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Application of Sustainable Livelihood Approach (SLA) to Address Climate-Induced Risks through the Lens of Africa Borderland

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Abstract: The objective of this study is to gain a holistic and enhanced understanding of the characteristics of the livelihood of communities in the Liptako-Gourma region. This region, known for the tri-border area, has become the epicenter of the conflict since 2015. The study employs the Sustainable Livelihood Approach to guide survey results, as well as a focus group discussion. The results of the survey are analyzed to assess the linkage between climate-induced risks and development challenges in the region. Furthermore, the paper explores the interactions between climatic stresses and conflict risk. By taking the Liptako-Gourma region (Mali, Niger, and Burkina Faso) as a focal study and analyzing the factors impacting the livelihoods of people in the region, a survey was conducted. It included questions related to agriculture, animal husbandry, and natural resource management, among other things. The survey had seven sections and was conducted with 287 people aged between 25 to 77 years from Bagawa and Tin-Akoff. Climate perceptions were evaluated through individual and group interviews. The result from the cohort study showed a close association between security and developmental challenges in the Liptako-Gourma region. This is due to the region's reliance on agriculture and animal husbandry, which involves frequent migration and population movement across the borders. Furthermore, the study revealed that (1) climate-induced shocks are increasingly manifested, (2) the adaptive capacity to weather climate shock remains low, (3) mobility and migration is a common strategy, and (4) the conflict over the usage of natural resources exists; however, it is not the primary cause of conflicts.



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Keywords: climate security; Liptako-Gourma; climate induced risk; development challenges

1. Introduction

In the last two decades, Burkina Faso has confronted a range of endogenous and exogenous shocks, including increased attacks by armed groups, insurgency, violence, and multiple coup d'états. These events have resulted in significant numbers and migration of internally displaced people (IDP). The conflict in the country started in August 2015 and has only escalated since then. The situation has severely impacted the livelihoods of communities and heightened their vulnerability to a range of risks, including those related to climate change and displacement. Furthermore, the number of registered IDPs was 870,000 IDPs in 2019 [1] and has grown by close to two million in 2022 [2]. On 11 June 2020, United Nations humanitarian agencies and non-governmental organizations issued an urgent call for the protection of civilians in the Sahel [3]. Triggered by the spillover of violence in the Sahel regions, the Liptako-Gourma which encompasses the Gao and Mopti regions of Mali, the Tillabéri region of Niger, and the Sahel region of Burkina Faso have become the epicenters of conflict since 2015 [4]. As a result of the conflict, Burkina Faso is experiencing a level of internal displacement that surpasses the capacity of the state.

Historically, the region is known for its frequent circular migration and population movement in the search of better livelihoods and economic opportunities [5]. The effective management of borderlands and addressing of multilayered and complex development

challenges is critical, considering that the Burkina Faso borderland is home to as many as eight million inhabitants [6]. This study assesses the livelihood characteristics, environment, and different drivers of fragility in the tri-border area of the Liptako-Gourma region encompassing Burkina Faso, Niger, and Mali in order to effectively address the challenges related to climate security.

The insights from this study can inform specific risk reduction and livelihood improvement strategies that address the pressing needs of the communities in the Liptako-Gourma region.

Characteristics of Livelihood in Liptako-Gourma Region in the Sahel

Liptako-Gourma an area where three borders converge, and according to UNDP, borderlands refer to the territorial margins of nation-states—regions where border contact is a central feature of economic and political life. The UNDP recognized that these border communities are among the most innovative and resilient, even amidst complex development and security challenges [7]. However, poverty remains a significant issue in the African borderlands due to the lack of essential infrastructure, education facilities, local governance, health care, and security. The UNDP emphasizes that poverty is a primary cause of violent conflicts and insecurity, which are prevalent in Africa's borderlands [7]. Three critical factors affecting the rural livelihood in Liptako-Gourma regions are (i) natural resource management, (ii) migration, and (iii) political crisis.

First, with regards to natural resource management, Liptako-Gourma is a transhumance region, but the region has been affected by a decrease in grazing areas because of land conversion for crop cultivation and the depletion of water and foraging resources [8]. These sectors play a critical role in the economics of the Liptako-Gourma tri-border area in the Sahel region. These sectors account for about 52.5% of the jobs in West Africa [9–11]. The population in the Liptako-Gourma region is growing rapidly. Among the countries in the region, Niger has the world's second-highest population growth rate, followed by Mali at the eighth highest, and Burkina Faso with the fifteenth-highest population growth rate [12]. This contributes to the further acceleration and expansion of two thirds of the region's arid zone.

