

ASSESSING THE EVIDENCE:

CLIMATE CHANGE AND MIGRATION IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA



POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH



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TABLE OF CONTENT

ACKNOWLEDGMENTS.....	4
FIGURES, TEXT BOXES AND TABLES.....	6
ACRONYMS.....	7
EXECUTIVE SUMMARY.....	8
1. INTRODUCTION.....	11
1.1 Setting the Scene.....	11
1.2 Methodology.....	11
1.3 Chapter Outline	12
2. NAVIGATING ETHIOPIA'S LANDSCAPE: SOCIO-ECONOMIC DYNAMICS.....	13
2.1 Geographical Aspects.....	13
2.2 Economy and Livelihoods.....	14
3. ETHIOPIA'S CLIMATE: TRENDS AND IMPACTS.....	15
3.1 Current Climate Patterns and Changes.....	15
4. AGRICULTURE AND OTHER LAND USE CHANGES.....	16
5. SOCIO-ECONOMIC DETERMINANTS OF RISK.....	18
5.1 Human Development Trends.....	18
5.2 Agricultural Livelihoods and Food Security.....	19
5.3 Inclusive Development and Gendered Dimensions of Risks.....	21
6. MIGRATION, RISK, AND CONFLICT.....	22
6.1 Migration and Climatic Change.....	22
6.2 Risk and Conflict	27
7. POLICY LANDSCAPE.....	34
7.1 National Migration Policies and Legislation.....	36
7.2 National Climate and Environmental Change Policies and Legislation.....	36
7.3 National Disaster Management Policies and Legislation.....	37
7.4 Current Developments at the Regional Level.....	38
8. CONCLUSIONS AND RECOMMENDATIONS.....	42

FIGURES, TEXT BOXES AND TABLES

[Figure 1](#): Traditional climatic zones Ethiopia

[Figure 2](#): Mean annual rainfall classes Ethiopia

[Figure 3](#): Evolution of agricultural production and productivity of maize, sorghum, wheat, and common beans in Ethiopia from 1993 to 2019

[Figure 4](#): Integrated Food Security Phase Classification (IPC), before and during conflict

[Figure 5](#): Environmental migration reasons and number of internally displaced households (2017-2020)

[Figure 6](#): Occupations of internally displaced people (2017)

[Figure 7](#): Climatic risk and socio-economic impacts—where is migration?

[Figure 8](#): Evolving interest in relationships between climate risk, migration processes and outcomes

[Figure 9](#): Conceptual model of climate, conflict, and migration

[Figure 10](#): Drivers of Displacement before the Tigray conflict

[Figure 11](#): Drivers of Displacement after the Tigray conflict

[Box 1](#): Forests and Migration

[Box 2](#): Exploring climate-migration-conflict in Lare and Itang Special Woreda, Gambella, South West Ethiopia

[Box 3](#): Migration Policy Framework for Africa and Plan of Action (2018-2030): Recommended strategies to deal with migration and environment

[Box 4](#): IGAD Regional Migration Policy Framework: Recommended strategies to cope with migration, climate change, environment, and adaptation

[Table 1](#): National policy and legal instruments that acknowledge human mobility in the context of climate change, disasters, and environmental degradation in Ethiopia

ACRONYMS

AEC	AFRICAN ECONOMIC COMMUNITY
AR5	FIFTH ASSESSMENT REPORT
AR6	SIXTH ASSESSMENT REPORT
AU	AFRICAN UNION
CHIRPS	CLIMATE HAZARDS GROUP INFRARED PRECIPITATION WITH STATION
COMESA	COMMON MARKET FOR EASTERN AND SOUTHERN AFRICA
COVID-19	CORONAVIRUS DISEASE
CRGE	CLIMATE RESILIENT GREEN ECONOMY
DRR	DISASTER RISK REDUCTION
DTM	DATA TRACKING MATRIX
EFD-JC	ETHIOPIAN FORESTRY DEVELOPMENT - JIMMA CENTER
ENSO	EL NIÑO SOUTHERN OSCILLATION
GDP	GROSS DOMESTIC PRODUCT
GHG	GREENHOUSE GAS
GNI	GROSS NATIONAL INCOME
HDI	HUMAN DEVELOPMENT INDEX
HDRP	HUMANITARIAN AND DISASTER RESILIENCE PLAN
IDP	INTERNALLY DISPLACED PEOPLE
IDDRSI	IGAD DROUGHT DISASTER RESILIENCE AND SUSTAINABILITY INITIATIVE
IGAD	INTERGOVERNMENTAL AUTHORITY ON DEVELOPMENT
IPC	INTEGRATED FOOD SECURITY PHASE CLASSIFICATION
IPCC	INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE
ITCZ	INTER-TROPICAL CONVERGENCE ZONE
NAP	NATIONAL ADAPTATION PLAN
NGO	NON-GOVERNMENTAL ORGANIZATION
NPSDM	NATIONAL POLICY AND STRATEGY ON DISASTER MANAGEMENT
OAU	ORGANIZATION OF AFRICAN UNITY
PDRE	PEOPLE'S DEMOCRATIC REPUBLIC OF ETHIOPIA
RCP	REPRESENTATIVE CONCENTRATION PATHWAYS
SDG	SUSTAINABLE DEVELOPMENT GOALS
SST	SEA SURFACE TEMPERATURE
UNFCCC	UNITED NATIONS FRAMEWORK CONVENTION FOR CLIMATE CHANGE
WHO	WORLD HEALTH ORGANIZATION

EXECUTIVE SUMMARY

The Federal Democratic Republic of Ethiopia (FDRE) stands out for its cultural, environmental, and biodiversity, now increasingly subject to the impacts of climate change. Challenges including droughts, heavy precipitation, landslides, and floods endanger human settlements and livelihoods dependent on agriculture, pastoralism, and forestry. Both sudden- and slow-onset environmental change also affect internal and cross-border population movements. This report aims to showcase the linkages between climate change, disasters, environmental degradation, and human mobility in Ethiopia. It seeks to guide policy-makers dealing with climate impacts and the factors driving population movement to and from vulnerable areas of the country.

Socio-economic dynamics: Ethiopia has a diverse terrain, from high plateaus to the Great Rift Valley, with a population of 113.6 million, mostly rural, experiencing varied climates across its five traditional zones, from arid lowlands to moist highlands. Agriculture, employing 70 per cent of the workforce, is tied to local climate conditions, facing challenges such as droughts, flooding, and land degradation. Temperature rises and erratic rainfall patterns impact soil health, crop yields, and livelihood. Whilst agriculture remains the primary employment sector and shifts to wood lots are notable. The service economy contributes significantly to Gross Domestic Product (GDP), but growth is uneven, leaving the poorest vulnerable to shocks. Infrastructure limitations, climate adversities, and political conflicts, particularly in lowland areas, hinder diversification and heighten risks. Ethiopia's diverse ethnic composition and complex political history shape its social and political landscape, marked by royal successions, rule under the Derg, and conflicts like the Ogaden War (1977-78) and Ethiopian Civil War (1974-91). These socio-political factors, alongside climate change, drive distinct forms of human mobility, with rural livelihoods under threat and political instabilities persisting. Ethiopia faces challenges of internally displaced persons and cross-border migration due to these factors.

Climate trends and impacts: Ethiopia's diverse climate, influenced by its heterogeneous topography, varies from arid to semi-arid. It features two main seasonal rains, the 'Belg' (March-May) and the 'Kiremt' (June-September), with a dry season known as 'Bega'. However, variability in these patterns is observed, with central and western regions experiencing long rainy seasons, while the South East follows a bimodal rainfall pattern. Large-scale climate drivers and phenomena, such as the El Niño Southern Oscillation (ENSO) and the Indian Ocean Dipole (IOD) further complicate this variability. ENSO affects Ethiopia's weather conditions, especially the Kiremt rains, by influencing sea surface temperatures (SST) in the equatorial Pacific. Similarly, a positive IOD enhance Kiremt rains in Ethiopia. Climate change is evident through warming trends and changing rainfall patterns, with long rains declining in some regions while short rains increase in others, known as the 'East African Climate Paradox'. Projections indicate more frequent droughts despite overall precipitation increase, affecting agricultural productivity and rural livelihoods. Economic stress drives migration, with residents from drought-prone areas like Afar or Somali regions moving to more stable climates or urban areas. displacement is also common due to extreme weather events such as severe droughts and floods.

Land use: In Ethiopia, agriculture employs over 70 per cent of the population and contributes to the country's GDP. Smallholder subsistence farming dominates, with agricultural output doubling between 2004-2005 and 2013-2014 due to improved seeds, fertilizers, expanded agricultural land, and commercial farming. Staple crops like teff, maize, wheat, sorghum, millet, and coffee face environmental challenges, heavily reliant on rainfall due to limited irrigation. Climate change exacerbates weather impacts and soil degradation. Ethiopia boasts the largest livestock population in Africa, vital to both pastoralism in lowland areas and mixed farming systems in highlands. The sector is also impacted by climate change through increased water stress and changes in rainfall patterns.

Human development trends: Despite recent progress, Ethiopia, with a Human Development Index (HDI) value of 0.498, ranks 175th globally, indicating low human development. Improvements over the past two decades are threatened by coronavirus disease (COVID-19), conflict, and climate-related risks, jeopardising the gains in health, education, and standard of living. Life expectancy has increased, supported by developments in disease prevention and access to essential services. Ethiopia has also made strides in enhancing enrolment rates and expected years of schooling. However, the quality of education and learning outcomes can still be improved, especially given persistent

disparities based on gender, location, and socio-economic status. Still, the country has experienced high economic growth rates, aiming to transition to a lower-middle-income status by 2025. Despite this growth, poverty reduction has been modest, with the poorest segments of the population remaining vulnerable to shocks. The link between poverty and vulnerability to climate-related disasters is to be noted, creating a vicious cycle that exacerbates poverty and reduces the capacity to cope with extreme weather events.

Agricultural livelihoods and food security and gendered dimensions of risks: Climate-related risks threaten agricultural production and livelihoods in Ethiopia, especially for smallholder farmers reliant on subsistence farming. Challenges like droughts and changing precipitation patterns strain food and income sources, worsened by factors such as land fragmentation and limited access to resources, with only 2 per cent of land under irrigation. Climate variability threatens food security, increasing poverty and malnutrition. Pastoralists, 12-15 per cent of the population, face specific risks from climatic shocks, notably droughts, impacting livestock feed and water availability. The early 2020's drought, intensified by La Niña, caused widespread food insecurity and livestock losses. Women, girls, and minority groups are particularly vulnerable to climate risks due to persistent gender inequalities, limiting their ability to mitigate vulnerability and choose response strategies, including migration. These inequalities contribute to Ethiopia's low ranking in the Gender Inequality Index. Progress is underway to integrate women and girls into resilience building and sustainable climate solutions.

Migration and climate change: In Ethiopia, climate change and environmental degradation are identified as an important factor in migration, exerting both direct and indirect influences on the habitability of regions and agricultural and water resources. Evidence suggests a correlation between increased temperatures and altered precipitation patterns, and migration, with projections indicating an increase in the number of especially internal population movements towards the mid-21st century. The northern highlands and central Great Rift Valley experience significant out-migration due to socio-economic stresses, land degradation, and climate change impacts, notably on water resources crucial for agriculture. Droughts worsen soil degradation, crop production, and livestock maintenance, driving migration. However, internal migration, while an adaptation for many, may heighten vulnerability to poverty and food insecurity, particularly for women who face risks like gender-based violence. Ethiopia also faces substantial internal displacement due to droughts, floods, and extreme weather events, compounded by socio-economic and political factors, revealing community vulnerability. Mobility patterns affect demographics, economic stability, and social cohesion in both origin and destination areas, exacerbating famine and food insecurity, which are both outcomes and drivers of population movements, worsened by climate change and environmental degradation. Seasonal migration acts as an adaptive strategy, diversifying household livelihoods and improving food security but can negatively impact agricultural productivity and societal cohesion in origin areas, potentially trapping populations in deteriorating conditions.

Risk and conflicts: The 2022 IPCC's Sixth Assessment Report (AR6) emphasises how conflicts exacerbate vulnerability to climate change by undermining adaptation efforts. It highlights socio-economic factors and governance as immediate conflict drivers, alongside displacement risks, particularly in low-income countries. Climate change indirectly intensifies conflict risks by amplifying underlying factors like poverty and economic shocks. Quantitative projections are challenging due to migration's multi-causal nature. Concerns arise about tensions and conflict in host communities due to climate-induced migration. The report stresses understanding climate driver typologies and households' adaptive capacities, crucial for responding to sudden- or slow-onset changes like droughts. Case studies, including from Gambella, Ethiopia, shed light on the climate-migration-conflict nexus, revealing environmental factors' relevance in migration decisions. A nuanced approach to data collection and analysis is needed to grasp the interconnectedness of climate change, migration, and conflict dynamics.

Policies and legal frameworks addressing human mobility in the context of climate change, disasters, and environmental degradation at the national and regional levels: A review of 38 policies and legislation revealed that 12 recognise the linkages between (forced) population movements and environmental drivers. Despite this awareness, current migration legislation falls short in addressing movements induced by climate- and disaster-related events. Ongoing discussions about the formulation of a comprehensive migration policy could harness migration's potential for national development while integrating strategies to manage human mobility in the context of climate change, environmental degradation, and disasters.

On the other hand, Ethiopia's proactive approach to climate change is gradually extending to address the mobility implications of environmental changes. This includes acknowledging that 'trapped' populations in rural areas are particularly vulnerable to climate or environmental changes. The Disaster Risk Reduction (DRR) agenda showcases progressive strategies aimed at mitigating the displacement impacts of climate-related disasters. Noteworthy are the 2014 Disaster Risk Management Programme and the 2018 Humanitarian and Disaster Resilience Plan, which focus on return, resettlement, reintegration assistance, and the rehabilitation of communities affected by conflicts and disasters, respectively. At the regional level, the African Union (AU) and the Intergovernmental Authority on Development (IGAD) provide policy documents that support the integration of strategies at the national level, guiding the incorporation of mobility issues into national policy formulation.

Conclusions and Recommendations: Climate change, as a risk multiplier (a worsening of pre-existing challenges), has exacerbated vulnerabilities by intertwining with factors such as food security, socio-economic conditions, and political stability. Recommendations were developed and validated through a collaborative workshop in Addis Ababa (May 2023), highlighting strategic actions for researchers, policy-makers, as well as local communities. These include enhancing data collection on the climate change-human mobility nexus, formulating comprehensive policies addressing the topic, promoting agricultural and infrastructural resilience, and fostering social inclusion and adequate mobility planning and management.

1. INTRODUCTION

1.1. Setting the Scene

Climate change is causing more intense and disruptive weather patterns and climatic events globally, including prolonged droughts, heavy rainfall, flooding, heatwaves and other occurrences. The effects of these extremes, although they vary regionally and locally, contribute to human migration. There is also increasing concern that tension within host communities towards mobile people, whether towards refugees crossing international borders or internally displaced persons (IDPs) within a country, may intensify due to competition for resources aggravated by climatic change. This report focuses on Ethiopia, where these challenges have emerged as a pressing concern for policymakers, civil society groups, and practitioners in a multitude of fields.

Climate-linked migration is usually multi-causal, expressed in different human mobility types—ranging from displacement, migration, relocation, even immobility—and occurs on a spectrum from voluntary to involuntary. It can stem from both slow-onset environmental change (e.g., droughts, sea level rise) or rapid onset environmental change (e.g., flooding, storms), be long-term or short term, as well as long-distance or short-distance. Climate change, of course, interacts with a variety of factors, such as socio-economics, politics and governance, peace and stability, as well as food security (Nicoletti et al., 2022). It is this interaction of climatic and other factors which affects migration. In other words, the climate change-migration nexus is not understood to be linear, whereby gradual changes or a climatic event alone determines whether a person or community moves. Rather, climate change effects interact with a range of other factors to influence whether people stay or go. Similarly, climatic change acts as a threat or risk-multiplier, rather than a single cause, of conflict or in the conflict-migration nexus.

The report presents these dynamics with respect to Ethiopia by focusing, firstly, on how anthropogenic climate change affects Ethiopia. It then presents the interaction of climatic change with several systems that humans depend on for their livelihoods, including land-based agriculture and forests. A substantive section then presents the available scientific evidence on the link between climatic change, livelihoods impacts, human migration, and conflict. The report, finally, turns to analysis of relevant developments in Ethiopia and the region in law and policy, pointing to accomplishments and gaps.

1.2. Methodology

The report is based on extensive research of publicly available information and literature by climate scientists and migration scholars. Both primary and secondary literature was consulted for this report, as well as a thorough law and policy review conducted. An early draft of the report was shared and discussed with local stakeholders at a workshop in Addis Ababa in May 2023. Workshop participants provided validation of findings, as well as valuable feedback concerning report content and structure.

Framing the research for this assessment report are concepts of climate ‘risk’. The concept of ‘risk’ has been a focal point for successive IPCC reports, which frames risk from climate impacts as a function of climate-related hazards, exposure, and vulnerability. That said, as policymaker concern over climate change impacts on migration grows, there is also increasing acceptance of the need for new conceptual framings of climate change risk within climate migration research (Szilagyi, 2021). Generally, the emergence of climate migration developed as a response to the limited attention given by established theories on migration to socio-economic and political factors underpinning households’ decisions to move or stay (de Sherbinin et al., 2022). For this reason, this report, first and foremost, sets out the risk, exposure and vulnerability context for climate linked migration in Ethiopia.

The report focuses on climate-linked migration. Nevertheless, a variety of related terms are now used in the relevant literature, amongst them climate migration, mobility, and immobility. Of these, the first may be most readily accessible, the second most inclusive (encapsulating migration, displacement, relocation, etc.), as well as increasingly being used in academic outputs, and the final one indicative of not moving, whether by choice or not. All terms are found in this report as relevant.

