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SUMARIO

The central Sahel: climate change, migration and conflict

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Abstract: The effects of climate change will be particularly severe in the Sahel zone in the coming decades, with rising temperatures, possible widespread desertification and environmental degradation (IPCC, 2019). Policymakers, think tank reports and statements from international organizations point to a «threat multiplier» as an effect of climate change, which would lead to increased conflict and displacement (Tesfaye, 2022; World Bank, 2022). But the reasoning is less obvious than it seems. First, it is necessary to deepen the relationship between climate phenomena and mobility, and to reflect on the climate change-fragility-conflict nexus. Finally, it is necessary to identify what the main impacts of climate change will be and how they could affect conflict and migration.
From a political ecology approach, the article focuses on the interaction between climate change, human mobility and conflict in the central Sahel, mainly in Niger, Mali and Burkina Faso.
Keywords: Climate Change; Migration; Conflict; Sahel.

El Sahel Central: cambio climático, dinámicas migratorias y conflictos

Resumen: En las próximas décadas, los efectos del cambio climático se manifestarán con particular intensidad en la región del Sahel, una zona ya caracterizada por su fragilidad ecológica y social. El aumento sostenido de las temperaturas, la posible desertificación generalizada y la degradación ambiental progresiva representan desafíos significativos para la sostenibilidad de los medios de vida en esta región (IPCC, 2019). Los responsables políticos, informes de centros de investigación (think tanks) y declaraciones de organismos internacionales han caracterizado al cambio climático como un «multiplicador de amenazas», aludiendo a su potencial para intensificar conflictos existentes y provocar desplazamientos forzados (Tesfaye, 2022; Banco Mundial, 2022). Sin embargo, esta lógica es menos evidente de lo que parece. En primer lugar, es necesario profundizar en la relación entre los fenómenos climáticos y la movilidad humana, así como reflexionar sobre el nexo entre cambio climático, fragilidad estatal y conflicto.

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Finalmente, es fundamental identificar cuáles serán los principales impactos del cambio climático y cómo podrían afectar a los conflictos y a la migración.

Desde un enfoque de ecología política, el artículo se centra en la interacción entre el cambio climático, la movilidad humana y el conflicto en el Sahel central, con especial atención a los casos de Níger, Malí y Burkina Faso.
Palabras clave: Cambio climático; Migraciones; Conflictos; Sahel.

Introduction

Climate change impacts appear likely to be particularly severe in the Sahel zone (IPCC, 2019). Although uncertain, increases in rainfall variability (in time and space); in the frequency of extreme events such as droughts and floods; and in temperatures relative to the global average seem likely to be the main impacts of global warming (IPCC, 2019; Trisos, et al. 2022). Logical reasoning asserts that degradation will exacerbate conflict and instability and encourage more migration (Tesfaye, 2022). This statement evokes a «threat multiplier» based on climate change-fragility-conflict and migration. But questions arise: how are the different phenomena related and is this hypothesis rigorous?

There is an open debate in academia between those who suggest that climate change would be a driver of conflict (Hsiang et al. 2011; Burke et al. 2015) and migration (Myers, 1995; Christian Aid, 2007); and those who qualify this, or prioritize other social and political aspects (Buhaug 2010; Charbonneau, 2022). Former UN Secretary General Ban Ki-moon was one of the first to introduce the global warming-conflict connection, speaking of «climate wars» related to the Darfur war (Raleigh & Urdal, 2007). Some scholars have replicated this narrative by re-examining the climate change-conflict-migration nexus (Burrows & Kinney, 2015).

This paper aims to overcome simplistic approaches that present the Sahel as a devastated area due to a precarious climatology. It intends to delve into the political, social and cultural aspects that intersect with the impacts of climate change (Benjaminsen, 2012). From a political ecology approach, the study analyzes the consequences of climate change on livelihoods in Mali, Niger and Burkina Faso, three of the most impoverished countries in the world.

The article is divided into different sections: the first section reviews the nexus between climate change, conflict and migration; the second focuses on presenting the Sahel in relation to mobility and conflict; and the third explains what the main drivers of climate change are expected to be and how they will affect displacement and conflict.

