ClimBeR: Building Systemic Resilience Against Climate Variability and Extremes

FACTSHEET 2023/3

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How does climate exacerbate root causes of conflict in Ethiopia?

Climate Security Pathway Analysis

Niklas Sax, Gamal Mohamed Hassan, Abdimajid Nunow Abdi, Tanía Ferrè Garcia, Ignacio Madurga-Lopez, Bia Carneiro, Theresa Liebig, Peter Läderach and Grazia Pacillo

This factsheet gives answers on how climate exacerbates root causes of conflict in Ethiopia, using a climate security pathway analysis. Two main pathways are identified:

1. Livelihood and Food Insecurity: The majority of Ethiopia's land is vulnerable to climate extremes, which affect the availability of food. Local hotspots of food insecurity in the Tigray, Somali and Afar regions correlate with a higher occurrence of conflict, making them prone to climate security risks. Vulnerability to climate and conflict also differs along gender and age lines, while pastoralist livelihoods are particularly affected by the compounded pressure of climate effects and political marginalization. Natural disasters and biophysical changes have led to the displacement of people, adding to the large number of internally displaced people due to conflict, which are leading to further tensions with host communities in the areas of refuge.

2. Resource Access and Availability: Climate variability and extreme events are putting pressure on Ethiopia's natural resources of land and water. This is leading to an increase in conflict rooted in resource competition, particularly in border regions. These conflicts, particularly those around land, exacerbate ethnic violence between communities as they vie for territory and power within the context of ethnic federalism. Complicating matters further are conflicts arising between pastoralists and farmers over different land use options, including the transition towards large-scale farming and conservation programmes. These affect the availability and accessibility of pasture and water. Conflicts around water manifest at local, national and international levels. Such conflicts can concern issues related to access to water at boreholes, unequal distribution of water among industries and rural communities, as well as national water security among the riparian countries of the Nile River Basin.

IGAD CAEP IGAD Centre of Excellence For Climate Adaptation and Environmental Protection

CGIAR FOCUS Climate Security

This publication is part of a factsheet series reporting on the findings of the CGIAR FOCUS Climate Security Observatory work. The research is centered around 5 questions*:

1. **How does climate exacerbate root causes of conflict?**
   Climate Security Pathway Analysis
   Ethiopia Guatemala Kenya Mali Nigeria Senegal Sudan Uganda Zimbabwe
   Econometric analysis
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2. **Where are the climate insecurities hotspots?**
   Spatial analysis
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3. **What is the underlying structure of the climate, conflict, and socio-economic system?**
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4. **Are climate and security policies coherent and integrated?**
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5. **Are policy makers aware of the climate security nexus?**
   Social media analysis
   Kenya Mali Nigeria Senegal Sudan Uganda Zimbabwe

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* Questions 1, 2, 3, 5 are analyzed at country level through a Climate Risk Lens (impact pathways, economic, spatial, network and social media analyses). The policy coherence and scopus analyses are at continental level.

**Scopus is one of the largest curated abstract and citation databases, with a wide global and regional coverage of scientific journals, conference proceedings, and books. We used Scopus data for analyzing: (1) how global climate research addresses the dynamics between climate, socio-economic factors, and conflict, and (2) how the countries studied are represented in the database.

For more information please contact: p.laderach@CGIAR.ORG

1. CONTEXT

Climate Profile

Ethiopia is characterised by its climatic and topographic heterogeneity. Conditions vary from semi-arid desert in the northeast, east and southeast lowlands to high rainfall and high humidity in the south and southeast equatorial rainforests (UNFCCC 2015). The country has a significant degree of inter-annual variability, characterised by three rainy seasons: June to September ('kiremt'), October to January ('bega') and February to May ('belg'), the first accounting for 50 to 80 percent of total annual rainfall (UNFCCC 2015). Mean average temperatures range from above 25 °C in the lowlands to below 15 °C in the highlands (UNFCCC 2015). Since 1960, average temperatures have risen by 1 °C, particularly from July to September, with a 20 percent increase in the number of hot days (WBG 2021). Similarly, there has been up to a 20 percent decrease in rainfall during the spring and summer seasons in areas situated in south and central Ethiopia between 1950 and 2010 (UNFCCC 2015). Due to highly variable precipitation patterns, there has also been a pronounced increase in heavy rainfall events (UNFCCC 2015). Projected future trends indicate an increase in extreme climate events, such as droughts and floods (UNFCCC 2015). Recent floods in several regions of the country, particularly in Somali, affected 240 000 people (ECHO 2023). Meanwhile, Ethiopia continues to suffer one of the most severe La Niña-induced droughts in recent decades, with four consecutive failed rain seasons since late 2020 affecting more than 8 million people, mostly in the southern and southeastern parts of the country (OCHA 2022; IOM 2023).