1.3. Chapter Outline

The report proceeds along the following trajectory:

Chapter 2, 'Navigating Ethiopia's Landscape: Socio-economic Dynamics', presents an overview of Ethiopia's socio-economic terrain. It highlights the role of agriculture, vital yet vulnerable to droughts and land degradation. The chapter also touches on the country's economic disparities, infrastructural problems, and the impact of political conflicts on social and economic stability. This section sets the stage for understanding Ethiopia's multifaceted risk environment, in which climate-linked migration occurs.

Chapter 3, 'Ethiopia's Climate: Trends and Impacts', analyses the country's diverse climate and its implications. It highlights the variability of Ethiopia's seasons, as well as the role of phenomena like the El Niño Southern Oscillation (ENSO) in influencing these patterns. This variability and change impact agricultural productivity, livelihoods, and (forced) population movements, particularly from drought-stricken regions to areas with more stable climates or urban centres.

Chapter 4, 'Land Use', delves into the role of agriculture in Ethiopia, which employs over 70 per cent of the population and which is a significant contributor to the GDP. The chapter outlines the sector's growth, driven by the adoption of improved agricultural practices and the expansion of farmland. It also addresses the impacts of climate change on crop production, such as rainfall variability and soil degradation.

Chapter 5, 'Socio-economic Determinants of Risk', assesses the role of human development dimensions in building resilience against risks in Ethiopia. The chapter highlights developments in health and education indicators, as well as poverty reduction amidst high economic growth—illustrating the linkages between poverty and vulnerability to climate disasters. With a focus on agriculture and food security, the chapter also underscores the impact of climate change on livelihoods, with smallholder farmers and pastoralists facing heightened risks from droughts and changing precipitation patterns. Gendered dimensions of risk are critically examined, revealing how social norms and inequalities expose women and girls to greater risks, particularly in agriculture and natural resource management.

Chapter 6, 'Migration, Risk, and Conflict', investigates the climate change-human mobility nexus in Ethiopia, illustrating how climatic factors intertwine with socio-economic, political, demographic, and cultural dimensions to influence population movements. Besides exploring the (in)direct impacts of environmental drivers on human

mobility, the chapter underscores migration both as an adaptation mechanism and a source of vulnerability, with implications for poverty, food insecurity, and societal cohesion. The discussion extends to risk and conflicts, drawing on insights into how climate risks, socio-economic factors, and governance issues intertwine to exacerbate vulnerabilities and drive migration and conflict.

Finally, Chapter 7 investigates 'Policies and legal frameworks addressing human mobility in the context of climate change, disasters, and environmental degradation at the national and regional level'. Despite 12 of the 38 reviewed policies explicitly recognising these linkages, a gap remains in current migration legislation to fully address climate- and disaster-induced human mobility. It also acknowledges Ethiopia's proactive climate agenda and its evolving considerations for the environmental drivers of mobility patterns. Special attention is given to DRR strategies, highlighting their role in managing displacement and supporting affected communities. Furthermore, the chapter examines the support from regional frameworks in enhancing Ethiopia's approach to incorporating the human mobility-climate/environmental change nexus into its policy formulations.

2. NAVIGATING ETHIOPIA'S LANDSCAPE: SOCIO-ECONOMIC DYNAMICS

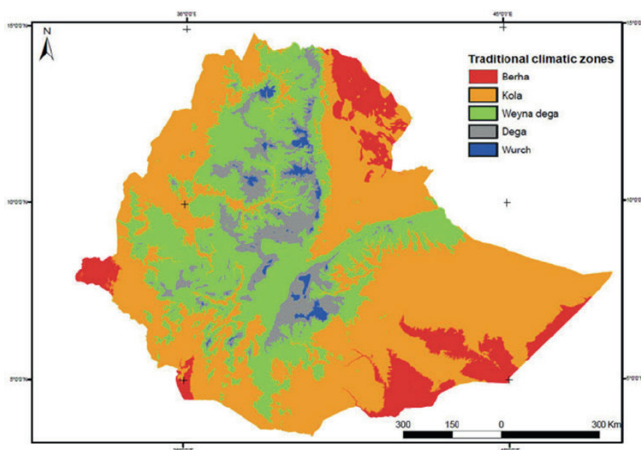
2.1. Geographical Aspects

The Federal Democratic Republic of Ethiopia (FDRE; henceforth, Ethiopia) is a land-locked country in East Africa. It is the second most populous African nation, with 78 per cent of its population of 129 million living in rural areas. Ethiopia shares borders with Sudan and Eritrea to the North, Djibouti and Somalia to the East, Kenya to the South, and South Sudan to the West. Though land-locked, Ethiopia has port access in neighbouring Djibouti, connected by a 759 kilometres (km) railway to Addis Ababa. Port access in Somaliland has also been negotiated as of 2024.

Ethiopia has eleven regional states, the most populous being Amhara, Oromia, and The Southern Nations Nationalities and Peoples' Region (SNNPR). Ecologically diverse, Ethiopia lies in a tropical zone between the equator and the Tropic of Cancer, featuring a high plateau and central mountain range divided by the Great Rift Valley. Climate varies by altitude: hot and humid in lowlands, cooler temperatures in higher altitudes, categorised into hot arid Berha (altitude <500 metres (m)); warm and semi-arid Kola (500-1500 m); cool sub-humid Weynadega (1500-3000 m); cool to humid Dega (2300-3200 m); and cold to moist Wurch (>3200m) (Figure 1).

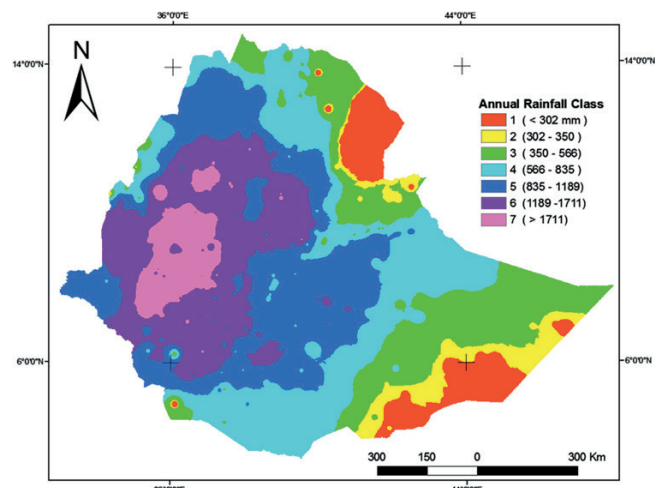
Ethiopia experiences three distinct seasons: Bega (October to January), Belg (February to May), and Kiremt (June to September) (Webster et al., 2020). The short rainy season falls between February and April, with heavier rains from mid-June to mid-September, including tropical monsoons (Figure 2). Rainfall varies widely, averaging 115-165 millimetres (mm) per year in arid and semi-arid lowlands and 1700 mm in the North and South West regions (Kassaye, 2021). Projected precipitation changes show uncertain but potentially increasing rainfall, with projected increases of 2.5 to 29 per cent by 2030, and 12 to 32 per cent by 2050, under Representative Concentration Pathways (RCP) 4.5 (lower medium trajectory) and RCP 8.5 (high trajectory), respectively (Teshome et al., 2021). Severe droughts in the long growing season, Kiremt, and unpredictable rains in the short growing season, Belg, have been observed (USAID, 2016)

Figure 1: Traditional climatic zones Ethiopia



Source: Berhanu et al., 2014. This map is for illustration purposes only. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the International Organization for Migration.

Figure 2: Mean annual rainfall classes Ethiopia



Source: Berhanu et al., 2013. This map is for illustration purposes only. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the International Organization for Migration.

2.2 Economy and Livelihoods

Agriculture employs 68 per cent of the population, with forestry as the second most common income source for rural households (Alemayehu and Melka, 2022). Opportunities for off-farm and non-farm employment in rural areas are limited, especially for women who carry domestic duties and private sector employment, and are often engaged in petty trade and 'traditional female roles' (World Bank, 2022a). For decades, Ethiopian smallholders have shifted from crop lands to wood lots for a better return on investment and to secure access to crucial resource like cooking and heating fuel (Alemayehu and Melka, 2022). Despite growth in these sectors, Ethiopia's service economy is the principle source of GDP. Although economic growth rates over the last 15 years have improved (9.5 % per annum), gross national income (GNI) per capita is among the lowest on the continent (890 US Dollars (USD)),¹ with the poorest still vulnerable to economic and environmental shocks (World Bank, 2022b).

Economic diversification outside of large cities, particularly in the Ethiopian lowlands, faces poor infrastructure and repeated disasters, triggering displacement (World Bank, 2022b). Improvements are expected in industrial and service sectors such as telecommunications and tourism, though the COVID-19 pandemic has impacted the latter (World Bank, 2022b). With port access in Djibouti and Somaliland, Ethiopia relies on neighbouring infrastructure for 95 per cent of its maritime trade. Recently, economic growth has slowed due to conflict with the northern Tigray region, resulting from political-constitutional dispute. Prime Minister Abiy Ahmed announced peace talks with Tigray in 2023, likely influenced by the high human and economic costs (inflation up to 37 per cent since May 2022).²

2.3. Political and Social (In)stability

With a population nearing 130 million in 2024, largest ethnic groups in Ethiopia include Oromo (35.8%) and Amhara (24.1%), followed by Somali (7.2%), Tigray (5.7%), Sidama (4.1%), Guragie (2.6%), Welaita (2.3%), Afar (2.2%), Silte (1.3%), Kefficho (1.2%), with the remaining 13.5 per cent comprising other groups (CIA World Factbook, 2022). Ethiopia's history diverges from many African countries due to its limited colonisation. Briefly under Italian rule from 1936 to 1941 as part of Italian East Africa, it reverted to monarchy until the 1974 military coup led by Aman Andom, followed by General Tafari Benti's brief leadership. Benti abolished the monarchy in 1975, but internal conflicts ensued. Mengistu Haile Miriam led

the Derg until its dissolution in 1991, transitioning to the People's Democratic Republic of Ethiopia (PDRE), mainly comprised of former Derg members. The Derg era in Ethiopia was marked by significant conflict, political, social, and environmental crises. In 1977, Somalia invaded Ethiopia in the Ogaden War (1977-1978), which overlapped with the broader Ethiopian Civil War (1974-1991). Rebel groups emerged in Tigray, Wollo, and what is now Eritrea, opposing the Derg regime. Amidst this turmoil, conflict and drought led to a catastrophic famine between 1983 and 1985, resulting in 1.2 million deaths, 400,000 refugees, and an estimated 2.5 million Ethiopians (Giorgis, 1989; Schewel and Asmamaw, 2021).

1. See "[The World Bank in Ethiopia](#)" (The World Bank, 2024).

2. See "[At Long Last, Ethiopia Prepares for Peace Talks](#)" (International Crisis Group, 2024).

3. ETHIOPIA'S CLIMATE: TRENDS AND IMPACTS

Climate change effects in Ethiopia include rising temperature, changes in precipitation patterns, and drought. In the last decades, Ethiopia has experienced a significant warming (Gebrechorkos et al., 2019; Mohammed et al., 2022), alongside changes in rainfall patterns. Long rains in spring have decreased across East Africa (Williams et al., 2017; Lyon and DeWitt, 2012; Wainwright et al., 2019), while short rains have slightly increased (Liebmann et al., 2014). These changes are linked to SST in the Indian and Pacific Ocean affecting the atmospheric circulation over East Africa (Williams et al., 2017; Liebmann et al., 2014). Extreme events like droughts have become more frequent in East Africa (Haile et al., 2020a), particularly affecting Ethiopia's southern regions during the spring season (Lyon, 2014; Zeleke et al., 2017). Future climate projections for Ethiopia suggest a wetting trend alongside increased drought occurrences. Despite models projecting more precipitation for East Africa (Almazroui et al., 2020), there is an observed overall drying labeled 'East African Climate Paradox'. Factors like aerosol emissions, sea surface pattern changes, as well as model errors or poor data quality are suggested causes (Rowell et al., 2015). While average precipitation is projected to increase, temperature will increase evapotranspiration, exacerbating drought conditions (Haile et al., 2020b).

3.1. Current Climate Patterns and Changes

Ethiopia's tropical climate is largely determined by the North-South migration of the ITCZ and its diverse topography. Much of the country consists of highland plateaus, with peaks exceeding 4,500 meters (Mengesha et al., 2020), separated by the Rift Valley. Regions below sea level, as well as the Somali and parts of Oromia in the South East, are lowland (Mengesha et al., 2020). Average temperatures vary with topography, with colder regions in the elevated centre and hotter regions exceeding 30°C in the lowlands. Similarly, the highest precipitation rates of over 2,000 mm per year occur in the central and western highlands or on their western slopes.

Ethiopia's seasons are determined by the precipitation cycle, with three main seasons, as previously described. Belg serves as the main rainy season in the South East of Ethiopia and a secondary rainy season in the centre and north-east (Alhamsry et al., 2019). Kiremt is the main rainy season in the centre and north-east of Ethiopia. El Niño events occur irregularly and provides 50-80 per cent of the total annual rainfall, largest El Niño being larger than the largest La Niña (Korecha and Barnston, 2007). The Southern regions are very dry during Kiremt season. Bega is the dry season in the South East, being considered a secondary rainy season (Yang et al., 2019). Overall, the centre and west of Ethiopia have one

long rainy season, while the South East experiences a distinct bimodal rainfall pattern. These patterns can be attributed to the ITCZ movements, SST and low-level wind pattern (Yang et al., 2015; Nicholson, 2016, Alhamsry et al. 2019).

Large-Scale Drivers

Large-scale climate drivers in Ethiopia include ITCZ (Diro et al., 2011a), Tropical Easterly Jet and East African Low-Level Jet (Segele and Lamb, 2005), equatorial Pacific SST (Gleixner et al., 2017), Indian Ocean Dipole (Bahaga et al., 2015; Kolstad et al., 2021) and other global variability modes (Segele et al., 2009). The Southern Annular Mode (SAM) also impacts East African short rains is an important climate driver for the Southern parts of Africa (Reason and Rouault, 2005; Mbigi and Xiao, 2023). These drivers are linked to drought affecting millions of people across East Africa, bringing an unprecedented sixth consecutive failed rainy season in 2023. In the first 11 months of 2022, drought displaced approximately 1.1 million Somalis and 590,000 (UNHCR, 2022a).

El Niño Southern Oscillation (ENSO)

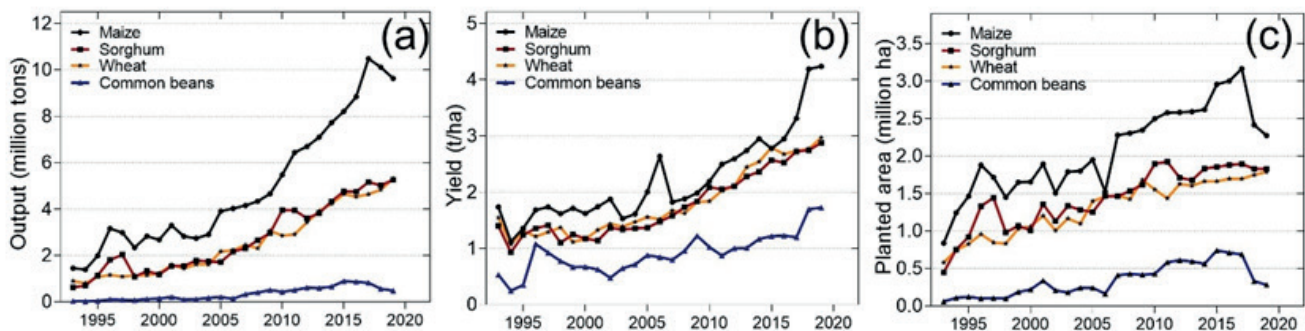
ENSO, characterised by El Niño and La Niña episodes of equatorial Pacific warming and cooling, is the most significant driver of inter annual climate variability globally. These events, defined by temperature anomalies, exhibit an asymmetry, with fewer El Niño events and usually multiple consecutive La Niña events. They typically peak around the end of a calendar year, developing in late boreal spring or during the boreal summer. These temperatures fluctuations influence atmospheric circulation pattern, impacting local weather and also global weather conditions (Timmermann et al., 2018; McPhaden et al., 2020). ENSO influences Ethiopia's weather, particularly the Kiremt rain season (Korecha and Barnston, 2007; Gleixner et al., 2017; Taye et al. 2021), which contributes 50-80 per cent of annual rainfall (Korecha and Barnston, 2007; Philip et al., 2018). ENSO drivers around 50 per cent of Kiremt rainfall variability (Korecha and Barnston, 2007; Gleixner, 2017). However, the Belg rain season shows no strong connection to ENSO, with regional differences in the relationship (Gleixner et al., 2017; Korecha and Barnston, 2007; Philip et al., 2018). The predictability of El Niño is hindered by the spring predictability barrier, making forecasts beyond the boreal spring challenging (Barnston et al., 2012; Timmermann et al., 2018; McPhaden et al., 2020). Pre-warning time for El Niño before the Kiremt season is usually limited to 1-2 months. However, methods exist to forecast El Niño onset as early as the previous calendar year (see, e.g., Lüdescher et al., 2013; Ham et al., 2019), potentially extending pre-warning time to over five months.