Methodology

This article bases on a mixed-methods design approach, combining qualitative literature review, semi-structured interviews an online survey. Desk research includes academic articles, grey literature, technical reports and policy briefs in order to prepare semi-structured interviews with relevant experts and stakeholders. Between July 2020 and February 2021, we conducted 38 online interviews with representatives of national, regional and international organizations, civil society organizations, and farmers' and pastoralists' organizations, as well as experts on development, security and climate issues.

Experts and stakeholders from the Central Sahel, mainly in Niger and Mali, participated in the online survey. It provides interesting insights into participants' preferences regarding adaptation and resilience measures in the region[1]. This methodology is the alternative to the initially planned representative face-to-face survey, which was impossible to carry out due to Covid-19 restrictions. Online surveys encountered difficulties in the Sahel, where Internet penetration is still limited, although growing exponentially, especially through cell phone access. Despite this, the survey was a success and provided interesting results and leads for future research.

Two hundred sixteen people out of a sample of 850 (82% men and 18% women) were invited by e-mail to respond to the survey. We consider this 25% response rate to be satisfactory in the pandemic context in which it was developed. The sample has certain limitations and biases, particularly in relation to gender and to the fact that a large number of experts live in urban areas, to the detriment of rural perspectives. Nevertheless, we made a great effort to reach out to experts with diverse profiles, in terms of country and areas of expertise and professional background. The majority of respondents, 82.4%, identified themselves as experts in Niger, followed by 53% in Mali and 45.4% in Burkina Faso. In terms of professional experience, 52% worked in the public sector and 43% in the private sector. Within the public sector, a large majority (50%) worked in universities, 14% in international organizations and national governments and 11% in other fields. In the private sector, the vast majority (63%) were in NGOs and 15% in other fields. In terms of expertise, we try to involve people from the fields of peace and security, development and food security and, of course, mobility, as well as experts in climate change adaptation and resilience.

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1 The complete raw data is published in Bourekba. M. & Puig. O. (2021). *CASCADES survey on the effects of Climate Change in the Sahel region* (2020). [Dataset]. Zenodo. http://doi.org/10.5281/zenodo.4727021. The results can also be found at Puig-Cepero, et al. (2021)

This article bases on an EU H2020-funded project that delves into the intersection of climate change, food insecurity and conflict in different areas of the world. It analyses how the cascading effects could eventually affect the European continent[2]. The text is only part of the larger case study on the Sahel that we carried out as part of the project.

1. The climate change-conflict and migration nexus

In recent years, the climate change-conflict-migration nexus has been extensively addressed in the academic literature (Scheffran et al. 2012). Some authors find a primary connection between climate stress and insecurity, while others conclude that rising temperatures or rainfall variability do not determine the risk of violent conflict or political instability (Burrows & Kinney, 2015). The first group finds a correlation between higher temperatures, droughts, and social conflict in Syria or in Sub-Saharan Africa (Hendrix & Salehyan, 2012), whilst the second rejects it (Sletteback, 2012). Werrell & Femia, for example, affirm that climate was either a «primary or substantial factor» in Syrian conflict, while Selby, Dahi, Frohlich and Hume insist in «the extremely weak» link between those phenomena (2017: 240). Something similar happens vis-à-vis 2003-2005 Darfur conflict, considered by a large number of policymakers as the «first climate war» (Mazo, 2010) but with no solid evidence relating the Sahelian drought to anthropogenic climate change –in fact, possibly the opposite-, according to Dong & Sutton (2015). Verhoeven (2011), for his part, associates this link to «naivety and securitization» discourse. Like him, other studies confront the one-dimensional narrative about desertification, violence and migration, emphasizing the importance of political and social factors in climate change impacts (Gleditsch, 2012).

