HABITABLE

The Place of Migration in Coping and Maladaptation: Qualitative Insights from Four Countries

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D4.4

The **HABITABLE** project – Linking Climate Change, Habitability and Social Tipping Points: Scenarios for Climate Migration – aims at significantly advance our understanding of the **current interlinkages between climate change impacts and migration** and displacement patterns, and to **better anticipate their future evolution**.

Running for **4 years** (2020-2024), HABITABLE brings together **21 partners:** University of Liège, University of Vienna, Potsdam Institute for Climate Impact Research, University of Exeter, the IDMC, Lund University, Sapienza Università di Roma, adelphi, Université de Neuchâtel, Institut de Recherche pour le Développement, Council of Scientific and Industrial Research, UNESCO, University of Ghana, CARE France, University of Twente, Université Cheikh Anta Diop, Stockholm Environment Institute Asia, Raks Thai Foundation, Addis Ababa University, Institut National de la Statistique du Mali and Samuel Hall.

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Please visit www.habitableproject.org for more information about the project.

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Introduction

The HABITABLE Project Work Package 4 investigates individual, household, and community-level strategies that reduce displacement pressures or help support migration in contributing positively to household resources and capabilities, as well as how government-led strategies support these goals.

This report brings together vast experiences from HABITABLE case study areas. While the depth and breadth of information gained from the semi-structured interviews are significant and cover many different topics, this report focuses on one set of issues: micro- and meso-level coping strategies.

This report explores the linkages between these strategies and migration in selected communities in four HABITABLE primary case study countries. It builds on critical factors, trends, and context previously identified in the literature and HABITABLE project. Many of these learnings are illustrated in HABITABLE D4.2, on factors influencing the probability of migration (Blocher, Hoffmann, and Weisz, 2024). Critical categories relevant to this report were identified in the co-development of the methodological framework as well as data collection tools and approach (Blocher *et al.*, 2024).

This report emphasizes cross-cutting issues and response strategies for communities in which migration and climate change adaptation go hand in hand. The target audience of this research report/policy brief includes policymakers and stakeholders involved in designing adaptation measures.

How to read this report

The present research report first offers an overview of the methodological approach of WP4 data collection and then a summary of the data collected in each country. We then present a number of the key socio-economic characteristics explored across study sites. Following that, we describe the hazards and adverse climatic or environmental events reported by the interviewees in each community. Next, we describe the main reported coping strategies employed at the community, household, and individual levels as well as the perceptions of our interview partners of the "success" (or not) of these efforts. We then describe the role of migration among these strategies as reported by the interviewees. Finally, we draw comparisons across sites for migration trends as well as coping strategies.

This research report is intended to complement the other WP4 outputs and forthcoming policy brief series (the first of which has been published at the time of writing: Serraglio *et al.*, 2024)).

Methods and Data

Methodological Approach and Data Collection

Work Package 4 of the HABITABLE project draws largely from semi-structured interviews (SSIs) conducted in each focus country. The research protocols and sets of questions were developed by the Potsdam Institute for Climate Impact Research (PIK) team together with each of the country teams in a series of Methods Workshops between December 2021 and September 2022. An overall framework for the research, field protocols, sets of questions, ethics and consent guidance, and information about the development of the database are detailed in the methods Handbook available online (Blocher *et al.*, 2024). This toolkit is intended to help future researchers replicate and build on the work conducted in the HABITABLE project. A brief summary of those efforts is presented here to contextualize the present research report.

The project methods toolkit for qualitative interviews was adapted to each country context for the data collection phase carried out in 2022. The interviews were conducted with individual participants in their local language in a conversational manner, allowing for follow-up and probing questions, to gain in-depth insights into the opinions and experiences of the target population. Questions in an SSI context are generally asked sequentially, but flexibility was allowed for the interviewer to probe and maintain conversational flow. This is good practice in qualitative data collection (Patton, 2002; Adams, 2015). Deep insights and nuance gained through the SSI methodology add value to the quantitative survey carried out by Work Package 1.

Interview transcripts from each study site were translated into English, verified by the country teams, and then processed by the PIK team. Processing of the transcripts involved some text editing for meaning and accuracy, as well as significant harmonization efforts. MaxQDA, a qualitative data analysis software, was used in the content and thematic analysis in two ways: deductive and inductive coding.

In order to produce a harmonized database, the PIK team used *deductive* coding to divide the transcripts by question. For this, the initial set of codes corresponded to the interview questions. This allowed the team to match up interview fragments with the question it answers, which is necessary in part because the SSI context is not question-and-response, as noted above. This procedure allowed for the interviews to be compared across study contexts in a structured database. Following additional processing and verification, the overall database (Serraglio and Blocher, 2024) has been anonymized for public accessibility online.

For a deeper analysis, the PIK team also took an *inductive* approach to qualitative content analysis, which involved coding all transcripts first for broad themes and research questions, and then coded for patterns and secondary lines of inquiry. Conceptual analysis of the qualitative interview data allows us to determine the prevalence, frequency, and weight of different concepts/issues of importance to the target population. The insights in the present research report are the result of this inductive two-cycle qualitative text analysis. Careful readings of the transcripts also helped to

identify "representative" narrative stories from interviewees that were shared with Work Package 7 to help produce scenario narratives.[1]

A first research validation and triangulation workshop was held in Potsdam, Germany in July 2023, following which additional conversations with each country team were intended to ensure research findings are contextualized and relevant to each national context.

Sample by Country

This section provides an overview of the interview sample, divided by country. In all countries, interviewees were selected based on their migration experiences and exposure to climate risks, based on criteria and distinctions developed with the country teams.[2]

Ghana

In Ghana, interviews were undertaken within three chosen communities in the Northern and Volta Regions (see Table 1) by the country team[3] between April and May 2022. Out of a total of 166 interviews, the majority (144) were conducted in the origin communities, specifically, 48 interviews were held in Kpendua, 32 in Lingbung, and 64 in Vome. Additionally, 20 interviews were conducted with migrants residing in Tema, a suburb of Greater Accra, which serves as a common destination for migrants from the Volta Region. Moreover, two community leaders were interviewed, representing Lingbung and Vome, respectively.

Table 1: Summary of Qualitative Interviews in Ghana

Community Name	Site Type	Total verified interviews*
Kpendua	Origin area	48
Lingbung	Origin area	32
Vome	Origin area	64
Tema	Destination area	20
		164

*Includes semi-structured interviews, excludes community leader interviews.

The sample of the origin communities comprised 144 interviewees with a gender distribution of 86 males (59.7%) and 58 females (40.3%), indicating a relative balance throughout the activity. The age profile of the interviewees highlights the representation of middle-aged adults, who are likely the most active in agricultural activities and most affected by migration decisions. The bulk of participants are between 35 and 49 years old, encompassing 84 individuals (58.3%), with the 35-39 years age group being the most represented at 36 individuals (25%). Other age groups include 40-44 years

[1] See HABITABLE Scenario Narratives.

[2] For details on the critical case criteria, see Blocher, Julia; Vinke, Kira; Winter, Lena; and Serraglio, Diogo (2022). Handbook for Qualitative Interviews on the Climate-Migration Nexus. Potsdam: Potsdam Institute for Climate Impact Research.

[3] In Ghana, data collection was conducted by the Regional Institute for Population Studies (RIPS) at the University of Ghana.

with 25 individuals (17.4%) and 45-49 years with 23 individuals (16%). Ethnically, the sample is comprised of two major groups: Dagomba with 79 interviewees (54.9%), followed by Ewe with 64 interviewees (44.4%).

Mali

In November 2022, the country team[4] conducted interviews in four selected communities in the Kayes and Sikasso Regions of Mali. A total of 134 interviews were carried out in these origin communities (see Table 2). Four community leaders – each representing one of these communities – were also interviewed. Furthermore, 25 interviews were planned to be conducted in Bamako and Koutiala, towns that frequently receive migrants from the Kayes and Sikasso Regions, respectively.

Table 2: Summary of Qualitative Interviews in Mali

Community Name	Site Type	Total verified interviews*
Dogo	Origin area	25
Fatao	Origin area	35
Gory	Origin area	35
Kignan	Origin area	35
		130

*Includes semi-structured interviews, excludes community leader interviews.

In the sample of 130 interviews from Mali's origin areas, a pronounced gender imbalance is noted throughout the activity, with 120 males (92.3%) and only 10 females (7.7%). The difficulty to conducting safe and ethical research with women is reflective of broader societal roles and patriarchal norms in the country. The age distribution of the interviewees indicates a representation of middle-aged to older adults. Age groups from 30 to 59 hold steady numbers, ranging from six to 20 interviewees, with the 45-49 age group being the most represented with 20 individuals (15.4%). Notably, older adults, with ages 60-64, 65-69, and 70-74 also showed some representation (17, 10, and 11 interviewees, respectively). Ethnic diversity is marked by a range of ethnic groups, including Bambara with 47 interviewees (36.2%), Soninké follows with 36 participants (27.7%), and Peuhl and Sarakolé being also notable with 15 (11.5%) and 10 (7.7%) respectively. Other groups such as Malinké, Senoufo, as well as other less represented ethnicities such as Bananikoro, Dogon, among others, make up smaller fractions of the sample.

Kenya

In Kenya, interviews were conducted within three selected communities in Makueni County (see Table 3) by the country team[5] in the second half of 2022. Of 158 total verified interviews, the majority (102) took place in origin communities: 36 interviews took place in Kathyaka, 37 in Kikoko, and 29 in Ngulu. 53 interviews were carried out with migrants in Chaani, a suburb of Mombasa and a common destination for migrants from Makueni. Three community leaders were interviewed, representing Kathyaka, Kikoko, and Ngulu.

Table 3: Summary of Qualitative Interviews in Kenya

Community Name	Site Type	Total verified interviews*

[4] In Mali, HABITABLE activities were coordinated by the National Statistical Institute (*Institut National de la Statistique*, INSTAT).

[5] In Kenya, data collection was conducted by Samuel Hall.

Kathyaka	Origin area	36
Kikoko	Origin area	37
Ngulu	Origin area	29
Chaani	Destination area	53
		155

*Includes semi-structured interviews, excludes community leader interviews.

The sample from Kenya's origin communities includes a nearly balanced ratio of 52 males (50.98%) and 50 females (49.02%). Interviewees predominantly fall within the middle to older age groups, with the largest age segment (45-59 years) including 49 interviewees (48.05%). Following this, the 65-69 age group comprises 14 interviewees (13.73%). All interviewees were of the same ethnicity: Kamba.

Thailand

In Thailand, interviews were conducted by the country team[6] in April and May of 2022 within two communities in Chiang Rai Province (Ban Rak Thin Thai and Ban Phaya Lao-U) and three communities in Udon Thani Province (Ban Non Tao, Ban Don Hai Sok, and Ban Nong Kla). Of the 124 verified interviews, 99 occurred in the origin communities: 47 in Chiang Rai and 50 in Udon Thani. An additional 25 interviews were conducted with migrants in Greater Bangkok (Pathum Thani, Samut Pakran, and Samut Sahkon). The leaders of the two communities from Chiang Rai were also interviewed.

Table 4: Summary of Qualitative Interviews in Thailand

Province Name	Site Type	Total verified interviews*
Chiang Rai	Origin area	47
Udon Thani	Origin area	50
Greater Bangkok	Destination area	25
		122

*Includes semi-structured interviews, excludes community leader interviews.

Among the 97 individuals interviewed, there is a gender composition of 53 females (54.64%) and 44 males (45.36%), reflecting a relative gender balance. The age distribution shows a concentration in older age groups. Young adults (20-24) were minimally represented with only three individuals and it gradually increased up to the 40-44 year group with nine people (9.28%). The number of interviewees peaks among those aged 45-59, with 41 individuals (42.27%), indicating that middle-aged and older adults were more prominently featured in the interviews conducted throughout the activity.

[6] In Thailand, data collection was conducted by Raks Thai Foundation.

Socio-economic Challenges and Subjective Measures in the Study Sites

This section describes some of the socio-economic conditions and related challenges in the study sites. More information by site is available in Annex 1, "Community Profiles".

Educational attainment

Barriers to education were noticed in all four study sites, with portions of the population lacking access to formal education. This is summarized in Figure 1. Ghana and Mali have the highest percentages of individuals lacking formal education, with 52.86% and 50.77%, respectively. This highlights barriers to education that are prevalent in the rural areas selected for this study. Incomplete primary education is common among interview participants in Mali (23.85%). Higher education attainment is low in both countries, with Ghana at 2.86% and Mali at 5.38% (see Figure 6).

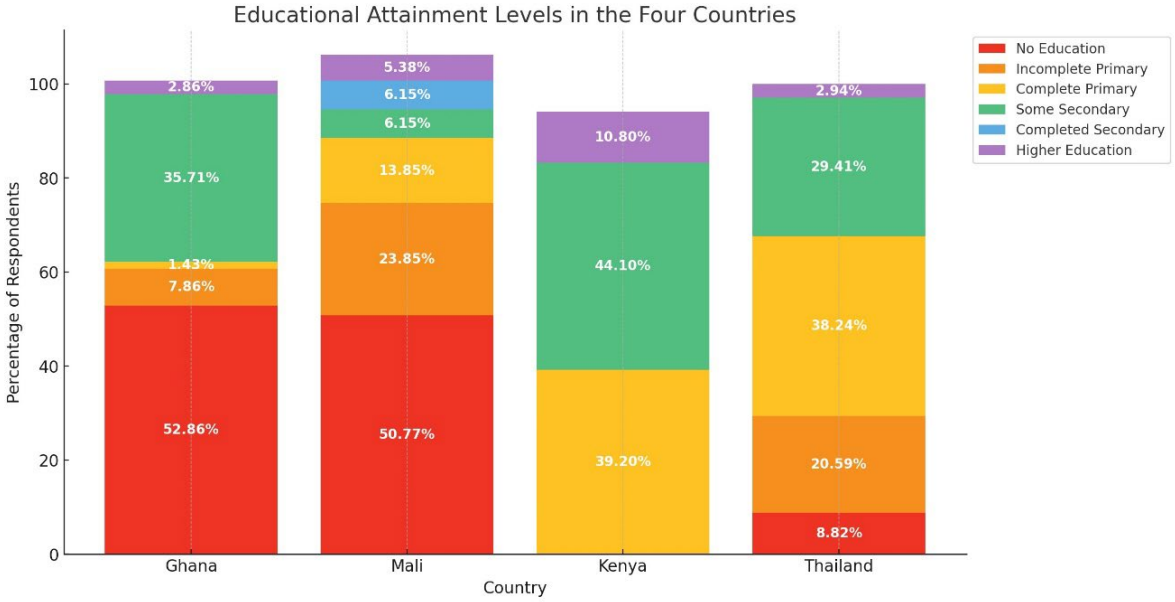

Figure 1: Educational attainment levels in the study sites, by country

In turn, the interview participants in Kenya had a more balanced educational attainment. While 39.2% of respondents have complete primary education and 44.1% with some secondary education, 10.8% have achieved higher education. This indicates better access to and progression through the education system compared to the sites in Ghana and Mali. Connectedness is also an important element, as the study sites in Kenya were relatively close to major roads and generally less remote than those in Ghana in Mali. Lastly, Thailand also presents a relatively favorable educational scenario with 38.24% of the population studied completing primary and 29.41% secondary education. However, like the other countries, higher education attainment remains low at 2.94%.

