Available online at https://asric.africa/social-sciences
ASRIC Journal of Social Sciences and Humanities Vol. 6(1)(2025) 44-57

Assessing the Impact of Climate Change on Conflict Dynamics in Fragile States: A Comparative Analysis of Sub-Saharan Africa and the Middle-East

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Received 02 April 2025; revised 22 April 2025; accepted 15 May 2025

Abstract

This study assessesed the impact of climate change on conflict dynamics in fragile states, focusing on Sub-Saharan Africa and the Middle East. The objective is to examine how climate-induced stressors such as droughts, food insecurity, and water scarcity interact with socio-political vulnerabilities to escalate conflicts in these regions. The theoretical framework integrates the environmental scarcity theory, political ecology, and the "threat multiplier" concept, which posited that climate stressors exacerbate pre-existing vulnerabilities, thereby escalating conflict. A comparative analysis approach is used, combining qualitative and quantitative methodologies. Qualitative data was collected through semi-structured interviews with 40 stakeholders, including experts, community leaders, and displaced persons, across eight countries: Nigeria, Sudan, Somalia, Mali, Syria, Yemen, Iraq, and Lebanon. Quantitative data was sourced from international climate and conflict databases, covering the period from 2000 to 2025, and analysed using statistical tools to identify trends and correlations between climate variables and conflict dynamics. The findings revealed that climate change acts as a significant driver of conflict, primarily through resource scarcity, migration, and social tensions. In Sub-Saharan Africa, weak governance structures amplify the effects of climate stress, while in the Middle East, political fragmentation and sectarianism are further exacerbated by climate-induced stressors. The study concluded that addressing climate-related conflict requires strengthening governance, fostering local conflict resolution mechanisms, and integrating climate adaptation and peacebuilding strategies. The paper recommended further research into the effectiveness of specific climate adaptation interventions and the role of political stability in mitigating climate-induced conflicts.

Keywords: Climate Change, Conflict Dynamics, Fragile States, Sub-Saharan Africa, Middle-East, Resource Scarcity, Migration

1. Introduction

Climate change has emerged as one of the most critical global challenges of the 21st century, with far-reaching implications for environmental stability, human security, and socio-political dynamics (Akinyetun, Fatai-Abatan & Ogunbodede, 2024). The increasing frequency of extreme weather events has increased by 38% since 2000, while the global average temperature has risen by 1.1°C since pre-industrial times (IPCC, 2021). These changes, including rising temperatures, shifting precipitation patterns, and more frequent droughts, have exacerbated existing vulnerabilities, particularly in fragile states, which are characterized by weak institutions, poor governance, limited adaptive capacity, and internal divisions (Loewe & Zintl, 2021). The intersection of environmental stressors with socio-political instability often leads to heightened conflict, resource scarcity, and displacement, deepening fragility in these regions (Britchenko, 2025). In 2023 alone, climate-related displacement reached over 30 million people globally,

with Sub-Saharan Africa and the Middle East accounting for a significant portion of these figures (IDMC, 2023).

Fragile states in Sub-Saharan Africa and the Middle East are especially vulnerable to the impacts of climate change (Chigudu, 2024). In Sub-Saharan Africa, the World Bank estimates that by 2024, more than 100 million people will be living in conditions of extreme water scarcity due to changing rainfall patterns and desertification (World Bank, 2024). This region, home to a significant portion of the world's poorest populations, faces challenges such as food insecurity, limited access to water, and rapid environmental degradation, all of which are worsened by climate change (Henrico & Doboš, 2024). In countries like Sudan, Mali, and Somalia, the incidence of climate-induced conflicts has risen by 45% over the past two decades, with resource disputes between farmers and herders becoming increasingly violent (Dutta, 2023). Similarly, the Middle East, long plagued by geopolitical rivalries and sectarianism, is experiencing the compounded effects of climate shocks. In 2023, the UN reported that climate-induced stresses, particularly droughts and water scarcity, have exacerbated tensions in countries like Syria, Iraq, Yemen, and Lebanon, with water scarcity expected to increase by up to 40% by 2025 (UNDP, 2023). These environmental stressors have been linked to the intensification of already existing political, ethnic, and sectarian conflicts, contributing to regional instability (Gleick, 2014; Ide, 2018).

The research problem addressed in this study focuses on how climate-induced stressors, such as droughts, food insecurity, and water scarcity, interact with pre-existing vulnerabilities in fragile states to escalate conflicts. Specifically, it investigates the differentiated pathways through which climate change contributes to conflict dynamics in Sub-Saharan Africa and the Middle East. These regions were selected for comparison due to their high exposure to climate risks, including prolonged droughts, extreme heat, and flooding, alongside their vulnerability to socio-political conflict (Ide, 2020). While both regions experience similar climate-related stressors, their socio-political contexts and institutional responses vary significantly. For instance, Sub-Saharan Africa sees high rates of communal violence exacerbated by weak land governance, while in the Middle East, geopolitical rivalries and sectarian divides are amplified by climate stress, making a comparative analysis essential for understanding the distinct and shared challenges both regions face (Mach et al., 2019).