4. AGRICULTURE AND OTHER LAND USE CHANGES

Agriculture plays a pivotal role in Ethiopia's economy and as a form of livelihood, employing over 70 per cent of the population and contributing to GDP (CIA World Factbook, n.d.). In 2021, it accounted for 37.6 per cent of the GDP, second only to the service sector (World Bank, 2021). Also, at least 80 per cent of annual export commodities are agricultural products, with non-agricultural export often relying on agricultural inputs (Bachewe et al., 2015). The majority of Ethiopians, about 90 million people, live in rural areas (World Bank, 2021). Despite the rural population's share of the total population decreasing to 78 per cent in 2021, it continues to grow (World Bank, 2021). In these regions, agriculture is the main source of income and subsistence, with over 70 per cent of

farmers practising smallholder subsistence farmers, the predominant form in Ethiopia (FAO, 2022a; Fantaye, n.d.). With farm sizes averaging less than 1 hectare (ha) and expected to decrease further due to population growth, smallholder systems in Ethiopia primarily rely on mixed farming with limited mechanisation of irrigation (FAO, 2022a; Fantaye, n.d.). Ethiopia has seen rapid agricultural growth, with total output doubling between 2004/05 and 2013/14 (Bachewe et al., 2015), particularly in cereal, livestock, and food production (Figure 3). Increased use of agricultural inputs, such as improved seeds and fertilisers, and expansion of agricultural land and commercial farming have been key drivers of this growth (World Bank, 2021; Bachewe et al., 2015).

Figure 3: Evolution of agricultural production and productivity of maize, sorghum, wheat and common beans in Ethiopia from 1993 to 2019



Source: FAOSTAT, 2022.

Agricultural systems in Ethiopia vary across the landscape. Crop farming, dominant in the highlands, involves the most farmers and generates the highest values (Bachewe et al., 2015). Pastoralism, prevalent in the lowlands, contributes significantly to GDP (Murken et al., 2020; Metaferia et al., 2011). Although fishery plays a minor role, it supports local livelihoods (Kebede et al., 2017; Henabo and Wake, 2020), particularly in Lake Tana and some Rift Valley Lakes (Kebede et al., 2017).

The main staple crops in Ethiopia - teff, maize, wheat, sorghum, and millet - cover 80 per cent of cultivated land (Updated as of 2016, Fantaye, n.d.). Wheat, suited to moderate temperatures and higher elevations, is mainly grown in Central Ethiopia (Fantaye, n.d.; IPAD Country summary, 2023). Teff, maize, sorghum, and millet are cultivated across various regions, with teff concentrated in the Central Highlands, particularly in Amhara and Oromia (Tadele and Hibistu, 2021). Maize requires higher

temperatures and rainfall, and it is grown between 1500 and 2200 m above sea level (Ibid.). Sorghum and millet, a adaptable to different climates, are grown across agro-ecological zones (Ibid.).

Coffee, Ethiopia's primary cash crop, drives the economy as the country's largest producer and consumer in Africa. It contributes 25 per cent to exports, valued at over USD 1 billion annually, mainly to the USA, Saudi Arabia, and Germany (OEC, 2020; Eshetu and Mehare, 2020). Concentrated in the South West, coffee regions benefit from favourable conditions (Chemura et al., 2021). Engaging around 5 million smallholder farmers, coffee cultivation covers over 10 per cent of total crop land, with distinct systems including forest coffee, small plots, and commercial plantations (Williams et al., 2017).

Weather also impacts crop production in Ethiopia, where factors like rainfall, soil conditions, and access to inputs are important. With only 5 per cent of land irrigated, rainfall is key, especially during rainy seasons like Belg and Kiremt (Chandrasekharan et al., 2021; IPAD Country Summary, n.d.). Changes in precipitation patterns affect production, and extreme events like droughts cause crop failures and livestock losses (Reliefweb, 2022; Bogale and Erena, 2022; Wakjira et al., 2021). Climate change worsens crop vulnerability to weather, with rising temperatures and water stress affecting agriculture. Shifting rainfall patterns and increased unpredictability hamper coffee harvests, while climate-induced droughts devastate crops and livestock in East Africa (Williams et al., 2017). Soil degradation, driven by population growth and urbanisation, intensifies due to deforestation and farming expansion, undermining agricultural productivity. Efforts to promote better soil management practices aim to mitigate such threat (Hussein, 2021; Wassie, 2020; Hörner and Wollni, 2021).

Livestock

Ethiopia boasts Africa's largest livestock population, with two-thirds owned by lowland herders and many crop farms maintaining small livestock numbers in mixed farming systems. Rising temperatures and decreased Belg rainfall have intensified water stress on livestock, particularly affecting pastoralists reliant on Belg rainfall (Gummadi et al., 2017; Tirfi et al., 2022; FEWSNET, 2012). Ethiopian livestock primarily consists of cattle, goats, poultry, and sheep (USAID, 2021; Statista, 2021), serving purposes from animal protein to export goods like leather (USAID 2021). Livestock management remains extensive with limited input and low production, with the average Ethiopian cow producing only about 1.35 litres of milk per day (USAID, 2021; Statista, 2021).

Fisheries

The Ethiopian fishery sector grapples with climatic impacts like habitat shifts and increased fishing pressure due to crop failures, exacerbating overfishing (Hebano and Wake, 2020). Despite having water resources, the fishery industry remains underdeveloped, with potential fish production at 95 thousand tonnes annually, but only half achieved (Ibid.). Challenges include limited access to modern equipment, inadequate storage, transportation infrastructure, and lack of fishing regulations (Ibid.). Urbanisation, agriculture, and industrial development have degraded Ethiopian wetlands, increasing water pollution and endangering the fishing industry (Ibid.). Moreover, the loss of shoreline vegetation, key for fish breeding, worsens the situation (Tessema et al., 2014).

Forests

Ethiopia's diverse landscape supports a variety of different forest ecosystems, including evergreen montane forests at 1,800 and 3,000 m (Friis et al., 2010), moister Afromontane

forests in regions with higher rainfall (Bishaw, 2001; Friis et al., 2010; Wassie, 2020), and transitional forests between 500 and 1,500 m. Ethiopia boasts remarkable biodiversity, being part of two global biodiversity hotspots - the Eastern Afro-Montane and the Horn of Africa (EBI, 2014). Around 10 per cent of its vascular plant species are endemic (EBI, 2014), with many endangered, particularly in mountainous regions (FDRE, 2022). Moist evergreen montane forests are important for biodiversity conservation (Asefa et al., 2020), while dry deciduous forests and woodlands host the highest plant species richness and endemism (Friis et al., 2010). Ethiopia's forests are crucial for livelihoods, meeting 92 per cent of household energy demands, mainly through wood burning. Wood is also harvested for construction and charcoal production (Wassie, 2020). Furthermore, non-timber forest like fibre, resin, and fruit provide income. Forests also support local communities with medicinal plants and contribute to the quality and quantity of drinking water resources (FAO, 2017; Teketay, 2001)

Natural high forests covered about 35-40 per cent of Ethiopia's land area around 1900's, but due to increasing demand for agricultural land, firewood, and construction wood, they were reduced to just 3 per cent of these forests by 1989 (Bishaw, 2001; Teketay, 2001). According to Sisay and Gitima (2020), closed natural high forests decreased from 2.64 per cent to only 0.2 per cent, with the share of moderately to severely disturbed forests increasing. Global Forest Watch reports a 4.2 per cent decrease in Ethiopia's humid primary forests from 2002 to 2021 (University of Maryland and World Resources Institute, n.d.). The total forest cover declined from 18.5 per cent in 1990 to 15.1 per cent in 2020 (World Bank, n.d.), while FAO's Global Forest Resources Assessment Report (2020) indicates a change from 17.2 per cent to 15.2 per cent between 1990 and 2020. Wassie (2020) estimates an average annual deforestation rate of 1.6 per cent since the 1950's. However, local studies report higher deforestation rates of up to 2.9 per cent (Bekele et al., 2015). Due to differences in the underlying forest definitions and the methods applied, these numbers must always be compared with caution.

Deforestation in Ethiopia is mainly due to forests being converted into agricultural land, with agriculture being the primary driver of forest cover loss (Ometto et al., 2022; Bekele et al., 2015; Wassie, 2020). Other factors include infrastructure development, timber extraction for construction and fuel wood, and charcoal production. Dry montane forests face threats from fire and overgrazing, while commercial tea and coffee plantations pose risks to moist mountainous forest ecosystems (EBI, 2014). Population growth exacerbates pressure on forests, leading to over-exploitation of natural resources (EBI, 2014; FAO, 2017; Sisay and Gitima, 2020). Political, economic, technological, and cultural settings and their future pathways also impact the future of the forests (Bekele et al., 2015; Ometto et al., 2022).

Box 1. Forests and Migration

In Ethiopia, human mobility and migration are linked to forests. Internal migration movements within Ethiopia are common and are caused, for example, by the overuse and exploitation of natural resources. They are often linked to drought and famine events (Getahun et al., 2017). On the other hand, resettlement can be seen as a driving force behind local deforestation and increasing pressure on forests, as there is a need for arable land, housing, and forest-based resources (Getahun et al., 2017; Sisay and Gitima, 2020). For example, recent resettlement programmes resulted in severe decline of 55 per cent of forest cover in the Hawa-Galan district in the Oromia National Regional State of Ethiopia between the years 2000 and 2018 (Yadeta et al., 2022). In the Chewaka district, resettlement even caused a decrease in forest area by 59 per cent between 2000 and 2018 (Abera et al., 2020). Human mobility is thus both the cause and the consequence of deforestation and forest degradation (Wassie, 2020). Forest loss and degradation have a negative impact on the water balance and expose soils to erosion. Deforestation, which involves the removal of vegetation cover, leads to a reduction in precipitation and an increase in temperature (Ometto et al., 2022), which negatively affects the water balance at the local and regional scale. The tropical moist forests of Ethiopia, which are severely reduced and at risk, play a crucial role in the water cycle, making their decline critical (Berkhout et al., 2021). Soil erosion, mainly water erosion, is already a severe problem in Ethiopia, especially in the highlands, where most soil is washed away from croplands and areas where vegetation has been cleared (Berkhout et al., 2021; Wassie, 2020).

5. SOCIO-ECONOMIC DETERMINANTS OF RISK

With climate change intensifying, socio-economic vulnerabilities in Ethiopia may push more people to seek livelihoods elsewhere. Climate change acts as a ‘threat multiplier’, exacerbating existing stressors, especially for those in poverty (Olsson et al., 2014: 796).

Despite recent progress in human development, Ethiopia still faces challenges that jeopardise its past achievements. Ranked 175 out of 191 countries in the 2021 Human Development Index (HDI) with a value of 0.498, Ethiopia falls into the category of countries having ‘low human development’ (UNDP Data Center, 2022a).³ The HDI assesses health, education, and standard of living (UNDP Data Center, 2022a). While Ethiopia’s HDI has improved over the past two decades, rising from 0.287 in 2000, ongoing issues such as COVID-19, conflict, and climate-related risks pose threats to its human development trajectory (UNDP Data Center, 2022b).

5.1. Human Development Trends

Health

Improvements in Ethiopia’s healthcare system have led to a rise in life expectancy from 50.5 years in 2000 to 65 years in 2021 (Ibid.). Significant strides in healthcare development include prioritising disease prevention and ensuring universal

access to essential health services (Habtemariam and Semegn, 2018; GBD 2019 Ethiopia Subnational-Level Disease Burden Initiative Collaborators, 2022). Child health in Ethiopia has improved, with the under-5 mortality rate dropping from 201.3 per 1,000 live births in 1990 to 48.7 per 1,000 live births in 2020 (UN IGME, 2021), aligning with the United Nations Sustainable Development Goal (SDG) target of reducing under-5 mortality to 25 per 1,000 live births. Ending malnutrition (SDG 2.2) would further improve child health, as malnutrition contributes to half of all deaths of children under five, according to Ethiopia’s Ministry of Health (2022: 7). In Ethiopia, maternal mortality dropped from 1,030 to 401 per 100,000 live births between 2000 and 2017 (WHO, 2019), aligning with Eastern and Southern Africa averages, estimated at 384 (UNICEF region). Nevertheless, emergent humanitarian crises and conflicts hinder progress (WHO, 2019: 45). The combined impact of COVID-19, conflict, and climate shocks threatens to reverse successes in reducing maternal mortality by compromising access to sexual and reproductive health services and maternal healthcare (UNFPA, 2022).

Education

Access to education is crucial for improving human development outcomes in a country with a young population.

3. The HDI is part of the Human Development Report, the annual flagship report of the United Nations Development Programme (UNDP). The composite index allows to track and compare human development trends in and across countries over time. For more information on the method and its limitations, visit the [HDI website](#).

4. An overview of countries of the UNICEF region of Eastern and Southern Africa UNICEF can be found at: UNICEF - [Where we work](#)

Primary school enrolment rates in Ethiopia are nearly 100 per cent with education being free in public schools (Freeman et al., 2020; UNICEF, n.d.). The average expected years of schooling in Ethiopia increased from 4.3 years in 2000 to 9.7 years in 2021, whilst the mean of years of schooling rose from 1.5 years to 3.2 years in the same period (UNDP Data Center, 2022b). Despite improvements, its quality remains a challenge as the public school system lacks adequate funding (Freeman et al., 2020; UNDP Ethiopia, 2018).

The education level of the household head significantly affects food consumption in Ethiopia, with lower educational attainment linked to higher household insecurity (WFP and CSA Ethiopia, 2019). Data from the Comprehensive Food Security and Vulnerability Analysis (CFSVA) show that about one quarter of households headed by individuals with no formal education are considered food insecure, compared to only 6 per cent of households with heads who attained education beyond secondary school (Ibid.).

While rural-to-urban migration may lead to higher educational attainments for individuals and households, migration to cities does not guarantee improved education for rural households. In Addis Ababa, 70 per cent of young people aged 18 to 20 from households with recent rural-urban migration had not completed primary education, decreasing 45 per cent for migrations occurring between 10 to 20 years prior. However, this rate is still lower than the nearly 90 per cent primary education completion rate among young people aged 18 to 20 in non-migrant households (World Bank, 2020:25). Considering the importance of education in skill development and poverty alleviation, concerted efforts are needed to understand factors hindering better educational outcomes for migrants in Ethiopia.

Providing quality education and overcoming learning barriers for internally displaced and refugee children and youth in Ethiopia, such as language, discrimination, and trauma, requires concerted efforts, including those from outside the country. In 2019, Ethiopia revised its Refugee Proclamation (see Chapter 7), granting rights to refugees, including in education (UNHCR, 2019). The educational needs of refugee children and youth, primarily from South Sudan, Somalia, and Eritrea, further strain an education systems already facing substantial challenges (UNHCR, 2022a; UNICEF, n.d.). Global initiatives like Education Cannot Wait, a United Nations fund addressing educational needs in crises (Education Cannot Wait, 2023), can support Ethiopia to ensure that no learner is left behind.

Standard of Living

Despite Ethiopia's sustained overall economic growth, progress in poverty reduction has been modest, leaving many vulnerable to shocks (World Bank, 2022b). Ethiopia's

poorest have not benefited from growth. From 2011 to 2016, Ethiopia's poverty rate decreased from 30 per cent to 24 per cent (World Bank, 2022c), with a pronounced reduction in urban areas (from 26 to 15 per cent) compared to rural areas (from 30 to 26 per cent). This disparity is mainly from differences in consumption growth (World Bank, 2020). While poverty has declined, the pace of reduction is modest compared to other rapidly growing economies, making accelerating poverty reduction a key development challenge (World Bank, 2022b). Poverty reduction is also relevant for increasing resilience to climate-related shocks, as the poor lack capacities to deal with extreme weather events like droughts and floods, also in the aftermath of such events. This creates a "vicious circle" between poverty and disaster losses (Hallegatte et al., 2020: 223), with poverty as a major driver of people's vulnerability to disasters, which in turn increases poverty in a measurable and significant way (Ibid.).

5.2. Agricultural Livelihoods and Food Security

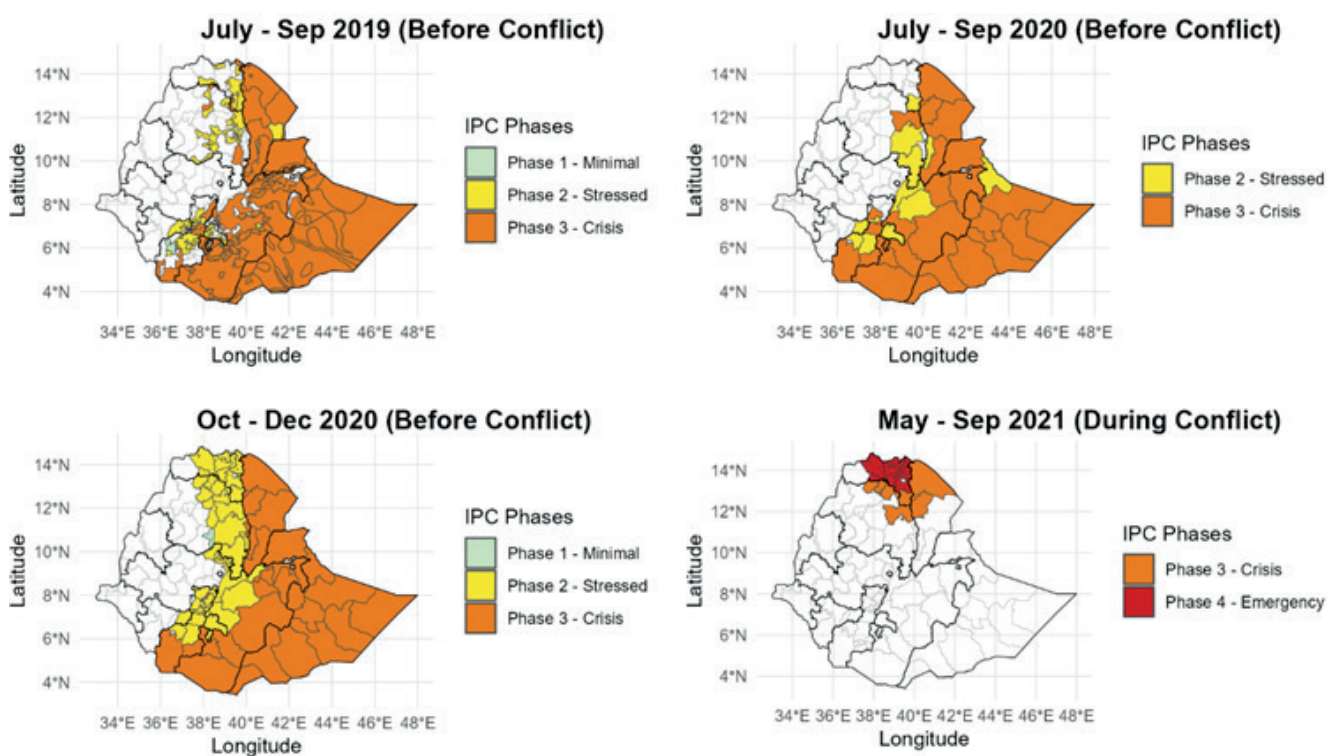
Smallholder farmers in Ethiopia face vulnerability to climate-related hazards. With over 70 per cent of farmers practising subsistence farming on small landholdings averaging less than one ha (FAO, 2018), their vulnerability is compounded by factors like fragmentation of farms, insecure land tenure, little access to machinery, low levels of productivity, and remoteness (FAO, 2018 and 2022a). Only 21 per cent of the agricultural output from these farms is sold, indicating their subsistence nature (FAO, 2018). Poverty is widespread, with an estimated 67 per cent of small farm households living below the national poverty line (Ibid.). Climate change exacerbates existing risks for smallholder farmers, especially with just 2 per cent of their land under irrigation (Ibid.). Changes in precipitation patterns and increasing droughts frequency across East Africa pose existential threats, leading to substantial food supply reductions and heightened food security risks in Ethiopia (Haile et al., 2020a; Federal Ministry for Economic Cooperation and Development (BMZ) et al., 2020).

