



CLIMATE CHANGE, CONFLICT, MIGRATION (CCM)

DESK REVIEW

This Desk Review was prepared by Dr. Erin K. McFee as a consultant for the International Organization for Migration (IOM) within the framework of the project “Increasing the knowledge base on community cohesion and mobility dynamics in the context of climate change and environmental degradation through a selected country-based case study within the Middle East & North Africa (MENA) region. Dr. Amy Krauss conducted supporting research.

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Cover photos: Displaced family collecting water at rehabilitated water point in East Jebel Marra, South Darfur © IOM SUDAN

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IOM Regional Program on Mobility, Climate Change and Water Scarcity

This desk review falls under the mandate of the IOM Regional Program on Mobility, Climate Change and Water Scarcity. Climate change and water scarcity increasingly threaten vulnerable communities in the Middle East and North Africa (MENA) region. The MENA region is the most water-scarce in the world and is projected to be one of those most severely affected by the impacts of climate change globally. Disasters like floods, droughts and wildfires are likely to increase in scale and frequency due to climate change, with severe impacts on people's livelihoods, security, well-being and resilience. Resultant displacement alongside resource and water scarcity can amplify disaster risk in areas where large-scale movements strain already limited water sources. These dynamics can combine to exacerbate tensions over access to key resources between different community groups, thereby amplifying fragility.

The International Organization for Migration (IOM) has a proven history of developing and implementing interventions that support communities and governments to prepare for, reduce the risks of, and respond to the effects of climate change, environmental degradation and disasters. Such interventions fall within the Migration, Environment and Climate Change (MECC) portfolio. IOM seeks to further strengthen the knowledge and evidence base on the nexus between mobility, climate change and water scarcity, and inform future policy development and programming in this domain. To achieve this, the organization has partnered with regional stakeholders to research the intersection of factors such as migration, climate change, environmental degradation, water scarcity and conflict interact and influence community resilience against climate and conflict shocks. The project's findings will provide IOM, partners and Governments with the knowledge and tools to design and implement interventions that support community and Government efforts to strengthen resilience against future shocks.

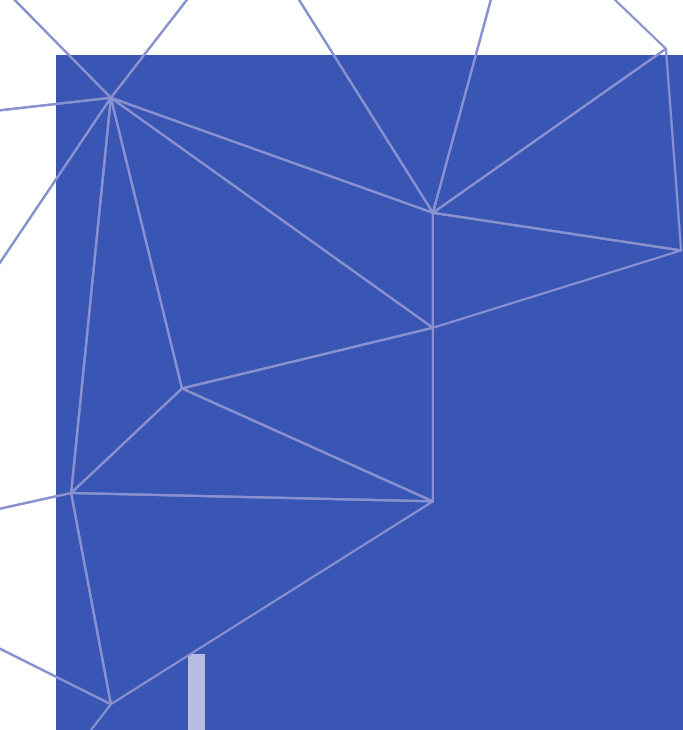
This desk review and subsequent research will support the program in delivering the following:

- A comprehensive regional research report on the interaction between climate change and environmental degradation, water scarcity, mobility, and community cohesion dynamics.
- Policy guidance, including recommendations and pathways forward for policymakers in the region and focus countries.
- One regional position paper on resilience building and effective water and climate-risk management in conflict-affected areas.
- Evidence-based capacity building for relevant regional actors to better prepare for and adapt to the evolving impacts of climate change and environmental degradation on mobility and community cohesion.