The debate between the different views is open and depends largely on «the data sets chosen, the time series, the definitions of conflicts, the non-consideration of compensatory studies, and the comparability of results and generalizability across different geographic settings» (Woertz, 2014). Quantitative approaches dominate the field with temperature and precipitation data in conjunction with conflict records, which provide «no answers about the relationship or the nature of any statistical relationship», according to Vivekananda et al. (2014: 488). The Fifth Assessment Report of the IPCC states, «collectively

2 This article is based on the project entitled CASCADES that has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement no. 821010. It reflects the views of the author; the European Commission and its Agency are not responsible for any use that may be made of the information contained therein. https://www.cascades.eu/

the research does not conclude that there is a strong positive relationship between warming and armed conflict» (Adger et al. 2014: 772). Others, meanwhile, consider that «the absence of conclusive quantitative evidence for a causal link between climate and conflict should not be seen as evidence for the absence of any connection between the two phenomena» (Kallis & Zografos 2014: 77).

Several works indicates that the links between climate change and conflict are complex and indirect (Gleditsch, 2012; Kloos et al., 2013). In this regard, Snorek states that these are «multidimensional phenomena whose contingent occurrence depends on the interaction of context-specific institutional, economic, social and historical factors, with which climate change impacts are often intertwined» (2014: 1). Vivekananda, from her side, exposes «people in weaker social positions, meaning those with less financial resources, assets, knowledge, representation and power, are in general more vulnerable to environmental and climatic change» (2014: 490). Poverty, thus, should be addressed as a political issue rather than a «natural» event or a consequence of meteorological variables, with no «strong association» between income inequality and civil war (Barnett & Adger, 2007).

Vivekananda et al. (2014) propose a climate-resilience-peace nexus to address the climate-fragility-conflict nexus, meaning that adaptive capacities among vulnerable societies have «positive» effects in the face of climate change conditions. The authors stress that although «this resilience-focused approach holds great promise, its practical implementation requires far-reaching structural changes (2014: 497). In fact, public authorities, NGOs and external donors have already implemented strategies along these lines, but instead of «positive effects», they have obtained counterproductive results, according to Benjaminsen (2012). These are «divergent adaptations» in Snorek's terms, those actions to «promote the success of an individual/community (user A) in a shared ecosystem that leads to a reduced adaptive capacity of an alternative individual/community (user B) in the same ecosystem» (2014: 2). In other words, «positive» actions in one population or territory can have «negative» consequences for other groups or regions.

Migration often appears related to climate change-vulnerability and conflict. The media and policymakers construct discourses based on how climate change threatens livelihoods and state security, and leads to armed conflict, which in turn leads to more migration (Burrows & Kinney, 2015; De Haas et al., 2020). This widespread approach originates from Myer's well-known book *Environmental Exodus* (1995), which establishes a direct connection between environmental change and large-scale migration, considering «deser-

tification, deforestation, lack of water, salinization of irrigated land and depletion of biodiversity linked to rapid population growth in less developed countries as the main causes of displacement» (Castles, 2002). This apocalyptic and simplistic discourse anticipates «the most important human crisis of our time» due to the impossibility of «containing the growing flood» of refugees, some 25 million «environmental refugees» that would increase to 200 million in 2050, according to their predictions (De Haas et al. 2020).

Richard Black, in his book *Refugees, Environmental and Development*, counter argues that «environmental factors in isolation do not help in understanding specific situations of population displacement» and asserts that there is «little evidence of actual large-scale permanent displacement caused by these factors» (1998). In this sense, «people rarely migrate for environmental reasons alone, so understanding how climate change may induce more migration requires understanding interactions with other factors,» in the words of Meze-Hausken (2000). Migration is the result of the interaction between structural, relational and individual factors driven by many reasons, and the environment is only one of them (Faist, 2000). De Haas (2020) is sceptical about mass migration due to climate change because most people affected by rapid onset stresses - earthquakes, floods and hurricanes... - usually move short distances rather than long distances (Salloum Lindegaard, 2021; Gemmene & Blocher, 2017).