The projected annual demographic growth rate ranges from 2.5 percent to nearly 4 percent, which is beyond the region's capacity. As a result, the prospects for socioeconomic development, agricultural production, and political stability in the Sahel are at high risk [13]. This is having a direct impact on the daily economic activity and livelihood of the population by limiting access to essential resources such as to water, wood, grazing zones, food security, health, and cultivable land [14]. Responding, mixed farming, associating livestock herding, and cropping are frequently exercised by farmers.

While herding and cropping have long been two complementary activities exerted by different social groups [15], today they are being combined to such an extent that some farmers now own more animals than herders and, in some areas, even the distinction between herders and farmers is no longer applicable [16]. This practice has become more popular after the droughts of the 1970s [17], considering that the mobility of livestock, as opposed to rainfed crop farming, can better adapt to increasing climate variability and unfavorable weather conditions [18]. Some research indicates that the livelihood convergence of farmers raising more livestock and pastoralists settling to cultivate farmland can increase the risk of local conflicts as it creates additional demands on the already fragile ecosystem [19]. There is, however, insufficient evidence to conclude that the scarcity of resources or climate pressures are the primary cause of conflicts involving pastoralist populations and farmers.

The situation is more complex and involves a multitude of other factors [20]. Second, migration to explore socioeconomic opportunities within Liptako-Gourma is frequently exercised by people as a way to sustain and diversify their livelihood strategies. People travel and cross borders in Liptako-Gourma for various reasons such as trading at the market hubs, seeking employment opportunities, searching for grazing zones, and visiting

family members. The mobility of people and livestock plays an important role in their survival and adaptation strategies [21]. For example, pastoralists frequently cross borders seeking water and fodder in sub-humid destinations [22]. Third, the security situation is deteriorating in Liptako-Gourma region. With the increasing conflict in the regions, borders have become an important factor in pastoral resource conflict. In the case of Burkina Faso, it is important to note that the governance of the borderland area significantly changed after Blaise Compaore was ousted from power in 2015. From 1987 to 2014, Blaise Compaore was said to utilize an informal approach to promote border security governance, building relationships with cross-border jihadist groups, non-state actors, and criminal networks operating in the Liptako-Gourma region. This has had a significant impact on the security of the region and the pastoralist populations living in the area [23]. In 2014, this informal network powered by actors from high-level bureaucrats, security forces, traditional leaders, and non-state armed actors became ineffective. In the absence of an informal network, armed attacks by insurgent jihadist quickly spread in Burkina Faso [24]. Today, 40 percent of Burkina Faso's territory [25] is out of the control of the state, according to ECOWAS. This alerts to the country's deteriorating security, humanitarian, political, and socioeconomic situation, particularly in the Liptako-Gourma region. This situation is partly due to the lack of equipment and professionally trained border security personnel.

Additionally, the spaces between official border crossings are difficult to control, leading to a higher risk and vulnerability to potential terrorist crossings [26]. Further, the absence of clear demarcation between the Mali and Burkina Faso border, which is over 1000 km, has resulted in repeated confrontations between the two countries. Notably, the conflicts in 1974 and 1985 required the arbitration of the International Court of Justice and mediation by the regional authorities. The official cause of the conflict is said to be the border delimitations following their independence from France [27]. The conflict of 1974 concerns the Agacher strip, which is located at the intersection of Mali, Burkina Faso, and Niger border.