Time occupation and agricultural activities

Agriculture is the predominant occupation in the communities studied across Ghana, Mali, Kenya, and Thailand. While 130 individuals engage in agricultural activities in Ghana, 89 individuals farm in Mali. Furthermore, farming activities involve 45 respondents in Kenya and 64 in Thailand. Despite the dominance of agriculture, each country also has a range of other occupations, from trades and services to distinct forms of manual labor. The presence of casual labor in Kenya and Thailand suggests economic instability and a lack of permanent employment opportunities. Moreover, each country exhibits a variety of crops, with maize being the most common crop in Ghana, Mali, and Kenya, while Thailand primarily focuses on rice (see Figure 2).

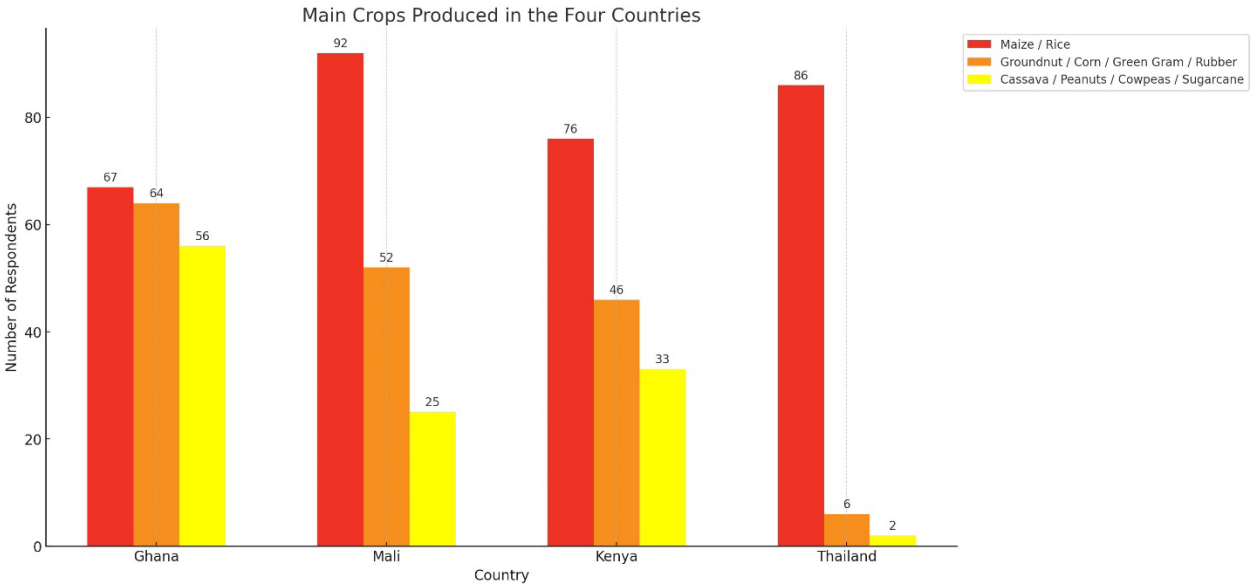

Figure 2: Main crops produced in the study areas, by country

In Ghana, the main crops are maize (67 respondents), groundnut (64), and cassava (56), reflecting an agricultural base focused on staple and cash crops. For its part, Mali's agriculture is dominated by maize (92), corn (52), and peanuts (25), emphasizing the importance of maize in their farming practices. In Kenya, the primary crops include maize (76), green gram (46), and cowpeas (33), indicating a mix of staple foods and legumes vital for food security and nutrition. Finally, Thailand's agriculture is centered on rice (86), alongside the economic relevance of rubber and sugarcane.

Land Ownership

A number of interviews indicated the importance of land tenure in subjective well-being as well as in migration decision-making. Land ownership is prevalent in Ghana (70.97%) and Kenya (62.7%), while Mali and Thailand show more reliance on rented or family-owned land, suggesting different land tenure dynamics and possibly more insecurity in land access.

Box 1. Agricultural dependence: a common challenge faced by the target communities

In the study communities across the four countries, distinct shared challenges underscore the interconnected nature of key common gaps affecting rural livelihoods, agricultural productivity, and socio-economic stability. Addressing these challenges alongside human mobility in the context of climate change, disasters, and environmental degradation calls for comprehensive policies and legal frameworks.

Ghana: In the study communities of the Northern and Volta Regions, villages rely on agriculture for their livelihoods. Whilst Lingbung has an irrigation system in place, its access remains restricted. The dependence on rainfall makes both communities vulnerable to weather-related risks such as droughts and flooding. Machinery use for fieldwork is not common in either community, possibly hindering agricultural efficiency and/or productivity. It was also noted that agricultural produce is often affected by pests.

Mali: In the study communities of the Kayes and Sikasso regions, all four communities depend on agriculture and livestock, which have been increasingly affected by environmental hazards such as changes in rainfall patterns and droughts. This is exacerbated by the lack of advanced agricultural technology and reliance on traditional farming methods, impacting crop yields and leading to situations of food insecurity.

Kenya: The majority of households in all three communities rely on agriculture. The reliance on traditional farming methods, exacerbated by limited access to irrigation, high costs of agricultural machinery, and the need for drought-resistant crops, hamper sustainable agricultural practices and food security. Whereas disputes over land, human-animal conflicts, and land tenure issues underscore the need for effective conflict resolution mechanisms and sustainable land management practices, the limited availability of water for agricultural and domestic use is, in large part, due to inadequate water management systems.

Thailand: In both study communities in Chiang Rai, agricultural productivity, and socioeconomic stability. Agriculture is the primary source of income, with both communities relying on rainwater and family and manual labor. Phaya Lao-U has shifted from traditional crops to more profitable ones; however, this shift has been met with issues like rising costs, falling market prices, and droughts, all of them leading to food and water shortages. Likewise, the high costs of farming traditional crops and water shortages due to droughts in Rak Thin Thai have resulted in rubber cultivation.

For more information on national policy responses to these challenges, see the forthcoming policy brief series: Securing habitability in a changing climate: The place of human mobility among local adaptation strategies. (see Serraglio *et al.*, 2024)

Adverse Climatic and Environmental Events

This section describes the most commonly reported climatic shocks and other environment-related events affecting households in the study sites, first overall and then by country.

Across all study countries, droughts are the primary environmental problem reported, with the highest impact seen in Ghana (85) and Thailand (73). Erratic rainfall patterns also pose a major challenge, particularly in Mali (67) and Kenya (30). Flooding affects Ghana (35) and Mali (38), while pest infestations are an issue in Kenya (23). Thailand also faces water shortages (18) and air pollution (12). Figure 3 describes the varied environmental difficulties faced by households, with droughts and erratic rainfall patterns emerging as common critical issues across the countries.

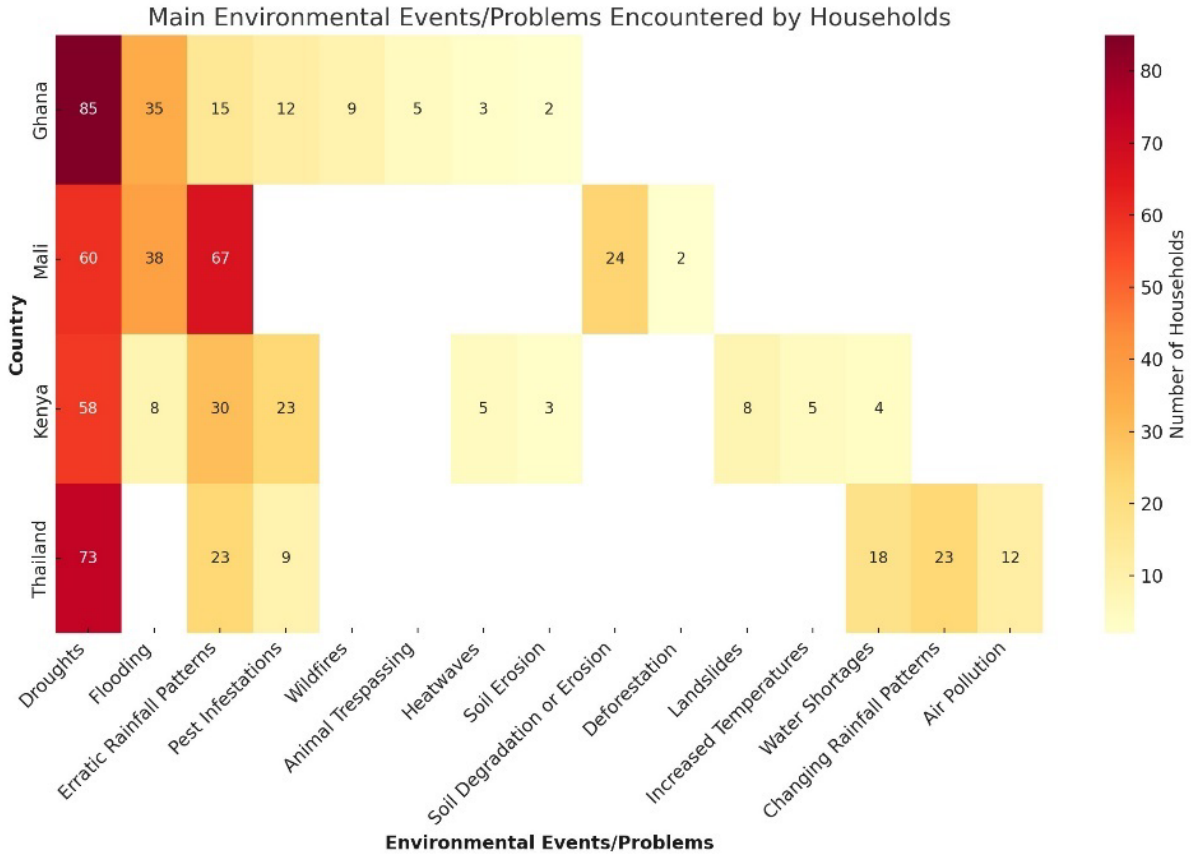

Figure 3: Main adverse environmental events reported by interviewees

Ghana

In Ghana, environmental problems such as droughts (85), flooding (35), erratic rainfall patterns (15), pest infestations (12), and wildfires (9) were reported to have caused impacts on households. Animal trespassing, heatwaves, and soil erosion were also noted but less frequently. Droughts had the greatest impact on households, affecting income and food security. Health issues such as illnesses and chronic diseases (38), the passing of family members and the associated costs with funeral services (18), increase in food prices (7), as well as other minor issues such as farming problems (3),

lack of financial resources (3), lack of jobs (2), and poverty (2) were reported to have contributed to worsening conditions – although many households reported having no effective alleviating factors (15). On the other hand, alleviating factors included migration and remittances (14), support from relatives, friends, and the community (9), selling livestock, managing surplus from previous harvests, and savings (2 each). Nevertheless, it is to be noted that 46 households reported the absence of any alleviating factors.

Mali

Malian households encountered various environmental challenges, with special attention to erratic rainfall patterns (67), droughts (60), flooding (38), soil degradation or erosion (24) sometimes combined with deforestation (2). In this context, rainfall variability and prolonged droughts were the most impactful, affecting households' livelihoods. These environmental issues were compounded by the lack of labor (force) (40), situations of water scarcity (21) and food shortages (16), as well as crop infestations (12). Lower wages and increases in food prices were mentioned by 3 and 2 households, respectively. Such contexts were alleviated by the receipt of remittances (29) and the migration of family members (9), as well as other sources of income (9) and the surplus from previous harvests (9). Furthermore, changes in farming practices, like using enhanced seeds (36), practicing crop rotation (21), using machinery (16), adjusting planting seasons (15), and applying fertilizers (14), among others, helped ease the challenges.

Kenya

Kenyans reported environmental problems like drought (58), erratic rainfall patterns (30), pest infestations (23), and, to a lesser extent, flooding (8), landslides (8), increased temperatures (5), and soil erosion (3), exacerbated such issues. Moreover, indirect impacts such as crop damages (46), loss of livestock (33), infrastructure damages (7), and water scarcity (4) further strained household resources and well-being.

According to the households, droughts have had the greatest impacts. Associated with that, the situation was further exacerbated by rising food prices (51), health problems among household members (21), lack of casual jobs and reduced income (12), difficulties in paying school fees (9), theft (9), high farm input costs (6), the impacts of the COVID-19 pandemic (4), water scarcity (3), and lack of access to financial assistance (2). On the other hand, casual work (41), government and NGO support (34), and remittances (31) helped to mitigate impacts. Support from relatives, friends, and neighbors (16), selling existing livestock (19), and loans (12) provided additional relief. Besides, selling vegetables (10), surplus from previous harvests (9), water management solutions (e.g. digging ponds) (9), meal reduction (9), and new businesses (8) also aided households in coping with such environmental challenges. Yet, 12 households reported no alleviating factors.

Thailand

The primary environmental impacts affecting households' crop production were droughts (73), and changing rainfall patterns (23). These, combined with water shortages (18), pest infestations (9), and air pollution due to the excessive use of fertilizers

and chemicals (12) worsened the situation. On the other hand, investing in water management responses, such as buying water supply, drilling groundwater, digging ponds, and pumping water eased the challenges for at least 30 households. Moreover, responses that made the situation easier included finding extra sources of income (27), changing farming methods (26), borrowing money and/or rice (20), remittances (13), taking out loans (7), using surplus from previous harvests (6), cutting expenses and migration (3 each).

Micro-and Meso-level Coping Strategies

This section describes community (meso-level) and household or individual (micro-level) coping mechanisms. These were reported by individual interview partners as direct or indirect responses to the adverse events described above.

Ghana

Households in Ghana employ a variety of strategies to cope with severe climatic events during or immediately after the occurrence of an adverse event. The use of reserves and savings, such as surplus agricultural production from previous harvests, was the most common response (18 households), followed by migration of family members and remittances from those who had previously moved to urban areas (17). Some households (15) reported doing nothing, while others relied on support from relatives and friends (9) or engaged in casual work (7). Changing farming practices, such as using pesticides or altering farming methods, were adopted by 4 households, and others still sought extra income from various sources, including secondary businesses (4), taking loans (3), fishing (3), as well as selling charcoal or fruits and vegetables (1 each). In addition, most households in Ghana (134) reported receiving no assistance from the government or NGOs: only 4 attested receiving some form of support, including fertilizers subsidies and help from local assembly members.

With regard to the effectiveness of responses, 35 interview partners considered their adaptation measures "successful". Effective strategies included changes in farming (23), such as using fire belts (4), pesticides (3), water management solutions (3), planting in different locations (3), changing land size (3), and adjusting planning times according to the weather (2). Migration (7), managing surplus from previous harvests (5), and support from relatives and neighbors (5) were also deemed successful by some households. Other effective strategies included casual work, new business ventures, selling fruits and vegetables, fishing, and selling charcoal or livestock. Moreover, preparations for future events varied, with some households focusing on farming methods, such as adjusting timing, size, fertilizers, and irrigation techniques (19). Others planned to use the surplus from previous production (9), start saving (7), or rear cattle (5). Still, some households intended to sell fruits and vegetables, or shea nuts (3 each). Only 1 household considers migration. However, 39 households reported no preparation, while 16 relied on their religious beliefs.

Mali

In Mali, the most reported strategy to deal with immediate environmental impacts was changing farming practices, with 119 households adopting distinct methods. This included using enhanced seeds (36), employing crop rotation (21), investing in machinery use (16), altering the planting and harvesting periods according to the weather (15), applying fertilizers (14), and modifying the size of areas for crop production (10). Using savings and surplus from previous harvests, as well as resorting to additional sources of income, were strategies mentioned by nine households each. More importantly, 29 households relied on remittances sent by migrant family members and 9 cases of migration were reported.