Faist, meanwhile, focuses on how «adaptation to adverse climate change (re)produces social structural and social stratification features, namely social inequalities» (2018). Likewise, other scholars highlight how development projects - dams, mining, airports, industrial zones or middle-class housing complexes - and wildlife conservation configure one of the main causes of displacement (Benjaminsen, 2012; Felipe-Pérez, 2022). There is thus a contradiction between the concept of «development» to mitigate hypothetical migratory risks and «development» itself as the main driver of displacement.

As for the exaggerated and spectacular European discourses on the waves of «climate refugees» trying to reach Europe, it is difficult to isolate the climate factor from others (Salloum Lindegaard, 2021; Pajares, 2020) and it is necessary to take into account the risk of instrumentalizing climate change-induced migration to legitimize migration containment policies (De Haas, 2020; Raineri, 2022). Concepts such as «climate refugees», «environmental refugee» or «ecomigrant» are controversial for different reasons: legal issues requiring the broadening of the interpretation of the Geneva Convention relating to the Status of Refugees, but also because of the monocausality evoked, which very rarely exists (Gemmene, 2015; Kraler et al. 2020). In the Sahel zone, migrations

are of increasing global importance, even if mobility has always been part of the populations of the region (Hampshire, 2002).

The central Sahel: human mobility and conflicts

In the Sahel, seasonal and circular migration has been a way of life for generations as a means of economic diversification and to cope with erratic rainfall conditions; a phenomenon that some have called «cultures of mobility» (Hahn and Klute, 2001). Different types of mobility are common in the Central Sahel: nomadism, transhumance, rural-urban migration and temporary migration to neighbouring countries, known as *exodus* (Boyer, 2019).

Mobility in the region is mainly internal and remains within Africa, historically reaching the Gulf of Guinea countries such as Ivory Coast, Nigeria and Ghana (Alpha Gado, 2000); or North Africa, mainly Algeria and Libya (Molenaar, 2017; Puig-Cepero, 2017). Only a small share of Sahelian migrants head to Europe, although current conflicts and political instability point to a slight increase in migrants heading north. This contrasts with the importance that migration through the Central Sahel has gained in EU policy circles in recent years.

Not least since the so-called «refugee crisis» in Europe and the 2015 Valletta Summit, the EU has been keen on curbing transit flows through the region. It has put in place a strategy of border reinforcement and development cooperation, aiming at the sedentarisation of mobile communities in the region. This system is mainly supported by the EU Trust Fund for Africa, which is backed to 75% by the European Development Fund (EDF) and to 25% by contributions from the member states (Venturi, 2017; Puig-Cepero, 2019). The EU has focused on stemming flows through Niger, a historical crossroads of African migrations to the north, which in recent years has become an important part of the central Mediterranean migration route to Europe (Puig-Cepero, 2019). Containment, however, is indirectly encouraging other, more clandestine routes and exposes migrants to more human rights violations (Brachet, 2018; Boas, 2020)[3].

Mobility is essential for livelihoods in the region. Sahelian countries have protocols on the free movement of people, adopted by ECOWAS in 1979, and a specific protocol on transhumance in 1998 (Idrissa, 2019). Cross-border pas-

3 Migration containment policies were in place from 2025 until 2023, when the coup d'état overthrew Mohamed Bazoum in Niger. Since then, the ruling military junta has shifted its sphere of influence and has stoked anti-colonial and anti-French rhetoric to reach out to other international actors such as Russia or China. Regarding migrations, it has repealed law 036/2015, which criminalized human trafficking and migration in Niger, which has meant the revitalization of the route through Agadez.

toral movements increased between Mauritania and Mali and between Niger and Benin, but pastoralists face increasing challenges when crossing borders (FAO, 2012). Informal border crossings continue to prevail, but migration containment policies have led to more controls in the region and violations of regional protocols on free movement (Zanker et al., 2020).

In general, migration patterns continue to be directed mainly towards the southern coastal countries, and less towards the north. Rural-urban migration constitutes a large part of mobility in the region. This migration may or may not be permanent, but it maintains links between rural and urban communities through remittances and social ties (Mounkaila, 2002).