The area is rich in water and is vital for pastoralists and farmers in the region. Both countries claim their territories, owing to cultural, racial, administrative, historical, and ecological factors. The severe droughts in the 1970s and 1984 also elevated existing tensions amongst farmers and pastoralists [28]. From the outset of conflict, Burkina Faso has experienced numerous regime changes through military coups. In total, there have been four attempted coup d'états over the course of 2015 through 2022. Since its independence, the history of Burkina Faso has been marked by military coups. The longest period without a military coup since its independence was from 1987 to 2014, during President Compaore's 27 years rule [4]. In November 2021, Burkina Faso's Transitional Legislative Assembly assumed office following military coup in September 2022. The junta leaders in Burkina Faso justified the coup, citing the government's failure to control the escalating violence. Captain Traore, was inaugurated as the president of the transition in October 2022, setting his sights on the objective of recapturing the areas occupied by terrorists organizations [29]. Similarly, Mali experienced coup d'état attempts in March 2012, April 2012, August 2020, May 2021, and May 2022. Over the last two decades, Mali enjoyed stability until 2012; however, democratic norms steadily eroded after the 2012 coup. Democratic norms have continued to deteriorate over the past decade, with frequent coup attempts and insecurity [30]. Coup leaders stated that they were acting due to the government's ineffective and corrupt handling of the conflict in the north and center of the country. They claimed that their intervention was necessary to address the issue and bring peace to the affected areas [31]. In February 2022, the African Union (AU) and the Economic Community of West Africa States (ECOWAS) suspended Burkina Faso and Mali due to the ongoing political and security challenges in both countries.

2. Materials and Methods

To better understand the livelihood characteristics of the rural communities in the Liptako-Gourma region of Burkina Faso, this study uses a Sustainable Livelihood Approach

(SLA). The SLA focuses on five assets of the households, namely, physical, natural, human, social, and financial, thus enabling a deeper understanding of the vulnerability context [32]. The household's asset portfolio is an indication of the type of livelihood strategies practiced by the household. To gather further information, in addition to surveying the five SLA capitals designed for the individual, a focus group discussion was held with the local government, associations, and other relevant parties to assess the impact of climate on the agro-pastoral production system.

2.1. Data Collection

An individual survey was designed to consolidate and analyze qualitative and quantitative data on agriculture, animal husbandry, and natural resource management-related activities, as well as social, environmental, and economic factors impacting their livelihoods. The individual questionnaire comprises seven sections, including respondent identity, climate perception, and five capitals of SLA, namely, human assets, natural assets, social assets, physical assets, and financial assets. In total, 287 villagers (Bagawa 95 and Tin-Akoff 192) were interviewed. Respondents ($n = 287$), who ranged in age from 30 to 77 years for Bagawa (mean: 42 years) and 25 to 73 years for Tin-Akoff (mean: 42 years), were interviewed to better understand the area's climate trends and their perception. In addition to the individual survey question using the below five SLA assets, climate perceptions were assessed based on an individual interview with the villagers and a focal group.

2.2. Data Analysis

Different criteria were developed under respective capitals (Tables 1 and 2) to create a capital pentagon, which was then evaluated on a scale from one point (low) to three points (high) for each respondent's assets, and the mean score per estuary was recorded, as presented in the results sections.

Table 1. Criteria for evaluating five SLA assets.

Human	Age, Health Condition to Work
Natural	Access to land, possession of livestock, access to grazing zone, use of fertilizer, knowledge of adaptation practices
Social	Membership of village associations focused on agriculture, animal husbandry, and access to village meetings/information
Physical	Availability/accessibility of agricultural equipment, tools for animal husbandry, possession of radio, bicycle, bike, communication, access to market, and access to energy
Financial	Income from agriculture, animal husbandry, available paid/unpaid workers

Table 2. Criteria for evaluating different types of capital based on framework by the DFID SLA.