Government and NGO support in this country was mixed, with 87 households reporting no assistance and 43 receiving some form of support, such as temporary financial support (8) and participation in food relief programs (7).

At least 70 interview partners found their responses "successful". Effective adaptation strategies included generating extra income through casual jobs (5), using enhanced seed for agricultural production (4), community support (3), and relying on savings (2). Although on a smaller scale compared to Ghana, migration and livestock production were also mentioned as successful strategies by some households.

Kenya

Seeking casual work is a major coping strategy reported in Kenya, engaged in by 41 households. Support from the government and NGOs (34), reliance on remittances (31), and assistance from relatives, friends, and neighbors (16) were also mentioned as common practices. Concerning government and NGO assistance, 46 households confirmed receiving various forms of support, including loans and access to micro-finance initiatives (10), food relief programs (15), and bursaries to cover school fees (8). Whilst some households (12) reported doing nothing in response to the events, other strategies included selling livestock (19), taking out loans (12), selling vegetables (10), water management (9), using surplus from previous harvests (9), reducing meals (9), starting a new business (8), and producing charcoal (4). Dropping out of school, reducing household expenses, using savings, and migration were less commonly mentioned by the interviewees.

In Kenya, no less than 30 interview partners explicitly reported "successful" responses, which included the use of savings (14), surplus from previous harvests (13), keeping and selling livestock (9), changes in farming practices such as crop diversification and the use of enhanced seeds, as well as casual work (5). Interestingly, the success of such measures is also tied to the feeling of being better prepared for future impacts (13) or working harder (12), as well as to the need for better skill development (8), religious beliefs (3), and family unit (3). Concerning preparation for future events, 20 households underlined water management solutions, such as investments in water tanks and pumping systems, digging terraces, and irrigation. Arrangements also included changes in farming techniques, like crop diversification (6), adjusting land size (4), and the use of enhanced seeds (3). The production and sale of livestock were mentioned in 8 interviewed households. Still, some households would rely on their religious beliefs (8), focus on food and production storage (8), work harder or engage in casual work (5), save (5), rely on family and community support (2), or consider migration (2).

Thailand

Water management strategies are prominent in Thailand, with households buying water supplies, drilling groundwater, or digging ponds (30 households). Other strategies included finding extra sources of income (27), changing farming methods (26), borrowing money or rice (20), as well as relying on remittances (20). With specific regard to changes in agricultural practices, strategies involved using chemicals or fertilizers (9), buying enhanced seeds (5), and focusing on paddy sown fields (3). Still, some households reported taking out loans (7), using surplus from previous harvests (6) or

savings (3), cutting expenses (3), considering migration (3), and selling livestock (2). A number of households (71) received either government or NGO support, translated mainly in the form of compensations shared between landowners and renters due to prolonged droughts, and assistance from the Subdistrict Administrative Organization (SAO). Other forms of support at the local level included cooperatives or rice banks.

In the Asian country, successful adaptation strategies included water management solutions like digging ponds and water ridges, planting and selling fruits, practicing crop rotation, and using machinery and new seeds. The installation of solar cells was also pointed out by some households. In the event of future occurrences, whilst 15 households reported no planned changes, common preparations included engaging in casual work (8), adopting other farming methods (8), implementing water management solutions, and, in one case, cutting household expenses. No household considered migration as a possibility to prepare for future climate or other environmental changes.

Migration Responses and Impacts

Migration is often one of the several strategies employed by households in climate-vulnerable areas to respond to challenges such as food scarcity and livelihood loss. This section describes migration as a response strategy, as reported by the interview partners.

Ghana

In Ghana, when asked whether they or a family member had considered migrating after experiencing one of the slow-onset events, hazards, or related environmental events mentioned during the interview, 68 considered moving compared to 60 who did not. This could indicate an inclination towards migration as an adaptation strategy in the face of climatic and other environmental changes. Nevertheless, in Ghana, migration is largely driven by economic and food security concerns. The primary reason for migration cited by the interviewees was the pursuit of better income and living conditions, with 35 households highlighting this factor. Food shortages also called attention as a driver, with 14 households indicating that the lack of food prompted their migration decision. Education, training, and skill development were also noticed, mentioned by 8 households. Farming challenges and personal interests each accounted for 7 and 4 responses, respectively. Poverty was specifically cited by only 4 households. In Ghana, the sentiment towards migration is predominantly positive, with 87 households highlighting its advantages compared to 61 who also pointed out its drawbacks. Remittances stood out as the most frequently cited positive aspect of migration, with at least 34 households underlining this benefit.

Mali

In Mali, when inquired about whether they or a family member had contemplated migrating following one of the slow-onset events, hazards, or related environmental incidents discussed during the interview, more households (74) did not consider migration compared to those who did (56). This may indicate stronger attachments to their lands or even fewer perceived opportunities associated with migration. In fact, it was observed that cultural factors play an important role in migration decisions in Mali, with 22 households referring to cultural aspects as their primary motivation. Economic hardships, including poverty and the need to provide for their families, were cited by 14 and 12 households, respectively. Job opportunities and work-related reasons motivated 11 respondents to migrate. An interesting finding is the specific mention of mining by 8 individuals, suggesting a localized economic driver. Still, studies and food insecurity were explicitly raised by 3 households each.

Kenya

Kenyan households showed a nearly balanced scenario when asked whether a family member had considered migrating after experiencing one of the slow-onset events, hazards, or related environmental events referred to during the interview, with a slightly higher number of individuals considering migration (52) compared to those who did not (47). This relative balance may reflect varying levels of vulnerability and coping capacity within the population studied. Yet, economic opportunities were the

foremost reason for migration in Kenya, with 41 households citing job opportunities as their main motivation. Food insecurity also seemed to be an important driver, with 9 interviewees pointing to this reason. The search for education opportunities and paying children's school fees were motivations for 6 households, as were marriage (in the case of migrant women) and generally better living conditions. Family conflicts and the need for income to cover medical expenses were less frequently mentioned.

Thailand

Similar to the other countries examined, when asked about key reasons for migration, economic motivations were also prominent within Thai households, with 25 indicating the need to earn extra income and 15 highlighting job opportunities in other locations. Education, weddings, and new professional experiences were cited by a smaller number of households, reflecting a variety of personal factors. Interestingly, 30 interviewees explicitly noted that environmental drivers would not be the main reason for their migration decision. On the other hand, environmental reasons (e.g. droughts and erratic rainfall) were mentioned by 5, showing that while not primary, they play a role in some migration decisions. Still, education, weddings, and new professional experiences were cited by a smaller number of households, reflecting a variety of personal factors. When asked whether they or a family member had considered migrating after experiencing one of the slow-onset events, hazards, or related environmental problems mentioned during the interview, more than half of the households surveyed (62) did not consider migrating, compared to 32 that did. This aligns with the previous observation that environmental drivers are not seen as the main reason for migration in Thailand.

Comparative insights: Migration and Coping in Four countries

This section describes migration trends in Ghana, Mali, Kenya, and Thailand based on the information provided in the previous section. The overall Work Package 4 analysis spans various aspects of the social context and migration environment of the case study areas, including personal appearance, household composition, living conditions, migration patterns, educational attainment, wealth perception, primary occupations, agricultural productivity, and land ownership. Here, we focus on migration patterns and their place within other coping mechanisms.

Migration is often one of the several adaptive strategies employed by households in climate-vulnerable areas to cope with challenges such as food scarcity and livelihood loss. This section explores the motivations behind migration across the four countries studied, using the detailed breakdown of the situation in each country provided in the previous sections to compare the similarities and differences among them. The interview data reveals diverse reasons for migration, mainly influenced by economic, cultural, and other personal factors.

Overall Migration trends

We observe different trends in human mobility and urbanization in HABITABLE study sites. Kenya and Thailand have higher mobility rates, with notable numbers of respondents having moved to urban centers like Nairobi and Bangkok. In Kenya, 31.4% of respondents experienced migration, with popular destinations including Nairobi and Mombasa. Thailand shows a migrant ratio of 0.383, with international migration and movements to Bangkok. In the meantime, Ghana and Mali have more respondents remaining in their birth villages, with Ghana having a portion moving to Accra and Kumasi. Mali's international migration is prominent, with many moving to Côte d'Ivoire. These patterns highlight distinct levels of rural-urban migration and the subsequent pursuit of better opportunities in urban centers or abroad.

Figure 4 below demonstrates that migration is a common phenomenon across all four countries, though rates vary. Ghana and Thailand exhibit higher migration rates, reflecting the search for better life conditions elsewhere or other factors driving people to move. On the other hand, Mali and Kenya show relatively lower migration rates, which might indicate successful adaptation measures in situ, fewer opportunities elsewhere, or even situations of involuntary immobility.

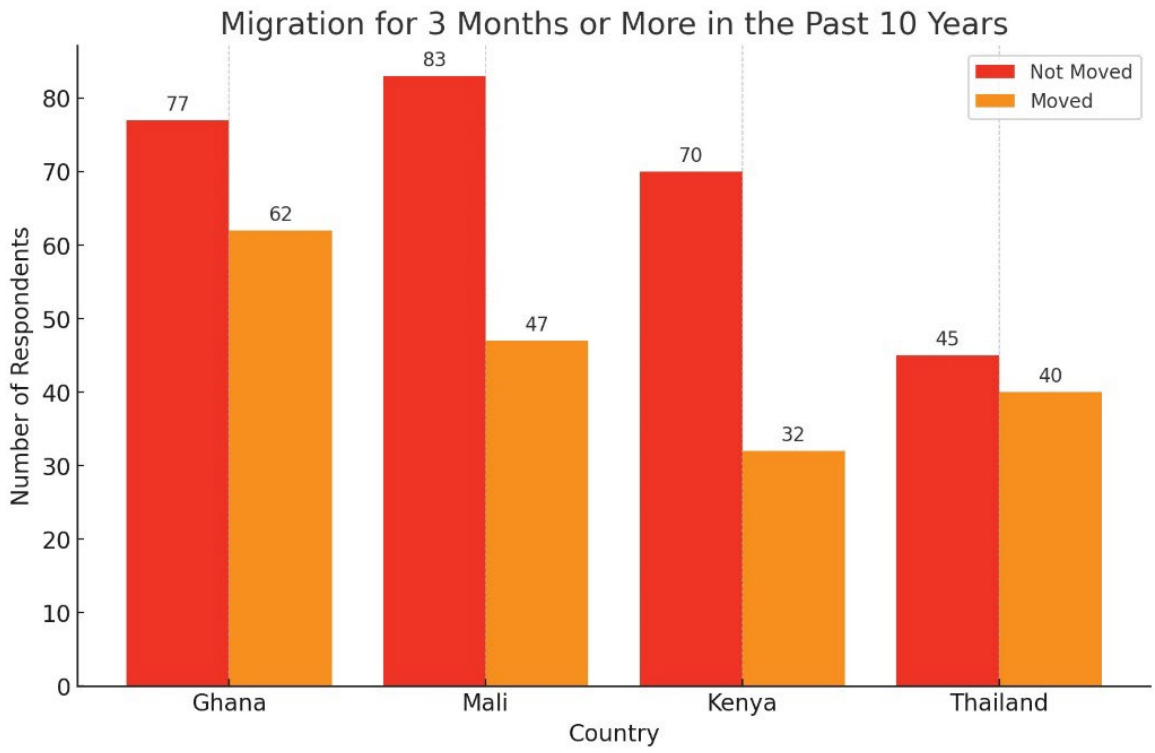

Figure 4: Interview partners reporting a household member had migrated for 3 months or more in the past 10 years, by country

Furthermore, the migration patterns reveal a strong urban pull in all four countries, with major cities like Greater Accra, Bamako, Nairobi, and Bangkok being key destinations. Additionally, Figure 5 below demonstrates that international migration is adopted in Mali and Thailand, emphasizing cross-border movements in search of better living conditions, job opportunities, and access to social services, among others.

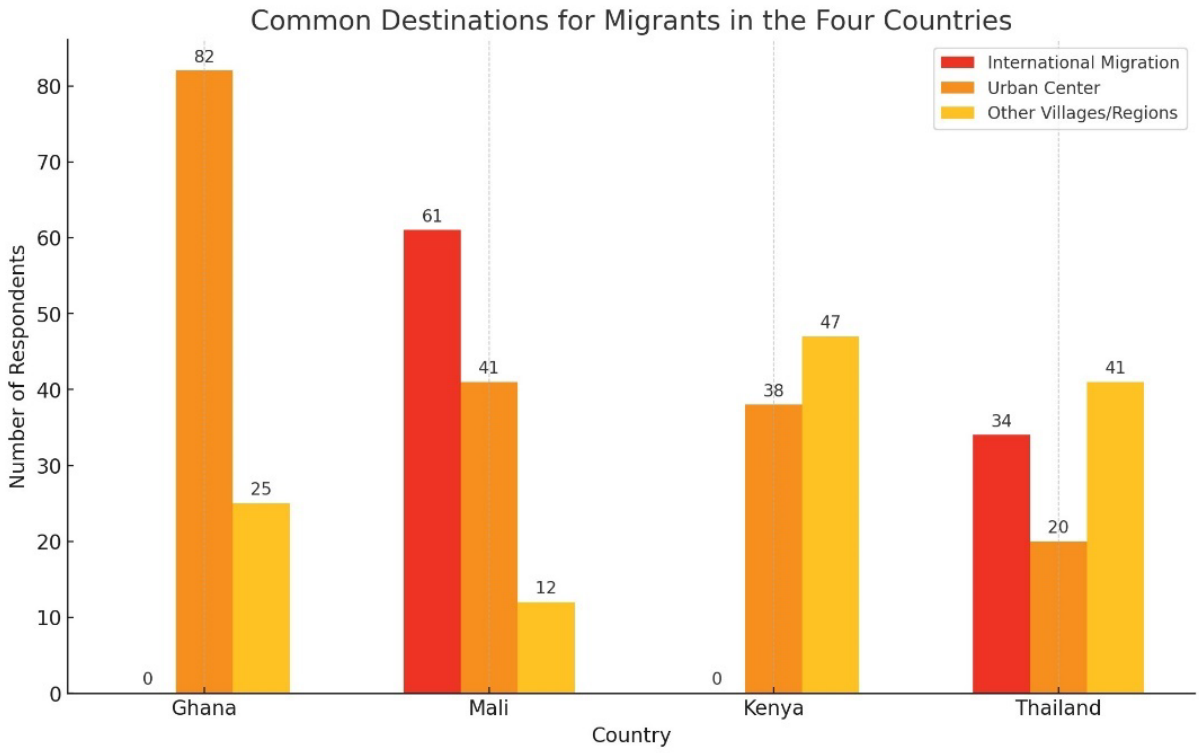

Figure 5: Common destinations for migrants reported by interview partners, by country

Migration among planned responses to environmental challenges

Households in these countries employ diverse strategies to cope with the immediate impacts of climate and other environmental changes, with varying degrees of effectiveness. Initially, in Ghana, households relied on reserves and savings from previous agricultural production, followed by migration and support from relatives. Casual work and changing farming practices were also featured as strategies. In Mali, the predominant response was altering farming practices, such as using enhanced seeds and crop rotation. Remittances also called attention, along with government and NGO support, savings, and additional income sources. In both Ghana and Mali, the number of respondents who stated they did nothing to address the immediate impacts of climate and other environmental changes is noteworthy (see Figure 6).