For their part, disputes between farmers and herders have been present in the region for centuries (Turner, 2004). In most cases peaceful coexistence and cooperation has prevailed, but over time there have also been tensions, which in some cases have turned violent, as in recent years (UNOWAS, 2018).

The Central Sahel is home to a number of traditionally sedentary farmers (Bambara, Sonray, Malinké and Fulani), pastoralists (Fulani, Tuareg and Moor) and fishermen (Bozo), who compete and cooperate over natural resource management and access to land (Brottem & McDonnell, 2020). However, it must be said that agriculture or pastoralism are not exclusive to specific ethnic groups: a combination and hybridization of activities is increasingly observed, which also induces collaboration and tension.

In any case, since the destabilization of Libya in 2011 and the consequent proliferation of weapons in northern Mali, inter-communal conflicts have become more violent, especially in the center of Mali, in the inner delta region, and the border area between Mali and Burkina Faso. Interestingly, most of the communal violence has taken place in or close to agro- pastoral and border areas, especially in Mali. In most cases, these areas also overlap with historical trade routes, where currently much of the illicit trafficking is taking place (International Crisis Group, 2017).

Violence between the historically sedentary and agricultural Dogon and Bambara communities and the traditionally nomadic and semi-nomadic Fulani pastoralists escalated since 2015, resulting in several massacres (Human Rights Watch, 2018). The conflict between communities can be traced back to longer-term historical grievances over natural resource management, as well as policies that have favored agriculture over time, to the detriment of pastoralism (Benjaminsen, 2012).

Currently, the lack of clear demarcation and non-compliance with protocols for the use of grazing and agricultural areas - by both pastoralists and farmers - have led to agricultural encroachment on pastoral lands, overgraz-

ing, intensification of livestock production and lack of compensation for crop damage (Brottem & McDonnell, 2020). Other factors such as the increasing privatization of land, exclusive agreements that contravene customary tenure relations, or the current ineffectiveness of conflict resolution mechanisms, including local and traditional ones, have also aggravated tensions (Chevallier et al., 2019).

Tensions occur within communities due to highly stratified social relationships that benefit a small feudal elite (Ba & Cold, 2021). The mismanagement of natural resources often lies at the heart of these conflicts, as do corruption and rent-seeking at multiple levels, from the local to the national level. This is visible in pastoralist communities, for example, whose leaders have historically charged fees for allowing grazing. Today, these Jowros, local Fulani leaders, stripped of their former powers and authority, continue to collect part of these fees and collaborate with state officials to do so (Benjaminsen et al., 2012). This is fueling grievances among pastoralists, which are skillfully exploited by armed groups (Ba & Cold, 2021). Disputes over grazing areas have also been exacerbated by xenophobic attitudes towards herders of other nationalities in recent years (UNOWAS, 2018).

Local communal tensions and social inequalities are frequently exploited by political elites or armed groups with larger geopolitical ambitions. They are thus intertwined with dynamics that operate at the national level and beyond - for instance, in relation to the penetration of Wahhabi Islam into the region and armed groups adhering to this ideology. This has led to a loss of trust and legitimacy of formal and informal institutions, and a growing role for non- state actors, including armed groups (UNOWAS, 2018).

Violent extremist and armed opposition groups (AEG) have proliferated throughout the Sahel, especially following the international intervention in Libya in 2011. Although they operate throughout the region, their main reach is currently limited to three areas: northern Mali, especially Timbuktu and Kidal; the Liptako-Gourma region (border between Mali, Niger and Burkina Faso), as well as the Lake Chad basin (Boas and Strazzari, 2020). In these areas, they operate (loosely) under the umbrella of globalized terrorist groups such as Al Qaeda and the Islamic State. Tensions between these groups are frequent and sometimes lead to open factional clashes (Nsaibia & Weiss, 2020).