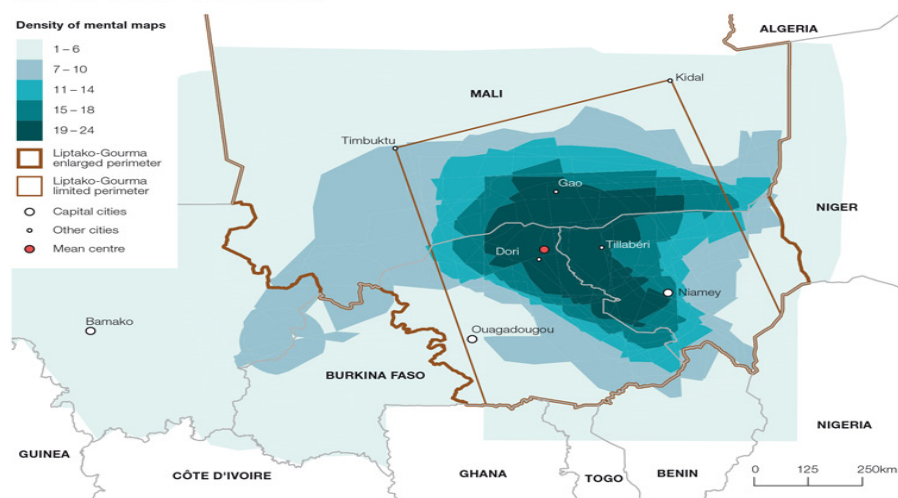
Points	Human Capital	Natural Capital	Social Capital	Physical Capital	Financial Capital
Criteria 1	With health issues, long absence from work, over 50 years old.	Farmland access only. No livestock, no fertilizer, without knowledge of traditional land/water conservation techniques.	Excluded from membership, except village meeting participation.	No agricultural or animal husbandry tools, without bike/bicycle/reliable energy/weather information.	No major income from agriculture, animal husbandry, limited work force, no harvest in the past cycle.
Criteria 2	Occasionally absent from work due to mild health issues, age between 40–50.	Access to farmland, no livestock, uses fertilizer, without knowledge of traditional land/water conservation techniques.	Membership in agriculture or animal husbandry and participates in village meeting.	No agricultural tool, but owns cattle-cart, moto-bike, radio, have access to weather information, and basic energy.	Relies on income from agriculture or animal husbandry, with acceptable work force.
Criteria 3	Good health condition to work, at all ages.	Access to farmland, livestock, and grazing zone. Uses fertilizer with knowledge of land/water conservation techniques.	Membership in both agriculture and animal husbandry and participates in village meeting.	With agricultural and animal husbandry tools, bike/bicycle/ source of energy.	High income from agriculture and animal husbandry, with multiple and longer period of work force.

3. Results

3.1. Study Area

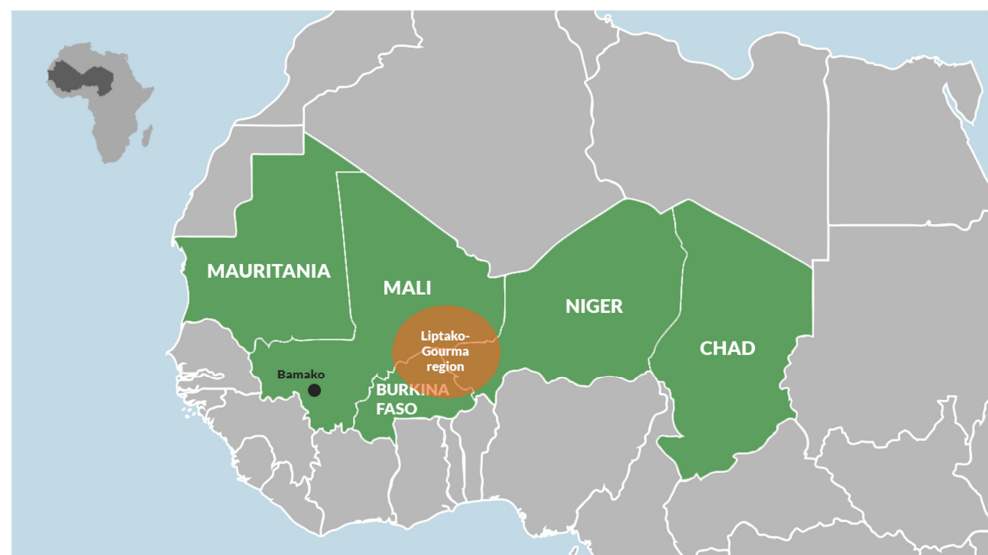
The Oudalan province in the Sahel region of Burkina Faso, which borders Mali to the northwest and the Niger to the east (Figure 1), is part of the Liptako region that has a historical significance due to the Kingdom of Liptako. Since 1970, Burkina Faso, the Republic of Mali, and Niger established a Liptako-Gourma regional framework to promote an integrated and harmonized approach to ensure sound borderland management in the region [33]. The Oudalan province's principal livelihood relies on agriculture, pastoralism, and the use of forest products. The climate of Oudalan province is known for its inter-annual variation and is marked by long dry seasons lasting over 9 months and only 3 months of the rainy season, during which the number of rainy days varies from 29 to 35.

PRIORITY AREA FOR CROSS-BORDER CO-OPERATION IN LIPTAKO-GOURMA



Extract: OECD/SWAC (2017), Cross-border Co-operation and Policy Networks in West Africa, OECD Publishing, Paris
 © 2017, Sahel and West Africa Club Secretariat (SWAC/OECD)

(A)



(B)

Figure 1. (A) Mapping the Challenges of the Liptako-Gourma Region: Understanding the Complexities of Borderland Governance and Development: Source OECD; (B) Exploring the Dynamics of Livelihood Strategies and Fragility in the Liptako-Gourma Region: A Geospatial Analysis: Source: Daily Maverick, Africa.