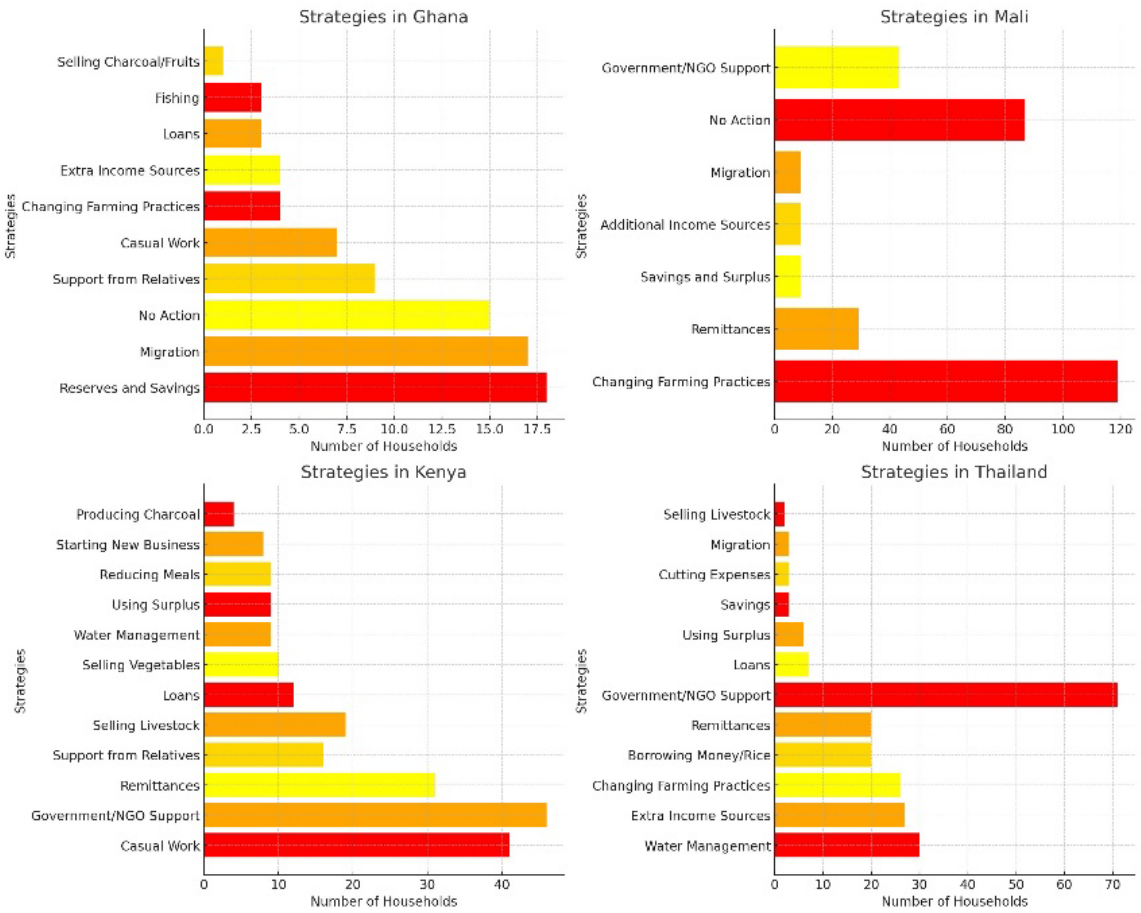

Figure 6: Strategies adopted by households in response to adverse environmental events, by country

In Kenya, casual work emerged as an important coping strategy, supported by remittances and government/NGO assistance. Households also engaged in selling livestock, taking out loans, and implementing water management solutions. In turn, Thailand's response was characterized by water management solutions, extra income sources, borrowing money or rice, as well as remittances. Notably, government/NGO support was also critical, with many households receiving compensation and local assistance (see next section).

Interview partners were asked whether migration was considered among the responses to one of the adverse events discussed earlier in the interview. More households considered migrating (68) compared to those who did not (60) in Ghana. Kenya showed a nearly balanced scenario, with a slightly higher number of individuals considering migration (52) compared to those who did not (47). Conversely, in Mali and Thailand, the situation was different. While in Mali a larger number of respondents did not consider migrating after such events (74) compared to those who did (56), in Thailand fewer respondents considered migrating (32) in contrast to the larger number who did not (62) (see Figure 7).

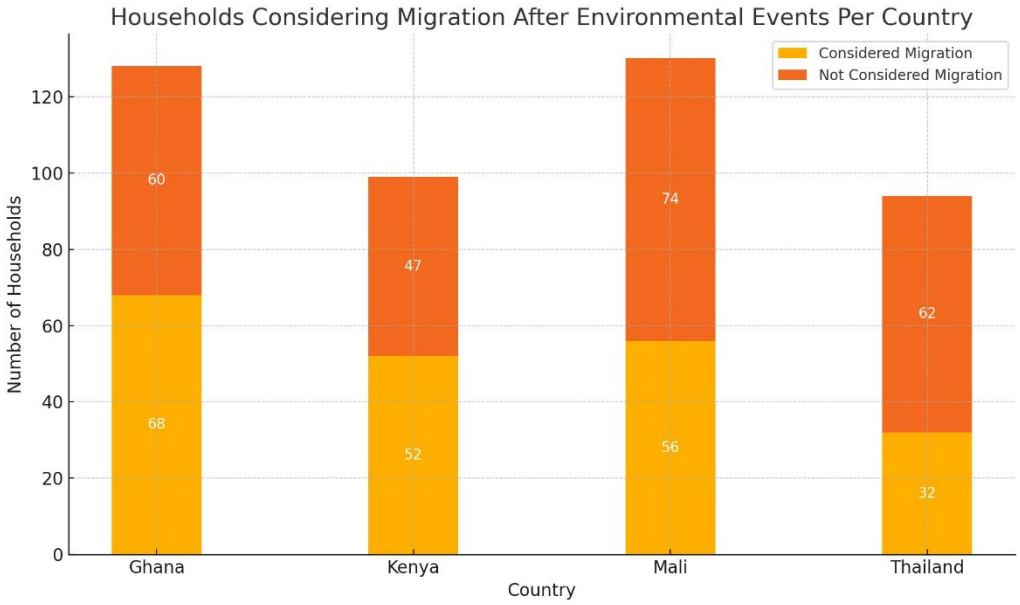

Figure 7: Households considering migration after climate and other environmental events mentioned during the interview

In examining the reported "success" of strategies across the countries, 35 households deemed their adaptation measures successful in Ghana. Mali saw at least 70 households finding their responses positive, while in Kenya no fewer than 30 households reported the same. Thai households, although without a specific number of successful measures, highlighted a range of effective strategies. Figure 8 below illustrates the effectiveness of various coping strategies employed by households in Ghana, Mali, Kenya, and Thailand in response to climate and other environmental events.

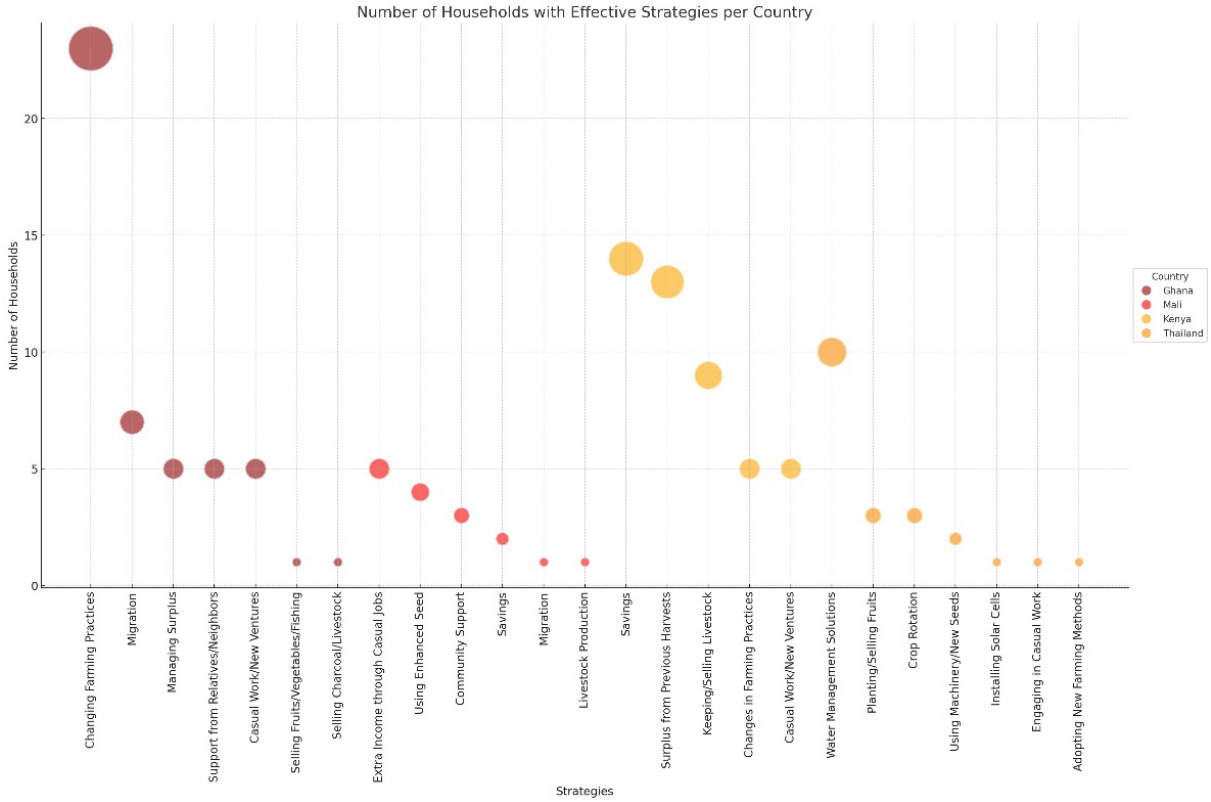

Figure 8: Number of households with reportedly "effective" strategies, by country

In Ghana, changing farming practices stood out as the most recurrent effective strategy, with 23 households finding it successful, followed by migration (7) and managing surplus from previous harvests (5). Within Mali's set of effective strategies, extra income through casual jobs (5) and using enhanced seeds (4) were considered the most effective. In Kenya, savings (14) and utilizing surplus from previous harvests (13) were the top strategies. Thailand's households found water management solutions to be the most effective (10).

Adaptive factors: positive conditions, strategies, and support

Interviewed households were also asked about potential factors that mitigated or alleviated conditions around the time that adverse events took place, and whether or not migration was part of the chosen response. In Ghana, migration and remittances (14) and support from the community (9) were pointed out as the primary sources of relief, while selling livestock, managing surplus from harvests, and savings each aid a smaller number of households (2 each). In Mali, enhanced farming practices (36) and remittances (29) were cited as alleviating factors, followed by migration of family members, other sources of income, and surplus from harvests (9 each). Kenya shows reliance on casual work (41), government and NGO support (34), and remittances (31), with selling livestock (19) and support from relatives and friends (16) also playing important roles. Additionally, loans, selling vegetables, and water management solutions benefit smaller groups (9 to 12). In Thailand, remittances and savings (32) and extra sources of income (27) were the most impactful factors, followed by changing farming methods (26) and borrowing money or rice (20). Better living conditions and

surplus from harvests each help 6 households, while loans, cutting expenses, and migration provide relief to a smaller number of households (3 to 7). Figure 9 below highlights the diverse strategies households employ to alleviate adverse conditions.

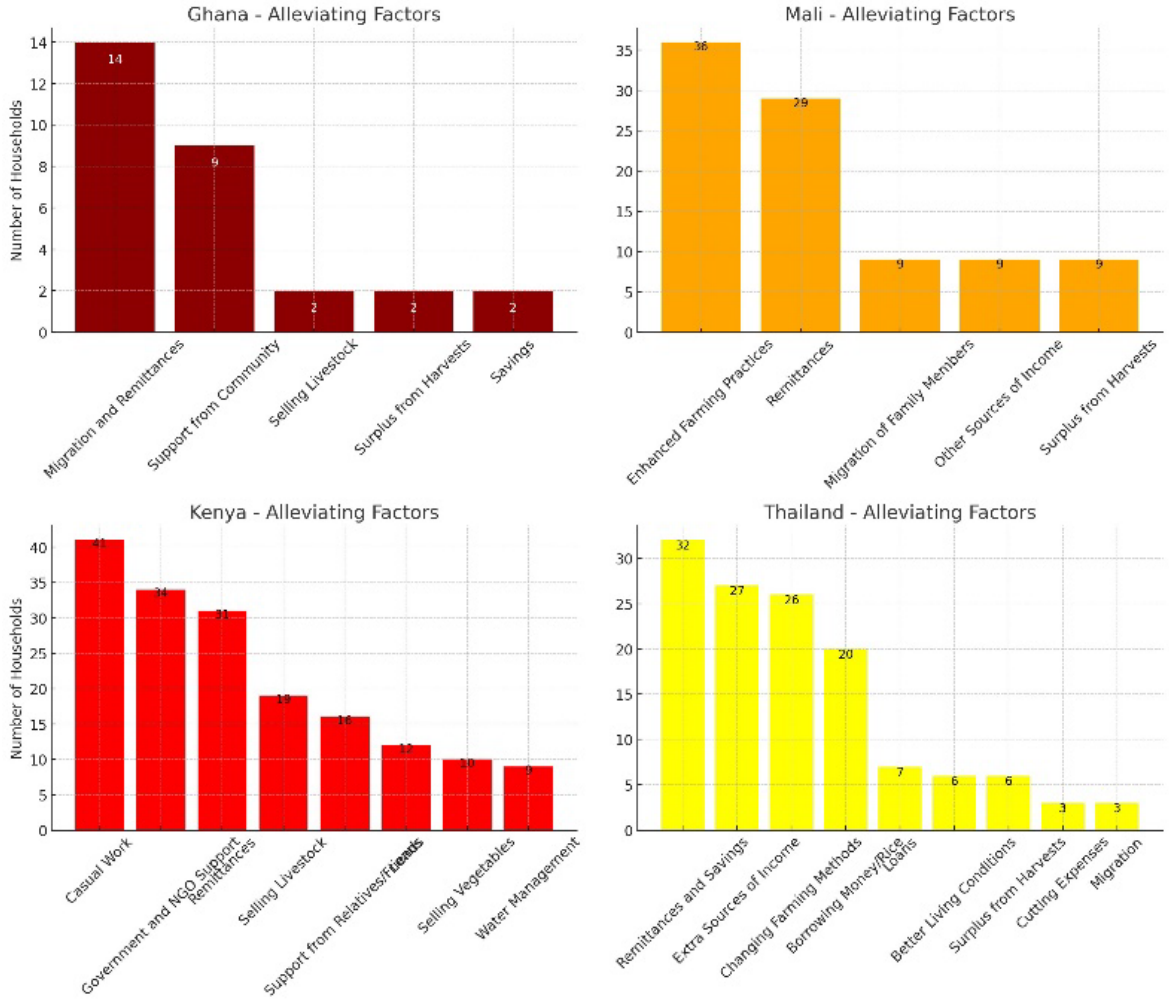

Figure 9: Factors that alleviated adverse conditions, by country

In conclusion, migration and remittances emerged as critical support mechanisms in all four countries, highlighting the importance of external financial support in coping with environmental and economic challenges.

Government and NGO support

In terms of government or NGO support, 97.1% (134) of households reported receiving no support in Ghana, with only 2.9% (4) obtaining some form of assistance, primarily in the form of fertilizer subsidies and help from local assembly members. In Mali, 33.1% (43) received support, which included temporary financial aid and participation in food relief programs, while 66.9% (87) did not get any form of assistance (see Figure 10).