The project will also create a platform for IOM, the United Nations system, and other regional partners to share good practices, learn from each other and identify avenues for future collaboration and cross-border interventions.

ACRONYMS

AU	African Union
CCM	Climate Change, Conflict, Migration
CM	Climate Migration
DRR	Disaster Risk Reduction
EU	European Union
IOM	International Organization for Migration
KII	Key Informant Interview
MECC	Migration, Environment, and Climate Change (MECC)
UNISFA	United Nations Interim Security Force for Abyei
UNSC	United Nations Security Council



State of the Field: Climate Change, Conflict, Migration (CCM)



1. State of the Field: Climate Change, Conflict, Migration (CCM).

This desk review analyses existing research on Climate Change, Conflict, and Migration, both thematically and in the MENA region with a focus on the two countries featured in the study: Libya and Sudan. The field of academic literature most aligned with these dynamics, associated challenges and current attempts to address them identifies a climate change, migration, and conflict “nexus” (e.g., Burrows and Kinney, 2016; Scheffran, 2020; Zingg, 2021). This review analyses the appropriateness and usefulness of this term, suggesting that “ecologies of vulnerability” and “constellations of factors” may be more appropriate. The accompanying desk review (in a separate document) on Migration, Water Scarcity, and Climate Risk elaborates more on the thinking behind these proposed conceptual changes. To summarize those arguments, “nexus” connotes a fixed point of intersection, whereas existing literature suggests that multiple forces act simultaneously upon one another, even if the effects are not direct (e.g., the idea of climate change as a “threat multiplier”). Second, the use of the term “nexus” in practice has grown so widespread that it has begun to lose purchase and significance. For this reason, the present study seeks to increase the empirical basis for these terms and, in turn, their precision, as well as to develop a better understanding of how they relate to one another.

1.1.A constellation of factors

Migrants, displaced populations, returnees and host communities in the Middle East and North Africa are able to exercise their rights in an inclusive and equitable environment that is guided by evidenced-based policy and programming under these three pillars and their objectives.

1.1.1 Migration

This study builds on “migration” and “migrant” as these terms are defined by IOM. Migration refers to any movement of persons away from their place of usual residence, either across an international border or within a State. A migrant is any individual who engages in migration either temporarily or permanently and for a variety of reasons (e.g., forced displacement, voluntary, economic). The term includes several well-defined legal categories of people, such as migrant workers; persons whose types of movements are legally defined, such as smuggled migrants; as well as those whose status or means of movement are not specifically defined under international law, such as international students (IOM 2019).

Migration represents a key node in the constellation of CCM and related factors: it is the most frequently cited connection between conflict and climate change (Brzoska & Fröhlich, 2016). Thus, focusing on mobility patterns is one approach to tracing the interdependencies and interconnectedness of these domains. For example, climate changes and extreme climate events can contribute to the displacement of populations forced to migrate due to damage to their property, lands, and livelihoods; it remains difficult, however, to isolate singular causal pathways (Dun & Gemenne, 2008). What we do know is that these processes can shape mobility decisions when 1) increasingly extreme and intensifying events force people from their homes; 2) longer-term changes result in a gradual degradation in standards of living, which can drive various forms of livelihood-motivated migration; and 3) the arrival of migrants in contexts of already strained resources can feed into existing or emergent tensions (Seyuba et al., 2021). The literature review found that analyses of climate migration tend to fall into five categories: out-migration, in-migration, networks (that facilitate movement either out or in), public policies, and personal motives (Black et al., 2011).

In the last few years, valuable critiques have also emerged related to the implicit connection of climate-induced migration to conflict and insecurity. Such presumptions pathologized and individualized human mobility. More recent thinking in both academia and practice defines climate migration (CM) as an adaptation strategy in the pursuit of fundamental human security. These strategies include both movements in search of new livelihoods, and tactics that allow people to stay where they are despite environmental challenges. While this conceptual step is important for thinking about the relationship between human security, adaptation, and resilience, more still needs to be done to account for the structures and systems within which migration decisions are made due to the effects of climate change (Bettini, 2014). This begins with the recognition that simply looking at the individual security, adaptation, and resilience of the migrant creates a blind spot concerning understanding the roles and responsibilities of other relevant actors. The present study seeks to avoid this myopic approach by instead addressing the complete ecologies of vulnerability that populations face.