Pastoralist livelihoods in Ethiopia are vulnerable to changing weather patterns and climatic shocks, such as droughts, which can lead to feed and water scarcity for livestock. Accounting for about 12 to 15 per cent of Ethiopia's population and inhabiting about 60 per cent of the country's land, pastoralists often face precarious conditions (Badel Ali, 2021; Gebremeskel et al., 2019).

Dominant in Ethiopia's lowlands (Murken et al., 2020), pastoral agricultural systems are at risk due to changes in precipitation cycle and warming trends, jeopardising the sustainability of livestock-dependent livelihoods reliant on healthy grasslands. A study in the Southern Afar concluded that agro-pastoral household, diversifying risks through both livestock and crop production, were more resilient to climate-induced shocks than pure pastoralists (Mekuyie et al., 2018). Enhancing livestock assets, productivity, social safety nets, market access, credit, extension services, education, and irrigation crop farming bolstered pastoralists' resilience to climate change and variability (Ibid.). Crop diversification also proves vital for managing drought or other agricultural risks in rural Ethiopia, functioning as a form of "self-insuring strategy" (Mesfin et al., 2011: 78).

Food insecurity resulting from extreme weather events remains a major concern, particularly for climate-sensitive livelihoods in rural areas, occurring amidst and already changing and degrading environment. In Ethiopia, "frequent severe weather events alongside long-term impacts of climate change undermine agriculture and pastoral livelihoods as well as food security" (World Bank, 2022b: n.p.). Severe malnutrition is highlighted as a potential health impact of extreme events in Ethiopia's latest National Adaptation Plan (NAP) (FDRE, 2019b), which builds upon the development of a Climate Resilient Green Economy (CRGE) strategy adopted in 2011 (FDRE, 2019b). While better agricultural practices can improve livelihood, resilience to extreme weather also depends on critical infrastructure, financial and technological capacities, as well as political stability.

Figure 4: Integrated Food Security Phase Classification (IPC), before and during conflict



Source: Data compiled by Sinafekesh Girma Wolde, contributing author, from IPC Database, n.d. This map is for illustration purposes only. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the International Organization for Migration.

Rural households in Ethiopia can take years to recover from climate-related shocks. Dercon (2004) found that 1984-1985 famine had long-term effects on consumption growth, particularly for asset-poor and uninsured households. This was particularly true for asset-poor and insured households, which, on average, needed about ten years to reach pre-famine levels of livestock holdings. Early 2023 analyses suggest severe levels of acute food insecurity will persist in southern and south-eastern areas (FEWS NET, 2023: n.p.). While losses in livestock holdings from the recent drought, poor households reliant on livestock are likely to continue facing economic pressures.

5.3. Inclusive Development and Gendered Dimensions of Risks

In Ethiopia, gender inequalities hinder women's ability to cope with and adapt to climate change. Like many countries, Ethiopian women face limited access to resources and participation in decision-making processes related to climate change (EFCCC and UNDP, 2021). The country ranks 129th out of 170 countries in the 2021/2022 Gender Inequality Index (UNDP Data Center, 2022a). Nonetheless, progress has been made in empowering women in both private and public spheres (Freeman et al., 2020). In 2018, Prime Minister Abiy Ahmed allocated half of cabinet positions to women (Burke, 2018), and currently, they hold 41.3 per cent of the seats in the lower chamber and 30.6 per cent in the upper chamber of the Federal Parliamentary Assembly, among the highest in Africa (IPU, 2023).

In Ethiopia, women's participation in agriculture is relevant, yet their access to critical resources like land, livestock, credit, and advisory services is limited (EFCCC and UNDP, 2021). While the proportion of female agricultural landholders increased from 12 to 19 per cent between 2013/14 and 2017/18, their average land size remains smaller than that of male landholders (CSA and UN Women, 2017). Women also

have less access to agricultural advisory services, crucial for productivity improvement (CSA, 2019). Although women are more involved in livestock production than crop production, only 18 per cent of livestock holders were women (CSA and UN Women, 2017).

As climate change progresses, empowering Ethiopian women and girls with skills for diversified employment beyond agriculture grows increasingly crucial. Limited income opportunities outside farming make them more susceptible to climate-related challenges (EFCCC and UNDP, 2021). Education plays a pivotal role in addressing gendered climate risks and enhancing resilience. Enrolment rates for girls in primary schools improved significantly, rising from 18 per cent in 1993 to 101 per cent in 2021 (The World Bank, 2023c). However, efforts must ensure these high enrolment rates translate into better educational outcomes for both genders, as education also positively impacts child health and food security.

Ethiopia has acknowledged gender disparities in climate impacts in key climate documents. In its NAP, gender is identified as a key consideration, recognising women's heightened vulnerability due to socio-economic inequalities (FDRE, 2019b). To ensure gender integration in the NAP, the Environment, Forest and Climate Change Commission (EFCCC) and the NAP Global Network conducted a gender analysis (2019). Ethiopia's Submission on Gender and Climate Change to the UNFCCC in 2019 asserts that "Ethiopia seeks to promote gender-responsiveness in undertaking climate actions" (FDRE, 2019c: 2),⁵ detailing completed trainings and awareness efforts, with plans for further measures (Ibid.). A gender analysis of Ethiopia's climate policy framework identifies gaps in gender integration and a "lack of institutionalisation", concluding that government departments need to embed gender issues as core processes (Ayalew and Mersha, 2020: 2).

5. A gender-responsive policy or measure considers and responds to different capacities and needs of women and men in a given context, based on the recognition that these are socially and culturally constructed and shaped. It is, thus, not only sensitive to gender-based differences but seeks to integrate measures in its design that empower women and promote gender equality (Aguilar, 2015).

6. MIGRATION, RISK, AND CONFLICT

6.1. Migration and Climatic Change

The report has so far demonstrated the diverse nature of the climate in Ethiopia, the influence of anthropogenic climate change on it, as well as its impact on critical biophysical spheres, such as forests, and economic sectors, like agriculture—that many livelihoods in the country depend on. It has also focused on key socio-economic factors of risk, which interact with climatic change to affect migration. The report now shifts focus to the interaction between these factors and their effect on human migration.

The interplay between climatic or environmental change and human migration is complex, both in Ethiopia and elsewhere. One of the main challenges is that the nexus is further influenced by social, economic, political, demographic, cultural, and other factors (Black et al., 2011), leading to cascading risks across multiple sectors affecting human mobility (Thalheimer et al., 2021a), and obstructing universal conclusions (Borderon et al., 2018). A deteriorating environment can act as both a cause and effect of human mobility at the regional level, where migration is most common (Hermans-Neumann et al., 2017). Generally, migration can serve as a notable adaptation response in areas where the climate becomes more extreme or erratic (Harrington and Otto, 2018), though entrapment—the inability to move away from precarious situations—is also a possibility, as is moving into locations of further precarity (Foresight, 2011). Despite this complexity, understanding about the migration and climate change nexus in Ethiopia and the wider region has grown:

Migration Numbers & Hotspots

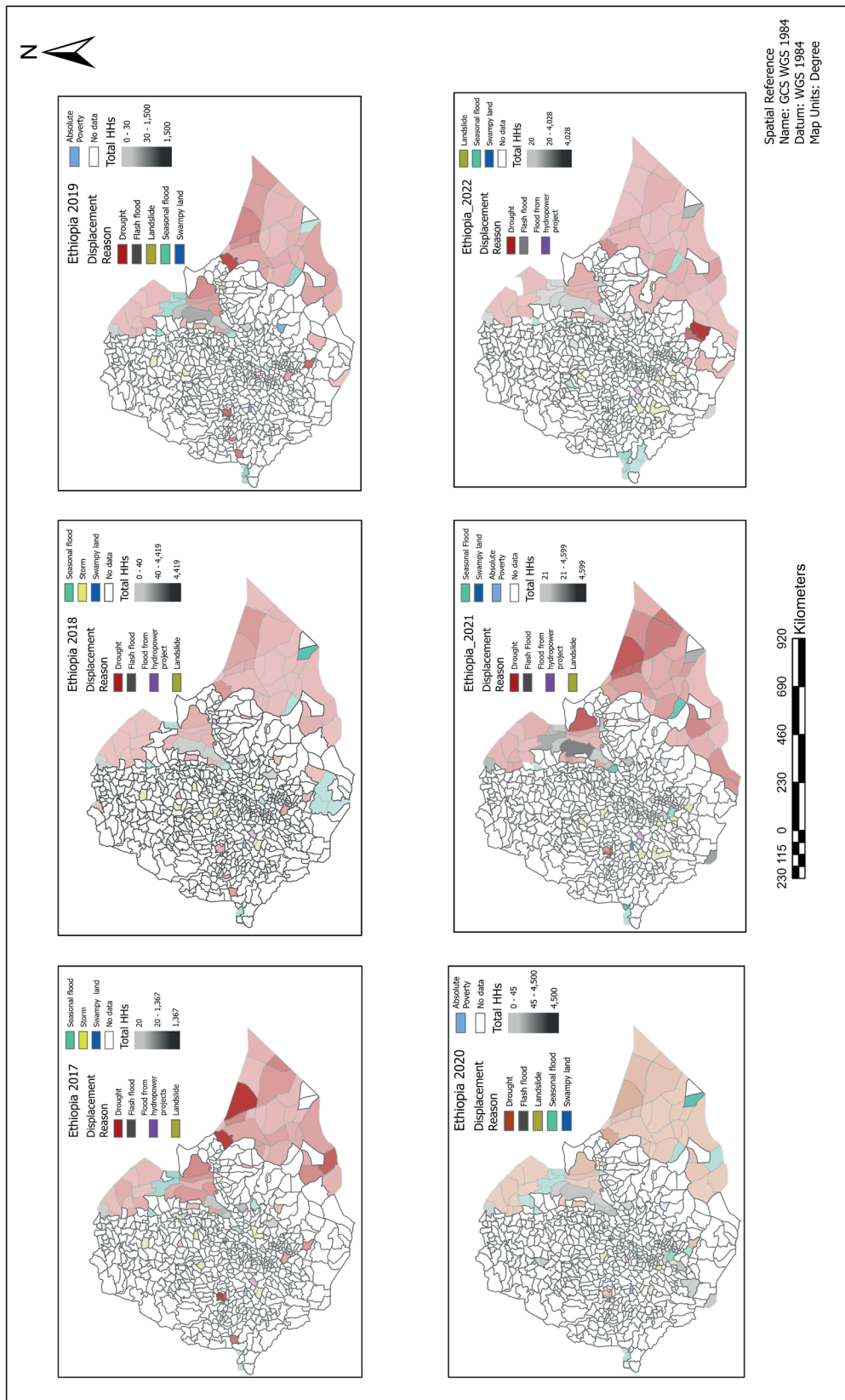
Quantifying migration driven by climatic or environmental change is complicated by intricate causal relationships (Thalheimer et al., 2021b, Hoffmann et al., 2020). For

Somalia, which neighbours Ethiopia, a local increase in monthly temperature by one degree has been calculated to lead to a roughly tenfold increase in displacement over time (Thalheimer et al., 2023). Similarly, a decrease in average monthly rainfall from 100 mm to 50 mm is associated with a doubling of anticipated internal displacement in Somalia (Ibid). For Ethiopia, the World Bank's report *Groundswell: Preparing for Internal Climate Migration* (Rigaud et al., 2018) stipulates that the number of in-country climate migrants could nearly triple by the middle of the century due to the effects of climate change. In other words, numerical evidence suggests that climatic change is highly likely to contribute to an increase in migration in Ethiopia in the forthcoming decades.

The spread of climate linked migration will differ across Ethiopia. Hotspots of out-migration are those where climatic change interacts with areas of socio-economic pressure. Studies show that this includes areas with high population densities, steeply declining net primary production, and significant precipitation variability, located largely in the northern highlands and central parts of the Great Rift Valley (Hermans-Neumann et al., 2017). On the other hand, migrating elsewhere, or in-migration, is also shown to contribute to environmental decline, for example where grassland regions experience cropland expansion. (Ibid).

Since 2016, IOM (2016) has been surveying and recording the number of internally displaced persons (IDPs) using its Displacement Tracking Matrix (DTM) database. Figure 5, presented below, outlines the different environmental reasons leading to internal displacement and the number of households affected in various parts of Ethiopia.

Figure 5: Environmental displacement reasons and number of IDP households (2017-2020)



Source: Sinafekesh Girma Wolde., n.d. IOM Displacement Tracking Matrix dataset. This map is for illustration purposes only. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the International Organization for Migration.

Migration Causes

Two factors predominate amongst the causes of migration in relation to environmental change in Ethiopia (Groth et al., 2021: 135): household agricultural production and non-farm activities. Regarding the former, environmental change heightens the likelihood of migrating from areas with poor or decreasing agricultural production. With the latter, migration escalates in regions where non-farm activities foster income growth, thereby facilitating mobility. In other words, both increases and decreases in resource availability contributes to migration and can be targeted by policy makers to prevent or foster migration. Prevention measures should be bottom-up and locally-adapted and include land management practices as an effective means to counter mobility pressures in response to environmental change (Ibid).

Water availability is a critical factor associated with migration in Ethiopia, as it is across the region. It particularly affects agricultural livelihoods in areas struggling to adapt to water stress (de Bruin et al., 2022). The world's drylands, where increasing temperatures put pressures on multiple sectors, leading to cascading risks that influence migration, are prime example of this (Thalheimer et al., 2021a). Seventy per cent of Ethiopia comprises of drylands, where predominantly agricultural livelihoods are becoming precarious, affecting migration patterns. Conversely, mass migration or distress migration has historically been an early indicator of impending famine conditions, often employed by international aid agencies (Corbett, 1988; Watts, 1983).

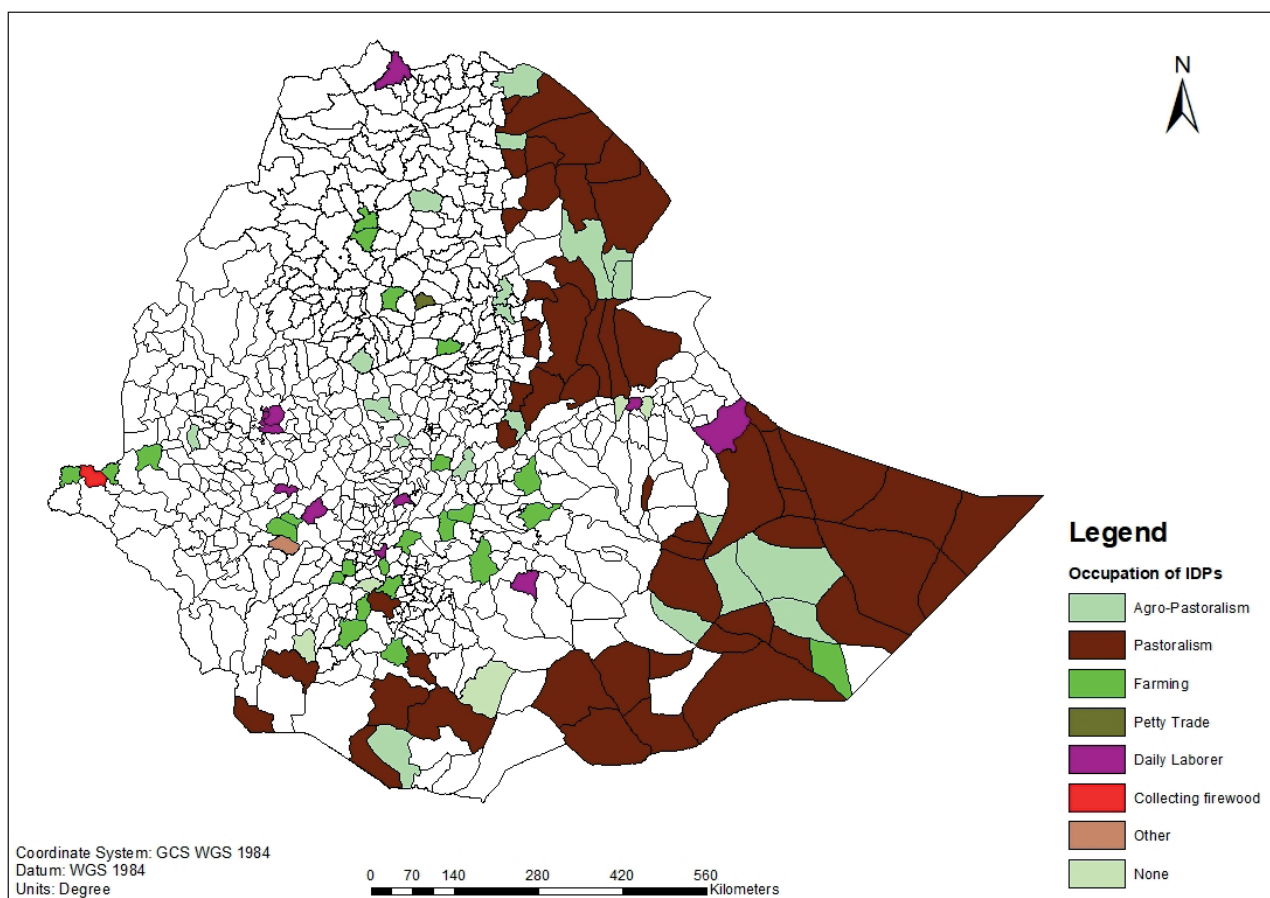
Drought and its impacts on soil and crop viability (also Sec. 4), as well as livestock keeping, are key factors in human migration in Ethiopia. This is not only due to its link to decreases in agricultural productivity (van der Geest and Warner, 2014) but also because of resulting food insecurity (Puma et al., 2018). However, drought often acts as a moderating factor rather than the primary or single driver of migration (Hermans and Garbe, 2019: 1108). Instead, it interacts with distance (e.g., to alternative livelihoods), and perceptions about and motivations for migration (e.g., the belief that migration will lead to improved prospects elsewhere), creating various external and internal barriers and opportunities for moving or staying. Relieving water stress, for example through decreasing reliance on rain-fed agriculture where possible, would support more people to stay, instead of searching for livelihoods alternatives elsewhere that may or may not be less precarious.

