Vegueta

ANUARIO DE LA FACULTAD DE GEOGRAFÍA E HISTORIA

Volumen 26 Número 1 • Año 2026 • eISSN: 2341-1112

ULPGC
Universidad de
Las Palmas de
Gran Canaria

Vegueta

ANUARIO DE LA FACULTAD DE GEOGRAFÍA E HISTORIA

ISSN: 1133-598X
eISSN: 2341-1112

Vol. 26, Nº1
(2026)

ULPGC
Universidad de
Las Palmas de
Gran Canaria

Vol. 26 Núm. 1 • 2026 • D.L.: GC1206-1214
ISSN: 1133-598X • eISSN: 2341-1112
https://doi.org/10.51349/veg
Periodicidad: Semestral

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ANUARIO DE LA FACULTAD DE GEOGRAFÍA E HISTORIA

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Facultad de Geografía e Historia de la Universidad de Las Palmas de Gran Canaria

Colaboración / Collaboration
Departamento de Ciencias Históricas (ULPGC)
Departamento de Geografía (ULPGC)

Diseño y Maquetación / Design & Layout
Margullía – Cultura Digital

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Dossier

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African Studies, Multidisciplinary Approaches from the Humanities and Social Sciences

Vegueta. Anuario de la Facultad de Geografía e Historia
26 (1), 2026, 181-202
eISSN: 2341-1112
https://doi.org/10.51349/veg.2026.1.09

A climate of migration in the Sahel: between mobility and immobility

Un clima de migración en el Sahel: entre movilidad e inmovilidad

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Recibido: 03/07/2025; Revisado: 03/11/2025; Aceptado: 10/12/2025

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). Policy makers and international organizations evoke a «threat multiplier» with climate change impacts, increased food insecurity, more conflicts and more displacement (Tesfaye, 2022). But the reasoning is less obvious than it seems. First, the relationship between climate phenomena and mobility must be deepened; second, the main climate impacts in the area must be well and rigorously delimited to elucidate whether desertification is occurring or, on the contrary, a greening in the Sahel; finally, how climate change will impact displacement in the area; and how migration policies affect mobility in the region. This article focuses, from a political ecology approach, on the complex interaction between human (in)mobility and climate change in the central Sahel, basically Niger, Mali and Burkina Faso.

Keywords: Climate change, migration, adaptation, borders, Sahel.

Resumen

Los efectos del cambio climático serán especialmente graves en la zona del Sahel en las próximas décadas, con un aumento de las temperaturas, una posible desertificación generalizada y la degradación del medio ambiente (IPCC, 2019). Los responsables políticos y las organizaciones internacionales evocan un «multiplicador de amenazas» con los efectos del cambio climático, el aumento de la inseguridad alimentaria, más conflictos y más desplazamientos (Tesfaye, 2022). Pero el razonamiento es menos obvio de lo que parece. En primer lugar, es necesario profundizar en la relación entre los fenómenos climáticos y la movilidad; en segundo lugar, se requiere delimitar de forma clara y rigurosa los principales impactos climáticos en la zona para dilucidar si se está produciendo una desertificación o, por el contrario, un reverdecimiento en el Sahel; por último, hay que determinar cómo afectará el cambio climático a los desplazamientos en la zona y cómo las políticas migratorias influyen en la movilidad en la región. Este artículo se centra, desde un enfoque de ecología política, en la compleja interacción entre la (in)movilidad humana y el cambio climático en el Sahel central, básicamente Níger, Malí y Burkina Faso.

Palabras clave: Cambio climático, migración, adaptación, fronteras, Sahel.

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1. INTRODUCTION

This article sheds light on the possible effects of climate change on human displacement in the Central Sahel, especially in Niger, Mali and Burkina Faso. It examines the complex interplay between climate stresses and human mobility, highlighting displacement as one of the preponderant livelihoods in the area and attending to immobility because of environmental and climatic degradation.

The paper questions reductionist perspectives on climate change and mobility that weave direct cause-effects between the two phenomena. It addresses the importance of climate variability in the region and its socioeconomic impacts, due to the high dependence on rain-fed agriculture, pastoralism and other climate-sensitive livelihoods. However, it considers that its effects must be understood in a broader social context. Therefore, this article considers climate change not only as a physical process, but also as a driver of existing social challenges and inequalities, and as a potential force for positive social change and adaptation.

In addition to incorporating existing literature and analysing publicly available data, this paper presents the results of original research including individual interviews and a survey with experts from and in the region. We asked them about their perception of the linkages between climate change; food insecurity; conflict and mobility and how they may evolve over the next 30 years. The purpose is to promote a multifaceted understanding of climate-related challenges and vulnerabilities in the region, including the role of unequal power relations operating at different levels. In addition, we consulted experts and stakeholders on possible measures and initiatives to reduce these vulnerabilities. However, the interaction of climate change with conflict is beyond the scope of this article, which focuses on mobility.

The article's hypothesis is clear: to what extent is climate change in the Sahel related to increased migration to Europe, and how do restrictive migration policies impact displacement?