As an example of these complexities, mobility patterns may shape conflict patterns in each setting, but conflict-induced migration can also result in environmental damage and degradation (e.g., combatants may choose to levy environmental destruction as a weapon of war). Alternately, communities may adopt environmentally harmful practices due to conflict-related displacement that have long-term negative repercussions on resource availability. Periods of abundance have also been found to result in migration, though findings on whether that migration contributes to or detracts from conflict have been mixed. Pastoralism, non-state armed group recruitment and activity, and rural-urban migration have all been identified as dynamics that interact with conflict and migration dynamics under conditions of environmental scarcity (Selby & Hoffmann, 2012). Scenarios also exist in which environmental change and migration occur somewhat independently of one another and yet result in conflict when their effects are experienced together (Freeman, 2017).



In all instances, the convergence of these dynamics impact conditions of human security understood as “the right of people to live in freedom and dignity, free from poverty and despair and [to promote] the protection of their physical safety, economic and social well-being, and human rights. It includes the right of all individuals, vulnerable people in particular, to live free from fear and free from want, with an equal opportunity to enjoy all their rights and fully develop their human potential” (IOM 2019: 95). The presumed direct connection of climate-induced migration to conditions of insecurity has been critically examined in recent years, leading to fewer alarmist views of these dynamics and resulting in a more tempered approach to thinking about forms of governed and ordered migration as an adaptation strategy (Morrissey, 2009). Importantly, these approaches to thinking about the constellation of forces and actors related to climate change, conflict, and migration identify the fact that migration itself does not inherently pose a security risk; it is instead a necessary and regular part of global population dynamics and occurs quite regularly without threat (Humphrey, 2013). Simply put, most migration does not lead to conflict (Nordås & Gleditsch, 2007).

For the above reasons, it is important not to overstate the relationship between climate change, migration and conflict without a strong empirical base for analysis. Although linkages have been identified, it is still unclear how significant migration is as a catalyst for conflict (Burrows & Kinney, 2016). Taken together, this evinces the need for a nuanced approach to understanding the relationship of each of these elements to the other that does not presume direct causality or linearity. The study supported by this desk review attempts to enable this degree of nuance by capturing narrative accounts for these dynamics as they occur in the context of individuals' everyday lives.

1.1.2 Violence, Conflict and Human Security

Human security refers to the capacity of individuals and communities to manage stresses to their needs, rights, and values (Barnett & Adger, 2007). More recent work adds considerations of the political, economic, and social structures within which stakeholders in the field of human security embed. This more holistic analytic approach cautions against the false pretence that, if people were simply resilient enough, they could contend with the forces that generate insecurity (Van Praag, 2021). Instead, expanding the analysis to include political, institutional, and other actors in context ensures a more systematic understanding of processes that are systematic in nature. The present study builds on a definition of violent conflict as a consequence of mutual hostilities resulting from the incompatibilities dividing rival actors that escalate into violence (Conteh-Morgan, 2019). Furthermore, recent violent conflicts tend to increase vulnerability to future ones. This suggests that the limited adaptive capacities of some North African countries will result in heightened vulnerability to the violent potentials of combining food and water scarcity, climate change and events, civil unrest, and political exclusion (Scheffran, 2020).

One important factor in researching CCM is the governance capacity of a given society

to manage conflicts – at the national, regional, and local levels (Scheffran et al., 2014). Though not all conflicts end in violence, studying those that do make possible a deeper understanding of the limits of these capacities and develops a data-driven approach to addressing shortcomings. Additionally, many interventions and community-building exercises are embedded in contexts with ongoing violence (e.g., still-active community militias) (Seyuba et al., 2021). One particularly useful definition of conflict violence is the following: the direct, intended and reciprocal killing of people taking place between state forces and an organised non-governmental group (Scheffran et al., 2014). However, existing work has demonstrated that the variety of different forms that violence can take when all factors have been considered exceeds the tidy division between state- and non-state armed groups. The research from this desk review will extend our understanding of how violence and conflict manifest in context by soliciting narrative accounts from our interlocutors, who may have both direct and indirect experience with these matters. We also draw from an understanding of violence as including that which does not necessarily result in killing (e.g., gender-based violence) (Adano et al., 2012; Schilling et al., 2012).