The Islamic State in the Greater Sahara (ISGS), with its various subgroups, and Al Qaeda's regional branch, Jama'at Nusrat al Islam wal Muslimin (JNIM), also known as the Support Group for Islam and Muslims (GSIM), are the most active groups in the area. It should also be noted that other violent extremist

groups are active in the region, for example Ansarul Islam in northern and eastern Burkina Faso. These groups are seen as elements of broader social movements, fueled by social discontent, challenging the social order (International Crisis Group, 2017). The expansion of violent extremist groups has resulted in a complex security situation, where these groups have implanted themselves into pre-existing criminal networks (Assanvo et al., 2019).

The EU, France and the United States deployed extensive military missions to contain the proliferation of armed groups in the region. France intervened in Mali in 2013 following the occupation of the north of the country by Tuareg rebels and the 2012 coup d'état. It halted the jihadist advance southward by recapturing occupied areas in the north. From then until 2020, with the coup d'état of Assimi Goïta, the former colonial power kept several thousand troops fighting under the umbrella of Operation Barkhane, launched in 2014. In 2015, the Algiers peace accords were signed between the Tuareg insurgent groups and the Malian central administration, which provided for political decentralization and redistribution of power, especially towards the northern regions. The current military regime in Mali, however, has left these agreements in wet water.

Despite regional security coalitions under the umbrella of the Group of Five Sahel Joint Force (G5 Sahel, which included Burkina Faso, Chad, Mali, Mauritania and Niger) and EU peacekeeping (MINUSMA) and military training and support missions (EUTM, EUCAP-Sahel), all of which have now been deactivated, the proliferation of armed groups has continued and violence has been exacerbated in recent years (Boas & Strazzari, 2020).

Foreign military interventions have thus failed miserably and have faced numerous accusations of human rights abuses and violations (Guichaoua, 2020; Pérouse de Montclos, 2021, 2022). Both armed groups and military factions that have seized power have taken advantage of the context of discontent, violence and instability to increase their ranks and followers.

The proliferation of violent extremists capitalises on poor state governance and the lack of legitimacy and effectiveness of local and non-formal systems of resource management and conflict resolution (International Crisis Group, 2020; Raineri, 2020). Violent repression and human rights abuses committed by police and security forces in pursuit of (suspected) jihadists further alienate local communities and damage already fragile state-citizen relations (Nagarajan, 2020).

The lack of economic opportunities, especially for young people, as well as the social status and prestige that come with taking up arms have also been identified as an important factor in the current context of conflict and

recruitment into violent groups (Brottem and McDonnell, 2020). Other factors influencing recruitment include a limiting gerontocracy, as well as political and ideological radicalisation and the stigmatisation of certain age and/or ethnic groups as perceived supporters or members of armed groups (Nagarajan, 2020). AOGs recruit members of both pastoralist and farming communities, although they are more successful among historically disadvantaged groups, who tend to be pastoralists. However, dangerous stigmatization of certain communities needs to be avoided, as was the case when the Dan Na Ambassagou ethnic militia was created to fight communities allegedly supporting jihadist groups. This led to the perpetration of massacres against the Fulani, which in turn led to reprisals and an increase in inter-communal violence (UNOWAS, 2018).

Armed groups also intervene in natural resource management to curry favor with local communities. Extortion and (the threat of) violence are common practices to gain control of territory and expand their influence (Assanvo et al., 2019; Ba & Cold, 2021). However, in some instances, they have also provided a kind of «justice» for pastoralist communities, offering them protection and promoting grazing rights (Bagayoko et al., 2017; UNOWAS, 2018).

For their part, military coups d'état in Mali, Burkina Faso or Niger, under the guise of anti-colonial and anti-French rhetoric, and self-presented as an antidote to the threats of terrorist groups, have so far failed to deliver on their counter-insurgency claims. Even the intervention of foreign mercenary groups, especially Wagner, far from containing violence has intensified it, especially in Mali and Burkina Faso (ACLED, 2025).

2. Climate change impacts in migration and conflicts

Regarding the impacts of climate change, although uncertain, it is likely that global warming will lead to greater variability of precipitation in the Central Sahel and, with it, an increase in the frequency and severity of extreme events such as droughts and torrential rains. According to the experts surveyed in our study, these effects will be strongest in the ecoclimatic zones with the lowest rainfall, i.e. the Saharan and Sahelian zones. Over time, climate change is also expected to increase temperatures in the region, especially in the northern parts of Mali and Niger. Average annual rainfall is also expected to increase in Niger and along the Mali-Burkina Faso border and to decrease in western Mali.