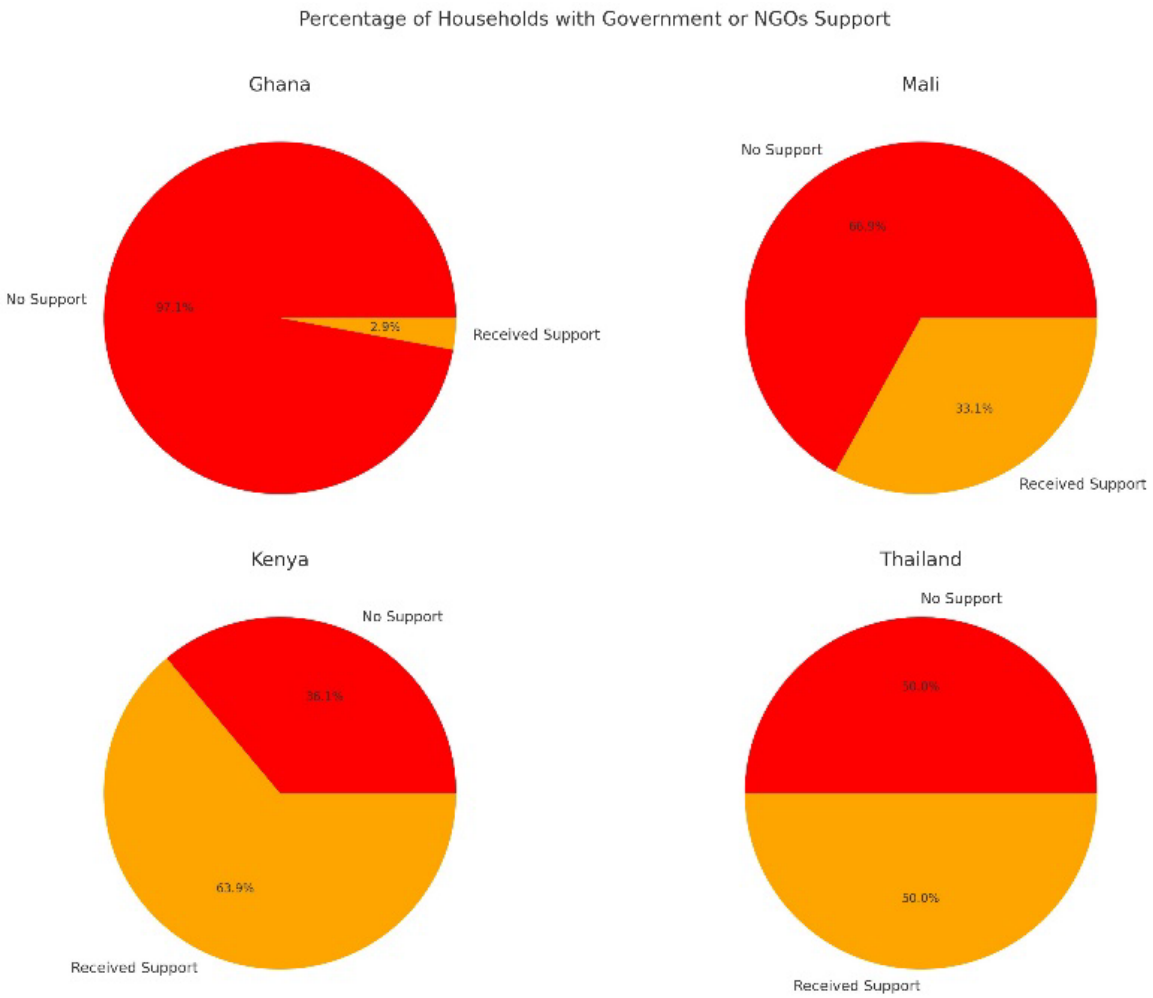

Figure 10: reported government or NGO support

On the other hand, Kenya shows a higher level of support, with 63.9% (46) of respondents acquiring various forms of aid such as loans, food relief, and bursaries, and 36.1% (26) confirming no support. Thailand presents an equal split, with 50% (71) receiving support, mainly through compensations and assistance from the Subdistrict Administrative Organization (SAO), while the other 50% (71) had no assistance to cope with the impacts of climate and other environmental challenges.

Preparations for future events reflect the resource challenges of each country. While Kenyan households aim to focus on water management solutions (20), using surplus from previous harvests (8), and diversified farming methods (6); Ghanaian households believe that the implementation of different farming methods would better prepare them for future impacts (19). In addition, the use of surplus from previous harvests, looking for casual work positions, and savings would also be considered as strategies for the future. Still regarding Ghana, it may be interpreted that a reliance on religious beliefs undercuts other ways to address the impacts of climate and other environmental changes (see Figure 11).

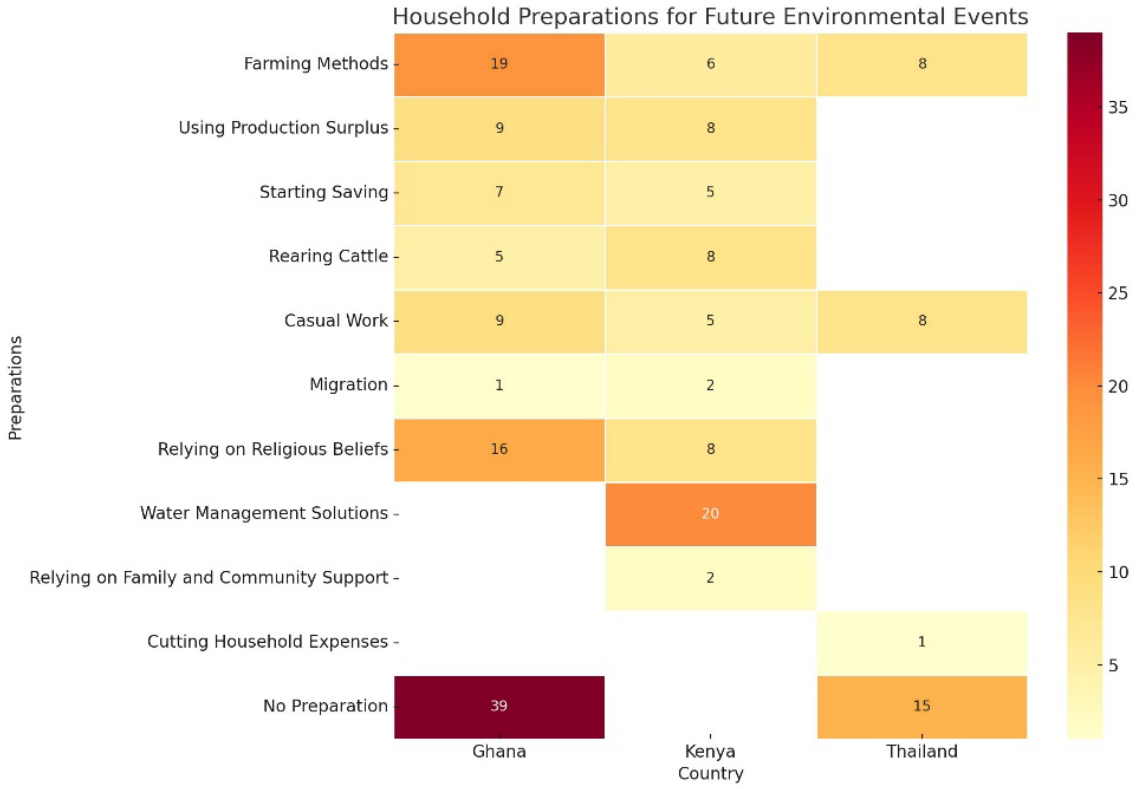

Figure 11: Preparations for future environmental events

Thailand households' preparation included changes in agricultural strategies and extra sources of income through casual work (8 each), with 15 households explicitly opting for no changes. In this regard, the same was observed in the studied communities of Ghana, where 39 interviewed households stated they did nothing to prepare for potential future impacts of climate change. This indicates that these households either lack the knowledge or the adaptive capacity to deal with the adverse effects of climate and other environmental challenges.

It is important to note that migration – and remittances – are not among the primary successful strategies pointed out by the households affected by the impacts of climate and other environmental changes. The same applies to future preparations for such events, where migration is not considered the primary strategy. Notably, certain conditions highlight the maladaptive potential of migration. Specifically, the social circumstances under which migration occurs and the socio-economic status of households choosing migration in response to adverse environmental events can influence how adaptive migration is. In Mali, for example, young men are often the primary potential migrants, with casual labor facilitated through existing social networks serving as the main migration pathway. This leads many migrants to work in gold mines under inadequate conditions. Some interviewees noted that these migrants were unable to send remittances, suggesting that such movements might ultimately be maladaptive for both the migrants and their areas of origin.

Maladaptive factors

In Mali, at least 68 households acknowledged the benefits of migration, while 76 expressed concerns. Financial support from remittances emerged as a key positive aspect, with a minimum of 28 households discussing financial remittances in general and 15 focusing on remittances for basic expenses or needs, better livelihood conditions (6), and farming inputs (2). Structural improvements in housing and community infrastructure, such as health clinics and schools, were acknowledged by 16 households. Conversely, the lack of labor force due to the migration of family members had a prominent negative impact, cited by 41. The (negative) costs of migration, including the risk of life during population movements, were another concern mentioned 30 times.

When asked, interviewees in Ghana, Kenya, and Thailand lean towards a favorable perception of migration, whereas interviewees in Mali tend to focus more on its disadvantages (see Figure 12).

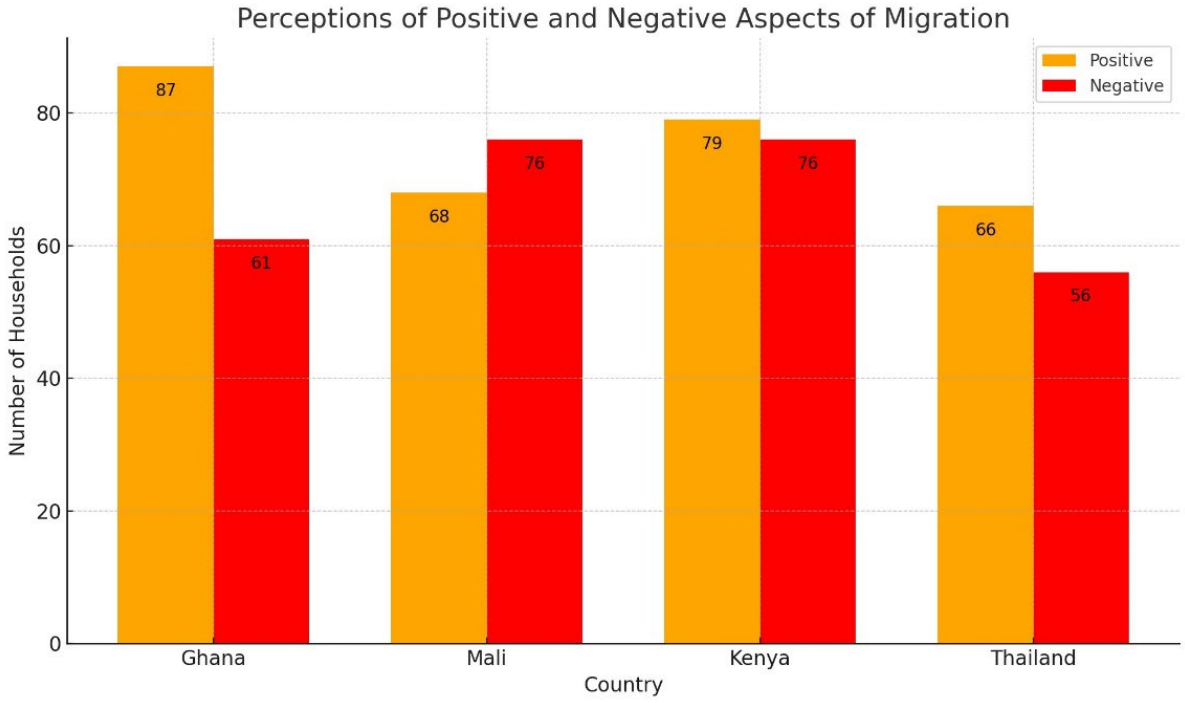

Figure 12: Perceptions of positive and negative aspects of migration, by country

Box 2. The role of migration and remittances among adaptation strategies

The analysis of the data from Ghana, Mali, Kenya, and Thailand reveals various aspects of how migration and remittances contribute to resilience and adaptation in the communities studied. In Ghana, at least 17 households relied on migration and the financial support sent by family members working elsewhere to cope with the impacts of climate and other environmental changes. In Mali, 29 households reported relying on remittances and 9 cases of immediate migration were identified, providing essential financial support during times of climatic stress. Migration and remittances are also important adaptation strategies in Kenya, with 31 households relying on remittances in such a context. Lastly, in Thailand, 20 households

highlighted reliance on financial support from migrated family members. Among others, migration provides financial support, enables income diversification, and facilitates investments in resilience-building activities:

- Migration allows households to diversify their income sources, reducing reliance on climate-sensitive agricultural activities. This diversification is key for building resilience against climatic shocks and ensuring a more stable income flow.
- Financial support from migrants is usually reinvested in agricultural and non-agricultural activities that enhance resilience. This includes, among others, purchasing new seeds, investing in farming equipment, improving water management practices, and exploring alternative livelihoods.
- Migration creates a social safety net, with family members who migrated being able to support those who remain in the community. This support is key for maintaining household cohesion and ensuring that basic needs are met during times of stress.
- By migrating, individuals can also reduce the pressure on local resources, such as land and water, which may be overburdened due to the impacts of climate and other environmental changes.

Remittances: an overwhelmingly positive strategy

In line with current migration and development literature, the promise of financial remittances is among the primary motivations for migration and a core part of the social contract between the migrants and the household at origin (Lucas and Stark, 1985; Stark, 1988; Azam and Gubert, 2006). A relatively clear message emerges from an interpretation of the interviewees' sentiments in regard to migration as compared to the range of strategies available: migration is more likely to be seen as a beneficial phenomenon by remittance-receiving households. While perceptions differ across countries, across Ghana, Mali, Kenya, and Thailand, remittances are consistently recognized as a positive aspect of migration. All of them highlighted that remittances assist in covering basic needs or expenses. Malians pointed to household and community structural achievements, Kenyans to migrants' financial independence, and Thais to savings. On the negative side, the reduction of the workforce is a common issue in all countries, with Ghanaians reporting concerns about the development of bad behaviors and theft. Malians also noted the negative costs of migration, especially those associated with death, while Thais underscored the strain on family bonds. Overall, the shared emphasis on remittances highlights the appreciation for the economic benefits of migration.

Financial remittances also play an important role in addressing livelihood challenges across the four countries. In Ghana, 80 respondents emphasized the relevance of financial support from migrants in improving their livelihoods. In Mali, Kenya, and Thailand, households also reported receiving financial remittances, including farming inputs, food supply, and basic household expenses. In Kenya, for instance, financial remittances were primarily used to address food shortages, pay school fees, and cover medical expenses. In Thailand, financial support was often allocated for basic needs, savings for housing, and business investments.