Among other closely related domains is food security. Food insecurity results from an array of factors: some of these are directly related to climate change and events, while others link to systematic and structural concerns (e.g., demographic changes, poverty, failures in institutions and governance). Food insecurity can both contribute to and result from armed conflict (Brinkman & Hendrix, 2011; Pinststrup-Andersen & Shimokawa, 2008) and, due to its demonstrable links to migration decisions as well, it warrants dedicated consideration in CCM analysis.

In West Africa, researchers have established a relationship between conflict and food insecurity (Ujunwa et al., 2019). The mechanisms that connect each to the other can include the destruction of infrastructure and livelihood supply chains, which results in increases in both food prices and the creation of refugees (Deininger & Castagnini, 2006; Maystadt et al., 2014). Conflict also results in a reduction in revenues from tourism and foreign investment, accelerating economic decline and exacerbating the above-mentioned conditions (Breisinger et al., 2015).

1.1.3 Climate Change

Framing climate change as a variable that amplifies existing conditions of insecurity, as opposed to a direct causal mechanism, represents one of the more productive approaches to conceptualizing these relationships as a constellation rather than a path-dependent linear progression – i.e., the relationships between one domain (e.g., conflict) and another (e.g., climate change) are not direct, but rather mutually influential and mediated by other things. For example, some have argued that migration mediates the causal relationship between environmental change or climate change and political violence and that these effects are determined by social, economic, and political factors (Freeman, 2017). According to such lines of thinking, climate change stresses the abovementioned dimensions of human security (e.g., it can result in reduced agricultural productivity and thus food shortages, water scarcity, and competition for resources).

This, in turn, tests the responsive and adaptive capacities of implicated individuals, communities, and institutions (Council of the European Union, European Commission, 2008; Scheffran et al., 2014).

Researchers have found that the physical effects of climate change can increase the risk of conflict due to livelihood deterioration, changing migration and mobility, armed group tactics, and exploitation and mismanagement by elites in several contexts across the world (Ovidie Grand & Tarif, 2021). It interacts with trade policies and pathways, national finances and debt, regional cooperation, and management of shared natural resources (Sisdoia, 2022). However, governments do not currently mainstream climate risk management in their short, mid, and long-term planning. This undermines other critical policy areas, including trade, investment and aid flows, and social and geopolitical efforts (including migration). And, although international cooperation and development agencies have begun to turn their attention more thoroughly to the domain of climate security, the effects on social cohesion and mobility remain underexplored, even though they are inextricably tied up in the dynamics of extreme climate events, environmental degradation, and competition over resources. Fortunately, the United Nations Security Council (UNSC), African Union (AU), and European Union (EU) have begun to recognize that regional cooperation is necessary to address these complex challenges (Ovidie Grand & Tarif, 2021).



2.

Regional Overview



2. REGIONAL OVERVIEW

Climate change, conflict, and migration are particularly salient issues with respect to the MENA region, given the increase in the incidence of droughts, floods, changes in temperature and rainfall patterns, and desertification (FAO, 2022; AWC, 2019). Consequently, these environmental changes often result in migration to primarily urban regions as an adaptation strategy (though migration to rural settings does occur). Migration can occur at the individual or household level, depending on the context, and can mitigate the negative impacts on physical and economic security, particularly in rural communities given their dependence on agriculture (Rodgers, 2022; IOM, 2021; Brzoska and Frohlich, 2016; Van Praag, 2021; Baldwin and Fornale, 2017; Bettini, 2014). As mentioned previously, there has been concern in some academic and policy settings regarding assumptions of direct linkages between climate change, migration, and subsequent conflict. Some studies have found that climate change leads to a reduction in the availability of resources and, as groups migrate to new regions, increased competition for resources followed by conflict (Brown, 2007; Balsari et al. 2020; van Baalen and Mobjörk, 2016; Gupta et al. 2021). However, more nuanced works paint a picture of how climate change and climate events combine with other factors, such as economic insecurity, political instability, and pre-existing social tensions or armed violence, to exacerbate (rather than trigger) vulnerabilities related to migration and conflict (Freeman, 2017; Abel et al. 2019; Burrows and Kinney, 2016).