Humility, intellectual honesty and avoidance of Eurocentrism as much as possible - being aware that biases are always present but recognizing them when they occur- are key elements of our approach. The article divides into four main sections. The first on the general theoretical framework on climate change and migration. The second on the specificity of the Sahel as a mobility zone and its current importance as a transit territory for migration to Europe. The third on the biophysical impacts of climate change in the area. Moreover, fourth and last, on the impacts of climate change on (in) mobility in the region.

2. 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 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 collected experts' perceptions on environmental vulnerabilities linked to food (in) security, conflict and migration phenomena. 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.

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 analyzes 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.[3]

1 The complete raw data, as well as the methodological design of the survey as a whole, the sample inclusion criteria, all the complete questions, and how the responses were analyzed can be found in the following source: Bourekba; Puig-Cepero (2021). CASCADES survey on the effects of climate change in the Sahel region (2020). [Data set]. Zenodo. http://doi.org/10.5281/zenodo.4727021. The results can also be found in Puig-Cepero, et al. (2021).

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/

3 It is important to note that the study covers the period prior to the creation of the Sahel Alliance in 2023, which has reconfigured the entire Sahel region and led to the withdrawal of Niger, Mali and Burkina Faso from ECOWAS. Future studies should analyse the impacts of this withdrawal on

3. CLIMATE-MIGRATION: A COMPLEX NEXUS

3.1. Exploring the nexus over time

Migration is increasingly being linked to climate change: the consequences of climate disruption would threaten the livelihoods of different populations, leading to conflict (Scheffran *et al.*, 2012b) and/or further displacement (De Haas *et al.*, 2020). This logical reasoning, which is increasingly widespread, and to a large extent applied to our study area, the Sahel, derives from seminal, albeit controversial, work such as Norman Myers' 1995 *Environmental Exodus*, in which he established a direct, if simplistic, connection between environmental change and large-scale migration. He considered «desertification, 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). His apocalyptic discourse anticipated «the most important human crisis of our time» due to the impossibility of «containing the growing avalanche» of refugees, some 25 million «environmental refugees» that would increase to 200 million in 2050, according to his theories.

Richard Black in his book *Refugees, Environmental and Development* disputed this assertion by stating, «environmental factors in isolation do not help in understanding specific situations of population displacement» and asserting 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, therefore, is the result of the interaction between structural, relational and individual factors driven by many factors of which the environment is one (Faist, 2000; De Haas *et al.*, 2020). These positions reject old-fashioned push-pull models that assume migration because of poverty and violence, ignoring the multiplicity of causalities (Massey *et al.*, 1993). Furthermore, De Haas (2020) asserts his scepticism about mass migration due to climate change on the basis of the possibility of adapting to slow onset effects, arguing that most people affected by rapid onset stresses - earthquakes, floods, hurricanes... - move short distances, following a dominant idea in this academic field (McLeman and Hunter, 2010).

In recent times, moreover, different authors have increasingly approached migration as an adaptation to climate change, which is quite appropriate in the already difficult and arid climatic and environmental context of the Sahel (Scheffran *et al.*, 2012a; Gemmene and Blocher, 2017). In this regard, the 2011 Foresight report was instrumental in promoting this idea of looking at migration in the context of environmental change not as a problem but as an adaptation strategy and part of the solution. The International Organization for Migration (IOM) has also echoed this idea, providing a strong rationale for the promotion

regional protocols for the free movement of people.

of mobility and migration options, for example through the creation and consolidation of free movement zones and regional agreements for migration and settlement (IOM, 2025).

The Foresight study recommended improving livelihoods, including through migration, facilitating temporary and circular labour migration and remittances, and using migration as an insurance strategy against risks associated with environmental change. Faist, for his part, focuses on how «adaptation to adverse climate change (re)produces social structural features and social stratification, namely social inequalities» (2018). Another stream highlights development projects - dams, mining, airports, industrial zones or middle-class housing complexes - and wildlife conservation as a major cause of displacement (De Haas, 2020; Benjaminsen *et al.*, 2012). There is a huge contradiction here because within the concept of «development» to mitigate the hypothetical risk of migration lies one of the main drivers of displacement (Vigil, 2022).

3.2. Securitization of climate change and mobility

Regarding the often-exaggerated European discourses on the waves of «climate refugees» trying to reach Europe, it is necessary to point out firstly, that it is not scientifically proven that the people arriving do so strictly for reasons stemming from climate change (Gemmene, 2011). Therein lies one of the main challenges in analysing the phenomenon. Secondly, this narrative relies on the construction of a security threat linked to migration, which is useful for both theoretically progressive and conservative positions: the former to draw attention to the urgency of tackling climate change, and the latter to legitimise their migration control policies (De Haas, 2020). In this sense, the securitisation of the climate change-migration nexus is one of the other challenges to be considered when addressing the phenomenon. From this point of view, concepts such as «climate refugee», «environmental refugee» or «eco-migrant» remain controversial for different reasons.