There are three principal and open grazing zones critical for farmers and pastoralists in the Oudalan province, including the area of 107,000 ha of the ‘forage christine’, 50,000 ha ‘beli’, and the 15,000 ha around Oursi pond. While the pastoral zone is an open and rich source of water and grazing zone, the major constraint is the water availability during the dry season, particularly from March to June, which becomes the most challenging period for pastoralists. Due to the changes in rainfall patterns, including flooding, drought, and shift of the rainy season, as well as the extreme heat waves in the Sahel resulting from climate change, the Oudalan province in the Sahel region has been identified as one of the zones most vulnerable to climate change [34]. The Oudalan province is also known for the artisanal mining of gold. The 2017 survey identified 53 mines in the east, and its annual production is estimated to be 11 billion CFA francs [35]. Per the study, illegal export of gold to neighboring countries is being done to evade taxes, which has led to concentration of extremist groups mainly in the border areas between “Burkina Faso, Niger, and Mali”. Consequently, this illicit economic activity has played both strategic and significant role in causing environmental instability in the region [36]. Recently, there has been a notable escalation of conflicts in the Liptako-Gourma regions, as multiple sources have reported the existence of violent extremist organizations, Malian armed groups that have signed the peace agreement, and self-defense groups. They are directly or indirectly involved in illicit activities and local conflicts [36]. Traditionally, conflict resolution is managed by the local authorities through informal discussion with the Oudalan provincial government as well as the study on natural resource management in Oudalan province.

However, due to the sharp increase in insurgencies, the traditional authorities’ ability to resolve disputes is weakening. For example, some local authorities in Oudalan province left their communities due to death threats by an armed group. In the absence of local authorities, the extremist group’s power turned them into ‘mediators’ capable of settling differences. Furthermore, many examples have been reported from Mali and in Oudalan province in Burkina Faso, where the dispute between livestock farmers and crop farmers was managed by the armed group. Natural resource governance is another critical aspect of ensuring equitable and sound water management. The transhumance routes are often blocked by local farmers. The mobility of those who practice transhumance is limited as a result. This often results in conflicts between farmers and pastoralists [37]. Moreover, numerous suggest that traditional justice actors inadequately resolve the conflicts, contributing to the escalation of local disputes [38]. The study focuses on the Oudalan province in Burkina Faso’s Liptako region to investigate the link between climate-induced risks and development. Two villages were selected based on their socioeconomics, geographics, and livelihood characteristics, where the majority of the population depends on agriculture, animal husbandry, and natural resources. Critical water points are available for farmers, pastoralists, and transhumance, providing a significant water source for the villagers and surrounding communities as well as transhumance herders from Mali.

The village of Bagawa, named after its village chief, is situated approximately 30 km from Gorom Gorom, the capital of the Sahel Region of Burkina Faso. With a total population of 950 the village covers an area of 9931 km² and is primarily inhabited by the Peulhs (60%) and Tamacheks (30%) [39]. The village itself and surrounding areas are the grazing zone for both animals in Bagawa as well as transhumance. This area can retain water during the wintertime and serves as a water point for animals. Of the respondents, 86% practice agriculture and animal husbandry, while only 7% solely practice agriculture. However, the village’s socioeconomic infrastructure is limited.

The second village of Tin-Akoff is in the extreme north of Burkina Faso, bordering Mali. The village is part of the province of Oudalan and is about 75 km from Gorom Gorom and 131 km from the Dori, the capital of the Sahel Region of Burkina Faso. Tin-Akoff means ‘land of rôniers’, and the village was formed by people from Gao (Mali) escaping from numerous wars. Out of the 1551-strong population, 192 villagers were interviewed, and most of the respondents engage in both agriculture and animal husbandry (81%); agriculture-only respondents represent 15%, and the nomadic community 3%. The principal source of

water for the village is a stream from the Niger River. This seasonal source of water is vital for most villagers and surrounding communities and transhumance to sustain small irrigation, animals, and fishery-related activities. However, the inter-annual rainfall, extreme temperature, and violent wind have been impacting the population as well as the production system. The shortage of cereal production due to drought and sand silting over the pond in the changing climate conditions has made food security a challenge for the community.