These alternate approaches configure climate change as a "threat multiplier". For example, wealthier individuals may be able to migrate to new regions without selling their belongings, but poorer individuals in rural communities typically must sell their homes, land, and valuables in order to leave (Burrows and Kinney, 2016). In Iraq, this has led many migrants to establish makeshift homes on the outskirts of cities like Basra and work in informal positions with minimal access to social services (IOM, 2021). Similarly, women throughout the MENA region will likely contend with additional vulnerabilities given that traditional gender roles charge women with water collection and childcare (Chindarkar 2012). Some women have been assaulted while walking to wells and reservoirs, which could occur more frequently as they are forced to travel farther distances for water (Putsoa, 2022). In essence, vulnerability begets vulnerability, and those in already precarious situations will experience greater hardships than those in more secure positions.

Therefore, in order to mitigate these vulnerabilities, stakeholders must work to build local adaptive capacity against climate change. These strategies can vary widely, though it has been noted that national policies or programs can be slow to reach communities affected by climate change (Van Praag 2021). In particular, irrigation and water management systems must be improved to reduce water waste and allow people, particularly in rural

communities, to maintain their livelihoods. However, approaches must be tailored to the local context. Project X in Morocco is an example: a local government official pools portions of labour migrant families' remittances to fund climate resilience projects. Not only does this give agency to community residents, but it also promotes community-building in pursuit of a common goal (Van Praag, 2021). Similarly, women's education and empowerment, conflict resolution infrastructure, and economic diversification are necessary investments to be made at local, regional, and national levels to ensure that citizens' physical and social needs are met (Hamad et al. 2017; Chindarkar, 2012; Soltani and Mellah, 2022; Brika, 2019).

Such proposed strategies and policies are indeed essential but often suffer from implementation challenges that result from early mischaracterizations of the nature of the relationship between climate change, conflict, and migration. If it is understood that climate change is an exacerbating factor, then building climate resilience must be part of a larger multifaceted agenda to address these domains. Strategies cannot be applied universally across the MENA region, so researchers must better define the social, political, and institutional factors that contribute to the rise of migration and conflict in context. For instance, water scarcity was believed to be a driving force in the internal conflicts throughout Darfur; however, rainfall from 2003 to 2005 was higher than the annual average (Selby and Hoffmann, 2014). While general water scarcity contributed to the severity of the conflict, climate data, coupled with scholarly insight regarding the sociohistorical background of Darfur and its peoples, demonstrate that climate change is just one of many compounding factors. In order to better assess and address climate change, conflict and migration in the MENA region, climate data along with the socioeconomic and political histories of distinct regions must be analysed more closely to allow for researchers to establish better causal frameworks and for policymakers to implement more effective programs.



3.

Libya



3. LIBYA

Libya is classified as both a destination country for people seeking a better quality of life and economic survival from across the continent of Africa and as a transit point (including trafficking and smuggling) due to its location on the Mediterranean Sea. Globally, the number of refugees fleeing conflict and violence has doubled worldwide to more than 25 million since 2007; more than 18,000 people have died crossing to Europe off the Libyan coast since 2014 (The Guardian, 2021). By 2016, the route from Libya to Italy became the most travelled and deadly smuggling route to Europe (IOM, 2017). Some of these people are fleeing violence and instability in their countries of origin; others are migrant workers, including those who can no longer make a living because of climate change (e.g., drought-induced crop failure, and rising ocean temperatures affecting fisheries).

This situation of extreme vulnerability has led to the emergence of human and sex trafficking networks, as well as conditions of modern slavery (Onuoha & Okafor, 2021). Both regular and irregular channels have presented signs of human-trafficking conditions, gender-based violence, and enslavement. Furthermore, these conditions serve the interests of non-state actors vying for power who benefit from the revenues generated by various centres and auction sites for migrants (Al-Dayel et al., 2021). In thinking about the issue of human smuggling, analysts call for attention to both the smugglers and the migrants, as exclusive focus on the latter results in both conceptual and physical displacement to other routes without getting closer to the root causes of the problem (Gathmann, 2008).