First, the difficulty of isolating the climatic factor, whether slow or rapid impact, from other elements, bearing in mind that migrations are always multifactorial[4] (Felipe Pérez, 2022a). Secondly, the need to focus on enforcing compliance with the Geneva Convention,[5] rather than expanding it, at the risk that opening the debate would devalue the already weakened current protection regime (Pajares,

4 «Climate migrations» are multi-causal population movements induced by the impacts of the climate crisis in conjunction with other social, economic, political and environmental factors and are part of the so-called «environmental migrations». Environmental migrations encompass mobilities induced by factors such as the construction of mega-projects, pollution, deforestation or industrial accidents». (Felipe Pérez, 2022a)

5 The Geneva Convention on refugee status is clear and refers to persecution on grounds of race, religion, nationality, membership of a particular social group or political opinion, and does not mention climate. However, UNHCR recognised in 2020 that some people fleeing in the context of the adverse effects of climate change and disasters may have valid claims to refugee status under the Geneva Convention.

2020). Refugee status should not be ruled out in all cases -especially when climate impacts intersect with conflicts or are a backdrop to persecution-, which may also occur in the Sahel, although it is difficult to establish a direct cause-effect.[6] In most cases, however, this is not the case. For this reason, for authors such as Felipe Pérez (2022b), it is better to avoid concepts such as climate refuge, since: 1) most climate-induced migrations are internal, often temporary, and therefore do not involve crossing international borders; 2) also, in most cases, states do not fail to protect their populations and are not responsible for their flight; 3) moreover, affected persons usually reject this terminology because they do not want to be perceived as victims and do not want to leave their homes; 4) similarly, the status of climate refugee, for some, would be tantamount to admitting defeat in the fight against mitigation and could be used by rich countries to stop funding adaptation (Felipe Pérez, 2022b).

For others, however, such as Gemmene (2015) or Pajares (2020), it is important to use concepts such as «climate refugee», since they consider that climate-induced migrations are forced and this connects with the idea of refugee. They also admit that it is easier to identify a refugee by a sudden disaster than by a slow-generation impact, but even so, they are committed to more research in this area and to prioritize the protection of people and emphasize the historical responsibility of the industrialized world in the displacement of people. In this line, they consider that the use of other terms is a way of depoliticizing the reality of climate migrations and, they insist, that to be considered as a «climate refugee» the cause should not be unique, but decisive, as is already the case in the Geneva Convention (Salloum Lindegaard, 2021; Pajares, 2020).

The terminological discussions only highlight the complexity of establishing direct causes between climate change and cross-border mobility, and the difficulty of establishing a concept to define different realities, especially those related to internally displaced persons. Despite the open debates, concepts such as «environmental migration and displacement» have recently gained ground, although they continue to attract criticism. In this sense, important advances have been made in recognizing the impact of climate change on mobility, such as, for example, its incorporation in the 2010 Cancun Agreements Adaptation Framework, which talks about improving understanding, coordination and cooperation on displacement, migration and planned relocation as a consequence of climate change. Moreover, the 2015 Paris Agreements, which refer to «migrants» in the Preamble as persons requiring special protection and create a working group to address climate migration. Or the Agenda for the Protection of Displaced Persons across Borders in the Context of Disasters and Climate Change (the Nansen Initiative, 2015) to improve understanding and identify effective practices to strengthen the protection of cross-border displacement caused by disasters, among others. For its part, the Kampala Convention is the first legally

6 For more information, please see the CASCADES project reports where we address the intersection between climate change and conflict in more detail. Broadly speaking, an indirect relationship is established between climate change and conflict in the Sahel, where other factors, such as the historical marginalization of pastoral communities, play a more important role.

binding instrument related to IDPs due to natural disasters such as climate change and is a regional instrument of the African Union (Apap & Harju, 2023).

What has undoubtedly gained relevance is the assumption of «clear connections» between environmental change, including climate change and different forms of migration, always considering the multifactorial nature of the migratory phenomenon (Kraler *et al.*, 2020).

4. THE CENTRAL SAHEL: A SPACE ON THE MOVE

One of the paradigmatic cases to exemplify the climate change-migration nexus in recent years has been the Sahel, an area historically based on mobility and one of the regions most affected by the climate crisis. Although the semi-arid belt stretches from the Atlantic Ocean to the Red Sea and includes 11 states, a myriad of ethnic groups and very disparate political and social situations, our case study focuses on the Western or Central Sahel, i.e. Burkina Faso, Mali and Niger. The area, conceived today as a hotbed of «terrorism» (Puig-Cepero & Roca, 2019; Boas & Strazzari, 2020); the «Europe's new frontier» to curb Mediterranean migratory routes (Brachet, 2018; Puig-Cepero, 2019), and «the most vulnerable region affected by global warming», according to UN Special Adviser on the Sahel, Ibrahim Thiaw,[7] stands as an interesting case to delve into the interplay between climate change and mobility. In our case, we do so from a political ecology perspective, which takes into consideration, qualifies and complexifies the main biases of official narratives based on neo-Malthusian visions, which blame everything on «excessive» population growth or resource depletion due to climatic factors (Benjaminsen & Ba, 2018; Raineri, 2022).