Drought is not the only causal factor in migration in Ethiopia. Rapid-onset extreme precipitation events, such as floods and heavy rainfall, have also displaced 367,000 people in Ethiopia in recent times. In many instances, heavy rainfall did

not directly cause displacement but rather destroyed crops already weakened by prolonged dry periods or flooded the drylands, leaving agricultural-dependent families without a means of livelihood (Wolde et al., 2023). Thus, in Ethiopia it is the interplay between too little and, at times, too much water which contributes to precarity, which contributes to pressures to migrate.

Figure 6 illustrates the occupations of IDPs, mostly located in the north and south-east regions of Ethiopia. In the last decade, these regions have been experiencing recurrent drought but also severe flood events (Tekalign, 2017). The adverse effects of hydroclimatic changes and variability, combined with underlying non-environmental drivers in the past few years, have exposed individuals' vulnerability to the point of forcing them to change their livelihood and place of residence. Over 90 per cent of the IDPs receive cash and food assistance, donations from host communities or donor organisations, and food distribution as a source of food (IOM, 2022).

Figure 6: Occupations of internally displaced people (2017)



Source: Sinafekesh Girma Wolde, n.d. IOM Displacement Tracking Matrix dataset. This map is for illustration purposes only. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the International Organization for Migration.

Migration Expression

The causes of migration linked to environmental and/or climatic change are multifarious. The same is true for patterns of migration, in other words how such migration occurs. Time, space and gender play particularly important roles here. Historically, population movement in response to environmental factors in Ethiopia has been affected by government policy. For example, a study of climate variability, political crises, and historical population displacements (Comenetz and Caviedes, 2002) examined periods of extended drought in Ethiopia from the 1970s to the 1990s. Impacted by El Niño, these droughts contributed to famine, political unrest, and coercive, often unsuccessful, population relocation and redistribution efforts, resulting in changes to both ethnic distribution and population growth. Drought and associated food crises also triggered further state-led relocation efforts in Ethiopia in the early 2000s. This time, relocation was on a voluntary basis, with families and

communities being resettled to areas of the country that were arguably more fertile and food secure (Pankhurst, 2009). Identifying such areas may present more challenges in a country increasingly affected by climate change. Migration patterns in contemporary climate change-affected Ethiopia are marked especially by the various coping and adaptation strategies in response to environmental change employed by rural households in its drylands (Wiederkehr et al., 2018). While strategies focusing on crop, livestock, soil, and water management are most common, 23 per cent of surveyed households also engage in some form of migration, such as internal, rural-urban, or international. Although climate change in African drylands may not necessarily or inevitably result in mass migration, the spectrum of human mobility could shift from more voluntary to the more forced movements, with the possibility of entrapment (Thalheimer, 2021a), requiring more intervention to get people out of increasingly precarious circumstances.

Gender plays a notable role in the movement of people driven by climate variability in Ethiopia. One finding (Gray and Mueller, 2012), based on a longitudinal study, indicates that migration in search of labour increases with drought conditions for men, particularly affecting land-poor households. Conversely, marriage-related mobility for women decreases with drought. This suggests greater mobility and, consequently, livelihood diversification opportunities for men, while indicating decreasing mobility and likely increased vulnerability for women under conditions of climate change. Women may therefore need twofold support: in situ to address their particular precarities and in accessing migration channels in greater numbers to move away from precarity.

Migration in response to climate or environmental change across the space-time continuum also varies in Ethiopia. Generally, out-migration from rural areas in Ethiopia is short-term, motivated by locational advantage (e.g., improved agricultural productivity) or food insecurity. It tends to be longer-term among households with higher educational levels, with this effect being more pronounced in smaller households (Tegene and Penker, 2016). In northern Ethiopia, it has been observed (Hermans and Garbe, 2019) that drought prevalence leads to short-term and short-distance migration, driven particularly by immediate needs like food supply. However, some (e.g., Dessalegn et al., 2023: 176) argue that due to the recurrent nature of climatic shocks in Ethiopia, the line between shock response and long-term migration may blur, with repeated short-term shock migration gradually merging into more permanent migration patterns. Female-led households are also slightly more inclined towards long-term migration in Ethiopia, which is attributable to both push (e.g. greater economic disadvantage) and pull factors (e.g. higher labour demand) (Tegene and Penker, 2016).

Between 2007 to 2013, one-third of village households in Ethiopia experienced rural-to-urban migration (Bezu and Holden, 2014). Environmental degradation ranks amongst one of the key push factors propelling such migration, contributing to outcomes including overcrowding and rising food costs in destination sites (Melesse and Nachimuthu, 2017) and generally greater precarity in cities (Bezu and Holden, 2014). Addis Ababa is likely to become an urban hotspot for climate-linked migration in Ethiopia in the coming decades, with smaller urban centres such as Jigjiga and Deri Dawa also affected (Rigaud et al., 2018).

Although internal mobility is bound to dominate in the climatic and environmental changes context in Ethiopia and the broader region it sits within (Afifi et al., 2012), for the time being, cross-border immigration or emigration also occur. International out-migration of Ethiopians is a comparatively recent phenomenon and often happens for economic

reasons, undertaken by those who are at least relatively well-resourced, towards the Gulf, South Africa, Europe, or North America. The potential for climate change to increase international labour migration has been observed (Webster, 2019). A regional study of the East and Horn of Africa region, which includes Ethiopia, notes that cross-border movement in response to climate change is relatively rare. When it does occur, it is secondary, “the first often being internal (and often induced by environmental considerations) and the second caused by violence, drought or a combination of both” (Afifi et al., 2012: 13).

Climatic and/or environmental change is already affecting migration patterns in Ethiopia – along several fault lines: gender, time and destination amongst them. What used to be short-term, *ad hoc* migration in response to especially drought is becoming longer and more frequent. Men are generally more easily able to move elsewhere in search of better livelihoods prospects than women, indicating that gender should become a key policy concern. Finally, climatic change contributes to rural-to-urban migration, which does not always contribute to the desired livelihoods improvements. Preparing cities for increases in migrant numbers and encouraging migration to smaller urban centres could improve rural-urban migration outcomes.

Migration Effects

The effects of human mobility driven by climate or environmental change are multifarious and relevant to those who move, those who stay behind, and those who host, though they have been investigated far less than the drivers of migration (Dessalegn et al., 2023).

That migration in Ethiopia is primarily an adaptation strategy impacted by livelihood insecurity is clear, predominantly driven by drought in the rural, agrarian areas of the country. The outcomes for those who move vary. On the one hand, moving away may alleviate livelihood pressures, as well as improve access to skills, education, health, and other services. Rural to urban migration, in particular, may offer “welfare and economic benefits” (Melesse and Nachimuthu, 2017: 40). However, such migration can also lead to increased precarity, especially among female migrants, resulting in homelessness and greater food insecurity (Dessalegn et al., 2023).

Those who stay behind, especially in rural areas, have to balance the potential benefit of reduced demand for land and food resources with reduced supply of labour resources (Dessalegn et al., 2023; Tegene and Penker, 2016), with the effect more likely to turn negative when out-migration is long-term (Redehegn et al., 2019). Nevertheless, remittances can contribute to balancing the negative effects of out-migration, with studies indicating that both have the potential to reduce

food insecurity (Dessalegn et al., 2023). Youth out-migration, in particular, has the potential to contribute favourably to overall household income (Mueller et al., 2018). Conversely, it reduces rural productivity in terms of available labour and increases the number of economically dependent households in rural areas (Dessalegn et al., 2023).

There is significant divergence within Ethiopia regarding the capacity of areas to host those resettled due to climate change impacts (Walelign et al., 2021). Based on existing human, physical, and financial capital infrastructure, it is argued there are high opportunity places in central, south-central, and northern Ethiopia, as well as along its southern and north-western borders. Moderate opportunity locations are generally scattered across the country, while low opportunity locations are found in south-eastern and western parts of the country (Ibid). Ideally, resettlement efforts should be managed in consideration of this distribution. As hosts to rural to urban migrants, municipalities' ability to cope can become overstretched, particularly in relation to service delivery, including housing, education, health, and security (Chawla, 2021).

The effects of climate-linked migration are numerous, and potentially both positive as well as detrimental. Positive effects to support include decreased vulnerability in some urban contexts and remittances finding their way to vulnerable, often rural places. Such impacts, however, are balanced by outcomes that include increased urban poverty and vulnerability, as well as rural skills shortages. Channelling and managing migration to high or medium opportunity places, working with urban centres to improve incorporation of migrant flows, as well as improving remittance channels would go some way towards enhancing migration's positive effects.

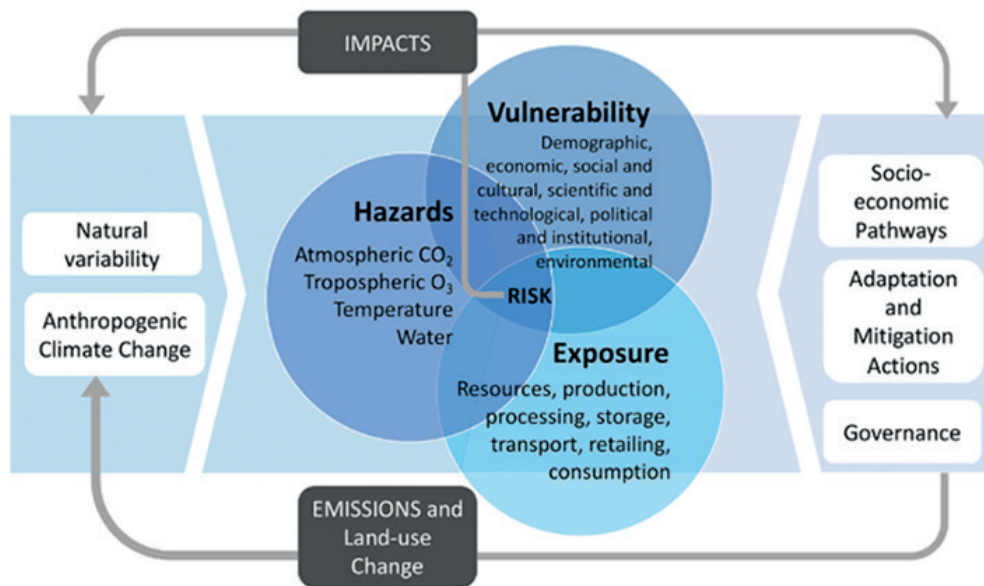
6.2. Risk and Conflict

In the past decade, the perception of migration as a climate risk in the Intergovernmental Panel on Climate Change (IPCC) assessment reports have evolved. Previously, the 5th IPCC Assessment Report (AR5, 2014) did not specifically mention migration in its framing of human security and risk in the context of climate change. Instead, migration was implied among various socio-economic processes (Figure 7) that have:

- (i) direct impacts on exposure and vulnerability to climatic hazards;
- (ii) affect emissions and land-use change; and
- (iii) are, in turn, affected by the impacts of climatic risk.

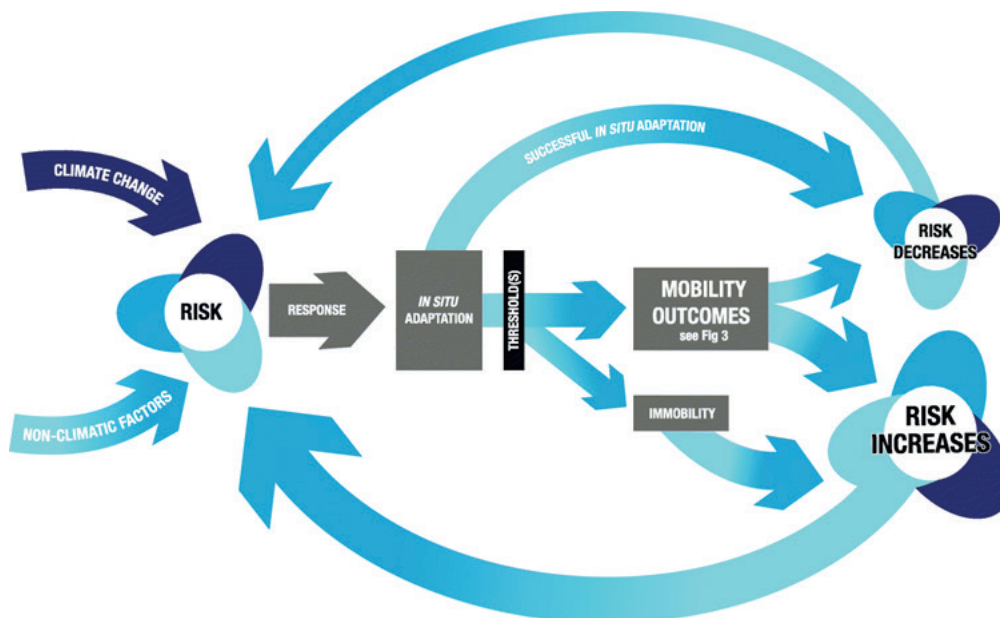
Since AR5, research on climate and risk has broadened to understand migration as occurring along a continuum of agency or voluntariness, where people make deliberate choices in response to hazards (McLeman et al., 2021: 4). These decisions to voluntarily leave are often heavily dependent on financial resources and can lead to positive outcomes. Households with remittance income can fall on the high-agency side of the spectrum, while those with low-agency can be characterised as entrapped, unable to leave due to financial constraints. Households with low-agency are deemed to be more vulnerable, particularly when forced to move in order to escape hazards such as floods or another life-threatening situation, such as conflict. The complexity of climate-migration risks, processes, and outcomes is represented in Figure 8 (McLeman et al., 2021: 3).

Figure 7: Climatic risk and socio-economic impacts—where is migration?



Source: Szilagyi, 2021.

Figure 8: Evolving interest in relationships between climate risk, migration processes and outcomes



Source: McLeman, 2021.

The latest IPCC report (AR6, 2022) articulates clearer statements on climate risk, mobility, and the role of conflict compared to its predecessor. With 'medium confidence', it articulates that socio-economic factors and governance will, in the near-term, drive violent conflict and migration patterns, albeit separately (IPCC, 2022: 16). It further elaborates that the risk of displacement increases for populations lacking resources for planned migration, experiencing higher exposure to extreme weather events in both rural and urban areas, particularly in developing countries characterised by low income. The report suggests that expanding opportunities to migrate can reduce vulnerability for these populations, this migration can be an effective adaptation strategy. However, the report emphasises that changes in migration patterns are difficult to project quantitatively, given its complex, multi-causal nature (Ibid.).