On the other hand, contrary to what is often assumed, purely climatic factors would probably lead to a greening of the Sahel (Schewe and Levermann, 2017). A desertification narrative has emerged in the region since the great

droughts of the 1970s and 1980s, but there is no scientific consensus on this (Fensholt et al., 2017). Some experts even denounce a «desertification myth» (Thomas & Middleton, 1994), inspired by colonial-era development narratives. However, desertification is present in some pockets of Nigeria and Sudan, although the popular assumption of a general desert advance does not seem to be confirmed by empirical evidence (Dardel et al., 2014). Earth observation studies generally show a positive trend in rainfall and vegetation greenness over the last three decades in the Sahel (Brandt et al., 2015). Conversely, non-climatic factors such as rapid population growth, overgrazing and deforestation could counteract or even reverse this trend (Seaquist et al., 2009). Overall, most of the experts interviewed for this study (58%) expect an increase in desertification in the study area, compared to only 23% who expect a greening, although most of them (52%) consider an overall increase in precipitation in the study area to be the most plausible scenario for the next 10 years (Seaquist et al., 2009).

Based on these expected impacts, climate variability can influence all types of Sahelian mobility, from transhumance and rural- urban migration to cross-border circular migration to neighbouring countries. In particular, rainfall variability and changes in access to water and forage, as well as agricultural encroachment, can lead to unpredictable changes in herd movements that would conflict with established transhumance protocols, corridors and calendars (De Haan, 2016; Brottem & McDonnell, 2020). According to local experts interviewed for this study, herds coming from the north could travel further south in search of water points; this could take place later than usually expected, depending on possible delays in the arrival of the rainy season because of increasingly erratic climatic conditions.

Meteorological variability and environmental degradation can provoke loss of livelihoods both for farmers and pastoralists, which in turn can lead to rural-urban migration, depending on means to travel and economic opportunities in cities (Hampshire, 2002). In this sense, mobility is usually more prevalent among wealthier households than poorer families who lack the means for travelling, accommodation, and other travel expenditures. In any case, some people may be trapped (Black et al., 2011). Mobility works as a diversification of financial capacities rather than as a mere survival strategy in this context (van der Geest, 2011; McMichael, 2014). In general, men are more mobile than women. Yet the «Kantché phenomenon» in Niger is an exception. It is a circular, seasonal mobility of women from rural areas of Niger to cities in Algeria, where women beg in city streets and send remittances back to their families. Sometimes they are exploited and forced into prostitution (Ouma-

rou, 2016). Women engaging in this type of mobility do so in order to respond to challenges in their communities, such as population growth, agricultural expansion, and extreme climatic events, as well as other cultural and social reasons, according to our research.

The overwhelming majority of our surveyed experts (87%) expect more mobility in the Central Sahel in the wake of climate change. Moreover, they identify different mechanisms that could connect climate change to increased mobility, including more violence in the wake of climate change (72%), soil degradation (61%), loss of livelihoods and economic opportunities (55%), or food insecurity (40%).

However, mobility is likely to remain mostly intra-regional, with a focus on movements towards coastal countries in West Africa, which would not represent a substantial change to current patterns (IOM, 2020). In fact, several experts are critical of the idea that climate change would lead to mass migrations towards Europe (De Haas et al., 2020). This view is also somewhat reflected in the results of our survey. A large majority of respondents expect climate-related mobility to remain within Africa (84%) or the Sahel itself (65%). Still, more than half of surveyed experts think that a part of climate- related movements could reach Europe (59%), while only a minority consider migration towards Asia or the Americas as likely (8% and 14% respectively).

Conflict scholars disagree over the specific role of climate change in communal tensions in the Sahel (Benjaminsen & Ba, 2018). A majority of studies find a complex and indirect link between both phenomena, intertwined with other socio-economic, political, and historical factors (Gleditsch, 2012; Kloos et al., 2013).