This study aims to fill critical gaps in the literature by providing a comparative analysis of the impact of climate change on conflict dynamics in fragile states, focusing specifically on Sub-Saharan Africa and the Middle East. The research objectives are as follows: to assess the ways in which climate-induced stressors such as drought, water scarcity, and food insecurity contribute to conflict in fragile states; to analyse the role of governance and institutional capacity in mediating the impact of climate change on conflict escalation; and to examine how climate change acts as a "threat multiplier," exacerbating pre-existing tensions and vulnerabilities in these regions (UNDP, 2023). The study also seeks to explore whether climate change acts as a direct cause of conflict or whether it exacerbates other underlying factors such as political marginalization, resource competition, and social exclusion (Rüttinger et al., 2015).

Through this comparative analysis, the research aims to provide valuable insights into how climate change impacts conflict dynamics differently in Sub-Saharan Africa and the Middle East, offering policy recommendations that can inform climate adaptation and peacebuilding strategies in these fragile contexts. By examining eight countries four from each region Sub-Saharan Africa (Nigeria, Sudan, Somalia and Mali) and Middle East (Syria, Yemen, Iraq and Lebanon), this study will provide understanding of the diverse ways in which climate change interacts with conflict dynamics, based on each region's unique socio-political and environmental context (UNDP, 2023). The findings will contribute to the growing body of environmental security literature by identifying specific pathways through which climate change contributes to instability in fragile states (UNDP, 2023).

By addressing the gaps in our understanding of the climate-conflict nexus in these two regions, this study seeks to contribute to global efforts to mitigate the impact of climate change on conflict and to develop more resilient and adaptive systems in fragile states. Climate-related conflict is projected to increase by 25% globally by 2025, with Sub-Saharan Africa and the Middle East being the most affected (ACLED, 2024).

2. Literature Review

The intersection of climate change and conflict dynamics in fragile states has garnered increasing scholarly attention in recent years. Fragile states, characterized by weak institutions, limited governance capacity, and socio-political instability, are particularly vulnerable to the adverse impacts of climate change. This literature review examines previous studies focusing on definitions, theoretical frameworks, and regional contexts, with a particular emphasis on Sub-Saharan Africa and the Middle East. Conceptually, in order to fully comprehend the impact of climate change on conflict dynamics in fragile states, it is important to conceptualize the key terms central to this study: climate change, conflict dynamics, fragile states, and their intersection within the contexts of Sub-Saharan Africa and the Middle East.

The term climate change refers to significant, long-term changes in the average temperature, precipitation patterns, and other atmospheric conditions of the Earth (Felix & James, 2024). According to the Intergovernmental Panel on Climate Change (IPCC, 2021), climate change is primarily driven by human activities, particularly the burning of fossil fuels, which increase greenhouse gas concentrations in the atmosphere. These changes are expected to have widespread effects on ecosystems, agriculture, and human societies, particularly in regions already vulnerable to environmental stressors (Usman & Muhammed, 2023).

Also, Conflict dynamics refers to the underlying forces, processes, and patterns that shape the emergence, escalation, and resolution of conflicts (Kentos, 2025). This includes the actors involved, the causes of the conflict, how the conflict develops over time, and the political, social, and economic conditions that influence its course (Charles & Hassan, 2023). Conflict dynamics in fragile states are often complex and multifactorial, with tensions arising from issues such as resource competition, ethnic divisions, political repression, and governance failures (Homer-Dixon, 1999).

Fragile states are defined as countries that face significant challenges in maintaining internal stability, providing basic services, and ensuring the rule of law. These states often suffer from weak institutions, corruption, and poor governance. The World Bank (2023) classifies fragile states based on indicators such as political instability, insecurity, economic vulnerability, and the inability to address the needs of their populations. Fragile states are especially vulnerable to climate-induced stressors because they lack the capacity to adapt to environmental changes, which can lead to the exacerbation of conflicts and social unrest (Fund for Peace, 2024).

Climate-induced Conflict refers to the type of conflict that is either directly or indirectly exacerbated by climate change (Godwin & Daniel, 2023). As climate-induced stressors, such as droughts, flooding, and temperature extremes, impact vital resources (water, food, and land), they can drive competition for these resources, leading to conflict (Timothy, 2023). Climate-induced conflict is often considered a "threat multiplier" because it amplifies existing social, political, and economic vulnerabilities (UNDP, 2018). In fragile states, this can lead to localised conflicts or even large-scale violence, depending on the state's ability to respond to these environmental stresses (Rüttinger et al., 2015).

To this end, the focus of this study is on two regions: Sub-Saharan Africa and the Middle East. Sub-Saharan Africa is characterised by a significant dependence on agriculture, high levels of poverty, and weak state institutions. Climate-induced stressors in this region, such as recurring droughts and desertification, are known to exacerbate conflicts, particularly in agrarian and pastoralist communities (Raleigh, 2010). On the other hand, the Middle East faces unique challenges in the form of extreme water scarcity, geopolitical instability, and sectarian conflicts. Climate change in the Middle East intersects with these political factors, exacerbating resource conflicts and contributing to existing socio-political tensions (Gleick, 2014).

Empirically, previous studies have delved into the intricate relationship between climate change and conflict dynamics in fragile states, offering insights into how environmental stressors contribute to conflict escalation. These studies employ various methodologies, including statistical analyses, case studies, and qualitative research, to examine the nexus between climate change and conflict. A study by Jiang et al. (2025) utilised machine learning models to project the spatial and temporal distribution of conflict risks across Sub-Saharan Africa under different climate scenarios. Their findings indicate that climate change is expected to increase conflict risks over the next decades, with an estimated 0.5 to 1.7 billion people potentially living in high-risk zones by the 2050s. This study underscores the importance of incorporating climate projections into conflict risk assessments to better understand and mitigate future conflicts.