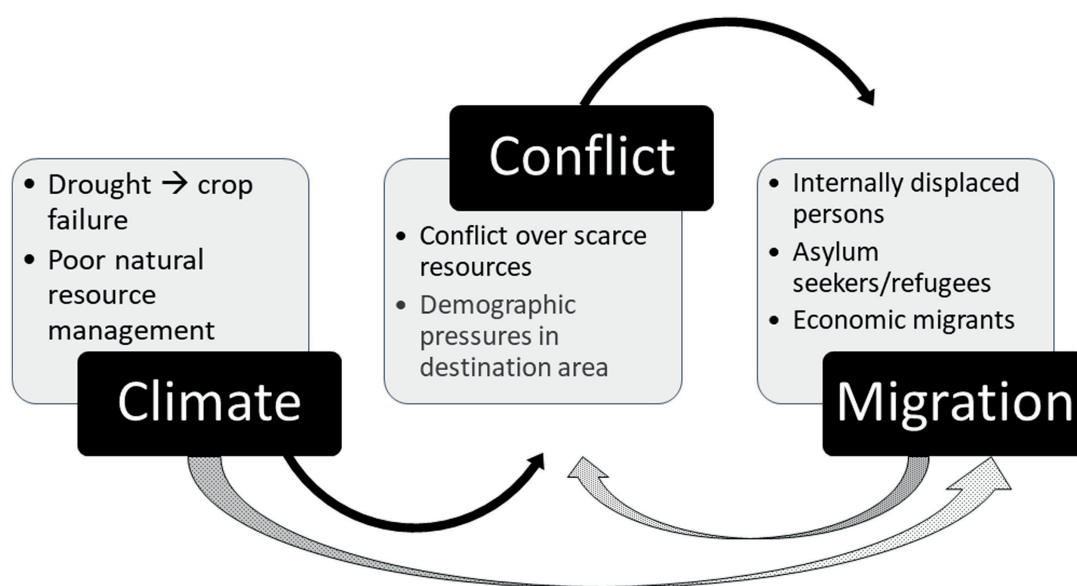
Climate change can indirectly increase the risks of violent conflicts, such as civil wars and inter-group violence, by amplifying well-documented drivers of these conflicts, including poverty and economic shocks (medium confidence). Multiple lines of evidence relate climate variability to these forms of conflict (Ibid.). One study (CGIAR, 2023) finds for Ethiopia that climate change-linked pressures on resource (especially land and water) availability and access, as well as on livelihoods and resource pressure exacerbate conflict. The former particularly in border regions, the latter predominantly in three regions: Tigray, Somali, and Afar.

Climate-Conflict and Mobility

Climate change and poor management of natural resources

can exacerbate conflict and instability due to competition over scarce resources (Martin, 2005; Miura and Tabata, 2022). Although direct causal linkages have not been established, the figure below (Figure 9) conceptually illustrates various ways in which climate change could induce migration and conflict, as well as how conflict can trigger migration (Fargues et al., 2020). Research on the climate-migration-conflict nexus seeks to identify potential causal structural relationships through exploring (i) how climate change influences conflict, and (ii) how conflict drives migration (Abel, 2019; Fargues et al., 2020). Currently, scientific evidence on environmental change as a cause of conflict remains inconclusive. From quantitative research on the environment-conflict nexus in African countries, a combination of climate change related factors, such as onset drought and rainfall growth, were deemed as determinate in the emergence of civil war (Buhang, 2010; Theisen, 2008, Bernauer, 2012). Earlier research has also linked socio-economic factors, such as political instability, economic marginalisation of ethnic groups, and inadequate adaptation strategies, as determinants of violent conflict (Bernauer et al., 2012). Similar to Ethiopia, Uganda, another country in the Western Nile region, has seen migration flows from South Sudanese refugees. These refugees have faced both climate and socio-economic drivers of violence, leading them to relocate to Ethiopia and Uganda. Studies have shown that mutual agreement and participation in resource use management between host community and refugees can alleviate feelings of mistrust and negative perceptions among different groups of resource users (Miura and Tabata, 2022).

Figure 9: Conceptual model of climate, conflict and migration



Source: Abel et al. 2019.

Recently, concerns about how climate-induced migration and displacement affect host communities have led to increased scrutiny of climate's role as a threat multiplier on peace and security. Specifically, there is a growing interest in whether climate-induced migration is increasing tensions—and potentially violent conflict—within host communities. Understanding the nature of climate driver typologies is critical, as it ultimately influences household decisions to move in response to slow-onset climate processes, such as drought, salinisation, and sea-level rise, or as an immediate response to sudden climactic events, like flooding from

monsoons, dam bursts, or hurricanes. The way a climate migrant responds to these climate drivers—whether long- or short-term—depends on a household's adaptive capacity, which can range from financial assets to social networks. In Box 2 below, a case study explores climate-migration-conflict nexus in two selected host communities in Gambella, an important agriculture and forest region in South West Ethiopia. These communities were selected based on their vulnerability to extreme environmental events and their role in hosting IDPs and refugees.

Box 2. Exploring climate-migration-conflict in Lare and Itang Special Woreda, Gambella, Southwest Ethiopia

Gambella, a regional state in southwest Ethiopia bordering South Sudan, is known for its unique vegetation and forests. The region hosts refugees from South Sudan and IDPs from Amhara and Afar, with a population of 360,462 (UNHCR, 2022b). Ethnic groups include Nuer, Anyuaa, Mezenger, Opio, Komo, Amhara, Oromo, Tigray, and others (Sewonet, 2002). Common livelihoods include agroforestry, agropastoralism, fishing, livestock husbandry, mining, trading and farming. Forest products such as firewood and charcoal come from natural forests, plantations, and Eucalyptus woodlots, providing posts and poles for construction (Bekele, 2011). Households employ migration as one of several coping and adaptation mechanisms. In this region, a total of three refugee camps (Bonga, Punido, and Dimma) exist under the protection of the UNHCR and the Agency for Refugees and Returnees Affairs (ARRA) (Sewonet, 2002). These camps host a population of 51,374 migrants, most of whom coming from rural areas of South Sudan and central and northern parts of Ethiopia. Though the number of migrants varies across districts within the region, the causes of migration were more or less similar, reflecting push-factors. Climate change factors such as rising temperature, heatwaves, declining rain fall, and flooding, along with conflict, are the dominant push factors for migration to the region. Rapid- and slow-onset climatic conditions, such as severe floods or droughts, can cause temporary migration and displacement. A collaboration between PIK and Ethiopian Forestry Development—Jimma Centre (EFD-JC) conducted research through household surveys (n=60 total respondents), evenly distributed between two host communities—Lare and Itang—in the Gambella District in October 2022. The aims and objectives of the research were to understand the impacts of climate, conflict, and mobility on forest communities, and develop EFD-JC's capacities for climate-migration research. Primary data were gathered through focus group discussion, semi-structured questionnaires, and field observations, while secondary data were collected from government census and IOM data sources.

In the Lare District, climate change (including extreme drought, flooding, and decline in rainfall) alongside conflict, are push factors for household migration. Climate change and subsequent environmental degradation reduce agricultural and livestock production, as well as water availability, all of which have a negative impact on economic activity. From the research literature, significant impacts of pull factors attract migrants, primarily to urban areas. However, such pull factors were not observed from our study in Gambella District, where most households opted for rural-to-rural migration. Our survey revealed that household decisions (in both districts, combined) to migrate were influenced by reasons related to economy and climate change (41.6%), climate change, economy and conflict (38.3%), and economy and conflict (20%) as key push factors.

In Itang special woreda (or special district, so-named as it is not formally part of any district), the existence of flooding and monsoon rains emerged as the main push factor of migration among many households (43.3%). The preference of leaving their places of origin due to conflict and environmental instability in both districts were high. In terms of durable solutions, respondents (40%) in both Itang and Lare expressed a preference for local integration due to favourable environmental conditions (possibility to create alternative income sources better soil for crop production) that could support their livelihoods.

When queried about the possibility of returning to their places of origin, 26.7 per cent of respondents from Itang indicated they would consider returning if the conflict ceased. Only 3.3 per cent of Lare survey respondents stated they would return under conditions of peace or no conflict. A higher percentage of Itang respondents (26.7%) expressed that they would return if the rainfall and soil conditions did not create significant impact on crop growth preference of respondents in the Itang District (3.3%) as compared to Lare (46.7%). In general, Gambella was identified as a desirable destination for migrants (including refugees and IDPs), mainly due to its environmental suitability for agricultural, pastoral, and forest-based economic opportunities. Most of the migrants were refugees from South Sudan, and IDPs from other parts of Gambella. Extreme drought, monsoon rains, flooding and absence of peace were some of the main drivers of human mobility. At times, conflicts against existing migrants triggered migration in more remote areas, conditions of peace were restored. In both Lare and Itang, 40 per cent of respondents indicated they would reintegrate (return to place of origin), if the environment improves to enable income generating activities. This latter finding is of particular interest for this report, as migrant households in both districts indicated that improvement of environmental conditions at their places of origin, over the long term, carry more weight than 'conditions of peace'. This preference stems from the direct impact of environmental conditions on their ability to earn an income and secure food.

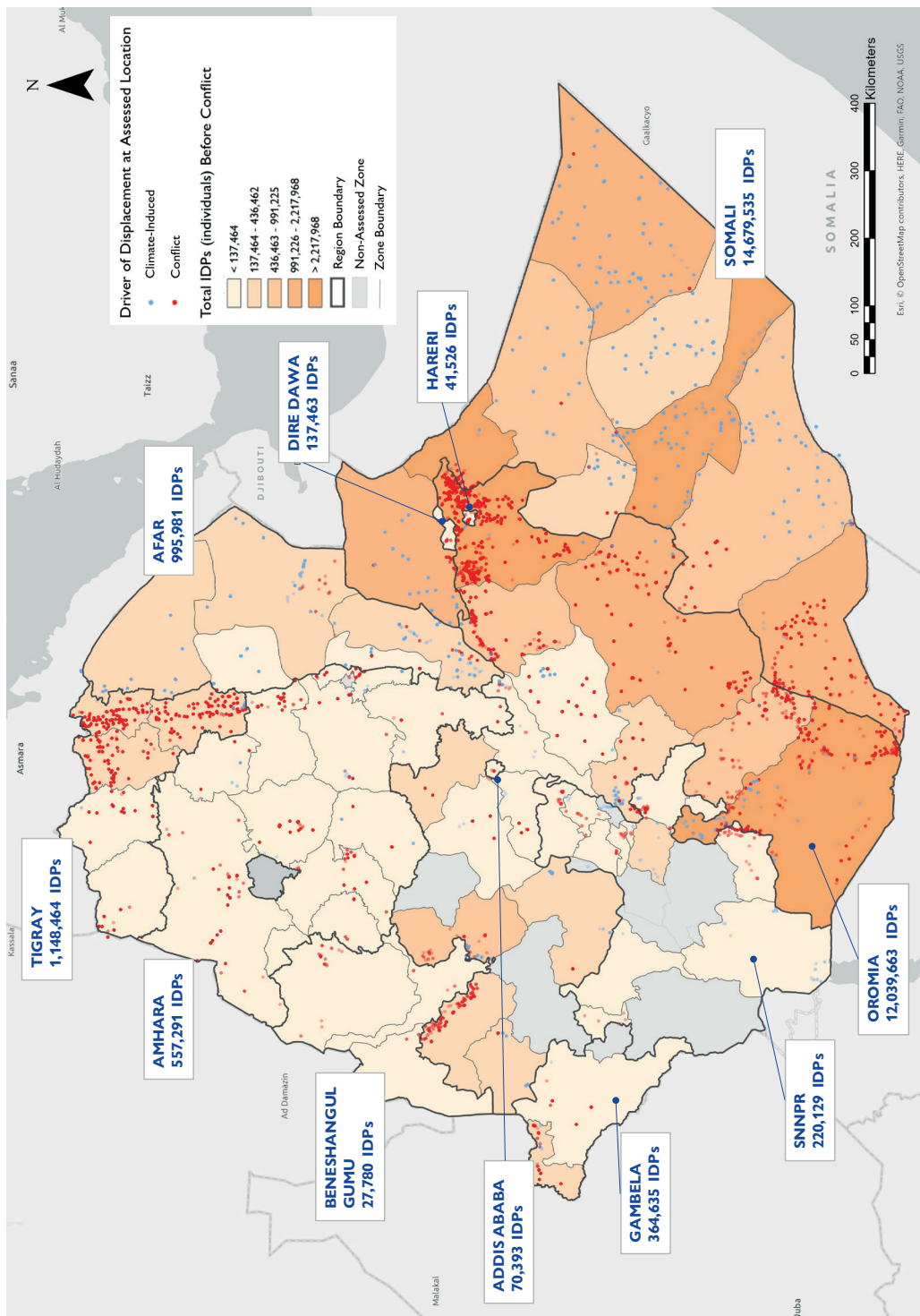
In terms of policy and legal frameworks, the Gambella Municipality welcomes all migrants but categorises them based on the drivers of their migration. To some extent, the municipality's policy and legal frameworks recognise and address mobility patterns associated with the impacts of climate change and other environmental degradation processes. The municipality has engaged in resilience planning for climate change, alongside a common plan for forest protection, conservation, and waste management through its Environmental Protection Agency. In this regard, discussions with forest experts determined that some migrants have contributed to deforestation in the region. Although the municipality has specific policy and legal frameworks for migration and related issues, there are no existing best practices or programmes that support refugee integration or IDPs into host communities or local labour markets. In some manner, the municipality's policy and legal frameworks recognise and address mobility patterns associated with the impacts of climate change and other environmental degradation processes. Overall, the immediate and long-term priorities identified by migrants in this case study include freedom, permanent residency in Ethiopia, education for their children, access to farming land, and improving their livelihood.

Displacement Before and During the Tigray Conflict

To illustrate drivers of displacement across the country in assessed locations before and during the Tigray conflict, Figures 10 and 11 uses DTM Site Assessment data spanning from November 2017 to May 2022. In both maps, drought is most commonly reported as the primary driver of displacement in Somali region, resulting in 14,679,535 IDPs before the conflict and 6,327,784 IDPs during the Tigray

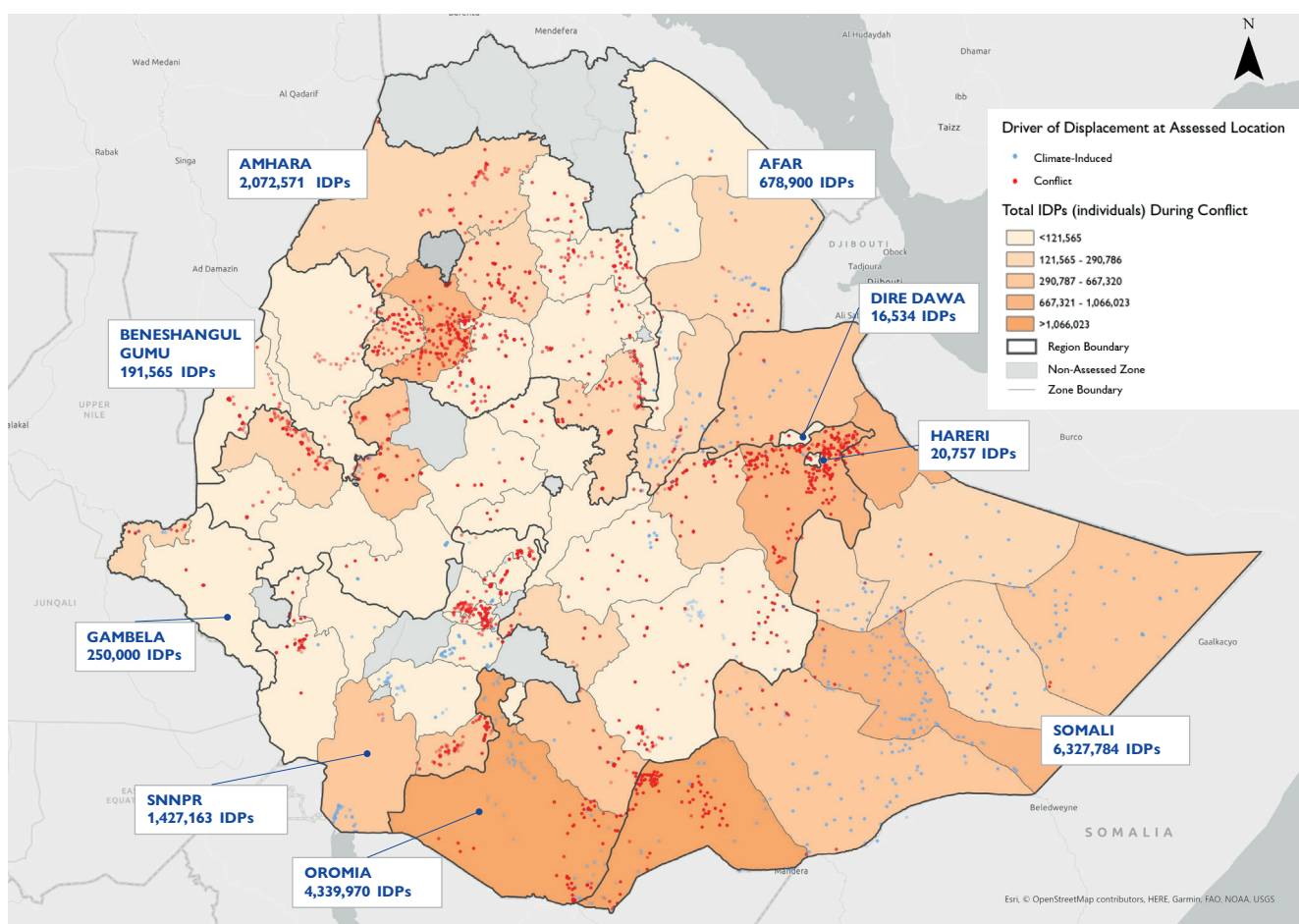
conflict. Prior to the Tigray conflict, flash and seasonal floods were additionally commonly reported in the Somali region. These events are believed to contribute to the threat of climate change, resulting in a 57 per cent increase in the IDP population compared to the Tigray conflict, where the extent of co-presence of climate-induced drivers was lower.

Figure 10: Drivers of displacement before the Tigray conflict



Source: Victoria Song, n.d. This map is for illustration purposes only. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the International Organization for Migration.

Figure 11: Drivers of displacement after the Tigray conflict



Source: Victoria Song, n.d. This map is for illustration purposes only. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the International Organization for Migration.

It should be noted that while the data depicts the period during the Tigray conflict, there were no data collection in the Tigray province after December 2020 (round 24) due to operational constraints. In drought contexts, both reintegration and local integration are most common amongst IDPs in assessed sites, and at more stable rates compared to conflict-driven displacement. A key reason for more stable rates for both forms of integration include that climate factors, such as drought, are slow onset and allow for planning in terms of household decision making to relocate long term. With conflict, households are more likely to move quickly for survival in the face of immediate danger, and these decisions can be long or short term.