4.1. Internal mobility

Mobility is one of the most important aspects of the Sahel zone. For centuries, rural households in the West African Sahel have incorporated a variety of migration strategies to adapt to seasonal rainfall and the effects of periodic droughts (McLeman & Hunter, 2010). These range from rural-urban mobility - rural exodus -, seasonal migration, transhumance, nomadism or other types of mobility. There is a large literature - more in French than in English - on this type of internal displacement as a form of economic diversification strategy mainly due to community factors but also to individual aspects (Hahn & Klute, 2007; Mounkaila, 2002, Bredeloup, 2008; Brachet, 2009; Bonnassieux & Gangeron, 2015). Furthermore, forced migration should not be overlooked. In March 2025, 3,303,761 people were displaced in the Central Sahel and Liptako Gourma region, including 2,670,331 internally displaced persons (81% of the displaced population) and 633,430 refugees (19% of the displaced population). Seventy-seven per cent of

7 See: «Remarks» Joint meeting between the United Nations Economic and Social Council (ECOSOC) and the UN Peacebuilding Commission, November 13, 2018, www.un.org/ecosoc/.

internally displaced persons were in Burkina Faso (2,062,534), while 14 per cent were in Mali (378,363) and 8 per cent in Niger (202,925).[8]

The Central Sahel area divides - with many exceptions and singularities - into three different portions from an ethnic and mobility point of view: the northern area with nomadic pastoralist groups - Tuareg, Tubu- (Lecocq, 2010); a southern territory closer to the savannah with semi-nomadic populations - Fula, Woodabe... (Hampshire, 2002) - who practice transhumant pastoralism and a third part with mostly «sedentary» farmers - much more varied, Wolof, Tucolor, Soninké, Bambara, Mandé, Ara, Sonray-zarma, Hausa, Kanuri - located in the more humid zone. Despite being considered «sedentary», southern farmers also moved around the area and abroad. From this arises the figure of the *exodant*, a concept of unknown origin and a deformation of the local term «exodus» to refer especially to internal migration (Boyer, 2019). It is «an adaptive migration strategy to reduce the impacts of dry conditions on household welfare, in a process sometimes referred to as 'eating the dry season'» (McLeman & Hunter, 2010).

In Central Sahel, this seasonal regional mobility has historically been addressed mainly to southern countries of Guinea Gulf such as Ivory Coast, Nigeria or Ghana (Alpha Gado, 2000). However, since the second half of the twentieth century with the discovery of hydrocarbon deposits and the economic transformation in Algeria and Libya, both countries became attractive destinations for these populations (Molenaar, 2017). The economic opportunities and pan-African ideas of Muammar Kaddafi made Libya the El Dorado of Africa - *Libya Kaman Turaï*, Libya as Europe, in Hausa- (Puig-Cepero, 2017). Obviously, rainfall variability and environmental conditions influence some of these forms of mobility, but so do other socio-political factors. Regarding migration from Nigerien urban areas to Libya, for example, the causes lie more in the impoverishment of the urbanized middle class than in climatic indicators (Puig-Cepero, 2017). Therefore, as De Haas affirms, «migration is thus an essential part of the economic and social structure of the region, rather than a response to environment decline» (2020).

Although men tend to be more mobile than women are, there is an exception in Niger, the *Kantché phenomenon*. This is a seasonal circular mobility of women from the rural areas of Niger to the cities of Algeria, where they beg in the streets of the cities and send remittances to their families. They are often exploited and forced into prostitution (Alternative, 2015). Women who engage in this type of mobility do so to respond to challenges in their communities, such as population growth, agricultural expansion and also extreme weather events, as well as other cultural and social reasons, according to our research.

4.2. The Sahel, Europe's advanced frontier

Mobility in the region is therefore mainly internal and remains within Africa -about 75% of migration is within the continent and in the case of West Africa the

8 Compared to March 2024, the figures show an increase in internally displaced persons in Niger (+7%) and Mali (+7%), but no change was observed in Burkina Faso (IOM, 2025).

ratio is %-. The rest diversifies between Europe, America and Asia-. Only a small share of Sahelian migrants go to Europe,[9] although current conflicts and political instability point to a slight increase in northbound migrants. This contrasts with the importance that migration through the Central Sahel has gained in EU policy circles in recent years, especially since 2015, especially in Niger - but also in Mauritania or Senegal - which has become «Europe's new advanced frontie» as a corridor to the North (Puig-Cepero, 2019; Afkar/Ideas, 2021).