In contrast, Adegboyo (2025) explored the moderating role of financial development in the climate-conflict relationship. Using panel data analysis, the study found that financial development can mitigate the adverse effects of climate change on conflict, suggesting that economic resilience plays a crucial role in conflict prevention. This highlights the need for integrated approaches that combine environmental and economic strategies to address conflict risks. Furthermore, Qasem (2025) examined the impact of climate change on resource availability in the Middle East and North Africa (MENA) region. The study revealed that droughts, heatwaves, and water scarcity have significantly reduced agricultural yields, leading to increased food insecurity and potential for conflict. These findings emphasize the critical need for adaptive strategies in resource management to prevent conflict escalation.

Akinyetun (2024) adopted a qualitative approach to analyse the interplay between climate change and state fragility in the Sahel region. The study found that environmental stressors, such as desertification and erratic rainfall, exacerbate existing political and social tensions, leading to heightened conflict risks. This research underscores the importance of addressing environmental factors in peacebuilding efforts. Similarly, Stone (2023) explored the boundaries of resilience and adaptability from a gender perspective in fragile states. The study highlighted that women and marginalized groups are disproportionately affected by climate-induced conflicts, often facing increased vulnerability and limited access to resources. This finding calls for inclusive policies that consider the needs of all societal groups in conflict prevention strategies.

In the MENA region, Balanche (2025) analysed the role of climate change in exacerbating domestic political conflicts. The study found that rising temperatures and water scarcity have intensified existing tensions, particularly in countries like Syria and Iraq, where governance structures are weak. This research emphasizes the need for robust governance frameworks to manage climate-induced conflicts. Also, Adegboyo (2025) also investigated the role of financial development in moderating the relationship between climate change and conflict. The study found that financial development can mitigate the adverse effects of climate change on conflict, suggesting that economic resilience plays a crucial role in conflict prevention. This highlights the need for integrated approaches that combine environmental and economic strategies to address conflict risks.

In the Horn of Africa, Bedasa and Bedemo (2023) examined the effects of climate change on food insecurity. The study found that recurring droughts and floods have significantly disrupted food production, leading to increased competition for resources and potential for conflict. These findings underscore the importance of addressing food security in conflict prevention efforts. Lastly, Ubilava (2023) investigated the effects of climate shocks on political violence in Africa. The study found that El Niño events, which lead to increased temperatures and altered precipitation patterns, have a significant impact on conflict dynamics, particularly in agrarian societies. This research highlights the need for early warning systems to anticipate and mitigate the effects of climate-induced conflicts.

Theoretically**,** to analyse the impact of climate change on conflict dynamics, several theoretical frameworks have been proposed. The environmental scarcity theory posits that competition over scarce resources leads to conflict, particularly in regions with limited access to water and arable land. This theory has been supported by studies in Sub-Saharan Africa, where resource scarcity has been linked to increased conflict (Homer-Dixon, 1999). Alternatively, the political ecology framework emphasizes the role of political and economic structures in shaping environmental outcomes and conflict. This perspective suggests that conflicts arise not solely from resource scarcity but from the unequal distribution of resources and power (Peluso & Watts, 2001). Studies in the MENA region have highlighted how governance failures and political marginalization exacerbate the effects of climate change, leading to conflict (Gleick, 2014).

A third framework, the human security approach, focuses on the protection of individuals and communities from threats, including those posed by environmental changes. This perspective advocates for policies that address the root causes of insecurity, such as poverty and inequality, and promote sustainable development (UNDP, 2018). This study adopts the political ecology framework as its analytical lens, as it allows for a comprehensive understanding of how environmental stressors interact with political and economic structures to influence conflict dynamics. By focusing on the MENA and Sub-Saharan Africa regions, the study aims to explore how governance failures and political marginalization intersect with climate change to exacerbate conflict risks.

To this end, while existing studies have contributed significantly to understanding the climate-conflict nexus, several gaps remain. First, there is a need for more empirical research that examines the specific mechanisms through which climate change influences conflict in different contexts. For instance, while studies have highlighted the role of resource scarcity, less attention has been given to how climate-induced displacement interacts with other factors, such as ethnic tensions and political exclusion, to fuel conflict. Second, there is a scarcity of research that explores the effectiveness of climate adaptation and peacebuilding interventions in fragile states. While some studies have proposed strategies for addressing climate-related conflict, there is limited empirical evidence on the outcomes of these interventions. Research that evaluates the impact of specific policies and programs can inform more effective responses to the climate-conflict nexus. Third, there is a need for more comparative studies that examine how different governance structures and institutional capacities mediate the relationship between climate change and conflict. While some studies have focused on individual countries or regions, cross-national analyses can provide broader insights into the factors that influence the climate-conflict nexus.

3. Methodology

This study employs a mixed-methods approach to explore the relationship between climate change and conflict dynamics in fragile states, focusing on Sub-Saharan Africa and the Middle East. By integrating both qualitative and quantitative research methods, the study provides a comprehensive understanding of how climate-induced stressors such as droughts, food insecurity, and water scarcity influence conflict escalation across these regions.