Notwithstanding of incomplete data collection (of which are constrained due to presence of conflict), local integration was the most common solution in a conflict context. Before conflict and in a drought context, local integration and reintegration are most common IDP solutions—in assessed sites. When considering the small sample from the Gambella case study above, it is noteworthy to point that most respondents who fled conflict and drought, chose local integration (host communities in Itang and Lare). Their decisions were largely influenced by environmental factors, mostly related to drought, as it affects their ability to earn a livelihood.

7. POLICY LANDSCAPE

The Constitution of the Federal Democratic Republic of Ethiopia, established by Proclamation No. 01/1995, prohibits discrimination based on distinct factors, including race, nationality, and social origin. This inclusive definition could extend to encompass migratory or displacement condition. Article 32 guarantees freedom of movement for all nationals, which could include those affected by the impacts of climate and other environmental changes. Article 44 addresses the right to a clean and healthy environment, and provides for compensation or relocation assistance for individuals uprooted by government programmes (FDRE, 1995). However, these provisions do not safeguard individuals who are (forced) to move due to environmental drivers.

This chapter aims to identify protection gaps and needs by examining relevant policies and legal frameworks regarding migration, climate and environmental changes, and DRR in Ethiopia. It also considers cross-cutting issues like development, gender, labour, others. The objective is to assess how these frameworks address human mobility in the context of climate change, disasters, and environmental degradation. The analysis builds upon a systematic review of regional and national policy and legal instruments, employing a pragmatic approach and combining distinct terms. Among the 38 policies and legislation identified in Ethiopia, 12 acknowledge the linkages between climate and/or environmental change, disasters, and (forced) population movements (Table 1).

Table 1. National policy and legal instruments that acknowledge human mobility in the context of climate change, disasters, and environmental degradation in Ethiopia

Governance sphere	Policy and/or legal document	Year of publication	References to human mobility in the context of climate change, disasters, and environmental degradation
Migration	Immigration Proclamation (No. 354/2003)	2003	No
	Proclamation on Ethiopian Nationality (No. 378/2003)	2003	No
	Refugees Proclamation (No. 409/2004)	2004	No
	Diaspora Policy	2012	No
	A Proclamation to Provide for the Prevention and Suppression of Trafficking in Persons and Smuggling of Migrants (No. 909/2015)	2015	No
	Refugees Proclamation (No. 1110/2019)	2019	No
Climate Change	Initial National Communication on Climate Change of the Federal Democratic Republic of Ethiopia	2001	No
	Ethiopia's Climate-Resilient Green Economy Strategy	2011	Yes
	Intended Nationally Determined Contribution of the Federal Democratic Republic of Ethiopia	2015	No
	Second National Communication on Climate Change of the Federal Democratic Republic of Ethiopia	2016	No
	Ethiopia's Climate-Resilient Green Economy National Adaptation Plan (NAP)	2019	Yes
	Ethiopia's Climate Resilient Green Economy: National Adaptation Plan (NAP) Implementation Roadmap	2020	Yes
	Updated Nationally Determined Contribution of the Federal Democratic Republic of Ethiopia	2021	Yes
	Third National Communication on Climate Change of the Federal Democratic Republic of Ethiopia	2023	Yes

Table 1. National policy and legal instruments that acknowledge human mobility in the context of climate change, disasters, and environmental degradation in Ethiopia

Governance sphere	Policy and/or legal document	Year of publication	References to human mobility in the context of climate change, disasters, and environmental degradation
Environment	Environmental Policy	1997	Yes
	Proclamation creating the Ministry of Environment and Forestry	2013	No
Disaster Risk Reduction	Disaster Prevention and Preparedness Commission Establishment Proclamation (No. 10/1995)	1995	No
	National Disaster Prevention and Preparedness Fund Establishment Proclamation (No. 2012/2000)	2000	No
	National Policy and Strategy on Disaster Risk Management	2013	Yes
	Disaster Risk Management Strategic Programme and Investment Framework	2014	Yes
	National Disaster Risk Management Commission Establishment Council of Ministers Regulation (No. 363/2015)	2015	No
	Humanitarian and Disaster Resilience Plan	2018	Yes
Cross-cutting issues	National Policy on Women	1993	No
	Ethiopia National Action Plan	1995	No
	Food Security Strategy	1996	No
	Foreign Affairs and National Security Policy and Strategy	2002	No
	Rural Development Policy and Strategies	2003	Yes
	Labour Proclamation (No. 377/2003)	2003	No
	Urban Land Management and Administration Policy	2003	No
	National Action Plan for Gender Equality (2006-2010)	2006	No
	AFAR National Regional State Rural Land Use and Administration Policy	2008	Yes
	Growth and Transformation Plan I (GTP I) (2010/11-2014/15)	2010	No
	Growth and Transformation Plan II (GTP II) (2015/16-2019/20)	2015	No
	National Strategy for Newborn and Child Survival in Ethiopia (2015/16-2019/20)	2015	No
	Climate Resilience Strategy for Agriculture and Forestry	2015	Yes
	Overseas Employment Proclamation (No. 923/2016)	2016	No
	Ethiopia 2030: The Pathway to Prosperity—Ten Years Perspective Development Plan (2021-2030)	2021	No
Overseas Employment (Amendment) Proclamation (No. 1246/2021)	2021	No	

Source: Developed by the authors, 2023.

7.1. National Migration Policies and Legislation

Migration-related issues in Ethiopia are governed by two legislation: the Immigration Proclamation (No. 354/2003) and the Proclamation on Ethiopian Nationality (No. 378/2003). The first regulates entry and exit, covering deportation, travel documents, and visas (FDRE, 2003a). The second policy document outlines the process for obtaining permanent residency after three years and nationality after five years, with conditions like sufficient income and no criminal record (FDRE, 2003b). The Ethiopian Government introduced the Diaspora Policy in 2012 to attract diaspora members to contribute to the country's economic development and support peace and democratisation efforts (FDRE, 2012). In 2019, the Ethiopian Diaspora Agency was launched to promote knowledge transfer, trade, and investment with the diaspora. The Proclamation to Provide for the Prevention and Suppression of Trafficking in Persons and Smuggling of Migrants (No. 909/2015) is also noteworthy. It focus on combating human trafficking within national borders, with special attention to vulnerable groups like women and children. It also aims to prevent human rights violations related to smuggling of migrants (FDRE, 2015a). Importantly, none of the identified legislation related to migration in Ethiopia addresses (forced) population movements resulting from the impacts of climate change and disasters.

Regarding the granting of refugee status, the 2004 Refugees Proclamation (No. 409/2004) was considered outdated in international refugee protection standards. To address this, the national Government enacted a new Refugees Proclamation (No. 110/2019) aimed at improving comprehensive protection and assistance to refugees in Ethiopia (FDRE, 2004 and 2019a). The updated Proclamation offers a broader definition of refugee and grants refuge seekers freedom of movement, access to work, social services, and local integration. While the 2019 Proclamation emphasise's refugees' duty to protect the environment (Article 39), it is silent with regard to the distinct dimensions of human mobility in the context of climate or other environmental changes. In conclusion, the existing national migration legislation does not regulate (forced) population movements impacted by climate and disaster events. Thus, the formulation of a comprehensive migration policy, which is currently a topic of discussion, would not only promote strategic considerations about the advantages of migration—maximising its potential for national development—but also allow for the integration of effective strategies to manage the distinct aspects of human mobility in the context of climate change, disasters, and environmental degradation.

7.2. National Climate and Environmental Change Policies and Legislation

Ethiopia's Government has developed climate and environmental policies to combat climate change and environmental degradation. This proactive stance includes addressing human mobility in the context of environmental drivers. Among the seven climate- and environmental-related policy documents examined, four recognise and/or address the topic. The 1997 Environmental Policy aimed to promote sustainable development through the sound management of environmental resources. A set of sectoral policies and strategies were envisioned to this end, including considerations for rural-urban migration and human settlements resulting from urbanisation processes, to be integrated into local-level planning and activities (FDRE, 1997). Ethiopia's Climate-Resilient Green Economy Strategy has taken actions to both reduce GHG emissions and implement adaptation initiatives. The Strategy outlines four key pillars: (i) improving agricultural production, (ii) protecting and restoring forests, (iii) expanding the use of renewable energy, and (iv) promoting the use of energy-efficient technologies. It acknowledges distinct dimensions of human mobility, particularly rural-urban migration contributing to urban population growth s. It also underlines the potential environmental and social impacts of expanding power generation capacity, including displacement. Nevertheless, the Strategy falls short in proposing effective measures to address (forced) population movements (FDRE, 2011).

In 2019, the national Government published the Climate Resilient Green Economy National Adaptation Plan, outlining adaptation strategies for sectors vulnerable to climate change. Besides acknowledging migration as exacerbating rural communities' vulnerability to climate and disaster risks, the Plan underlines that the increased incidence of droughts and flooding contributes to the migration of rural residents to urban areas (. This migration strains urban structures and social services (FDRE, 2019b). The Plan also acknowledges seasonal labour migration as a short-term coping mechanism (Ibid.). Importantly, adaptation strategies include facilitating voluntary resettlement or migration when livelihood diversification and access to credit are not viable for vulnerable populations (Ibid.).

The implementation of the National Adaptation Plan relied on the development of an Implementation Roadmap, released the following. This Roadmap identifies key activities required to achieve the adaptation strategies outlined in the National Adaptation Plan, along with specific timelines and milestones (FDRE, 2020).

It highlights that climate risks exacerbate human displacement, particularly in drought-prone areas, and mentions initiatives by non-state actors that facilitate the relocation of communities from high-risk to lower-risk regions (Ibid.). Among adaptation options for urban resilience, the Roadmap seeks to establish social structures to support individuals arriving in urban areas, minimising stress and risk-taking behaviours that can occur during situations of disaster displacement (Ibid.).

Ethiopia has submitted policy documents to the UNFCCC Secretariat. Whilst the country's 2015 Intended Nationally Determined Contribution (INDC) did not refer to the human mobility-climate change nexus, the 2021 Updated Nationally Determined Contribution (NDC) attests that climatic impacts are being experienced in various sectors across the country. These impacts contribute to conflicts over limited resources and lead to population movements (FDRE, 2015b and 2021). Ethiopia has submitted three National Communications to the UNFCCC Secretariat. Nevertheless, only the Third National Communication refers to human mobility in the context of climate change (FDRE, 2023). Besides recognising that the impacts of climate change intensify migration patterns, the policy document highlights that disaster-related displacements are the primary catalyst for outbreaks of communicable diseases (Ibid.).

In conclusion, Ethiopia demonstrates a proactive stance in its national climate response. The national Government has consistently emphasised adaptation and mitigation as pivotal components of this response. Policy documents increasingly acknowledge the impacts of environmental drivers in mobility patterns, with gradual incorporation of measures to avert it. National climate strategies must prioritise addressing vulnerabilities and the linkages between human mobility and climate or environmental changes. In rural areas, poorly designed mitigation measures might catalyse further (forced) population movements. Moreover, overlooking the needs of 'trapped' populations could result in socio-economic and security repercussions. It is essential to formulate a robust domestic climate policy framework, with the aim to (i) identify, protect, and support those affected by climate and disaster events; (ii) advocate for strategies focused on ecosystem resilience in managing climate risks; and (iii) foster opportunities for livelihoods that avert (forced) population movements (Serraglio et al., 2024).

7.3. National Disaster Management Policies and Legislation

Ethiopia has been improving its disaster risk management capabilities. Three out of six policy and legal instruments related to DRR include references or specific measures for addressing disaster displacement. The 2013 National Policy and Strategy on Disaster Management (NPSDM) aims to reduce risks and damages from disasters through a comprehensive disaster risk management system (FDRE,

2013). It advocates for the establishment of distinct systems like disaster risk management, early warning, resource mobilisation, as well as information and communication systems. It also recommends creating a Disaster Risk Management Council and Coordination to oversee policy implementation. While the Policy recognises vulnerability from climate-related disasters and suggests evacuating at-risk populations, it defines displacement as "the process of people being forced to move from their homes to other places because of a natural hazard, war/conflict, or other human-made action" (Ibid.: 20). Nonetheless, concrete measures targeting such mobility dimensions were not proposed.

In 2014, the Disaster Risk Management Strategic Programme and Investment Framework was implemented to operationalise the NPSDM. This Programme outlined priority investment areas and estimated financing needs from both the national Government and development partners. It established a strategic framework for planning investments to strengthen Ethiopia's disaster risk management system (FDRE 2014). The Programme focused on interventions for immediate and long-term recovery of displaced populations. It also aimed to support the return, resettlement, and reintegration of displaced people through durable solutions. These solutions provide rapid coping mechanisms and help rebuilding livelihoods and household assets (Ibid.). This approach aimed to facilitate integrated response strategies, complementing humanitarian efforts and reinforcing national development activities.

The 2018 Humanitarian and Disaster Resilience Plan (HDRP) introduced a multi-year planning framework in Ethiopia. The Plan seeks to enhance humanitarian responses, mitigate future needs in climate-affected areas, strengthen national service provision, as well as promote the recovery of communities affected by drought and conflicts (FDRE, 2018). The Plan outlines three strategic objectives: (i) save lives and reduce morbidity, (ii) protect and restore livelihoods, and (iii) prepare for and respond to distinct humanitarian shocks like displacements (Ibid.). Thus, it provides a platform for national measures to address displacement from climate-driven disasters. The Plan presents measures to address disaster displacement, including facilitating voluntary return to origin areas, integration into host communities, and resettlement in selected areas. It supports individuals displaced from border areas to return home and provides integration or resettlement options. Emergency shelters offer immediate life-saving assistance, while long-term efforts focus on disaster risk mitigation, safe building practices, and supporting household rehabilitation and recovery (Ibid.). The HDRP prioritise support for vulnerable groups—e.g. women, children, the elderly and persons with disabilities—during disaster displacement. Recognising their heightened vulnerability and limited access to services, the Plan aims

to implement community-based protection structures like women centres and child-friendly spaces, ensuring that individuals with special needs receive emergency protection services (Ibid.). Hence, the HDRP actively responds to the protection needs of internally displaced persons in disasters, underlining the national Government's commitment to this issue.

Ethiopia's DRR agenda is notably progressive in dealing with human mobility, particularly displacement and evacuation. The country's DRR policies and legal frameworks create avenues for mitigating displacement impacts from climate-related disasters. For example, the 2014 Disaster Risk Management Programme and Investment Plan facilitates return, resettlement, and reintegration assistance for prompt disaster response and sustained recovery. Meanwhile, the HDRP focuses on rehabilitating communities impacted by conflicts and disasters, encompassing humanitarian efforts to manage displacement.

7.4. Current Developments at the Regional Level

The study extended its scope to include an analysis of instruments from regional organisations of which the country is a member. Provisions established at the regional level can support the effective regulation of population movements in the context of climate change, disasters, and environmental degradation. The regional bodies considered were: (i) the African Economic Community (AEC), (ii) the African Union (AU), (iii) the Common Market for Eastern and Southern Africa (COMESA) and (iv) the Intergovernmental Authority on Development in Eastern Africa (IGAD).

The provisions of the African Union (AU)

The AU, established in 2002, succeeding the Organisation of African Unity (OAU), which operated from 1960 to 1999). Initially, the OAU aimed to eradicate colonisation and apartheid while promoting member States cooperation for the development and territorial integrity. In contrast, the AU has emphasised fostering cooperation and integration of African countries to bolster economic development within the continent (AU, 2022).

The AU has developed important instruments related to human mobility. The 1969 Convention Governing the Specific Aspects of Refugee Problems in Africa expanded the definition of refugees to include persons fleeing "events seriously disturbing public order" (OAU, 1969). Whilst the definition could be understood to cover persons fleeing climate-related disasters, further clarification by the treaty monitoring body is needed. Protecting the rights of individuals

on the move in such contexts remains subject to political, economic, and legal debates.⁶ In 2010, the AU introduced the Policy Framework for Pastoralism in Africa. The Framework establishes key principles, objectives, and targeted strategies aimed at protecting pastoralists and acknowledges migration as essential for safeguarding rangelands, as well as for adapting to climate risks (AU, 2010).⁷ Considering that pastoral mobility often involves movements through settled farming areas, across internal administrative and national borders, the Framework advises revising or developing policies to regulate and facilitate pastoralists' mobility. It emphasises the importance of understanding the dynamics of pastoralist mobility and involving both pastoralist and non-pastoralist stakeholders in dialogue and decision-making processes (Ibid.).

The 2012 AU Convention for the Protection and Assistance of Internally Displaced Persons in Africa (Kampala Convention) presents a potential avenue to address human mobility in the context of climate change, disasters, and environmental degradation. According to the Convention, 'internally displaced persons' refers to individuals who have been forced to leave their places of habitual residence as a result of armed conflicts, situations of generalised violence, violations of human rights, as well as natural or man-made disasters (AU, 2012). This definition only applies to persons who have not crossed a national border. While facilitating the regulation of climate-induced displacement at the national level, the Kampala Convention does not govern transboundary population movements.

The 2015 AU Humanitarian Policy Framework outlines the AU's intention to assist displaced populations affected by conflicts, as well as natural and man-made disasters. Goals include: (i) supporting member States to assist displaced populations; (ii) strengthening institutional framework and capacities for protection and assistance; (iii) encouraging collaboration among member States, international organisations, and humanitarian agencies; and (iv) supporting the adoption of national measures to assist displaced populations; as well as (v) encouraging the share of information on the situation of displaced persons in Africa (AU, 2015). The Framework aims to guide coordination for early warning and prevention efforts, addressing the humanitarian challenges caused by conflicts and climate-related disasters (Ibid.). However, effective implementation relies on the development of a detailed plan.

