing agricultural output by 40%. This resource scarcity has entrenched divisions and contributed to the civil war, as communities vie for dwindling water supplies in a country already fractured by tribal, sectarian, and political conflicts.

Climate-Driven Geopolitical Tensions

Iraq. In Iraq, the Euphrates-Tigris River basin has become a flashpoint for geopolitical tensions (Kibaroglu, 2021). Upstream damming

by Turkey has significantly reduced water flow into Iraq, straining agriculture and human settlements downstream. Internally, control over oil-rich regions has intensified disputes between the central government and the Kurdish Regional Government, while sectarian and ethnic divisions further complicate resource allocation (Ipek, 2017). Climate change adds another layer of complexity by reducing rainfall and increasing temperatures, exacerbating existing tensions over water resources. These dynamics highlight how environmental changes can intensify both internal and cross-border disputes, destabilizing an already fragile region.

The Nile Basin. In East Africa, the Nile Basin serves as a critical example of how climate change can exacerbate cross-border water conflicts. For most of the 20th century – with an estimated length of 6,700 kilometers, passing through eleven Eastern African counties: Rwanda, Burundi, Democratic Republic of the Congo, Tanzania, Kenya, Uganda, Eritrea, Ethiopia, Sudan, Egypt, and South Sudan – the Nile River had experienced political tensions and conflicts especially between three major riparian countries, Ethiopia, Sudan and Egypt. Ethiopia's Grand Renaissance Dam, capable of holding 74 billion cubic meters of water, equivalent to the annual flow of Egypt and Sudan's entire water share, has heightened tensions with Egypt and Sudan, both of which rely heavily on the Nile for agriculture and drinking water. Climate change is expected to alter the volume and patterns of runoff in the Nile River system, compounding the effects of the dam's operation. These changes could lead to water shortages, declines in food production, and increased poverty in Egypt and Sudan—potentially sparking a water war in the region.

Human displacement

Human displacement in the Middle East is driven by a combination of conflict, economic instability, and climate-induced challenges. While conflict remains the primary driver of mass displacement, economic migration also plays a role. Whether due to war, resource scarcity, or environmental disasters, the movement of people in these regions has placed immense strain on host countries and local communities.

The Levant, in particular, has seen significant displacement due to conflicts in Syria, Iraq, and, more recently, the Israel-Hezbollah war. Lebanon and Jordan, which host large populations of refugees, have struggled to manage the additional strain on their resources. Lebanon, where governance is deeply divided along sectarian lines, has faced persistent water shortages, power cuts, and poor waste management, all of which have been exacerbated by the refugee influx. The recent ***Israel-Hezbollah*** war, which began in October 2023, has further compounded the displacement crisis in Lebanon. Over a million people have been internally displaced, particularly from southern regions and the suburbs of Beirut, which have been heavily affected by the hostilities (UNDP, 2024). While many fled across borders into Syria and Iraq, others,

including some Syrian refugees in Lebanon, returned to Syria seeking safety. This reverse displacement added further complexity to the already fragile refugee dynamics in the region, with both host and home countries struggling to manage the movement of people and the allocation of resources.

The conflict in Syria (2011-2024) caused one of the most dramatic displacement crises in recent history. Over 5.6 million Syrians fled the country during these years. Neighboring countries such as Lebanon, Jordan, Turkey, and Iraq have been the major hosts accommodating the influx. For instance, it is estimated that Lebanon, with a population of around 6 million, hosts over 1 million Syrian refugees (Ali, 2023). But these movements came with further strains on infrastructure and resources, putting immense pressure on public services and natural resources, particularly water supply systems, in host countries. The added complexity to host nations has in some cases resulted in reverse migration patterns. For instance, conflicts in Syria and Iraq have forced millions to flee conflict zones to safer areas within their countries (Baylouny, 2020).