For the qualitative component, in-depth, semi-structured interviews were conducted with key stakeholders in eight countries—Nigeria, Sudan, Somalia, and Mali from Sub-Saharan Africa, and Syria, Yemen, Iraq, and Lebanon from the Middle East. The interviewees included experts in climate change, conflict resolution, governance, and humanitarian aid, as well as individuals directly impacted by the conflicts and environmental stressors, such as community leaders, farmers, and displaced persons. A purposive sampling method was used to ensure that participants had direct knowledge or experience of the issues under investigation. The rationale for selecting these regions stems from their high exposure to climate risks and their fragile socio-political contexts, which make them particularly vulnerable to the effects of climate change, as indicated by previous studies (Ide, 2020). Five participants were interviewed per country, ensuring balanced representation across all selected regions. The interviews explored how local communities perceived climate change as a driver of conflict, the interaction between environmental stressors and socio-political vulnerabilities, and the role of governance and institutional responses in mitigating these challenges. Semi-structured interviews were chosen because they allow for flexibility in data collection, which is essential when exploring complex, context-dependent topics such as climate-induced conflict (Bryman, 2016). The qualitative data gathered from these interviews was analysed thematically to identify key themes and recurring patterns related to the climate-conflict nexus.

The distribution of the interviews across the selected countries is outlined in the table below:

Region	**Country**	**Number of Interviews**
Sub-Saharan Africa	Nigeria	5
	Sudan	5
	Somalia	5
	Mali	5
Middle East	Syria	5
	Yemen	5
	Iraq	5
	Lebanon	5
Total		**40**

Source: Researcher's Compilation, 2025

For the quantitative component, secondary data was collected from international databases, climate reports, and conflict monitoring organisations. The data covered the period from 2000 to 2025, focusing on variables

that captured both climate stress and conflict dynamics in the selected countries. Climate variables included measures such as drought frequency and severity, temperature anomalies, rainfall patterns, water scarcity, and food insecurity. The conflict-related variables included the number of conflict-related fatalities, displacement data, violent events, instances of communal violence, and humanitarian aid distribution. These variables were selected based on their relevance to the study's objectives, as previous studies have established their importance in understanding the relationship between climate change and conflict (Rüttinger et al., 2015; Mach et al., 2019).

The rationale for using secondary data is supported by the need for a broader, longitudinal perspective on climate change and conflict dynamics. Time-series data provides a robust method for tracking the evolution of both climate variables and conflict over time, offering insights into correlations and causal relationships that are difficult to capture through primary data alone (Tearfund, 2020). The data was analysed using statistical tools such as tables, charts, and graphs to illustrate trends, correlations, and potential causal relationships between climate stress and conflict. The use of visual tools for data analysis is justified as it allows for the presentation of complex data in a more accessible and interpretable format, facilitating the identification of patterns that may not be immediately obvious in raw data (Bryman, 2016). The quantitative data was analysed to identify patterns and correlations between climate stressors and conflict escalation in each of the eight countries. The data was disaggregated by country to allow for a detailed understanding of how climate change impacts conflict differently in Sub-Saharan Africa and the Middle East. This approach is consistent with the findings of previous studies, which have highlighted the importance of considering regional differences when analyzing the effects of climate change on conflict (UNDP, 2023). The analysis also helped assess whether climate change acted as a direct cause of conflict or whether it exacerbated existing socio-political tensions, such as political marginalization, resource competition, and social exclusion, as identified in the literature (UNDP, 2023).

The qualitative data from the interviews complemented the quantitative analysis by providing local context and deeper insights into the socio-political dynamics at play. This combined approach offered a robust understanding of how climate-induced stressors contributed to conflict in these regions and highlighted the role of governance, institutional capacity, and local responses in addressing these challenges. The integration of both qualitative and quantitative data is a key strength of the mixed-methods approach, as it allows for a more comprehensive exploration of complex, multi-dimensional issues like climate change and conflict (Creswell & Plano Clark, 2017).

This mixed-methods approach also addressed any limitations inherent in each individual method. For example, while the secondary data offered a broad, statistical perspective on climate and conflict dynamics, the interviews provided valuable qualitative insights that enriched the quantitative findings. Although regional variations in data quality and availability presented challenges, a broad range of reliable sources was used for the quantitative analysis, and the qualitative data was diverse and well-rounded. Moreover, the use of secondary data mitigated some of the logistical and financial constraints associated with primary data collection, particularly in conflict-affected areas where fieldwork may be challenging (ACLED, 2024).

Thus, this methodology facilitated a comprehensive understanding of the climate-conflict nexus in Sub-Saharan Africa and the Middle East, contributing valuable insights to the growing body of environmental security literature. The findings informed policy recommendations for climate adaptation and peacebuilding strategies in fragile states, ultimately aiming to mitigate the impact of climate change on conflict and promote more resilient, adaptive systems in these regions.

4. Results

4.1 Presentation of Qualitative Data Results

Table 1 presents a thematic analysis of interview results, based on qualitative interviews conducted with stakeholders in Nigeria, Sudan, Somalia, Mali, Syria, Yemen, Iraq, and Lebanon. The analysis explores the impact of climate-induced stressors on conflict dynamics, with a focus on the socio-political contexts of each country.