Agadez, the gateway to the Sahara Desert, was the crossing point for nearly 90% of the flows that reached Italy in 2017, according to IOM data. Since the La Valleta Summit in 2015, the EU established a security-development strategy to curb migratory flows, evoking a response that includes social, economic, security and humanitarian aspects, as well as climate stress risks, known as border externalisation (Prestianni, 2018). One of the main instruments for this was the Emergency Trust Fund for Africa (EUTF) to «tackle the root causes» of migration from a push-pull perspective to sedentarize people (Kervyn & Shilhav, 2017). The result, however, has been a prioritisation of security instead of development; the redirection and clandestinization of routes; the reinforcement of national frontiers with more military and police checkpoints and biometric controls, with more violation of human rights (Prestianni, 2018). EU firmness to restrict migration, thus, could lately imply counterproductive measures for seasonal mobility, conceived as an adaptive capacity of populations (Boas, 2020). Despite these restrictive migration policies, mobility continues and is still «widely seen locally as an opportunity, rather than as a threat» (Venturi, 2017: 21).[10]

Mobility is essential to livelihoods in the region. The Sahelian countries have had protocols on free movement of people for years, adopted by ECOWAS in 1979 and a specific protocol on transhumance in 1998 (Opanike *et al.*, 2015; Idrissa, 2019.)[11] Cross-border pastoral movements are increasing between Mauritania and Mali and between Niger and Benin, but herders face increasing challenges when crossing borders (FAO, 2012; IOM, 2019). 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).

Overall, migration patterns continue to be mainly towards coastal countries in the south, and not so much to the north. Rural-urban migration specially makes up a large part of mobility in the region (Boyer, 2019). This migration may or may

9 Historically, migrants from the Soninke group have been present in France due to a long tradition of travel within the community. Other nationals from Burkina Faso or Mali have migrated to EU countries such as Italy mostly as a result of increasing conflicts, although most migration remains intraregional (IOM, 2020).

10 Migration containment policies were in place from 2015 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 seems to have led to the revitalization of the route through Agadez.

11 Future work should analyse how the departure of Mali, Niger and Burkina Faso from the regional body has affected the region and how the emergence of the AES has impacted free movement in the area.

not be definitive, but it maintains the links between rural and urban communities through remittances and social ties (Mounkaila, 2002). Growing urbanisation in the region, although still minor compared to other regions[12] also implies new challenges in terms of urban planning, access to and guarantee of basic services, and social cohesion.

5. CLIMATE CHANGE IN THE SAHEL

The Sahel is one of the regions of the world most affected by climate change (IPCC, 2019). Increased rainfall variability, rising temperatures and extreme weather events, mainly droughts and floods, are the most acute effects of global warming in the area (Tschakert et al. 2020). The entire region receives low to very low precipitation annually and is particularly sensitive to precipitation variability. It has a very long dry season and a short rainy season, the timing of which fluctuates from year to year (typically between May and October). This section focuses on the main biophysical impacts of climate change in the area, including gradual changes in temperature and precipitation, changes in the frequency of extreme weather effects, as well as potential impacts on water resources and desertification.

5.1. Changes in the variability of precipitation and frequency of extreme phenomena

Climate projections for the Sahel are inconclusive and differ across climate models, time periods and geographical areas (Hulme, 2000; Nicholson, 2013). However, there is some agreement on increased rainfall variability (in time and space); increased frequency of extreme events, such as droughts and floods; and rising temperatures, 1.5 times faster than the global average (IPCC, 2019).

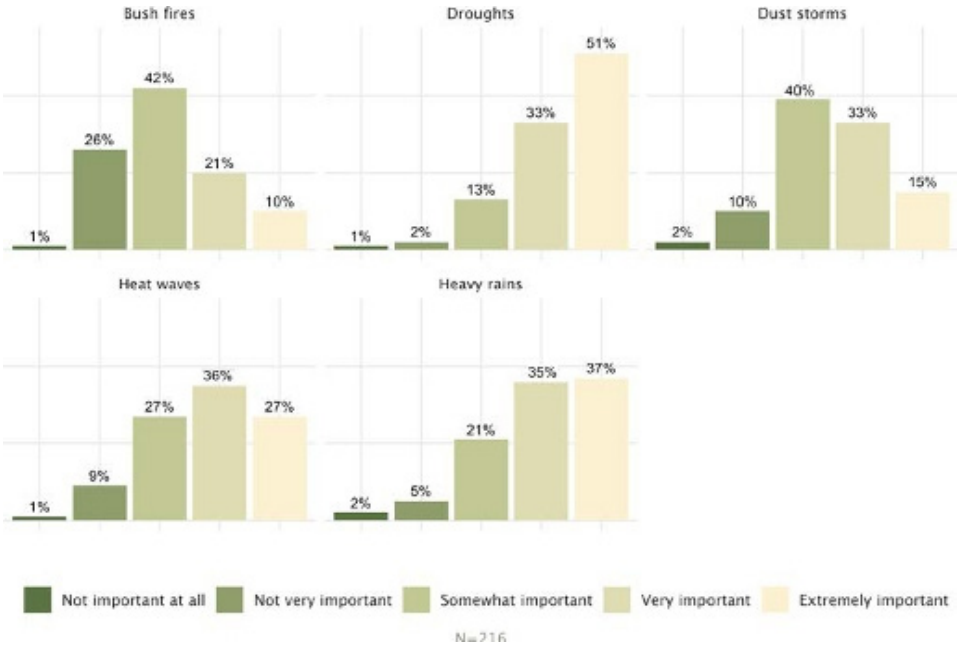
Climate experts identify increasingly frequent and severe extreme events, such as droughts and heavy rains that can lead to devastating floods, as major climate change- related challenges in the Sahel (IPCC, 2019). The results of our survey also corroborate this. A large majority of interviewed local experts identify droughts (84%) and heavy rains (72%) as a very or extremely important consequence of climate change. This contrasts with somewhat lower levels of importance for other extreme events like heat waves and bush fires, although a large number of interviewed experts identifies these at less «important» consequences of climate change.