3.2. Climate Perception in the Study Area

The survey indicates the increase in temperature and shortage of annual rainfall, particularly during the growing season, as confirmed by more than 80% of respondents. Furthermore, 90% of respondents pointed out an increase in drought, accelerated soil erosion, sand silting over the pond/water stream, and higher frequency in extreme temperature, resulting in a decrease in the type and number of medicinal plants and forest products.

3.3. Livelihood Assets of Villages of Bagawa and Tin-Akoff

The capital diagram (Figure 2) depicts the levels of five types of capital in two study areas. The results show that the village of Bagawa has scores higher than the village of Tin-Akoff in all five categories. When it comes to human capital, the village of Bagawa has better health and working conditions at 68%, compared to Tin-Akoff at 40%. In terms of natural capital, the assessment was conducted using multiple variables (Table 1), revealing that Bagawa has higher percentages of land, grazing zone, livestock ownership, fertilizer use, and awareness of adaptation practices at 54%, while Tin-Akoff scored only 25%. Despite over 95% of the respondents in both areas acknowledging a decline in soil fertility, Bagawa has a higher percentage of respondents at 86% who use soil fertilizer; mostly animal manure is used in Tin-Akoff. Additionally, 88% of respondents in Bagawa indicated favorable changes in agricultural products, while 80% noted the improvements in livestock products and forest product availability. In contrast, Tin-Akoff had 66% of respondents reporting negative changes in agriculture quantity, 61% indicating declines in livestock productivity, 64% facing challenges in accessing fodder, and 82% also noting a decline in the quality of forest products. The usage of adaptation practices remains low in both areas, with only 86% of Bagawa respondents utilizing mulching, known for soil fertility practices, while 33% of Tin-Akoff respondents had some knowledge of the community practice of 'sand dune fixation,' but none actively utilized any adaptation practices.

The physical assets were evaluated based on the availability of basic equipment for agriculture and animal husbandry, as well as the possession of means of transportation and communication. However, in the study areas, there is no electrification. More than 90% of respondents utilize wood for cooking, and an electric torch/mobile phone torch or a kerosene lamp for lighting, and solar energy is not regularly utilized. As a result, respondents are facing more challenges and are forced to spend a long time accessing natural resources. In the village of Tin-Akoff, access to the nearest market is less than one hour for most respondents. However, in the village of Bagawa, two-thirds of respondents spend three hours to reach the nearest market. The local infrastructure is limited to the study area, which is located at the periphery of the main town of the Oudalan province. In the village of Bagawa, there are only four boreholes for 950 habitants, which is equivalent to one borehole per 250 users. Furthermore, the village has no cereal bank or haybarn to stock their products, despite the inhabitants' high dependency on agricultural and pastoral activity. Most respondents do not have any vehicle, except for a few that have a bicycle. In Bagawa, 27% of respondents indicated the availability of limited tools such as cattle-carts, moto-bikes, radios, and mobile phones, with limited access to sources of lightning. Although subsistence agriculture is practiced by over 90% of respondents in both areas, there is a severe shortage of agricultural equipment in both Bagawa and Tin-Akoff. Only 1% in Bagawa and 2% in Tin-Akoff have access to all the above-mentioned equipment, including agricultural.