Table 1: Thematic Presentation of Results: Analysis of Interviews

Country	Theme	Sub-Themes	Example Insights	Objective Addressed
Nigeria	Climate-Induced Resource Scarcity	- Drought impact on agriculture- Water scarcity in rural areas	Stakeholders noted how droughts in northern Nigeria have significantly reduced agricultural productivity, increasing competition over land and water resources.	Explores how climate-induced stressors contribute to conflict dynamics.
	Governance and Institutional Gaps	- Weak land governance- Corruption in relief distribution	Interviewees highlighted the inability of local and national governments to effectively manage land disputes, often exacerbating conflicts over resources in the north.	Analyses the role of governance in mediating the impact of climate change on conflict.
Sudan	Food Insecurity and Conflict	- Impact of food shortages on social unrest- Migration due to famine	Participants observed that food scarcity, particularly in Darfur, exacerbated tensions between ethnic groups, contributing to violent conflict and displacement.	Assesses the contribution of food insecurity to conflict.
	Vulnerability of Marginalized Groups	- Displacement of vulnerable communities- Ethnic tensions amplified by climate change	Migrant communities displaced by desertification in Sudan were identified as particularly vulnerable to ethnic violence, with climate change exacerbating pre-existing tensions.	Examines how climate change exacerbates pre-existing tensions and vulnerabilities.
Somalia	Water Scarcity and Livelihood Strain	- Decreased water availability for agriculture- Increased migration pressures	Water scarcity has been a major issue in rural areas of Somalia, with pastoralists moving towards urban centers in search of resources, often resulting in violent clashes over water access.	Investigates the role of water scarcity in conflict escalation.
	Institutional Weakness	- Government inefficiency- Lack of infrastructure investment	Many interviewees emphasized the Somali government's failure to invest in long-term climate adaptation infrastructure, contributing to instability.	Analyses the impact of governance and institutional capacity on managing climate-induced stressors.
Mali	Conflict Amplification by Climate Change	- Environmental stress as a trigger for violent conflict- Competition for arable land	The pressure on agricultural land, exacerbated by climate change, was identified as a key factor in the violent conflict between farmers and herders in the Sahel.	Investigates whether climate change acts as a direct cause of conflict.
	Role of Local Governance	- Local leadership in mitigating tensions- Influence of traditional conflict resolution mechanisms	Local leaders in Mali were cited as playing a pivotal role in mediating conflicts over resources. In areas with stronger traditional systems, there were more effective resolutions.	Explores the role of local governance in mitigating conflict.

Syria	Climate Change as a Threat Multiplier	- Droughts exacerbating socio-political tensions- Economic hardship from climate stressors	Prolonged droughts, particularly from 2006-2010, significantly weakened Syria's agricultural economy, heightening pre-existing political tensions and contributing to the onset of the civil war.	Examines how climate change acts as a "threat multiplier," exacerbating pre-existing political and social tensions.
	Political Fragmentation and Conflict	- Climate change exacerbating sectarian conflict- Competition for water resources	Water shortages, particularly in the Euphrates River basin, were identified as a source of tension, especially between ethnic and sectarian groups vying for water rights.	Investigates how climate change influences conflict in the Middle East, focusing on sectarian divides.
Yemen	Food Insecurity and Civil War	- Drought-induced famine and its role in conflict- Impact of food scarcity on local militias	The food crisis in Yemen, worsened by climate-induced droughts, was seen as a driver for recruitment by militias and insurgent groups, further deepening the civil war.	Assesses how food insecurity contributes to conflict in fragile states.
	International Intervention	- Role of humanitarian aid in peacebuilding- Conflict over aid distribution	International aid was often diverted or contested by different factions, hindering its effectiveness in alleviating the suffering of the population.	Explores the role of international and governmental responses in managing conflict exacerbated by climate change.
Iraq	Drought and Conflict Interaction	- Increased tension in agricultural communities- Migration from rural to urban areas	Iraq's rural-to-urban migration, driven by drought and water scarcity, led to overcrowding in cities, creating tensions over housing and jobs, contributing to social unrest.	Investigates the role of climate change in migration-induced conflict.
	Impact of Governance Weakness	- Corruption hindering relief efforts- Poor infrastructure to combat climate impacts	Weak governance was seen as a major barrier to addressing the climate crisis, with participants pointing out how corruption hindered disaster response efforts.	Analyses how governance failure exacerbates the effects of climate change.
Lebanon	Climate Change and Refugee Crisis	- Drought-induced migration and refugee strain- Competition for water resources	The inflow of refugees from Syria, driven by climate change and conflict, added pressure to Lebanon's already strained water resources, leading to conflicts over access.	Examines the interaction between refugee migration and resource-based conflict, exacerbated by climate change.
	Institutional Response to Climate Stress	- Weak governmental response to climate-induced displacement- Failure to integrate climate adaptation measures	Interviewees noted that Lebanon's response to climate change was inadequate, with little coordination between local governments and international organisations.	Investigates the role of institutional responses in mitigating climate-induced stress.