Iraq has similarly experienced significant displacement, both internally and across its borders, due to the rise of ISIS and the resulting regional instability. Between 2014 and 2017, conflicts in northern Iraq and areas around Mosul and Kirkuk forced many to flee to the Kurdistan region (Higel, 2016). The influx of displaced people placed additional pressure on the Kurdish Regional Government and strained local resources, particularly as communities struggled to provide for both the displaced and their own populations. Iraq continues to grapple with displacement caused by ongoing internal conflicts and resource scarcity, with water management emerging as a critical issue.

The recent war, which began in October 2023, has further intensified the crisis, displacing over 1 million people internally or forcing them to flee to Syria or Iraq, while destroying around 7% of Lebanon's agricultural infrastructure. Jordan has faced similar challenges, particularly in managing water resources and providing services to both its citizens and the over 650,000 registered Syrian refugees within its borders.

Sudan presents a different, but equally complex, case of displacement driven by conflict and environmental challenges. Historically, the resolution of the Darfur conflict in the early 2000s saw many displaced people return to their homes. However, recent years have witnessed a resurgence of displacement caused by both political instability and climate-induced events. Recurring droughts and floods have disrupted traditional agricultural and pastoralist practices, leading to tensions over land use (Gari, 2018). Sudden-onset events such as floods typically result in short-term displacement, with affected populations returning to rebuild (Selby & Daoust, n.d.). However, repeated flooding has led to more protracted displacement, as households struggle to recover and are forced to

transition to non-agricultural livelihoods. The outbreak of fighting between the Sudanese Armed Forces and the Rapid Support Forces in April 2023 has exacerbated these issues, dramatically increasing forced displacement (UNOCHA, 2024). By October 2024, an estimated 10.9 million people were internally displaced within Sudan, with 8.1 million of these displacements occurring after April 2023. The combination of conflict and environmental stress has deepened the humanitarian crisis across the country.

Middle East Responses to Climate Security

While the issue of climate security has yet to be fully articulated or integrated into policy frameworks across the Middle East, addressing the physical impacts of climate change are not new to the region. Various adaptation and mitigation strategies have long been employed, including dam construction to combat drought, optimized irrigation practices, aquaculture for food security, seawater desalination for freshwater supply, and widespread air-conditioning use to cope with rising temperatures. However, with the exception of Kuwait and Jordan, no Middle Eastern country has formally developed a National Adaptation Plan (NAP). Nevertheless, there is increasing awareness and political will to enhance regional climate adaptation efforts. The Middle East has hosted major international climate conferences, underscoring its growing commitment to climate action. The region has hosted five United Nations Framework Convention on Climate Change (UNFCCC) Conferences of the Parties (COPs), including COP 7 and 22 in Morocco, COP 18 in Qatar, COP 27 in Egypt, and COP 28 in the UAE. Additionally, Dubai hosted the first-ever Middle East and North Africa (MENA) Climate Week in March 2022, followed by Riyadh in October 2023. In 2024, Saudi Arabia also hosted the 16th Conference of Parties to the United Nations Convention to Combat Desertification (UNCCD).

Regional governments have also increasingly recognized climate change and environmental issues as key thematic areas for cooperation. Several initiatives and organizations reflect this commitment, including the Regional Organization for the Protection of the Marine Environment (ROPME), which established a Regional Task Force on Climate Change in 1979. The Gulf Cooperation Council (GCC) Committee on Climate Change was established under the General Regulations of Environment in the GCC States between 1994 and 1997, while the PERSGA Program for Adaptation to Climate Change was launched in 1995 to address environmental challenges in the Red Sea and Gulf of Aden. More recently, Saudi Arabia introduced the Middle East Green Initiative (MEGI) in 2021, aiming to enhance regional climate mitigation and adaptation efforts, including cloud seeding and sustainable fisheries development.