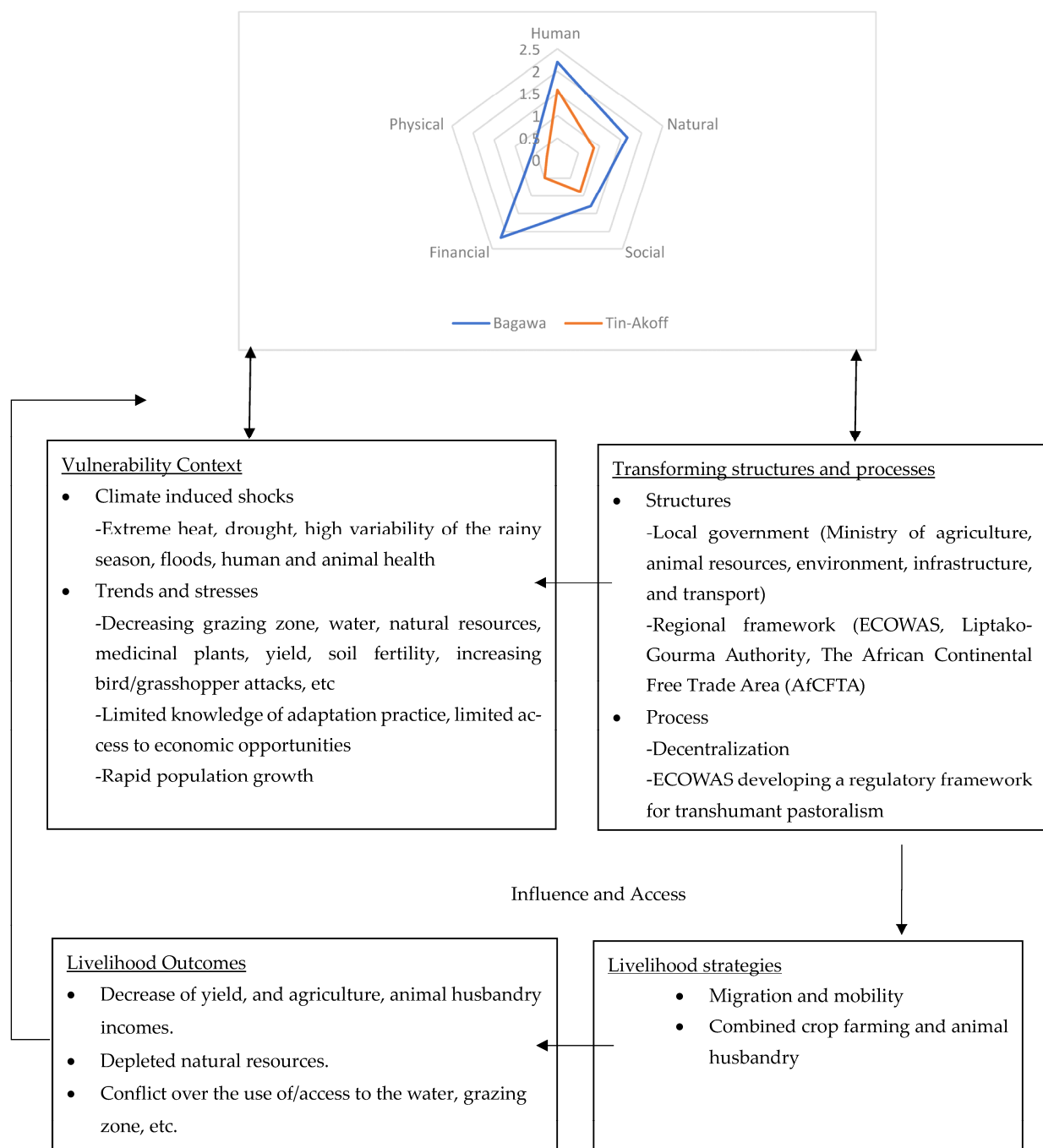


Figure 2. Livelihood Assets.

The social assets were evaluated based on the membership of local farmers or livestock associations in addition to their participation at village meetings. In Bagawa, 50% belong to either or both associations on agriculture and animal husbandry, and 70% attend village meetings for information, while in Tin-Akoff, 21% belong to either or both associations on agriculture and animal husbandry, and only 29% attend the village meetings for information.

Finally, the financial assets were evaluated based on the revenue generated from agriculture and livestock, as well as the availability of paid/unpaid workers. In Bagawa, 87% have a steady income from either agriculture or livestock and availability of unpaid labor during the growing season, while in Tin-Akoff, 20% have a steady income from either agriculture or livestock.

4. Discussion

An increasing amount of literature has investigated the influence of climate change on migration. However, there are still significant gaps in understanding the complex relationship between climate change and migration. More specifically, as yet there is no unified theoretical approach that adequately represents the relationship between climate change and migration. [40] Further, many scholars now agree that long-term environmental degradation (for example, soil erosion, etc.) has a limited or insignificant role in generating civil or international wars ([41,42]). In short, studies of environmental security consistently reiterate that the “political and economic characteristics” of countries are the strongest indicators of conflict risk.