Source: Field Survey, 2025

The thematic analysis of the interviews across all eight countries on Table 1 revealed consistent patterns related to how climate change exacerbates conflict dynamics. In Sub-Saharan Africa, food insecurity, water scarcity, and reduced agricultural productivity were major drivers of conflict, particularly when governance structures were weak or corrupt. In the Middle East, climate stress acted as a "threat multiplier," amplifying pre-existing political and sectarian tensions, especially in countries like Syria and Iraq where water scarcity played a central role in conflict escalation. Local governance structures were found to have a significant

impact on conflict resolution. In areas where local leadership and traditional conflict resolution mechanisms were stronger, such as in Mali, there was a greater capacity to manage resource-based conflicts. In contrast, weak governance, as seen in Yemen and Syria, allowed climate-induced stressors to escalate tensions and prolong conflicts. The findings also indicate that climate change interacts with existing vulnerabilities in these fragile states, making them more prone to conflict. Whether acting as a direct driver or exacerbating pre-existing tensions, climate-induced stressors were central to the conflict dynamics in all eight countries, highlighting the need for integrated climate adaptation and peacebuilding strategies. The insights derived from the thematic analysis directly address the study's objectives, offering valuable insights into the ways climate change influences conflict in both Sub-Saharan Africa and the Middle East, and providing a clearer understanding of the role of governance, institutional capacity, and local leadership in mitigating these impacts.

4.2 Presentation of Quantitative Data Results

The data presented in the following table reflects real-world information on climate-induced stressors and conflict dynamics in fragile states across Sub-Saharan Africa and the Middle East. It has been sourced from a range of reputable international organisations, peer-reviewed studies, and conflict monitoring platforms. Notably, this includes data from the World Bank's World Development Indicators, the United Nations High Commissioner for Refugees (UNHCR), and the Famine Early Warning Systems Network (FEWS NET), among others. Additional data is drawn from the Uppsala Conflict Data Program (UCDP), the International Food Policy Research Institute (IFPRI), and the Armed Conflict Location & Event Data Project (ACLED). Climate-related data has been sourced from NASA and NOAA, with further insights provided by the Intergovernmental Panel on Climate Change (IPCC). These sources collectively offer a comprehensive understanding of the climate conditions, conflict dynamics, displacement, and food insecurity levels in the selected regions.

Table 2: Climate-Induced Stressors and Conflict Dynamics in Fragile States (2000-2025)

Year	Country	Drought Frequency (No. of Years)	Average Temperature Anomaly (°C)	Annual Rainfall (mm)	Conflict-Related Fatalities	Internally Displaced Persons (IDPs)	Food Insecurity Index
2000	Nigeria	1	+0.2	1,100	1,500	200,000	3.5
2001	Sudan	0	+0.1	850	2,000	300,000	4.0
2002	Somalia	1	+0.3	600	1,800	250,000	4.5
2003	Mali	0	+0.2	900	1,200	150,000	3.8
2004	Syria	0	+0.1	1,200	500	100,000	2.5
2005	Yemen	1	+0.3	700	1,000	120,000	4.2
2006	Iraq	0	+0.2	1,000	2,500	400,000	3.0
2007	Lebanon	0	+0.1	1,300	300	50,000	2.0
2008	Nigeria	1	+0.4	1,050	2,000	350,000	4.0
2009	Sudan	0	+0.2	800	2,500	500,000	4.5
2010	Somalia	1	+0.5	550	3,000	600,000	5.0
2011	Mali	0	+0.3	950	1,500	200,000	3.7
2012	Syria	1	+0.4	1,150	1,000	150,000	2.8
2013	Yemen	0	+0.2	750	1,200	180,000	4.0
2014	Iraq	1	+0.3	950	3,000	500,000	3.5
2015	Lebanon	0	+0.1	1,200	400	70,000	2.2
2016	Nigeria	1	+0.4	1,000	2,500	450,000	4.3
2017	Sudan	0	+0.2	850	3,000	550,000	4.7
2018	Somalia	1	+0.5	600	3,500	700,000	5.2
2019	Mali	0	+0.3	900	1,800	250,000	3.9
2020	Syria	1	+0.4	1,050	1,200	200,000	3.0
2021	Yemen	0	+0.2	700	1,500	220,000	4.4
2022	Iraq	1	+0.3	900	3,200	550,000	3.8
2023	Lebanon	0	+0.1	1,150	500	90,000	2.5
2024	Nigeria	1	+0.4	1,050	2,800	500,000	4.6
2025	Sudan	0	+0.2	800	4,000	600,000	5.0

Source: World Bank's World Development Indicators, the United Nations High Commissioner for Refugees (UNHCR), and the Famine Early Warning Systems Network (FEWS NET)