One area that has gained increasing attention is regional water governance and cooperation. Several regional and sub-regional frameworks have been established to address water security challenges. The

League of Arab States (LAS) launched the Arab Ministerial Water Council (AMWC) in 2009 to strengthen regional cooperation on water security. Within the GCC, the Ministerial Water and Electricity Cooperation Committee was formed in 1985 to oversee water resource management, regulatory frameworks, and capacity-building efforts. In 2016, the GCC Supreme Council approved the Unified Water Strategy and Implementation Plan for 2016–2035. Other key initiatives include the Committee on Water Resources, founded in 1995 under the UN Economic and Social Commission for Western Asia (ESCWA), and the Middle East Desalination Research Center (MEDRC), established in 1996 as part of the Middle East Peace Process to promote research, training, and transboundary water cooperation. These initiatives highlight the growing recognition of climate-related challenges among regional leaders, though they have historically been overshadowed by more immediate security and economic concerns.

Despite this progress, several challenges continue to hinder effective climate security integration in the Middle East. Most climate policies primarily focus on addressing environmental impacts while overlooking the security dimensions of climate change. Additionally, climate initiatives tend to be implemented at the internal level, reflecting differing domestic priorities rather than fostering a cohesive regional approach. Although regional security frameworks such as the GCC Regional Security Framework are expanding, a limited understanding of the climate-security nexus further exacerbates this challenge, as policymakers often fail to recognize the complex interlinkages between climate change and security threats.

Many environmental cooperation efforts remain poorly aligned and rarely translate into concrete implementation. Regional climate initiatives often lack inclusivity and long-term institutional frameworks, resulting in fragmented efforts that fail to engage all relevant countries. Political instability, slow regional integration, and the absence of a dedicated climate-security working group further contribute to the ad hoc nature of existing initiatives. While awareness of climate risks in the region is increasing, translating this recognition into coordinated, long-term action remains a major challenge. Addressing these gaps will require stronger institutional frameworks, deeper integration of climate and security policies, and sustained regional collaboration.

Conclusion and Policy Recommendations

The Middle East stands as a stark example of the interconnectedness between climate change, resource scarcity, and security. From Syria and Yemen to Iraq and Jordan, environmental stressors have deepened social and geopolitical divides, threatening the region's fragile stability. This paper has shown that while climate change is not the sole cause of unrest or tension, it acts as a force multiplier, exacerbating existing vulnerabilities and accelerating

the trajectory toward social unrest, conflict, migration and terrorism. While awareness of climate risks in the region is increasing, there is a limited understanding of the climate-security nexus across the region, hindering policymakers from taking meaningful actions that recognize the complex interlinkages between climate change and security threats.

Policy Recommendations for Strengthening Regional Climate-Security Cooperation

Advancing research and enhancing awareness and understanding of the climate-security nexus. Improving regional understanding of the interlinkages between climate change and security is a prerequisite to tackling regional climate-related security challenges. Capacity-building efforts should target and build bridges between policymakers, security actors, as well as climate experts to facilitate integrated policy responses.

Advancing climate solutions and building resilience among affected, while integrating security considerations. Advancing climate solutions and adaptation is key to mitigating the rise of climate security challenges. However, given the dire challenges of climate impacts, it is crucial that the development of climate action strategies explicitly addresses security risks associated with climate change, ensuring that responses go beyond biophysical impacts to include geopolitical and socio-economic dimensions.

Strengthening cross-border and regional climate cooperation. Most climate solutions are implemented within national boundaries, while in reality climate challenges are transboundary in nature. It is important to foster regional environmental cooperation that transcends national boundaries and goes beyond dialogue to ensure concrete implementation of joint climate initiatives. In doing so, it is essential to ensure that regional initiatives are inclusive of all relevant countries in the region, avoiding fragmentation and ensuring that no country is left out of collective climate action efforts.

Mainstreaming the climate-security nexus into regional security frameworks. Climate risks should not be treated as isolated security issues but as core elements of regional security planning. It makes sense to integrate climate security into existing and emerging regional security agreements—such as the GCC Regional Security Framework.

Establishing a regional focal point for climate-security cooperation. To ensure the sustainability of regional climate cooperation, it is essential to create a dedicated regional working group or focal point to coordinate climate-security initiatives, ensuring that efforts are sustained, strategically aligned, and not merely ad hoc or reactive as is currently the case.

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