6. An exception is, for instance, the 2010 UNHCR Guidelines for Assessing the International Protection Needs of Asylum-seekers from Somalia. The document acknowledges that Somali displacement "due to human rights violations, conflict, natural disasters and economic crises have been commonplace" since the collapse of the Somali State in the early 1990s. The document states that Somalis may, depending on the circumstances surrounding flight, qualify as refugees within the meaning of the Refugee Convention definition, encouraging a group-based approach (Weerasinghe, 2018).

7. These include: which include: (i) the recognition of the role of pastoralism in development, (ii) demonstrating commitment to pastoral policy development, (iii) integrating pastoral issues into decision-making processes, (iv) acknowledging the legitimacy of indigenous pastoral institutions, (v) strengthening the role and rights of women in pastoral communities, (vi) mainstreaming pastoral issues in poverty reduction programmes, (vii) service delivery, (viii) pastoral rangeland governance, (ix) policy support to mobility within and between countries, (x) protecting pastoral livestock assets, (xi) marketing of pastoral livestock and livestock products, (xii) financial and insurance services tailored to pastoral areas, (xiii) protecting African genetic resources – pastoral animals and plants, and (xiv) research and extension (AU, 2010).

The Framework not only sets guiding principles but also suggests establishing coordination and operational mechanisms to implement its goals. While the instrument is relevant for tackling (forced) population movements due to climate-related disasters, it still depends on the formulation of an implementation plan.

In 2018, the AU released its Migration Policy Framework and Action Plan (2018-2030), aligning with international migration standards and regional policies. It provides a policy guide to assist in the formulation of national policies on the topic (AU, 2018). It comprises eight pillars,⁸ with a section dedicated

to migration and environment, recognising the role of environmental factors in population movements, the Action Plan emphasises the need to incorporate environmental considerations into migration policies (Ibid.).

The provisions of the African Economic Community (AEC)

The AEC, under the auspices of the AU, fosters mutual economic development among African countries. The 2018 AEC Free Movement Protocol⁹ facilitates free movements of people, as well as the right of residence and right of establishment across Africa. Article 24 of the Protocol regulates procedures for specific groups, allowing member

Box 3. Migration Policy Framework for Africa and Plan of Action (2018-2030): Recommended strategies to deal with migration and environment

- (i) Incorporate environmental considerations in national migration policies to better address environment-related causes of migration processes, as well as the impacts migration has on the environment;
- (ii) Establish in-country processes for resettlement or humanitarian visa programmes;
- (iii) Counter environmental degradation caused by the large protracted presence of displaced persons, including periodic review of ecosystem impacts and remedial measures to mitigate such impacts;
- (iv) Increase collaboration with relevant international agencies to strengthen research and data collection, management and dissemination of information on the topic;
- (v) Strengthen intra-regional cooperation to respond in a timely and effective manner to mass influx situations, including through the development of regional contingency plans; and
- (vi) Implement a common African position on climate change, integrating considerations about the topic.

Source: AU, 2018.

States to set up special procedures for the movement of vulnerable groups like refugees, victims of trafficking, asylum seekers, and pastoralists (AEC, 2018). While the Protocol does not explicitly address the human mobility-climate change nexus, its provisions could apply in such contexts.

The provisions of the Common Market for Eastern and Southern Africa (COMESA)

Established in 1994, COMESA is a regional economic community that aims to foster regional integration by promoting trade and developing resources for the collective benefit of the region's people. In 1998, the Common Market ratified its Free Movement Protocol,¹⁰ with provisions for visa requirements, such as eased restrictions, visa-free entry for periods up to 90 days, guidelines for entry refusal, rights

to residence, and the free movement of labour services (COMESA, 1998). This framework for free movement provides a foundation for potentially admitting individuals from other member States affected by the impacts of climate change.

The provisions of the Intergovernmental Authority on Development (IGAD) in Eastern Africa

The IGAD in Eastern Africa, established in 1996, aims, among others, to foster the free movement of goods, services and people within the region (IGAD, 2022a), having its structure divided into five key areas: (i) agriculture, natural resources and environment, (ii) economic cooperation and regional integration, (iii) health and social development, (iv) peace and security, and (v) corporate development services (Ibid.).

8. These are: migration governance, labour migration & education, diaspora engagement, border governance, irregular migration, forced displacement, internal migration, and migration & trade.

9. Entitled "Protocol to the Treaty Establishing the African Economic Community Relating to Free Movement of Persons, Right of Residence and Right of Establishment".

10. Entitled "COMESA Protocol on the Free Movement of Persons, Labour, Services, Right of Establishment and Residence".

Regarding its migration agenda, the 2012 IGAD Regional Migration Policy Framework offers an overview of migration realities and challenges in the region, addressing internal, irregular and labour migration; border management; forced displacement; migration data; and inter-state and regional cooperation. The primary goal is to align migration legislation and policies of its member States (IGAD, 2012). The Framework has a section on “migration, climate change, environment and adaptation”, underscoring the need for policies to address climate-induced migration. It provides recommendations and discusses humanitarian resettlement in cases of forced migration (Ibid.).

IGAD’s Protocol on Free Movement of Persons recognises the role of free movement in alleviating the impacts of conflicts and disasters. It underlines climate and environmental change as key drivers of displacement and migration in the region (IGAD, 2020). Article 16 regulates disaster displacement, allowing citizens from member States affected by disasters to enter the territory of any member State. Member States are required to facilitate the extension of stay or other rights for affected citizens when returning to their country of origin is not feasible (Ibid.).

Box 4. IGAD Regional Migration Policy Framework: Recommended strategies to cope with migration, climate change, environment and adaptation

- (i) Formulate appropriate national migration management policies geared toward conserving and improving the environment;
- (ii) Engage with international organizations and national authorities to provide technical and financial assistance, ensuring environmental protection in areas where the environment pushes out and those where it pulls migrants and displaced persons;
- (iii) Institute the collection, management, and dissemination of migration and environmental data in member States for sharing relevant information and finding lasting solutions;
- (iv) Monitor the behavior of displaced persons in the host communities, detecting plausible challenges and opportunities for formulating appropriate policies and programmes;
- (v) Encourage adaptation strategies that ensure environmental sustainability; and
- (vi) Encourage the formulation and implementation of appropriate strategies to factor migration in climate adaptation strategies in the region.

Source: IGAD, 2012.

Furthermore, the 2020 Protocol on Transhumance focuses on enhancing the social and economic potential of the pastoral system. It promotes the free, safe, and orderly cross-border mobility of transhumant livestock and herders as a climate adaptation measure (IGAD, 2020). The Protocol recommends harmonising national policies related to pastoralist development, land use governance, and cross-border mobility measures (Ibid.).

Recently, IGAD member States adopted the Kampala Declaration on Migration, Environment, and Climate Change, endorsing that climate impacts further affects African populations and livestock. This Declaration emphasises the need for increased cooperation to address (i) human mobility patterns that are influenced by desertification and land degradation, (ii) rural-urban migration processes triggered by climate change and disasters, (iii) the scarcity of reliable data on the human mobility-climate change nexus in the region, as well as (iv) funding challenges related to these topics (IGAD, 2022d).

Within IGAD's climate agenda, the Regional Climate Change Strategy and Action Plan (2023-2030) outlines interventions for climate adaptation and mitigation across four domains: (i) implementing climate strategies and actions; (ii) mainstreaming them into key economic sectors; (iii) enhancing regional climate-related knowledge generation; and (iv) pursuing low carbon development initiatives (IGAD, 2022b). Key Priority Area 9 focuses on human displacement and recognises that resource scarcity due to climatic impacts leads to competition, instability, displacement, and migration, exacerbating conflicts and regional security issues (Ibid.). The Action Plan addresses the impacts of climate-induced conflict and displacement through interventions like (i) assessing vulnerabilities, (ii) managing humanitarian responses, (iii) harmonising regional immigration, and (iv) and developing regional emergency evacuation guidelines (Ibid.).

IGAD has been engaged in DRR through its Disaster Risk Management Programme, initiated in 2004. This Programme has bolstered regional and national capacities for disaster preparedness and response, including the development of policy and legal frameworks for DRR (IGAD, 2022c). In this regard, IGAD's Drought Disaster Resilience and Sustainability Initiative (IDDRSI) Strategy (2013-2017) addresses the effects of drought and related shocks in the region. It aims to combat food and nutrition insecurity, poverty, and environmental degradation, building communities' resilience to drought-related impacts (IGAD, 2013). It notes that droughts have generated waves of 'climate refugees', and often result in conflicts between communities, both within and across national borders (Ibid.). Likewise, the document highlights that the "restrictive mobility of people" (Ibid, n.p.) undermines the resilience of pastoral and agro-pastoral systems. Still, the

Strategy advocates for harnessing the development potential of safe, orderly and regular mobility patterns, promoting migration as an adaptation strategy to cope with climate- and disaster-related movements (Ibid.). The subsequent IDDRSI Strategy (2019-2024) reiterates these points without proposing effective measures to address the phenomena (IGAD, 2019).

In conclusion, the effective implementation of existing regional governance frameworks can facilitate national initiatives addressing the distinct dimensions of human mobility in the context of climate change, disasters, and environmental degradation. This is because regional bodies offer policy and legal frameworks that provide an opportunity to integrate strategies on the topic at the national level. Both the AU, with its Humanitarian Policy Framework and the Migration Policy Framework for Africa and Plan of Action, and the IGAD, through the IGAD Regional Migration Policy Framework, have offered guidance for integrating these issues into national policy formulation. Furthermore, existing regional agreements on free movement offer a pivotal framework for the potential acceptance of individuals who might move or seek entry into Ethiopia due to climate change, environmental degradation, or associated disasters (Serraglio et al., 2024).

8. CONCLUSIONS AND RECOMMENDATIONS

This report explored the dynamics between the distinct dimensions of human mobility and climate/environmental changes in Ethiopia, showcasing how increased and disruptive weather events—including prolonged droughts, heavy rainfall, and flooding—are contributing to (forced) population movements, both internally and across national borders. The report highlights that the climate change-human mobility nexus is inherently multi-causal, manifesting in distinct forms of mobility, from migration and displacement to planned relocation and even immobility, influenced by a spectrum of factors ranging from voluntary to involuntary motivations. The analysis shows that this nexus cannot be viewed through a linear lens; rather, it is shaped by the interplay between climatic events and other drivers, such as food security, peace and stability, politics, and socio-economics. This interconnection underscores climate change as a risk multiplier that exacerbates existing vulnerabilities and challenges, rather than acting as a solitary cause of (im) mobility:

Socio-economic dynamics: Ethiopia's situation highlights the complex interplay between environmental sustainability, economic stability, and social cohesion. The impacts of climate change extend beyond the environmental into socio-economic domains, driving both internal and cross-border population movements, as individuals seek improved living conditions. The dependence on agriculture, whilst crucial for employment and income, is vulnerable to current climate threats, underlining the need for economic diversification and climate resilience strategies. Moreover, historical and ongoing political conflicts exacerbate the country's challenges, making political stability essential prerequisite for sustainable development and effective climate adaptation.

Climate trends and impacts: The country's climate dynamics underscore the need for adapting to climatic impacts while ensuring sustainable development. For instance, changes in rainfall patterns and the consequences of global climate phenomena (e.g., ENSO) highlight the need for adaptation strategies capable of withstanding these changes. Observed and projected climate trends signify not only environmental but also socio-economic challenges, particularly for a population that still is mostly dependent on agriculture. The 'East African Climate Paradox' exemplifies the intricate balance between different climate influences and the need for comprehensive adaptation measures to climate change.

Land use: Despite their significant role in Ethiopia's economy, and in the livelihoods of its people, the agricultural and agro-forestry sectors are threatened by the increasing impacts of climate change and environmental degradation, and this threat

contributes to outmigration from affected areas. Reliance on rainfall and exposure to a changing climate emphasise the need for sustainable land use and water management practices.

Human development trends: Recent gains in health, education, and economic growth are juxtaposed against emerging threats, such as pandemics, ongoing conflicts, and the impacts of climatic change. The health sector's progress underscores the importance of continued investment in public health infrastructure and preventive care. In education, efforts to increase enrolment must be matched with initiatives to improve quality and inclusivity. Economic growth needs to address the root causes of poverty and vulnerability to environmental shocks, calling for approaches that not only aim to sustain human development gains but also enhance resilience against multiple converging risks.

Agricultural livelihoods and food security and gendered dimensions of risk: The impact of climate change on Ethiopia's agricultural livelihoods and food security highlights the urgent need for resilient and adaptive strategies tailored to the unique vulnerabilities of smallholder farmers and pastoralists. Also, the disproportionate vulnerability of women and girls emphasises the importance of integrating gender-sensitive approaches into climate adaptation and related agricultural policies.

Migration and climate change: Climate change and environmental degradation increasingly play a role in contributing to population movements, both directly and indirectly affecting the habitability of regions and the sustainability of agricultural and water resources in Ethiopia. The intricate linkages between climate change and human mobility underscore the need for integrated policy responses that address the multifaceted nature of migration. These include strategies that enhance the resilience of vulnerable populations, particularly in agriculture-dependent communities. Recognising migration as an adaptation mechanism should be accompanied by investments in sustainable agricultural practices, water management, and the development of social protection schemes that can reduce the need for migration as a last resort. Enhancing the capacity of both origin and destination areas to cope with the demographic, economic, and social changes brought about by (forced) population movements is also key. This entails fostering economic diversification, ensuring food security, and promoting social cohesion, thereby transforming migration from a crisis-driven response into a managed, proactive element of climate adaptation and socio-economic development strategies.

Risk and Conflict: The report pinpointed socio-economic factors and governance as immediate precursors of conflict and migration, highlighting how scarcity of resources and exposure to extreme weather events amplify (im)mobility risks in low-income, developing nations. The report also acknowledged the indirect role of climate change in heightening conflict risks by aggravating poverty and economic instability. This complexity renders precise predictions of migration patterns difficult. The emphasis on a deeper understanding of the diverse drivers of climate-induced migration and its consequences on host communities signals the need for policies that manage migration in ways that minimise conflict potential and foster social cohesion.

Policies and legal frameworks addressing human mobility in the context of climate change, disasters, and environmental degradation at the national and regional levels: Ethiopia's national policies and legal frameworks are gradually recognising the impacts of climate change on (forced) population movements, yet gaps in comprehensively addressing the topic still remains. While the

country's climate and DRR agendas have started to integrate measures aimed at mitigating the effects of environmental changes on mobility patterns, there is a lack of specific legislation addressing the phenomenon. The development of a comprehensive migration policy, still under discussion, is key for effectively addressing the complexities of climate-related human mobility.

By shedding light on both knowledge and gaps concerning the distinct dimensions of human mobility in the context of climate change in Ethiopia, this report provides a roadmap for select actors to address pressing issues related to the topic. To foster resilient and sustainable solutions and strategic interventions, conclusions and recommendations noted here were discussed and validated with local stakeholders during a workshop on 10th and 11th May 2023 in Addis Ababa, resulting in the following recommendations:

Strategic directions for research:

- Address Ethiopia's climate dynamics and its implications, including human mobility, order to enhance climate data collection and projection capabilities, facilitating adequate planning and mitigation of climatic impacts on infrastructure, livelihoods, and in communities;
- Adopt multi-scalar and long-term approaches that delve into how specific climatic events catalyse (forced) population movements;
- Examine further the distinct types of human mobility linked to climate change, including migration, displacement, and planned relocation, whether internal or cross-border, regular or irregular, and focus on the movement of specific demographic groups by factors like gender, age, and livelihood; and
- Identify further concrete tipping points that clarify when and why mobility occurs or does not, analysing governance impacts and gaps concerning the topic (also giving attention to trapped or immobile populations).

Strategic directions for policy-making:

- Prioritise the formulation of a comprehensive migration policy that explicitly incorporates climate change and environmental degradation as factors influencing migration;
- Update existing legal and policy documents to include clear provisions for the protection and assistance of populations affected by climate change and disaster-induced mobility;
- Improve the coherence and coordination between Ethiopia's migration, climate change, and DRR policies to ensure a unified approach to addressing climate-induced mobility;
- Leverage existing regional governance arrangements and free movement agreements to support the management of population movements in environmental contexts;
- Establish robust mechanisms for ongoing monitoring and evaluation of policy effectiveness in addressing the distinct dimensions of human mobility in the context of climate change, disasters, and environmental degradation; and
- Efforts to address policy gaps should still focus on awareness raising, tackle pre-existing vulnerabilities and better understanding the complex nature of the topic at the local level, and increase institutional and financial support/capabilities.

Strategic directions for local-level actors:

- To address climate change and enhance resilience at the community level, a comprehensive structured approach of key actions – coupled with the set of recommendations proposed above, as well as international assistance – is suggested:
- Economic and livelihood diversification: Diversify communities' economic activities and livelihood opportunities, reducing dependence on single sources of income, such as agriculture, which is highly vulnerable to climate change.
- Agricultural and infrastructure improvements: (i) Enhance irrigation infrastructure, ensuring stable agricultural outputs where possible and securing livelihoods based on agriculture; and (ii) Adopt climate-smart agriculture and agro-forestry practices, such as crop adaptation, renewable energy-based irrigation, and crop insurance, all of them in a manner that incorporates environmental conservation as well as land management practices.
- Land and resource management: (i) Secure land tenure to foster agricultural productivity and sustainability; and (ii) Enhance early warning systems for better preparedness against climate hazards.
- Social inclusion: (i) Empower women, girls, and other vulnerable groups through equal access to resources, education, and participation in decision-making processes, which is crucial for building community-wide climate resilience; and (ii) Implement participatory scenario planning.
- Mobility & tension management: (i) Ensure migration pathways enable individuals to move away from vulnerability and precarious conditions, rather than exacerbating them; (ii) Support host communities experiencing influxes of people due to climate change or conflict-related crises with livelihood diversification and development assistance planning; and (iii) Provide resettlement assistance to mitigate the risk of conflict in areas where migrants resettle, especially those prone to hazards and resource scarcity.

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