According to local experts, most of these effects of climate change will be felt strongest in ecoclimatic zones with lower rainfall, i.e. the Saharan and Sahelian ecoclimatic zones in the northern part of our study area. These include the Gao

12 The degree of urbanisation remains low. Only 16.4% of the population lives in cities (FAOSTAT, 2018).

and Kidal regions (Mali), as well as Tillabery, Agadez, and Diffa (Niger), and, in Burkina Faso, the regions of the Sahel, the North and the Centre-North.

Graphic 1: Importance attributed to possible effects of climate change by surveyed experts[13]



In arid areas of the Sahel, river water resources, which depend chiefly on rainfall, are crucial. The main resources are provided by the Niger River (for Mali and Niger), the (Black) Volta River (for Burkina Faso) and the Lake Chad Basin (for Niger). For the Niger River, the most important water resources lay in the Inner Niger Delta region located in central Mali. In the inland delta, the effects of climate change relate to rainfall variability, although the construction of the Sélingué hydroelectric dam and the irrigation systems of the Office du Niger affect the quantities of water flow more. In the Volta River basin, climate change expects to lead to higher surface runoff and sediment yield, thus contributing to greater erosion (Op de Hipt, 2019).

5.2. Open debates on desertification or greening

Lake Chad, located on the border between Chad, Niger, Nigeria and

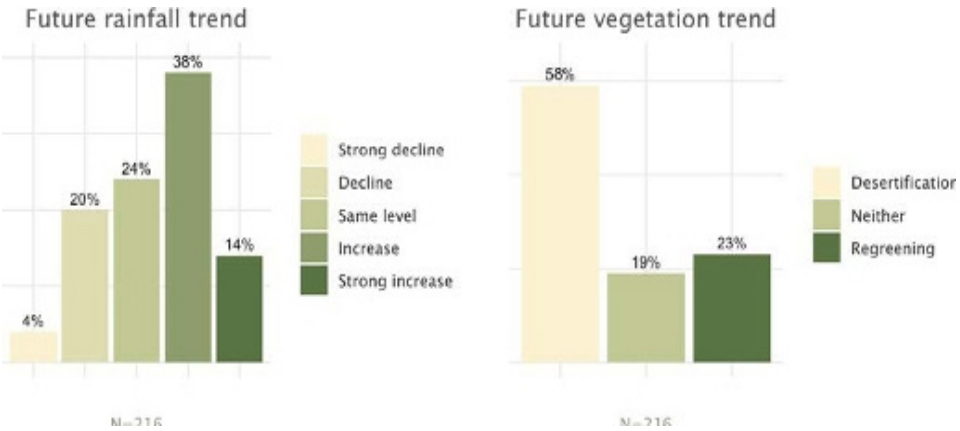
13 All graphs are from fieldwork conducted and published in Puig-Cepero, et al. (2021).

Cameroon, is often put forward as an example of the adverse effects of climate change on water resources in the Sahel. Political discussions are dominated by the assumption of a shrinking lake. However, new scientific evidence seems to challenge this view. The lake did indeed shrink significantly during the 1970s and 1980s, but in recent decades its groundwater reserves, which account for 80% of its reserves, are increasing (Nagarajan *et al.*, 2018). Moreover, its surface water reserves are in constant flux, depending on seasonal and yearly variations in rainfall. This accounts for variations in the size of the lake and can create the impression that the lake is shrinking when comparing satellite images between specific periods, although this is not entirely the case (Vivekananda *et al.*, 2019).

Positive rainfall trends since the mid-1990s have also led to an increase in the reserves of the Niger and Volta rivers basins, the other main aquifers in the region (Carvalho *et al.*, 2018; Helming *et al.*, 2019).

On the other hand, contrary to what is often assumed, purely climatic factors would likely lead to a greening of the Sahel (Schewe & 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 (Davis, 2016). 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).

Graphic 2: Expected future rainfall and vegetation trends in the Sahel (survey results)



Conversely, non-climatic factors such as rapid population growth, overgrazing or deforestation could counteract or even reverse this trend (Hutchinson et al.

2005; Seaquist et al. 2009; Brandt et al. 2015). Overall, the majority of experts interviewed for this study (58%) expect an increase in desertification in the study area, compared to only 23% who expect a greening, despite the fact that the majority of experts interviewed (52%) consider an overall increase in precipitation in the study area to be the most plausible scenario for the next 10 years.