The adaptive contribution of so-called social remittances (knowledge, skills, political integration) gained through migration, however, is less clear in our study. This is surprising considering previous research indicating social remittances as key to the positive, transformative potential of migration for climate change adaptation (Gemenne and Blocher, 2017). The role of social remittances in shaping local practices and improving

livelihoods across the studied countries. In Ghana, however, 40 households reported not receiving any social remittances, indicating a lack of ideas or knowledge from migrants to help with livelihood challenges. Among those who did receive social remittances, insights on general knowledge, farming techniques, and business advice were particularly valued. In contrast, in Mali, 76 households acknowledged the positive impact of social remittances, with many citing advice on livelihood improvements and agricultural practices. Similarly, in Kenya, a majority of respondents found social remittances helpful, particularly in agriculture and water management. In Thailand, although fewer respondents received social remittances, those who did found the knowledge, particularly regarding farming techniques, to be beneficial.

Outlook

More research with the HABITABLE qualitative dataset is needed to further explore uncertainties in the role of migration among other positive and negative strategies in the face of climate change impacts and other adverse environmental changes.

This must accompany efforts to better tailor policy solutions. To this end, the PIK team (Serraglio, D.A. and Blocher, J.M) has developed a forthcoming policy brief series: Securing habitability in a changing climate: The place of human mobility among local adaptation strategies. [URL TBC]. The first in the series has been published:

Serraglio, D.A.; Thornton, A.; Thornton, F.; Blocher, J.M. (2024) "Addressing human mobility in the context of climate change, disasters, and environmental degradation: Developments in Ethiopia's national and regional policy and legal frameworks". Migration, Environment and Climate Change: Policy Brief Series. Geneva: International Organization for Migration (IOM) & PIK.

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Annex 1: Community Profiles

This section provides an overview of background information derived from the qualitative interviews, with particular emphasis on contextual insights offered by the two community leaders (administrative officials and elders).

Ghana

Lingbung

The village, estimated to house around 6,000 people in approximately 500 households, predominantly belongs to the Dagomba ethnic group. Farming, encompassing crops like maize, groundnuts, soybeans, and guinea corn, constitutes the primary source of income, which is complemented by the raising of cattle and goats. Some individuals come from other places and do not have their land for farming upon arrival, thus seeking permission to use land from other community members. Family efforts often involve children in farming activities. Outsiders from neighboring towns including Salugi seek employment on the village farms, particularly for tasks like weeding. Irrigation covers roughly 405 hectares and employs pumping machines for water access and distribution. Nevertheless, machinery use – including for irrigation – remains limited, with only 30 percent of households using it for agricultural purposes. The community faces climate-related risks (e.g., irregular rainfalls leading to further drought or flooding episodes), affecting agricultural fields and causing losses in produce. Pest infestations also frequently challenge the community.

The average villager relies on community services and tends to experience financial hardship. Poor households often possess limited land ownership, typically around four hectares. While approximately 80 percent of village households have mobile phone access, internet availability is lower (30%). Car or pick-up ownership is scarce within the village, primarily seen among residents of Tamale rather than rural Lingbung local, whereas motorcycles are prevalent – with all households having access to them. About 15 percent of households have toilet facilities meeting improved standards, while improved housing – defined by built roofs, walls, and/or improved flooring – stands at approximately 40 percent. The nearby town frequently visited by villagers is Nyankpala, within the Tolon District. Furthermore, residents often frequent the markets in Tamale for shopping purposes. Lorries provide transportation services, picking up villagers in the morning and returning them in the afternoon, ensuring regular access to these markets

Migration has been a historical practice in the area, with migrants often selling agricultural products like ground-nuts, beans, and soy-beans in destination cities, driven by economic opportunities. In recent times, migration persists, with common destinations including Accra, Kumasi, and Tamale. Nevertheless, the nature of work pursued by migrants has diversified, including activities such as scrap dealing, fitting, and welding.

Vome

The village currently hosts around 1,025 people residing in 450 to 500 households, predominantly comprising farmers of the Ewe ethnic group. Fishing and farming, supplemented by small-scale businesses, serve as the primary source of income. Cultivated crops include cassava, maize, and groundnut, while livestock encompasses goats, sheep, and poultry. Individuals usually cultivate an average land size of about one hectare. Land-related disputes exist, but elders play an important role in resolving them to maintain order. Some individuals lack land, often due to (grand)parents' involvement in fishing. Agricultural labor is primarily organized within households, with household members collaborating on farming activities. Moreover, laborers are hired for a fee when needed. The community relies solely on rainfall for irrigation, lacking an established system, and the use of machinery for fieldwork is not common. Flooding impacts agricultural production. In response to difficulties, some community members mobilize friends for cassava harvesting, while others manage existing reserves or purchase maize for consumption. Adaptation plans for such situations are still absent, with reliance on mutual assistance and cooperation among community members – mostly from friends and family – for support.

The average villager tends to be poor, relying on community services. Each household in the community is reported to have access to mobile phones. Approximately half of the households own cars or pickup trucks, while around 300 households possess motorcycles. Improved housing features, including roofing, latrines, and tiled floors, are present in about 80 households. Nearby market towns such as Battor, Juapong, and Mafi-Kumasi are relevant trading hubs. However, transportation is costly, requiring crossing a river followed by motorbike taxis or boats for travel.

Work-related migration is widespread in the village, with individuals migrating to Accra and its suburban areas (e.g., Ashaiman and Tema), as well as to Afram Plains and Kumasi, in pursuit of job and academic opportunities. The nature of work undertaken upon migration varies according to individuals' qualifications. Nearly every household in the village has seen at least one member migrate within the past decade. The primary driver for this movement is the limited job opportunities within the village, compelling individuals to seek better prospects elsewhere.

Mali

Dogo

The community has a population of 1,650 people distributed across approximately 235 households. Main economic activities include agriculture, livestock rearing, and gold mining. Common crops are cotton, corn, and millet, whilst livestock includes cattle, goats, and poultry. Changes in crops and livestock over the past decades are observed, with a decrease in cotton yields in 2022 due to diseases. Agricultural work is primarily family-based, though some households hire tractors and laborers during cotton harvests. About 30 to 40 percent of households pay for mechanical assistance in fieldwork. Recent heavy rainfall has damaged homes and crops, as well as exacerbated the community's already poor road infrastructure, hampering transportation during the rainy season. To cope with these challenges, households have adopted strategies such as early sowing with the onset of the first rains. They are also involved in local microfinance and educational initiatives to bolster community resilience.

A "wealthy" household is defined as one who can meet food needs without relying on market purchases, while a "poor" one faces food shortages. Despite this, food security is maintained as households can typically prepare three meals daily throughout the year, thanks to mutual community support. The average land size among households is around five hectares and there are no reported disputes over land tenure. Households are well-connected, with virtually all of them having mobile phones and 80 percent having internet access. Transport needs are usually met by a private network of trucks facilitating daily trips between Dogo and Bougouni, which take about three hours. In this context, around 90 percent of households own a motorcycle, and most of them have improved living conditions with proper roofing and flooring, as well as sanitation facilities.

Currently, young individuals tend to migrate to gold mining sites in Yanfolila, near the border of Côte d'Ivoire, as well as towards Sélingué in search of gold. In the past, they engaged in agricultural labor on plantations in Côte d'Ivoire. These migrants are predominantly male.

Fatao

Fatao is a community with a population of 6,180 people spread across approximately 319 households. The most important market, Lambidou, is just a five-minute motorcycle journey away, reflecting the primary transportation in the community. Residents engage in livestock – including cattle, sheep, goats, donkeys, horses, and poultry – and farming, cultivating sorghum, millet, peanuts, and rice. Changes in rainfall patterns have impacted these activities over recent years, increasing reliance on remittances. In this regard, environmental challenges affecting agriculture include drought, bushfires, and sometimes floods. Agricultural labor is generally organized through family efforts and occasional work exchanges among households. The community lacks an irrigation system, relying instead on an undeveloped dam for watering agricultural lands. Traditional tools (e.g., ploughs) are used in rice cultivation, with some cooperative labor and about 15 percent of households hiring machinery for fieldwork. The community supports each other and, over the last decade, Fatao has participated in public and private development projects.[7]

In the local context, a "wealthy" household possesses agricultural land and animals, and lives in well-constructed homes, while a "poor" household lacks these attributes. Either way, most households manage to prepare three meals a day throughout the year and maintain food security event during the dry season. The average land size owned by households is approximately 0.5 hectares and no land conflicts were reported. About 90 percent of households have access to mobile phones and internet. Although only five percent of households own pick-ups, approximately 95 percent count with motorcycles. Roughly 90 percent of households have improved housing with proper roofs, flooring, and upgraded latrines.

Since the 1950s, Fatao has experienced (international) migration to destinations like France, Spain, Italy, the United States of America (USA), as well as other African countries (e.g., Algeria, Congo, Gabon, Mauritania, and Senegal). Migrants engage in distinct occupations and are predominantly young men, as women and girls rarely move

[7] For instance, Mali's Movement for Peace and Disarmament (MPDL).

from the community. About 10 percent of the households have had members who migrated for several months or more in the last decade for work or study.

Gory

The community has a population of around 7,000 people spread across 1,300 households. Its main trading center is the weekly market in Diongaga, accessible by motorcycles and cars. In addition to remittances, primary sources of income include agriculture, with the main crops being maize, millet, and groundnuts, alongside livestock such as cattle, sheep, and goats. Agricultural production in the community combines traditional family-based labor with the occasional hiring of external seasonal laborers. Although most farming relies on family labor, about 80 percent of households also use machinery to enhance efficiency. The community has limited irrigated land, dedicating only a few hectares for horticultural purposes. Environmental hazards such as droughts, irregular rainfalls, along with bushfires, regularly impact agricultural output. Households rely on available wells, including those with non-potable water, and sometimes incur debts to feed their livestock or are forced to sell animals to manage hardships. Given that former public projects have attempted to aid the community but have made little impact, community support comes primarily from friends and neighbors.

A "wealthy" household is typically defined by the ownership of around 15 hectares of land and a livestock inventory of approximately 300 cattle. In contrast, a "poor" household usually has limited land and livestock. The availability of three daily meals is not guaranteed year-round, often leading to food insecurity. Land size among households range from 15 to as little as one hectare. Large-scale farms are not common, and while there are no specific land-related issues within the community, conflicts may occur between neighboring communities. Connectivity is high, with all households having access to mobile phones and most of them able to connect to the internet. Transport options include an 80 percent ownership of motorcycles. About half of households enjoy improved living conditions with adequate roofing, flooring, or latrines. Water access is through taps connected to a well located 12 kilometers away, and the community lacks a public electricity supply – with some households relying on solar panels and torches for power.

Gory has experienced migration processes, with the majority of migrants heading to Kénieba for agricultural activities, while pastoralists often move to Mauritania, some of whom have not returned. Migration peaked during the drought years of 1983 and following events in 2021, leading to a number of household members migrating. These migrants engaged in agricultural and livestock-related activities, with involvement in trade as well. Around 70 percent of these migrants are men and 30 percent women. Some migrate during the rainy season, whereas others embark on extended journeys that may last for years.

Kignan

With a population of around 12,500 individuals spread across around 2,000 households, Kignan is connected to the nearby city of Sikasso by a public transport network. Daily bus services cover the journey in about an hour and a half. Households' primary sources of income are agriculture and remittances, with maize, millet, sorghum, cotton, and sweet potatoes being the main crops cultivated, together with livestock such

as cattle, sheep, goats, donkeys, and poultry. Agricultural labor consists of family-based work, which is often complemented by labor exchange between households. About 15 percent of households employ individuals with machinery to assist in agricultural tasks. Kignan experiences drought and irregular rains, forcing some households to send their children elsewhere to cope with the adverse conditions. The community also faces "religious extremism", disrupting its security. In response, local authorities seek help and consensus among parties. Over the last decade, the community has been involved in development projects to further support and enhance resilience.[8]

A "wealthy" household is defined by ownership of approximately 25 hectares of land and around 80 livestock. In contrast, a "poor" household typically has only two ha and no animals. Overall, households generally do not prepare three meals daily throughout the year, including during lean periods. No land disputes were reported and landless individuals, often foreigners, are allowed to farmland temporarily without compensation until the landowner needs it back. All households have mobile phones, but only 20 percent of them have internet access. Concerning transportation, motorcycles are common. Approximately 85 percent of households have improved living conditions, which include better roofing, flooring, and latrines. Everyone has access to water, but electricity is limited to around 15 percent of households.

Household members commonly migrate to cities including Bamako, Koutiala, and Sikasso, as well as other countries such as Algeria, Côte d'Ivoire, and Spain. Migrants primarily engage in manual labor and domestic work, being also influenced by the different educational opportunities available in such urban areas or countries. Around 60 percent of migrants are young men. Importantly, nearly every household in the community has had members migrate within the past decade.

Kenya

Kathyaka

The community comprises about 10,000 people, the vast majority of whom identify as Kamba. The people primarily engage in agriculture with crops like maize and pulses, and some raise livestock such as cows, goats, and sheep. Casual labor from various sources, including migrant workers, is common but difficult to estimate. Limited irrigation near the Athi River and partial use of machinery highlight resource constraints. Disputes over land resources are reported to be common, in particular, due to competing land use needs between exclusively farming households and households that practice livestock rearing. Droughts and financial constraints are among the most commonly reported limitations to agricultural productivity. Many farmers, if not most, rely on traditional crop varieties due to the high cost of specialized seeds.

The average villager is poor. Roughly 50 percent of households have decent housing, meaning with a built roof. Cell phone usage is moderate (approximately 70 percent have basic phones) and often shared between families. Access to the internet and car ownership is very low. A bit less than half of residents have improved housing – meaning sheet iron roofs, brick walls, and/or improved flooring – and a minority of

[8] For instance, Save the Children International.

people have permanent toilets. The village is not well connected in terms of transportation and the nearest market (Kisayani) is roughly 10 kilometers away. The most common mode of transport, therefore, is by *boda boda*.

People who migrate from the area to cities like Mombasa and Nairobi are typically seeking jobs to support their families. Unskilled individuals take any available work, while those with skills in mechanics, carpentry, or masonry look for relevant jobs in other urban centers such as Emali and Wote, as well as neighboring towns such as Makueni and Kitui. Migration in the area is also characterized by rural-rural mobility of pastoralists seeking better pastures, who often move their families on a semi-permanent basis. Over the last decade, an estimated 30 percent of households have had members move to urban areas for employment opportunities.

Kikoko

The community, which was incorporated in the late 1970s, has an estimated 7,000 residents, mostly *Kamba* farmers. The primary crops are maize, beans, *Sukuma wiki*, tomatoes, and arrowroots. Livestock rearing is limited due to scarce grazing land. Drought and water scarcity are the most commonly noted issues that impact crop production. Land availability and size of plots is a major constraint. Most residents own only half an acre, as compared to Kathyaka and Ngulu, where many people own 3 or more acres, which is reported to lead to disputes between and among families. Farming relies on family labor and traditional methods, with the terrain and lack of infrastructure limiting mechanization. Unpredictable weather patterns disrupt farming schedules, and financial issues complicate access to quality seeds and fertilizers. To tackle water scarcity, some residents have dug wells, and a borehole project, despite needing repairs, has provided crucial water access.

The average villager is poor. Roughly half of the households have decent housing, meaning with a built roof and/or latrine, but many are living in rented flats in the village center. Cell phone usage is moderate (approximately 70 percent have basic phones) but access to the internet and automobiles is very low. The village is not well connected by public transportation but private vehicles, especially *boda boda*, can be used to reach the nearest market (Nunguni), which is roughly 2 kilometers away.