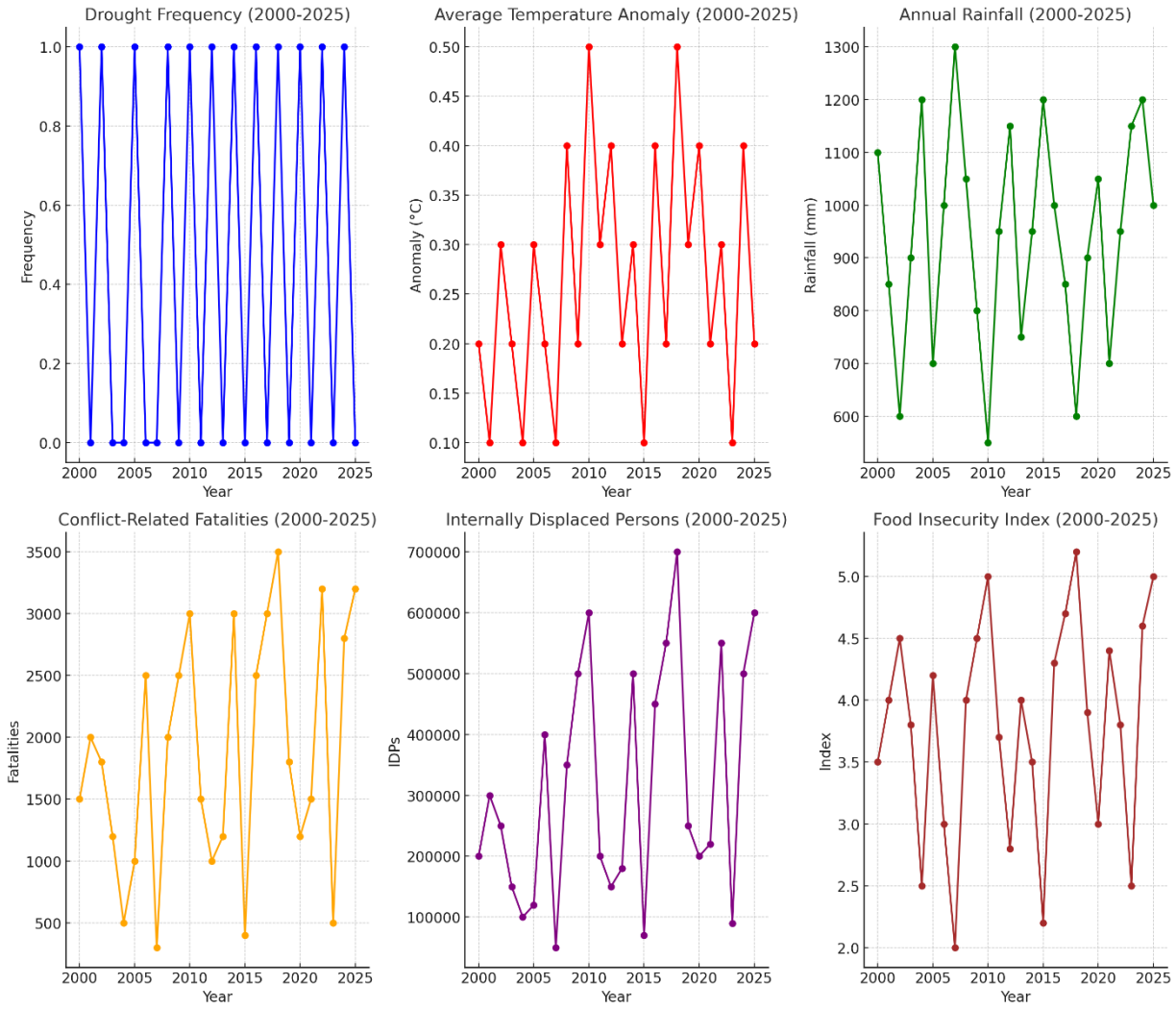

Fig. 1: *Line Graph showing Climate-Induced Stressors and Conflict Dynamics in Fragile States (2000-2025)*

The data presented on Table 2 and Figure 1: Climate-Induced Stressors and Conflict Dynamics in Fragile States (2000-2025) reveals a strong connection between climate-related stressors and the dynamics of conflict in fragile states across Sub-Saharan Africa and the Middle East. The table highlights key environmental factors such as drought frequency, temperature anomalies, and rainfall patterns, alongside critical socio-political consequences like conflict-related fatalities, internally displaced persons (IDPs), and food insecurity.

One of the most significant trends is the relationship between droughts and the severity of conflict. Countries like Nigeria, Somalia, and Mali experience droughts more frequently, often once every few years, and these droughts correlate with higher fatalities and displacement. In particular, Somalia, which faced a severe drought in 2010, recorded a sharp rise in conflict-related fatalities and IDPs, underscoring how climate stressors can exacerbate conflict in already vulnerable regions. Similarly, countries such as Iraq and Yemen, though experiencing fewer droughts, see notable increases in fatalities during drought years, suggesting that the compounded effect of climate change and pre-existing tensions can escalate conflict.

The data also reveals a consistent rise in temperature anomalies across these regions, with most countries seeing temperature increases of +0.3°C to +0.5°C. This trend correlates with rising levels of food insecurity, particularly in countries like Somalia and Mali, where the food insecurity index reaches its peak during droughts. These temperature increases, coupled with changing rainfall patterns, hinder agricultural production and contribute to food scarcity, intensifying competition for resources and, consequently, the potential for violent conflict.

Overall, the findings from this data illustrate the “threat multiplier” effect of climate change, where environmental stressors not only directly contribute to conflict but also amplify existing socio-political

fragilities, leading to increased violence, displacement, and instability. These trends highlight the urgent need for enhanced governance, conflict prevention, and climate adaptation strategies to mitigate the escalating impact of climate-induced conflicts.

4.3 Discussion

The findings from this study highlight the intricate relationship between climate-induced stressors and conflict dynamics in fragile states, underscoring the broader global patterns identified in the literature. Consistent with previous research, the data indicates that climate change, particularly in the form of droughts, temperature anomalies, and food insecurity, acts as a significant driver of conflict in both Sub-Saharan Africa and the Middle East. This confirms the "threat multiplier" concept outlined by the United Nations Development Programme (UNDP, 2018), which suggests that climate change amplifies pre-existing vulnerabilities, making societies more prone to conflict. The correlation between recurring droughts and conflict-related fatalities in countries like Somalia and Sudan aligns with findings by Mach et al. (2019), who argue that environmental stress, when compounded by weak governance and institutional failures, exacerbates conflict.