Since the collapse of the dictatorship and the death of Muammar Ghaddafi, state agencies have had to contend with faced economic collapse, resource scarcity, fragmentation of political and military groups, significant numbers of internally displaced persons (IDPs) and the resulting tensions with host communities and Arabic vs. non-Arabic speakers (El Ghamari & Gabriela Bartoszewicz, 2020). Multiple armed factions continue to jostle for power (including resources such as water and oil), and Libya remains intensely destabilized (Megerisi, 2021; USAID, 2017; World Bank, 2021).

Libya's geography is characterized by huge semi-deserts covering 85-90% of the country, with the Mediterranean coastal region giving way to the hyper-arid Sahara (Braun and Jeworutzki, 2020). It is one of the driest countries in the world, with less than 2% of its land mass receiving enough rainfall to sustain agriculture and only 5% of the country receiving a minimum of 100ml of rainfall annually (USAID, 2017). Despite the programs in the past to plant millions of trees, there has still been notable desertification. Many have also argued that the Arab Spring uprising was intimately tied to the effects of climate change (i.e., rising food prices caused by decreased rainfall or natural disasters) (Kuobi, 2019; Smith, 2014), in no small part due to reduced agricultural output of supplier nations like Russia and China. These conditions combine with issues related to water scarcity and the factors in the above paragraphs – “compound events leading to cascading events” (p.5) - portending ongoing instability in the region (Scheffran, 2020).

3.1. Extant Findings and Gaps in Understanding

More research on countries of origin for migrants in Libya is required to understand the relationship between the increased political unrest and the trajectories and intensities of migrant flows. To date, researchers have highlighted the diversity of needs, interests, and challenges within different implicated populations - i.e., there is no singular “migrant experience”. For example, a recent ethnographic study of children in Libyan refugee camps found that threats to their security are related to the health, safety, education, and recruitment of militias and terrorist organizations. Underlying conflict-induced factors exacerbated the situation (El Ghamari & Gabriela Bartoszewicz, 2020). The observable stunted growth of children that prompted the study supports the assertion that research into these contexts must also factor in the different challenges faced by individuals over the various stages of the life course, among other axes of differentiation (e.g., ethnicity, gender).

Libya has had to contend with conditions of food insecurity following prolonged conflict since 2011 as a result of power cuts, increased insecurity, inability to access or afford seeds and water resources, depreciation of the Libyan dinar, forced displacement due to conflict, high levels of food importation (80%), and its natural features (Ehdadan, 2020). As is the case in other settings, violent conflict can result in the death or injury of the head of household, job and income loss, disruptions in the supply chain and resulting scarcity of food and other items. Importantly, in Libya, Swesi and colleagues (2020) conducted a qualitative study of rural and urban areas in three regions and found that the election of a new government in 2012 and subsequent periods of stability resulted in reduced pressures on food availability. However, the renewed conflicts in 2014 contributed to a new wave of displacement, death, destruction of critical forms of capital, inflation, lack of liquidity in the banks, and unemployment – thus ushering in another wave of food insecurity.

Pre-2011 food subsidy programs run by the government consumer associations never returned to their former strength, which resulted in the WFP decision to resume food assistance operations in-country (WFP, 2018). A critical distinction between rural and urban households in this regard was that the former relied on food production and the latter on purchased foods. Migration resulting from conflict violence out of the rural regions signified an exodus of agricultural labour and rendered the rural populations particularly vulnerable. As a result of this, households adopted eight coping strategies, which illustrate further the interconnectedness of conflict and mobility decisions: food compromising, asset compromising, changing employment and income generation, budgeting, borrowing and renting, relying on food aid, using location cooperation, and migration (Swesi et al., 2020).

Importantly, coping mechanisms used in the Libyan context have also been used in non-violent contexts, suggesting that, while violent conflict may give rise to certain conditions of insecurity, the mechanisms that individuals, families, communities, and societies have at their disposal to adapt to these challenges may not necessarily be limited to conflictive

settings (Swesi et al., 2020). Furthermore, contextually embedded understandings of these mechanisms are critical since the study in Libya revealed novel approaches to coping with food insecurity and the absence of other approaches found in other contexts. This may be in part to the relative wealth of Libya to other comparable contexts and the general absence of hunting and gathering as a form of subsistence and livelihood (Crush, 2013; Farzana et al., 2017; Maxwell & Caldwell, 2008; Rademacher-Schulz et al., 2014).