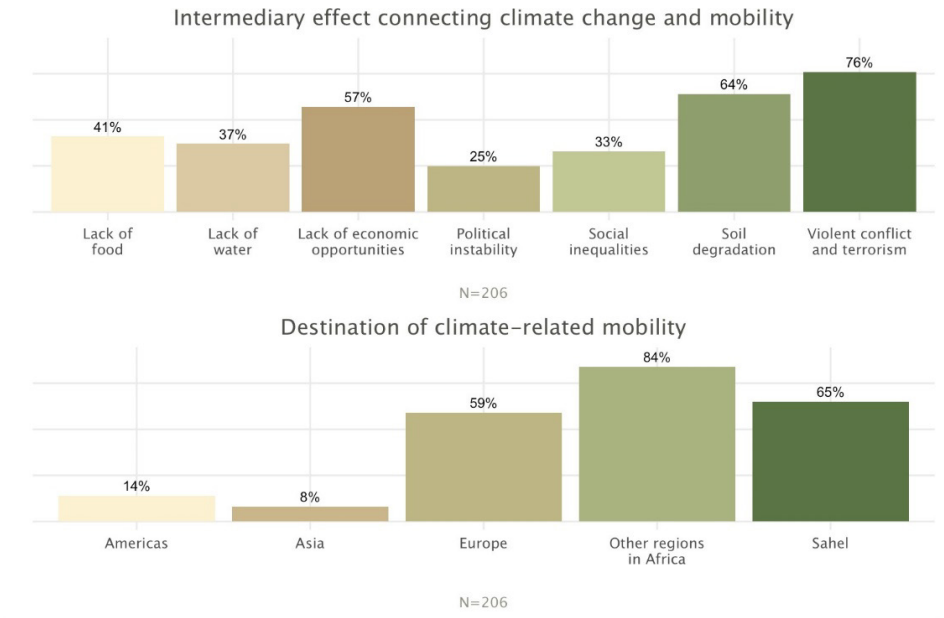
6. RESULTS

6.1. Climate change induced (in)mobility

All these biophysical impacts will have social and economic impacts that may affect displacement. In this sense, climate variability can influence Sahelian mobility, from transhumance and rural-urban migration to seasonal cross-border circular migration through neighbouring countries. In particular, variability of rainfalls and changes in access to water and fodder can be at odds with established transhumance protocols and corridors, leading to unforeseeable shifts in herd movements (De Haan, 2016). According to local experts interviewed, herds coming from the north could travel further south in search of water points; and this could take place later than usually expected, depending on possible delays in the arrival of the rainy season, due to increasingly erratic climatic conditions.

Weather variability and environmental degradation can lead to loss of livelihoods for both farmers and pastoralists, which in turn can lead to rural-urban migration, depending on the means to move and economic opportunities in cities. In this sense, mobility tends to be more frequent among wealthier households than among poorer families who lack the means to move, stay, etc. Indeed, pastoralists have even been shown to reduce migration during droughts (Hampshire, 2002). In this sense, some people may be trapped (Black et al. 2011). In this context, mobility functions as a diversification of financial capabilities rather than a mere survival strategy (Geest, 2011; McMichael, 2014).

Graphic 3: Expected effect of climate change on migration in the study area (survey results)[14]



The overwhelming majority of our surveyed experts (87%) expect more mobility in the Central Sahel in the wake of climate change (result not shown in the graphic). Moreover, they identified different mechanisms that could connect climate change to increased mobility, including more violence in the wake of climate change (76% of respondents), soil degradation (64% of respondents), loss of livelihoods and of economic opportunities (57% of respondents), or food insecurity (41% of respondents).

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). Indeed, several studies relativise the idea of mass migration to Europe as a consequence of climate change and warn against using this phenomenon to legitimise restrictive policies (De Haas, 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 climate-related movements could reach Europe (59%), while only a minority consider migration towards Asia or the Americas as likely (8% and 14, respectively).

14 Respondents could choose as many options as they wanted.

6.2. Externalization induced (in)mobility

For many communities in the Central Sahel, free movement is essential to cope with challenging climatic conditions. Yet, migration policies in the region are bent on curbing migration flows to the EU rather than responding to the needs of mobile local communities (Brachet, 2018; Boas, 2020). Restrictive migration policies promoted by EU and Sahelian countries hinder effective climate change adaptation in the region (Gemmene & Blocher, 2017; Zanker *et al.*, 2020). Increasing border control penalise vulnerable rural communities who either have limited access to identity documents or are unfamiliar with administrative procedures (Zanker *et al.*, 2020). They also lead to violations of ECOWAS protocols on free movement. For instance, Niger's law 036/2015 against human trafficking has been used until its repeal in 2023 to intercept persons in Agadez, more than 800 km from the regional borders in Algeria and Libya, which is in violation of ECOWAS protocols on free movement (Puig-Cepero, 2019; Zanker *et al.*, 2020).

According to experts, restrictive migration policies produce more clandestine migration, which exposes migrants to more human rights violations (Andersson, 2016; Molenaar, 2017; Brachet, 2018; Boas, 2020). Likewise, they create a number of additional problems in local economies, affecting social cohesion and West African integration (Idrissa, 2019). They reinforce national sentiment and tensions between groups from different countries (Snorek *et al.*, 2014), and trap thousands of people in cities such as Agadez, Niamey or Bamako, which strains local administrations and services and dampens sentiment in host communities and among migrants (Okunade & Ogunnubi, 2018). Moreover, EU funds dedicated to control migration perpetuate and increase predatory and clientelist structures and policies (Brachet, 2018). This could increase suspicions among communities, for example, between northern and southern communities in Niger over the hoarding of funds (Boas, 2020; Raineri, 2022).