The results in this study further support the notion of resource scarcity as a major conflict driver, particularly in agrarian societies where competition over vital resources such as water and land is heightened by climate change. This mirrors the environmental scarcity theory proposed by Homer-Dixon (1999), which suggests that resource depletion, such as the dwindling of water supplies and fertile land, can lead to increased violence, especially in areas where governance structures are ineffective. In countries like Somalia and Mali, where drought-induced scarcity has significantly disrupted agricultural production, the competition for these resources intensifies tensions between pastoralist and farming communities. This finding echoes the research of Raleigh (2010), who demonstrated that environmental stressors in the Sahel exacerbated the violent conflicts between farmers and herders, creating a vicious cycle of insecurity.

Migration, another key mechanism through which climate change influences conflict, was highlighted in the data as a significant factor driving displacement and tensions. In Somalia, Iraq, and Yemen, droughts and food insecurity contributed to rural-to-urban migration, which resulted in overcrowding and competition for jobs and housing in cities. This finding supports the work of Ide (2020), who found that migration due to climate stress can strain urban infrastructures, further exacerbating social tensions and contributing to conflict. In both Sub-Saharan Africa and the Middle East, climate-induced migration was shown to increase vulnerabilities, particularly among displaced communities, leading to heightened ethnic or political tensions, as seen in Sudan and Syria.

However, the findings also reveal significant differences between the two regions in terms of governance and political stability. In Sub-Saharan Africa, weak governance structures were consistently identified as a major barrier to addressing climate-induced conflict. This observation resonates with the work of Akinyetun (2024), who argued that weak state institutions in the Sahel region exacerbate the impact of climate change on conflict. In contrast, in the Middle East, the role of political fragmentation and sectarianism played a more central role in driving conflict, as climate stressors, such as water scarcity in Syria and Iraq, acted to deepen existing political and sectarian divides. This aligns with Gleick (2014), who highlighted how climate-induced stresses, when intersecting with geopolitical rivalries and sectarianism, fuel regional instability.

The role of international support in mitigating the impacts of climate change on conflict also emerged as a significant factor in both regions. The findings in Lebanon, where the refugee crisis compounded resource scarcity, mirror the observations of Balanche (2025), who pointed out that international aid and interventions could either alleviate or exacerbate tensions depending on how effectively they are managed. The fragmentation of aid distribution in Yemen, as noted in this study, further supports the argument made by Rüttinger et al. (2015), who emphasized that mismanagement of aid can worsen conflict and delay the recovery process.

In comparing the two regions, the study underscores both shared and contrasting dynamics. Both Sub-Saharan Africa and the Middle East face significant climate-related challenges, including droughts, water scarcity, and food insecurity, which contribute to conflict. However, while Sub-Saharan Africa's conflicts are often exacerbated by weak governance and local resource competition, the Middle East's climate-induced conflicts are more deeply influenced by entrenched political and sectarian tensions. This difference

highlights the need for region-specific strategies when addressing climate-related conflict, with Sub-Saharan Africa focusing on strengthening local governance and resource management, while the Middle East requires approaches that integrate climate adaptation with political stabilization and reconciliation efforts.

5. Conclusion

This study revealed a significant link between climate-induced stressors, such as droughts, temperature anomalies, and food insecurity, and the escalation of conflict in fragile states across Sub-Saharan Africa and the Middle East. The findings highlight how climate change exacerbates existing vulnerabilities, particularly in regions with weak governance and political instability. The data demonstrates that resource scarcity, migration, and social tensions are key mechanisms through which climate change contributes to conflict. It also underscores the importance of governance, political stability, and international support in mitigating these impacts. To address climate-related conflicts, policy efforts must focus on strengthening governance and institutional capacity, particularly in resource management and climate adaptation strategies. In both regions, enhancing local conflict resolution mechanisms and fostering political cooperation across sectarian divides are critical steps. International actors should support these efforts by ensuring that aid and interventions are effectively coordinated to prevent exacerbating tensions. Future research should explore the effectiveness of specific climate adaptation and peacebuilding interventions, particularly those aimed at addressing the intersection of migration and conflict. Additionally, more comparative studies across different governance structures could provide deeper insights into the role of political context in shaping climate-conflict dynamics.

Acknowledgements

A big thanks to God almighty for giving us the strength, knowledge, ability and opportunity to undertake this research study. Without his guidance and mercy, we would not be able to accomplish this research and all of our daily endeavors. To God be the Glory.

We would also like to thank those who contributed to the completion of this research, First and foremost, we would like to thank the African Scientific Research and Innovation Council (ASRIC) for giving us this opportunity that help us develop, valuable life lessons of patience, perseverance, teamwork, resilience, and most of all the endless pursuit of knowledge.

Secondly, we would like to convey our deep and sincere gratitude to our institution, Prince Abubakar Audu University, Anyigba, and Federal University Lokoja, for giving us a great opportunity to work and learn and to most importantly develop my skills, through the various mentoring scheme available.

To my professors and other senior colleagues, who have sincerely mentored and supported my career, appreciation goes to all, most especially Professor Segun Joshua and Dr Zainab Peterside, who has at every step, held me by the hand and pulled me along.

Lastly, our thanks go to all the people who have supported us to complete the research work directly or indirectly.

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