Many villagers have moved for work, while some have been transferred to places like Kajiado and Malili in Makueni County by their employers. Previously, migration was rural to rural in nature and rare due to limited land availability in destination areas. Malili, which is strategically located between a major trading center and Mombasa highway, became a particularly attractive destination area when land was consolidated by the government and subdivided for sale in the late 2000s. Today, an estimated 30 percent of households have a migrant member and the main driver reported is employment scarcity in the village. Migrants who leave Kikoko are often not seeking to farm in destination areas, but rather to seek employment in secondary or tertiary sectors. Unfortunately, government ambitions to develop a Silicon Valley-like technology city in Malili have not been realized.[9]

Ngulu

[9] See: Konza City Dream: What Happened?

Ngulu is home to nearly 11,000 residents since its subdivision and founding some 45 years ago. The community links to key economic hubs via the Kathyaka and Keoni markets. Land plots are larger as compared to the other study areas, with individual plots ranging from a quarter of an acre to 20 acres – or more, in the case of commercially owned land. Agriculture, focused on *Mawele*, green grams, and maize along the Athi River, faces pest invasions and reduces maize's viability. Livestock farming includes goats, sheep, and chickens. Land ownership is diverse, with local labor primarily used in the rainy season and family involvement in farming. Mechanized farming is accessible to about 40 percent of households. The community deals with inconsistent rainfall and water scarcity, impacting agriculture. Problems such as borehole water salinity lead some to buy water or rely on communal sources.

The average villager is poor. Roughly 50 percent of households have decent housing, meaning with a built roof and latrine. Cell phone usage is relatively high (approximately 80 percent have phones). The use of motorbikes and *tuk tuk*s, however, is relatively high compared to the other study sites (motorbike usage is estimated at 40 percent of households), as some people have loans to purchase motorbikes to become *boda boda* riders. The village is not well connected by public transportation but private means of transport, especially *boda boda*, can be used to reach the nearest markets (Keoni and Kathyaka), which are 10-16 kilometers away.

Residents along the Athi River have migrated, with some selling their land to move to more affordable areas like Kitui. Others have moved to Ngulu but return to their origins during droughts. Migrants often pursue casual jobs in urban areas (e.g. Gikomba in Nairobi), including selling second-hand clothes, construction, or housekeeping, primarily for extra income. Education is also a frequent reason for moving. An estimated 50 households have experienced migration of family members.

Thailand

Ban Phaya Lao-U

Phaya Lao-U became significant in 1981 when the Thai government allocated land to the Hmong for military training against communist influences from Laos, with promises of land ownership in return for peacekeeping. These promises were unfulfilled post-1983. Designated as forest land, the area saw conflicts with forestry officials over encroachment and logging accusations. Today, the community has around 815 inhabitants in 190 households, including Hmong and Akha groups. The Akha settled in the community in 1990, initially as laborers for reforestation projects. They faced challenges acquiring agricultural lands, with some buying from Hmong families. Phaya Lao-U lacks public transportation and its population travels 30 minutes to the Chiang Kham district market for their needs.

Sources of income in the community include agriculture and remittances from family members living abroad. Agricultural practices have shifted from crops like cabbage, corn, shallots, water spinach, and rice to more profitable crops like lychee and rubber due to rising costs and falling market prices. Households also rear young cattle, pigs, and chickens. Labor organization varies: 50 percent through labor exchange among households, 40 percent through hiring local labour, and 10 percent through family labor. The community has three water storage areas for agriculture, ineffective during

dry season and leading to reliance on rainwater. Only 10 percent of agricultural work uses machinery due to the sloped terrain, with the majority done manually.

In the last decade, Phaya Lao-U has faced droughts due to delayed and insufficient rainfall. These droughts disrupt crop growth cycles and reduce yields. Community leaders play a key role in addressing such challenges: They establish groups of agricultural producers to negotiate better prices with traders. Leaders also provide timely weather updates to help households adjust planting schedules, mitigating potential damages to crops.

"Wealthy" households usually have members who have sent remittances from abroad. Their wealth is translated into larger residences and improved living conditions. In contrast, "poorer" households lack agricultural land and often work as hired laborers in the agricultural sector. The average landholding size is about three hectares, with some owning no land. The community faces land-related issues, (e.g., internal disputes over agricultural land, conflicts with neighboring communities over land invasions, and tenure conflicts with local authorities over forest land classification. Still, approximately 90 percent of households have access to a mobile phone and the internet. Around 90 percent own a car, and every household owns a motorcycle. About 90 percent of them have improved housing conditions with better roofing, flooring, and latrines.

Approximately 60 percent of households have members who have migrated for work – either domestically or internationally. In this context, many have relocated to Greater Bangkok, finding employment primarily in the industrial textile sector. Others have worked as hired laborers in rubber tapping in southern Thailand. Besides, some have sought agricultural labor opportunities in Israel and South Korea, and some have moved to Taiwan for employment in the construction sector. Educational pursuits have driven less than five percent of the youth to move out of the community.

Ban Rak Thin Thai

Rak Thin Thai was founded in 1981 during political tension with the communist party as part of a governmental strategy. The inhabitants, chosen for being landless and without livelihoods, were promised land and housing for military participation. The promises were not fulfilled, and the community remained designated as a forested area. That resulted in disputes with the national government over forest product collection, encroachment, and illegal logging. Today, the Rak Thin Thai has 279 people in 102 households. The nearest market is in Chiang Kham district and, despite having scheduled passenger buses daily, direct bus service to the community is non-existent.

Agriculture is the primary source of income, with key crops including corn and rice. There has been a shift to rubber cultivation due to the high costs of farming and low market prices. As a result, rubber production accounts for approximately 80 percent of total agricultural income. Livestock includes cattle, buffalo, and fish. Agricultural labor is predominantly family-based (80%), with labor exchange among households comprising 10 percent and paid labour making up the remaining 10 percent. There is no irrigated agricultural land; households rely on mountain springs for their water needs, including consumption. Moreover, the use of agricultural machinery is minimal due to the sloping terrain of cultivated areas, with only one ploughing tractor in the entire community.

Over the past decade, Rak Thin Thai has experienced droughts that led to water shortages, affecting rice and corn crops. As mentioned, households have adapted by changing the types of crops they cultivate to those better suited to dry conditions – besides rubber, bananas, coffee, and durian trees. The district agricultural organization provides financial assistance to affected farmers. Furthermore, the Ministry of Defence introduced a project encouraging households to save money monthly for an emergency fund. Nevertheless, the project's conditions did not align with the community needs, requiring additional collections from households during emergencies without extra support from the national government.

"Wealthy" households engage road construction, possess agricultural land, and invest in cattle rearing. On the other hand, "poor" households lack agricultural land, depend on hired labor, and often live alone without siblings or close relatives. The average land size among landowners is approximately five hectares, though some households own no land. Internal community disputes arise from agricultural land encroachments. Besides, conflicts with local authorities occur due to land being classified as forest area, leading to accusations of trespassing, illegal logging, and forest product collection. Approximately 90 percent of households have access to mobile phones and the internet. Whilst only about five percent own a car, the majority has motorcycle. Still, 90 percent of households have improved housing, featuring good quality roods, floors, or latrines.

Rak Thin Thai has a low migration rate, with only about five percent of the population moving in the last decade. Migrants typically find jobs in construction or as security personnel in Greater Bangkok. Migration is more common among those with financial means, education, and good job prospects. In this context, drug addiction has become an issue, especially during periods of increased migration from neighboring countries. Community conflicts have also arisen due to diverse cultural backgrounds.

Annex 2: Social Context Analysis

This section presents a comprehensive analysis of social and economic conditions in the Ghanaian communities studied based on the information provided by the interviewed households. The information gathered spans a range of topics, including personal appearance, household composition, living conditions, migration patterns, educational attainment, wealth perception, occupational activities, agricultural productivity, and land ownership. By examining these aspects, we aim to construct a detailed social context that captures the lived experiences and challenges the community members face.[10]

Ghana

Interviewee appearance

The interview data indicates that almost half of the interviewees fall into the "fairly dressed" category, comprising 45.45% (65) respondents, with individuals presenting themselves dressed in a simple yet acceptable manner. Meanwhile, 28.67% (41) of the interviewees were categorized as "poorly dressed", reflecting potential economic hardships and limited access to clean and decent clothing. This segment also highlights broader social and economic issues prevalent in the communities studied. Conversely, 25.87% (37) of the respondents were considered to be well-dressed, indicating their ability to maintain good personal grooming and attire.

Household composition and dependency

The average household size among the respondents is 12.29 (range 2 to 39), with a dependency ratio of 0.506. This implies that for every working adult, there are approximately half a dependent, either children or elderly individuals. The data also reveals a gender disparity in household leadership, with 91.57% (76) of households headed by males and only 8.43% (7) by females. This suggests a predominantly patriarchal structure within the households.

Household conditions

At least 65% (93) of households were categorized under "poor household conditions", indicating widespread challenges related to basic infrastructure, access to water, and sanitation facilities. Notably, another 34.97% (50) fall into the "modest living conditions", showing that around a third of the population studied have modest living conditions with access to some essential amenities and more durable housing materials. Very few households have access to favorable living conditions, including clean water, private sanitation, and durable housing structures.

Birthplace and migration

A portion of the interviewees (85 individuals) reside in their village of birth, whereas 54 have moved away from their birth village. The common places of birth include

[10] For categorization criteria, see Annex 3.

Akyempe, Wassa Bekwai, Akatsi, and others, indicating a diverse set of origins within the regions examined. In the past ten years, 77 respondents have not moved for an extended period (three months or more), while 62 have experienced migration, with common destinations including Greater Accra (82), Kumasi (21), as well as short-distance moves (25). The migrant ratio of 0.207 indicates that about 20.7% of the household members surveyed have moved for an extended period in the past decade, with the wide range (1 to 20) showing variability in how households experience migration. The data suggests that migration is a common experience in the surveyed households, with a portion of people moving to major urban centers.

Educational attainment

The interview data reveals barriers to educational access, as approximately 52.86% (74) of respondents have not had access to formal education. Only 11 (7.86%) interviewees have incomplete primary education, while only 1 reported having completed primary school. Notably, 35.71% (50) of respondents have some level of educational progress either attending or completing secondary school. However, only 4 (2.86%) respondents have attained higher education, underscoring limited access to or completion of tertiary education.

Wealth perception

When asked about their wealth relative to others in the community, 43.57% (61) of respondents categorized themselves as "poor", illustrating financial difficulties yet managing to meet basic needs. A further 13.57% (19) identified as "very poor", highlighting severe financial struggles. Approximately 28.57% (40) of respondents perceive themselves as "moderately wealthy", with a relatively stable financial situation and some financial security to meet their basic needs. Only 14.29% (20) consider themselves "rich" or "very rich", reflecting a smaller segment with financial security and access to social services.

Occupations and agricultural activities

The predominant occupation among the interviewees is farming, with 130 individuals engaged in agricultural activities. Other occupations include blacksmith, corn miller, driver, fisherman, herdsman, mechanic, teacher, and trader, each represented by 1 to 4 individuals. The main crops produced include maize (67 respondents), groundnut (64), cassava (56), rice (16), millet (6), pepper (6), and okra (5). This diverse range of crops indicates a variety of agricultural activities, with maize and groundnut being the most commonly produced.

Agricultural productivity and land ownership

In terms of agricultural productivity, farmers reported producing an average of 21.45 bags of their main crop in a good year, with a median of 10 bags, and a broad range of production from 1 to 250 bags. In a bad year, the average production drops to 8.53 bags, with a median of 5 bags, ranging from zero to 80 bags. This variability underscores the volatility in agricultural yields influenced by the impacts of climate and other environmental changes. Additionally, 94 respondents reported a decrease in productivity over the past ten years, while only 7 reported an increase.

Land ownership is prevalent, with 70.97% (88) of respondents owing their land or using family-owned land. On the other hand, approximately 19.53% (24) of households rent land and another 9.68% (12) rely on alternative forms of land tenure, such as land allocated by authorities or borrowed land. The high level of land ownership could reflect stability in terms of long-term investments in agricultural activities within the communities studied.

Mali

Interviewee appearance

The "fairly dressed" category had the highest representation among interviewees, accounting for approximately 59,38% of the total (76 interviewees). This indicates that more than half of the respondents present themselves in a simple but acceptable manner. In contrast, 15.63% (20) of the interviewees are poorly dressed, implying that a smaller segment of the population studied lacking adequate clothing. Meanwhile, 25% (32) of the respondents were well-dressed, maintaining a higher standard of personal grooming and attire if compared to the previous categories, and likely indicative of better socioeconomic status.

Household composition and dependency

Similar to what was observed in Ghana, households in these Malian communities are large, with an average of 22.27 members, and a dependency ratio of 0.515. This means that for every working adult, there is approximately half a dependent, encompassing children and elderly individuals. There is also a pronounced gender disparity in household leadership, with males heading 92.31% (120) households, compared to 7.69% led by females. Given that gender balance was considered during the interviews conducted, this implies a predominantly patriarchal household structure.

Household conditions

The analysis shows that 46.34% (57) of households were classified under "medium household conditions", indicating some access to essential amenities and more durable housing materials for nearly half of the population investigated. Another 42.28% (52) of the households experience "poor household conditions", facing challenges related to infrastructure, water access, and sanitation. Only 11.38% (14) of households live in "good condition", suggesting a minority enjoys favorable living environmental with water, private sanitation, and durable housing materials.

Birthplace and migration

It was noted that 98 interviewees still reside in their village of birth, while 32 have migrated. In this regard, 27 were born in nearby villages. Over the past decade, 83 respondents have not moved for three months or more, whereas 47 have undergone migrations. Popular destinations include abroad (e.g. Côte d'Ivoire) (61), Bamako (41), as well as other districts or regions in Mali (12). These patterns suggest both local mobility and the pursuit of opportunities in other countries. The migrant ration of 0.1308 indicate that about 13% of the household members surveyed have moved for an extended period, with a range from 1 to 21.

Education attainment

Educational barriers are evident among the interviewees, with 50.77% (66) lacking access to formal education, pointing to obstacles in accessing education in Mali. Nearly a quarter (23.85%, or 31 interviewees) have some primary education but have not completed it. About 13.85% (18) have finished primary school, and only 6.15% (8) have attended or completed secondary school. Still, approximately 5.38% (7) of the interviewees have attained higher education. These low percentages reflect limited access to continued education.

Wealth perception

In terms of (subjective) wealth perception, 42.64% (55) of respondents identified as "poor", indicating financial difficulties with regular expenses such as education and healthcare. Around 12.40% (16) of the interviewees considered themselves "very poor", facing severe financial challenges and struggling to meet basic needs. Conversely, 44.96% perceived themselves as "average" or "moderate", suggesting a stable financial situation with relatively regular income that allows them to meet their basic needs and maintain some financial security.

Occupations and agricultural activities

Agriculture is the predominant occupation, with 89 individuals engaged in farming. Other occupations include commerce, gardening, carpentry, hairdressing, mayoral duties, teaching, gold mining, tailoring, and various others. The main crops produced include maize (92), corn (52), peanuts (25), sorghum (15), and beans (10). The diversity in agricultural activities emphasizes the variety of crops cultivated, with maize being the most prominent.

Agricultural productivity and land ownership

Over the last ten years, 58 respondents reported a decrease in their agricultural productivity, while 26 experienced an increase, and 4 saw no change. In this regard, farmers reported producing an average of 44.54 bags of their main crops in a good year, compared to 15.70 in a bad year. The median production values are 22.50 bags for good years and 8.5 bags for bad years. These findings underscore the critical influence of annual conditions on agricultural output, with good years providing opportunities for production increases and variability among farmers, while bad years result in constrained production levels – highlighting the pervasive impacts of climate and other environmental changes.