It is important to note that EU migration control policies are inconsistent with EU objectives in other policy areas. Control measures contradict several EU-supported multilateral free movement projects, such as the Free Movement of People and Migration in West Africa (FMM) and the related Migration Dialogue for West Africa (MIDWA) project, launched in 2001. Our survey results indicate that EU migration control policies in the region are viewed with some scepticism. Forty-four percent of respondents are even in favour of reducing EU involvement in this area.

Rural-urban migration will continue to be a challenge in the region and requires continued efforts to improve basic services in rural and urban areas, especially health and education.

Regarding transhumance, the measures implemented so far contribute to violate national and regional protocols for free movement across borders (UNOWAS, 2018). In this regard, bilateral border reinforcement agreements between Sahelian countries with the EU may exacerbate the nationalization of transhumance and aggravate xenophobic sentiments. Migrant status may preclude land ownership in some places, which can marginalize or exclude

certain communities, leading to grievances and tensions. On the other hand, people on the move may be seen as wealthy, which may also arouse resentment (Benjaminsen & Ba, 2009). In this context, mobility management must be improved to enable mobility as a resilience strategy (Gemenne and Blocher, 2017).

It should be kept in mind that climate change can lead to immobility, and that climate change adaptation strategies must also address the needs of «trapped» populations. In this sense, mobility management, rather than mobility per se, may entail problems that should not be ignored. Neither should mobility-related challenges be used as an excuse to legitimise sedentarisation (Nagarajan, 2020).

Enabling mobility in the Central Sahel should, in principle, be straightforward, as ECOWAS already has protocols in place to ensure freedom of movement. Yet, their implementation collides with some obstacles. In particular, the economic interests of organisations and elites that are involved in border control are not negligible. These involve huge profits for European companies and large sums of European funds to local elites (Akkerman, 2018). Furthermore, human trafficking networks proliferate due to the clandestinisation of routes resulting from stricter border restrictions (Andersson, 2016; Brachet, 2018). This set of rents, which are derived from the externalisation of borders, together with the incentive for Sahelian countries to keep the region at the forefront of European external action and development policy, may hinder the relaxation of migration control. All of this, spurred by the risk of using the climate change-migration nexus to legitimise restrictive policies and securitise borders, is a challenge that cannot be undermined.

Regarding transhumance, conflicts are an important obstacle to the implementation of free movement, as herders cannot stick to established corridors due to insecurity. Similarly, the co-optation of funds by cities at the expense of rural areas, as well as by rural elites at the expense of rural populations, is a challenge, which is only aggravated by chronic dependence on external funds. The limitation of national budgets, and their prioritisation towards defense and migratory control, are further obstacles to the promotion of sustainable development, especially in rural areas.

7. CONCLUSIONS

Climate change is and will be an important factor for the future of the Central Sahel. Both its current and future impact, however, are intrinsically linked to social and political factors that must be emphasised when addressing climate-related challenges in the region. To do otherwise would assume the depoliticization of hunger and conflict and enable policymakers to evade responsibility (ICG, 2020). That said, climate change will likely have significant impacts on the region, including more rainfall variability, more extreme events as droughts and floods, and higher temperatures over time that will rise faster than the global average. The results of our survey of over 200 experts in the region confirm this.

According to surveyed experts, the effects of climate change in the region will

be felt most severely in ecoclimatic zones with lower rainfall, i.e. in the Saharan and Sahelian zones. In particular, these include the northern part of Mali (Gao and Kidal), as well as the Tillabery, Agadez, and Diffa regions in Niger, and, in Burkina Faso, the regions of the Sahel, the North and the Centre-North.

These effects of climate change may trigger cascading risks to local livelihoods (especially agriculture and pastoralism), food security, community-to-community and state-citizen relations and could lead to further displacement. Mobility has been rooted in the region for centuries as a way of life, a strategy for economic diversification 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 migration and cross-border displacement. Migration to other African countries is likely to far outstrip migration to Europe (see also 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 pasture and access to markets (FAO, 2012). Yet it should be considered that climate change effects can 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. Policy initiatives in the region implemented since 2015 are hampering mobility as a way of life and as an essential survival strategy.

In this sense, if the EU wishes to improve the resilience of Sahelian communities, it should ease restrictions on migration on migration, which is incoherent with other policy objectives in the region. All this must be done by incorporating new narratives that focus on the fact that migration will remain largely within Africa - as the IOM has already done in its latest reports (IOM, 2020) - and by considering the links between climate change and (im)mobility. In this sense, it is important to avoid instrumentalising climate change as an excuse to securitise and legitimise restrictive migration measures, especially in places such as the Sahel, where these measures, far from contributing to defusing tensions in the area, contribute to decimating the livelihoods of populations, mobility being one of them.

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