The findings of the SLA survey support the findings that the combination of subsistence agriculture and livestock represents an important component of the livelihood strategies of rural households in the Sahel region. The respondents stated that climate variability is increasingly impacting agricultural and pastoral productivity as well as natural resource availability, making both villages extremely vulnerable to all kinds of risks, including climate-induced risks. However, in the village of Bagawa, we saw the higher use of adaptation practice and active memberships in agriculture and animal husbandry local associations, which enabled the respondents in Bagawa to be more familiar with animal husbandry and agricultural practice, resulting in a significant disparity between Bagawa and Tin-Akoff in financial, natural, and social capital (Figure 2).

The respondents in Bagawa and Tin-Akoff stated that high mobility is observed in the village. Many noted that emigration to other areas and migration to their villages are motivated by the pursuit of livelihood opportunities seeking better cultivable land, fodder production, etc. This is one of the frequently practiced coping strategies practiced by the community in response to decreasing natural resources. However, the lack of adaptation knowledge, limited usage of local agriculture, animal husbandry practices, and shortages of agricultural and livestock equipment are contributing to the respondents’ decisions to opt for mobility to explore and secure the needed resources outside of their community. The high mobility rate is also motivated by the lack of infrastructure and marginalized socioeconomic opportunities within the community. Both Bagawa and Tin-Akoff are located on the outskirts of the capital of the Sahel region and are 273 km from the country’s capital of Ouagadougou.

Today, the alarming increase in the number of migrants due to insecurity, as well as the effects of environmental and climate change, are growing concerns in the Liptako-Gourma region. In particular, there has been a sharp increase in incidents between agro-pastoral communities in the Liptako-Gourma region, [43] including damage to the farmland near the rangeland or transhumance route, failure to use the official transhumance route, armed attacks, and increasing inter-community tension. The surge in mass movement and precipitated transhumant movement could lead to competition over animal resources, and conflicts between farmers, herders, and transhumance, as well as inter-community tensions, and agro-pastoral conflicts [44]. Amidst these circumstance, seasonal migration have intensified, making borders a crucial conduit movement [45]. The 2020 Sahel Transhumance Crisis Response Plan [46] identified how insecurity and climate variability have led to changes in the seasonal migratory routes of transhumant movements in the Sahel as a result of insecurity and climate variability. As a measure to safeguard their crops yield, countries along the coast attempted to shut down their borders, which failed to prevent the transit of transhumant herds through their territories but made these movements more clandestine [47]. Responding to this, the IOM urges the States to act in a whole-of-government endeavor, addressing the linkage between agriculture, environment, justice, human rights, employment and training, investments, remittance, and trade.

The respondents in Bagawa and Tin-Akoff stated that different local conflicts are managed by the local administration which provides services to the population and answers directly to the ministries [48]. Effective management of natural resource in Burkina Faso depends heavily on decentralized actors, such as governors, prefects, and sub-prefects,

many of whom are responsible for vital services such as the land register, animal husbandry, taxes, state property, justice, and also play a crucial role in resolving conflicts between farmers and herders. Land management and conflict resolution services, particularly in cases involving disputes between farmers and herders, play a significant role in this context. Burkina Faso's government has placed great emphasis on decentralization as a means of expediting the country's progress. [48]. Nonetheless, decentralization has received criticism for supposedly favoring farmers over herders and research indicates that it has failed to resolve the issue of fair access to natural resources between the two groups "herders and farmers". Despite efforts to restore and resolve these conflicts, their numbers have continued to rise. As a result, it is crucial to reestablish trust between local communities and the elected decentralized officials to ensure equitable natural resource and effective natural resource management.

5. Conclusions

In this cohort study, we found a strong linkage between development challenges and security in Liptako-Gourma region, reflecting its livelihood strategy which heavily depends on agriculture and animal husbandry through active circular migration and population movement across borders. The drivers for fragility in the region include borderland governance, natural resource scarcity exacerbated by climate change, insecurity, and political situation. The lack of visibility and uncontrolled movements of people in the Sahel exacerbates the borderland-induced deficit in the Liptako-Gourma region. The borderland-induced deficit is conclusively dubbed as chronic poverty accelerated by remoteness, poor infrastructure and services, weak institutions, a sparse population, a lack of resources, and challenging terrain. As shown by the responses of our informants, the community remains marginalized and highly vulnerable to external shocks. The current policy, including the decentralization process, is not designed to address unique challenges that are faced in the borderland. To avoid and mitigate conflicts, local mitigation strategies must be reinforced with an early warning system that takes into account shifts in transhumant migration routes caused by climate change. It is crucial to focus on initiatives that support the livelihoods of rural populations in the Liptako-Gourma region.

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