As noted previously, there exist few studies that convincingly link the three elements of climate change, conflict, and migration – especially in terms of constituting a causal chain of relationships. However, one recent piece did find that there was a statistically significant relationship between these three factors during particular time periods and contexts. In the countries affected by the Arab Spring– Libya, Egypt, Syria, and Sudan – climatic conditions affected drought severity and the likelihood of armed conflict, which in turn became an explanatory factor for asylum-seeking between 2010-2012 (Abel et al., 2019).

These findings highlight several elements important for the present study: 1) it is apparent that some relationship exists between these dynamics; 2) the interplay among them is subject to specific sociohistorical, political, and economic factors; and 3) more empirical data, and especially qualitative insight that is based on the perspectives of those people most affected, is needed to be able to describe the relationship between CCM factors and their impact on living conditions. Some scholars have recently noted that contemporary Libya “is first and foremost characterized by conflict and war” (El Ghamari & Gabriela Bartoszewicz, 2020 p.15). And while violent conflict no doubt exerts significant pressures on all areas of population life and livelihood, this project will embed such a monochrome characterization within a larger array of environmental, mobility, and socioeconomic and political factors.



4.

Sudan



4. Sudan

In the Sudanese context, the effects of climate change challenge populations' abilities to adapt due to significant dependence on natural resources, limited alternative livelihoods, political marginalization, and violent conflict dynamics (for instance, due to conflicts over pastoral lands) (Seyuba et al., 2021). The Sahel (drylands) region of Africa, which cuts across Sudan, is particularly climate-vulnerable and climate change and events have threatened agriculture, pastoralism, and the relationship between the two critical economic sectors in multiple ways: rising temperatures, dwindling livestock sustainability, new instances of pests and diseases, and drought (Sisdoia, 2022).

These conditions have been shown to increase farmer-herder competition over land and water and elite and armed group exploitation of marginalized groups (Ovidie Grand & Tarif, 2021). Climate variability has resulted in the desiccation of the Sahel and three decades of near-drought conditions (even though this is sometimes erroneously attributed to only overpopulation pressure and overgrazing) (Young et al., 2009). These factors combine with recurring dust storms, deforestation, and drought to further reduce vegetation cover and quality of the topsoil – important changes for populations whose livelihoods are significantly connected to natural resources.

Additionally, desertification is one of the biggest environmental problems affecting Sudan. Desertification is caused by both climatic and human factors, these include drought, population growth, the spread of extensive agriculture, deforestation, rapid urbanization, lack of local political power, the lack of economic institutions and the absence of social institutions, which have tended to reduce the capacity of the local people to cope with the resource degradation problem (Laki 2009). As a result of all of this, several vulnerability indices rank Sudan among the most vulnerable to climate variability and change in the world. For example, the country ranks 176 out of 181 according to the Notre Dame Global Adaptation Index (ND-GAIN, 2022). Several indications thus suggest that the country is extremely vulnerable and unprepared to fight the devastating effects of climate change.

Local conflicts in Sudan have long histories rooted in a complex interplay of economic, social, and political conditions. Climate change and events exacerbate these dynamics. For example, in a situation where traditional and customary agreements have existed for dual land use by sedentary farmers and pastoralists according to well-established seasonal cycles and mechanisms to resolve land-use disputes, more frequent droughts have led farmers to extend cultivated land while pastoralists have sought new grazing land and changed their migratory routes and the timing of movements, all resulting in increased tension and conflict (Gari, 2018). Competition for water and fertile land, together with political instability and historical shifts in relations of power and authority, certainly undermine attempts to improve conditions of human security. Nevertheless, more

systematic data collection is required to develop a robust evidence base linking each element to the other, and it is important to bear in mind that environmental degradation can often be a relative political term in that one person's degradation often represents another's functioning livelihood (Watts, n.d.).

4.1. Extant Findings and Gaps in Understanding

Existing work thus suggests that, in Sudan, climate change interacts with livelihoods, migration and mobility, armed group tactics, and elite exploitation to threaten human development and security in the region. Already in 2007, then Secretary General of the United Nations, Ban Ki-Moon identified climate change as one root cause of the conflict in Darfur. What was framed in international dialogue as simply an ethnic conflict between Arab militias and African rebels and farmers was actually a complex suite of factors, not least of which was increasingly antagonistic inter-group tension tied to the effects of rising temperatures, drought, and dwindling food and water sources (Moon, 2007).