In terms of land ownership, 60.80% (76) of respondents own their land, while 32% (40) rely on alternative forms of land tenure, such as land allocated by authorities or borrowed land. Nevertheless, only 4% (5) reported renting land, and 3.2% used family-owned land. This diversity in land tenure reflects different strategies for securing land access within the communities studied.

Kenya

Interviewee appearance

Approximately 65.5% (67) of the respondents fell into the "fairly dressed" category. That is, these individuals typically wear simple yet clean clothing, reflecting modest economic means and a commitment to maintaining social norms of cleanliness and decency. About 23.5% (24) of interviewees were "well-dressed", exhibiting higher levels of grooming and neatly presented clothing, indicative of better economic conditions. In contrast, around 9.8% of the sample were categorized as "poorly dressed", which points to economic constraints and suggests a varying degree of socio-economic conditions within the communities.

Interviewee appearance

Households in these communities have an average size of 7.37 members, with a dependency ratio of 0.367. This indicates that for every working adult, there are approximately 0.37 dependents, including children and elders. Again, the data showed a gender disparity in household leadership, with 69.3% (70) households headed by males and 30.7% (31) by females, suggesting a still patriarchal household structure.

Household conditions

Approximately 58.8% (60) of the households fell under "good household conditions", with favorable living conditions, that is, access to essential amenities such as clean water from nearby sources and durable housing structures with metal sheet roods, brick walls, and cemented floors. On the other hand, around 41% (42) of the households were categorized as having "poor household conditions", facing challenges related to basic infrastructure (mud with low insulation), simple or absence of sanitation facilities, and limited access to water. Analysis shows the disparity in living conditions, underscoring the communities' pressing needs for infrastructural improvements within geographical areas.

Birthplace and migration

Out of the interviewees, 35 individuals still reside in their village of birth, while 66 have migrated to other locations. In this regard, recurrent birthplaces included Kitui, Wote, Machakos, and Nzaui, with others scattered across distinct regions. Over the past decade, 70 respondents (68.6%) reported no mobility for three months or more, whereas 32 (31.4%) experienced migration. Key destinations for migration included Nairobi (38), Mombassa (13), Machakos, as well as other unspecified locations (34).

Educational attainment

Interviews show that a number of individuals progress from primary to secondary education, with 40 (39.2%) completing primary school and 45 (44.1%) experiencing some level of secondary education, indicating wide access to education. Nevertheless, only 11 individuals (10.8%) advanced to higher education, mostly related to barriers such as financial constraints. While basic education is accessible, a drop in those advancing to higher levels of education is noted.

Wealth perception

When asked about their wealth relative to others in the community, respondents provided varied answers: 29 individuals (28.4%) described themselves as "very poor", struggling to meet basic needs like food supply. Another 43 respondents (42.2%) considered themselves as "poor", able to meet basic needs but facing financial challenges related to education and healthcare. About 25 respondents (24.5%) viewed themselves as "moderately wealthy", enjoying relative financial stability. Lastly, 5 respondents (4.9%) identified as "rich", and experiencing financial security. This distribution indicates that the majority (70.6%) of the community faces economic constraints, with wealth primarily perceived in terms of monetary income.

Occupations and agricultural activities

Farming is the predominant occupation, engaging approximately 44% (45 respondents) of the sample. Casual labor follows, involving about 22.5% (23). Other occupations, including traders, officers, sellers, *boda boda* riders, and charcoal burners, represent smaller segments of the population studied. The reliance on agriculture underscores the agrarian nature of the local economy, while the prevalence of casual labor points to economic instability and a lack of permanent employment opportunities. The main crops produced include maize (76), green gram (46), cowpeas (33), pigeon peas (8), sorghum, and others (40).

Agricultural productivity and land ownership

Agricultural productivity has decreased for 94 respondents (92.2%), remained the same for 2 (2.0%), and increased for another 2 (2.0%) over the past decade, indicating a general decline in agricultural productivity. In this regard, the analysis revealed differences in production between good and bad years. On average, farmers produce 9.45 bags in a good year versus 1.19 bags in a bad year. The median values highlight this disparity further, with 4.00 bags in a good year and 0.50 bags in a bad year. The variance in production is higher in good years (261.59) compared to bad years (11.43), indicating greater variability during favorable conditions. The correlation coefficient of approximately 0.724 between good and bad year production suggests that productivity remains proportionally consistent, though overall lower in bad years.

Land ownership prevails, with 64 respondents (62.7%) owning land and 29 (28.4%) using family-owned land. This suggests that land is a crucial asset for livelihoods, often retained within families and passed down through generations.

Thailand

Interviewee appearance

The "fairly dressed" category was the most common among interviewees, making up approximately 67.31% (35 individuals). This demonstrates that more than half of the respondents present themselves in simple yet acceptable clothing, also suggesting

moderate access to basic resources. Around 19.23% (10) were "poorly dressed", reflecting economic hardships and limited access to clean and decent attire. In contrast, about 13.46% (7) were "well-dressed", indicating a smaller segment that might enjoy higher economic status and places emphasis on personal grooming and appearance.

Household composition and dependency

Households in these communities average 3.76 members, with a dependency ratio of 0.269. This ratio shows that for every working adult, there are approximately 0.27 children and elderly dependents. The data on household leadership was not specified during the interviews.

Household conditions

Approximately 61.67% of households (37 respondents) fell under the "good household conditions", enjoying access to water, private sanitation, together with durable housing structures. In turn, about 28.33% (17) have "medium household conditions", implying access to essential amenities but possibly lacking in some areas. Still, around 10% (6) face "poor living conditions", struggling thus with basic infrastructure, limited water access, and sometimes inadequate sanitation. This distribution highlights a general trend of favorable living conditions.

Birthplace and migration

Among the interviewees, 60 individuals still reside in their village of birth, while 8 have moved to other areas. Over the past decade, 45 respondents have not migrated for three months or more, while 40 have undertaken migrations. The migration patterns underline both local and international mobility trends, with 34 cases of international migration, 20 moving to Bangkok, as well as other districts or provinces (41). The migrant ratio is 0.383, indicating that 38.3% of household members have migrated for extended periods in the past ten years, with the number of migrants ranging from 1 to 5.

Education attainment

Educational attainment in these communities showed that 38.24% (26 individuals) have completed primary school. However, 20.59% (14) have started but not completed primary education, highlighting retention challenges. Moreover, around 29.41% (20) have attended or completed secondary school, suggesting better access to secondary education. A small portion, 8.82% (6), have had no access to education, and only 2.94% (2) have attained higher education. This indicates that while basic education is accessible, progression to higher education remains limited.

Wealth perception

When asked about their wealth, 78.67% (59) considered themselves "average" or "moderate", with a relatively stable financial situation that allows them to meet their basic needs. On the other hand, around 9.33% (7) identified as "poor", thereby struggling with financial difficulties, particularly in areas like education and healthcare. A

smaller group, 6.67% (5), described themselves as "very poor", facing challenges in meeting basic needs such as food provision. Approximately 5.33% (4) viewed themselves as "rich" or "very rich", enjoying higher financial security and access to social services if compared to others in the community. This distribution suggests that more than half of the respondents feel relatively financially stable.

Occupations and agricultural activities

The primary occupation among interviewees is farming, involving 64 individuals. Other occupations include casual work (8), rubber tapping (10), shop ownership (5), construction work (3), selling (3), housekeeping (2), fishing (1), and other roles. This reliance on agriculture underscores its importance to the local economy, while the presence of casual labor indicates economic instability and a lack of permanent employment opportunities. In this regard, main crops include rice (86), rubber (6), sugarcane (2), eucalyptus (2), among others (12).

Agricultural productivity and land ownership

In terms of agricultural productivity, the analysis revealed disparities between good and bad years. Farmers reported an average production of 86.93 bags in a good year, compared to 45.61 bags in a bad year. Median values pointed out that half of the farmers' production is below 70 bags in good years and 30 bags in bad years. The variance in production during both good and bad years indicates differences in individual farmer performance. While favorable environmental conditions led to higher overall production, individual yields varied greatly, underscoring the impact of annual weather conditions on agricultural output.

Regarding land tenure, 34.38% (22) own their land, while 20.31% (13) rent land, and 18.75% (12) use family-owned land. Another 26.56% (17) rely on alternative forms of land tenure, such as land allocated by authorities or borrowed land.

Annex 3: Criteria for the Development of Social Contexts by Country

1. Interviewee Appearance Categorization:

Cat.	Overall description	Ghana	Mali	Kenya	Thailand
01	**Poorly dressed:** Clothing that is dirty, torn, or old. Described as wearing farming/funeral clothes. Appearance suggests a lack of attention to cleanliness, and they may not be fully dressed or have footwear.	Dirty, Torn, Farming/Funeral clothes, Partially dressed (Barefoot). *Working clothes.	Vêtement sale, (Très) Mal habillé, Sans chaussure, Modestement habillé, Chaussures en plastique. * Working clothes.	Dirty, Faded, Old clothing.	Old clothing, Partially dressed (No T-shirt), Wearing flip-flop.
02	**Fairly dressed:** Interviewees with a more acceptable manner than those in the previous category. Simple or basic clothing, generally clean and intact. Described as having a fair appearance or being presentable, but not considered well-dressed.	Casual, Fair Appearance or Dressed.	Vêtement, Habillement simples, Présentable, Moyennement, Humblement habillé, Décemment, Bonnes chaussures.	Presentable, Decently, Fairly dressed.	T-shirt, Short pants, Long sleeve shirt/pants.
03	**Well-dressed:** Higher level of grooming. Clothing is neat, clean, and described as nicely or smartly dressed. Wearing appropriate clothing for the occasion. The outfit may include accessories (e.g. proper shoes, jewelry).	Properly, Neatly, Nicely, Well dressed, Complete neat outfit.	(Très) Bien habillé, Chaussures fermés.	Very presentable, Smartly, Well dressed.	Wearing sneakers, Long sleeve shirt/pants, Hair ornament.

2. Household Condition Categorization:

Cat.	Overall description	Ghana	Mali	Kenya	Thailand

01	**Poor household conditions:** Challenges in terms of basic infrastructure. Limited access to water. Simple sanitation facilities, with common/public pit latrines - or absent. Housing structure with materials like mud or straw for walls (low insulation). Cooking facilities with charcoal and/or firewood.	Toilet (Public pit latrine, No toilet), Roof (Straw), Floor (Mud), Walls (Landcrate, Mud).	Access to water (Difficult), Cook (Wood), Toilet (Latrine), Roof (Tile), Structure (Banco).	Access to water (Long distance, Seasonal or no access), Kitchen/Cook (Outdoors, Charcoal/firewood), Toilet (Pit latrine), Roof (Metal sheet), Housing structure (Mud).	Roof (Thatched grass). Structure (Wood).
02	**Medium household conditions:** Modest living conditions. Access to water sources. Sanitation includes pit latrines. Housing structures with more durable materials (e.g. metal sheet roofs and cemented floors). Cooking facilities such as indoor cooking with gas or charcoal.	Access to water (River, Dam), Cook (Charcoal/Firewood), Toilet (Pit latrine), and Floor (Cemented).	Cook (Wood), Roof (Metal sheet, béton), housing structure (Mixed – Cement/wood). Latrines améliorées.	-	Roof (Tile, Galvanized iron), Structure (Wood), 01-floor house.
03	**Good household conditions:** Favorable living conditions and access to essential amenities. Access to clean water is assured through nearby sources or water tanks. Private pit latrines. Housing structure with metal sheet roofs, bricks, and cemented floor. Indoor kitchen with gas stoves.	Access to water (Treated water), Cook (Charcoal/Firewood), Toilet (Private pit latrine), Walls (Cement/bricks).	Toilet (inside household). Latrines modernes.	Access to water (Nearby, Water tank), Kitchen / Cook (Inside, Gas), Toilet (Pit latrine), Roof (Metal sheet), Structure (Brick walls).	02-floor house, Structure: Mixed (Wood/Cement).

3. (Self-Reported) Subjective Wealth:

Cat.	Overall description	Ghana	Mali	Kenya	Thailand

01	**Very poor:** Lowest level of wealth. Struggle to meet basic needs, such as food, shelter, and education. Jobless or employed in precarious/low-paying positions. Lack of essential services. Skipping meals. Remittance receivers.	No money, No material assets, Severely / Very poor, Jobless, No basic needs	Très pauvre.	Struggles with meals and education, Depend on remittances,	(Quite) challenging, Bad or poor conditions,
02	**Poor:** Generally able to meet basic needs, but still with significant financial challenges. Education and healthcare expenses can be burdensome. Remittance is common.	Poor, Enough to eat, Moderately poor, Remittances.	Modérément pauvre, Pauvre.	Moderately poor, Dependents on remittances.	Bad or poor conditions, Poor, Earn for living,
03	**Average / Moderate:** More stable financial situation compared to the previous groups. They have some source of income, regular salary or small business. That allows them to meet their basic needs. Not considered among the poorest. More financial security and access to resources for education, healthcare, and savings.	Middle, Neither rich nor poor, People with job.		Neither rich nor poor, Same level as others, Afford basic needs, Middle class.	Moderate level, Middle level, With Material assets.
04	**Rich / Very rich:** Relatively high level of financial security. They hold jobs, own businesses, and have assets such as land or livestock. If compared to the previous group, greater access to social services (education, healthcare). Considered affluent compared to others.	Moderate wealth, Better than others.	Modérément riche, Très riche.	Moderately wealthy.	Higher level compared to others, with material assets.

4. Education:

	Ghana	Mali	Kenya	Thailand
Categorization	**01 - Without access to education**	**02 - Incomplete Primary School**	**03 - Completed Primary School**	**05 - Higher Education**

Definition by country (structure of the education system)	1. Primary Ed. (06 years): 1.1 Lower Primary (1, 2, and 3); 1.2 Middle Primary (4 and 5); and 1.3 Upper Primary (6). 2. Secondary Ed.: 2.1 Junior High School (JHS, 03 years); 2.1 Senior High School (SHS, 03 years). 3. Tertiary Ed.	1. Primary Ed. (06 years). 2. Secondary Ed.: 2.1 First Cycle - Collège (04 years); 2.2 Second Cycle – Lycée (03 years). 3. Tertiary Ed.	1. Primary Ed. (08 years): 1.1 Lower Primary (1, 2, 3, and 4); 1.2 Upper Primary (5-8). 2. Secondary Ed.: 2.1 Junior Secondary (04 years); 2.2 Senior Secondary (02 years). 3. Tertiary Ed.	1. Primary Ed. (06 years): Grade 1 to Grade 6. 2. Secondary Ed.: 2.1 Lower Secondary Ed. (03 years, Grade 7 to 9); and 2.2 Upper Secondary Ed. (03 years, Grade 10 to 12). 3. Tertiary Ed.

5. Land Tenure Categorization:

Cat.	Overall description	Ghana	Mali	Kenya	Thailand
01	**Owner:** Interviewees who own the land they live or work.	Owner.	Propriétaire.	Owner.	Owner.
02	**Rented:** Interviewees who lease or rent the land they work on.	Rented.	Terres loués.	Rented.	Rented.
03	**Using family's land:** Interviewees who use land owned by the family (including inherited).	User	Terres familiales.	Family's land, Inherited land, Given by parents.	Inherited land, Family's land.
04	**Others:** Land allocated by authorities, borrowed land, etc.	Borrowed.	Terres prêtées.	-	Agricultural land reform. Undocumented land.