Several mechanisms could potentially connect climate change to communal violence in the region. The effects of climate change could, under certain conditions, affect local livelihoods and food security, or disrupt established patterns of transhumance and mobility. This in turn could, for instance, lead to more disputes over agricultural encroachment, crop damages, and access to water points, all of which could exacerbate conflicts between communal groups (Brottem & McDonnell, 2020).

According to our survey, climate change impacts are perceived to be among the main drivers of communal violence in Mali and Niger (selected by 47% of respondents), along with poor resource management (61%) and the marginalization of pastoralist communities (44%). The results are in line with previous work that deems resource management most important for the escalation of communal conflicts in the Sahel rather than resource scarcity per se, under-

lining the importance of considering environmental impacts in their wider societal context (Benjaminsen et al., 2012; International Crisis Group, 2020).

The proliferation of violent extremism and Armed Opposition Groups (AOG) is seriously challenging development and peace in the Central Sahel. Climate- induced losses of livelihoods or food insecurity could exacerbate this situation, for instance by creating opportunities for armed groups to more easily recruit destitute farmers and herders in search of food, money, or protection (Ba & Cold, 2021). It also highlights a lack of preparedness and overall failure of public authorities to effectively protect communities from the adverse effects of climate change, which subsequently exacerbates existing anti-state grievances (Ba & Cold, 2021).

The results of our research suggest that climate change is not a prominent direct cause of the proliferation of armed groups in the Central Sahel. This corroborates previous findings that describe climate change as an indirect cause of conflict in the region at most (Benjaminsen & Ba, 2018; McCullough et al., 2019). Our results not only underscore that the effects of climate change on YOG violence are more likely to be indirect than direct, but also suggest that they will largely depend on contextual socioeconomic or political factors, corroborating previous assessments (Brown, 2019; Nagarajan, 2020).

When it comes to identifying the drivers of terrorism in the region, the results of our expert survey suggest that climate change plays a secondary role. Only 23% of respondents identify the effects of climate change as key drivers of violent extremism and terrorism in Mali and Niger. Rather, more experts attribute the proliferation of armed groups to foreign military interventions (47%), religious grievances (44%) and the marginalization of pastoralist communities (37%).

Ultimately, climate change will be an important factor for the future of the Central Sahel. However, both its current and future impacts are intrinsically linked to social and political factors that need to be emphasized in addressing climate-related challenges in the region. To do otherwise would mean the depoliticization of hunger and conflict and allow policy makers to shirk their responsibility (International Crisis Group, 2020). That said, climate change is likely to have significant impacts in the region, including greater variability in precipitation, more extreme events such as droughts and floods, and higher temperatures over time, which will rise faster than the global average. The results of our survey of more than 200 experts in the region confirm this.

Conclusions

Mobility has been rooted in the region for centuries as a way of life, an economic diversification strategy and a measure of adaptation to climate variability. Adverse climate change and the potential loss of livelihoods could lead to further displacement, rural-urban migration and the intensification of regional and cross-border migration. Migration to other African countries is likely to far exceed migration to Europe (Puig-Cepero, 2017; Boyer, 2019). Climate change impacts could also lead to an extension and dispersion of transhumance in search of more and higher quality pastures and access to markets (FAO, 2012). However, it should be noted that the effects of climate change may also induce immobility and aggravate the situation of people who lack the means to relocate.

Restricting migration in the Sahel risks hindering effective adaptation to climate change, especially among households and communities that rely on mobility to cope with erratic weather conditions.

Climate change does not appear to be a direct cause of the proliferation of armed groups in the Sahel, although its disruptive effect on rural livelihoods, food security and dissatisfaction with public authorities could indirectly benefit armed groups. These effects can be expected to be more pronounced in structurally abandoned and peripheral areas. However, when it comes to identifying the drivers of terrorism in the region, the experts surveyed consider foreign military interventions and religious factors to be more important than climate change and resource scarcity.

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