The negative effects of climate change and extreme weather events will only increase Sudan's climate risk exposure, continuing to undermine peace and security until they are resolved. Among priority populations are groups whose livelihood depends on the weather; conditions of armed conflict heighten their precarity, increasing the likelihood of resorting to force to defend remaining resources (Seyuba et al., 2021). Already, Sudan is experiencing increased natural disasters and conflict-related displacement (Schaar 2022). These are both - directly or indirectly - related to the impacts of climate change and can be expected to increase further in the absence of adaptive actions. The persistent political instability and widespread poverty and food insecurity suggest a largely insufficient coping capacity; vulnerability to drought is extremely high. Rainfed crops are largely prevalent and fully exposed to dry spells, while relatively meagre pastures drive the nomadic habits of herders, with consequent risks of conflict over land and water resources. Moreover, the country is a net importer of staple food and is thus subject to price volatility. Critical situations in relation to water scarcity are common occurrences due to conflict, poor water management, over-exploitation, and contamination or lack of access.

Successful strategies for tackling the tensions in Sudan require a multidimensional approach and include those that have improved climate resilience through strengthening conflict resolution capabilities, managing the environmental conditions, and addressing the root causes of vulnerability and exclusion. Climate resilient approaches to development adopt a long-term thinking and planning horizon to address the underlying causes of conflict, integrating environmental management considerations into this thinking, as well as a suite of other factors. In Sudan, as in other comparable settings, such an extended time horizon can be challenging due to 1) humanitarian agencies' tendencies to focus on emergency response; 2) security threats that drive the risk-reward ratio upward (and thus, out of the range of donors' comfort); and 3) uncertainty around governance and stabilizing capabilities at the local and national levels (Watts, n.d.). Some successes have been found,

however, with developing local entrepreneurship initiatives in forestry and agriculture supply chains, which can help to address the challenges of youth unemployment (Sisdoia, 2022).

At the institutional level and beyond (e.g., cross-sector and inter-institutional collaborations), recent studies have convincingly argued that leveraging regional institutions in collaborative policy and program development for those issues that transcend the Sudanese national border can better equip national leaders to adapt to climate change and its cross-cutting, transboundary effects. Freedom of movement, disease monitoring and response systems, and pastoral preservation in general feature among these issues (Sisdoia, 2022).

National governments and international bodies (when compared, for example, to local and regional leaders), are uniquely suited to contribute to developing solutions in the domains of trade, border sovereignty, foreign direct investment and borrowing, and human development and security. For this reason, they would benefit from mainstreaming climate management into their policy planning over the short, medium, and long term through National Adaptation Plans (NAPs) (Sisdoia, 2022).

Though a persistent challenge in all conflict-affected contexts, it is no less true in Sudan than it is in other settings that emergency responses do not address the long-term issues and underlying causes of conflict. At its worst, humanitarian aid can exacerbate historically entrenched challenges by generating cycles of dependence that directly undermine sustainable solutions (UNEP, 2007). This represents a key priority for international cooperation and third-sector partners in collaborating with communities and local and national-level state institutions. Climate resilient development also constitutes a complex challenge with a long time horizon; for this reason, it is particularly appropriate that policymakers and program designers approach the two domains in tandem (Watts, n.d.). To support this, the present study looks to fill the gap in empirical data on how these dynamics manifest in interconnected ways in context. For example, even though a great deal of the work of the United Nations Interim Security Force for Abyei (UNISFA) includes resolving local resource-related disputes, the threats to human security that climate change poses are rarely mentioned in official mandates and program directives.

In sum, any programs or policies attempting to build resilience and adaptation to climate change, conflict, and migration require a more robust set of empirical evidence, and a more thorough accounting for the wider socio-political and economic context in which they embed (Watts, n.d.). Explicit recognition and response development related to the constellation of CCM and related factors as they embed within broader ecologies of vulnerability are critical for ensuring a complete MECC and DRR assessment in both countries included in this study.



5.

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