Future projections of rainfall and temperature patterns in Ethiopia remain highly uncertain (FDRE 2011). Climate models point to an increase in temperatures ranging between 1.5 °C and 3 °C by 2050 (UNFCCC 2015). In the case of rainfall, there is greater uncertainty as to whether or not it will increase or decrease, as estimates range from increases of 30 percent to possible declines of up to 25 percent (FDRE 2011). Overall, rainfall projections indicate a reduction in rainfall (from minus 30 to minus 50 mm) in eastern parts of the country from the southeast to northeast, with southern regions suffering the greatest declines, ranging from minus 50 to minus 100 mm (UNFCCC 2015). Reductions of more than 150 mm per year during the belg and kiremt rainfall seasons are expected to strongly impact the southern and western areas of the Somali and Oromia regions, characterised for being the most densely populated and largest crop growing areas in Ethiopia (UNFCCC 2015).

Conflict and Fragility

Never colonized and ruled by successive emperors until 1974, Ethiopia is one of the oldest countries in the world (UCDP 2022). Its political and conflict history and present realities are shaped by relations between its heterogeneous ethnic groups, as well as challenges imposed by the complex interplay of climatological and topographic conditions. Long droughts induced by El Niño events, like those in 1972-73 and 1982-83, have led to famines that contributed to ethnic rebellions, political turmoil and radical changes of government (Comenetz and Caviedes 2002). Consecutive droughts in the mid-1974s triggered social unrest that was used by the pro-Soviet Marxist-Leninist military junta known as the 'derg', to overthrow the regime of emperor Haile Selassie (Comenetz and Caviedes 2002; UCDP 2022). The even more devastating famine of 1984-85 stemmed from a combination of drought and military counterinsurgency that denied food aid to Tigray and used food as a major element of a strategy to combat secession movements, with devastating effects on the population (de Waal 2018).

The derg's mismanagement of the 1984-85 famine and loss of international credibility due to their mishandling of relief aid contributed to their fall in 1991 (Fullerton Joireman 1997; ICG 2009).

Ethiopia's diverse population comprises more than 70 ethnolinguistic groups, many of whom have a long history of separatist sentiment and interethnic conflict (UCDP 2022). The unitary imperial state (1930 to 1974) and the Marxist derg regime (1974 to 1991) both aimed to maintain ethnic cohesion by promoting nation-building with the arms of the state (Yusuf 2019). Numerous opposition groups – including the Western Somali Liberation Front (WSLF), Oromo Liberation Front (OLF), Eritrean People's Liberation Front (EPLF), and the Tigrayan People's Liberation Front (TPLF) – joined forces to coordinate military efforts and organise offensives to overthrow the derg regime (Fullerton Joireman 1997). From 1976 to 1991, Ethiopia was in an intra-state conflict on various fronts. Tensions with Somalia over ideas of a "Greater Somalia", as well as marginalization of the Somali region within Ethiopia, led to the Ogaden War in 1977-78, which Ethiopia won with the help of the Soviet Union, but grievances of Somali-speaking peoples in Ethiopia remain (Nkaisserry 1997). Eritrea's long war for independence, fought since 1961 to break out of the then Federation of Ethiopia and Eritrea under the Ethiopian crown, finally saw victory in 1991 when the EPLF defeated the Soviet-backed Ethiopian army and took control of Eritrea´s capital Asmara, paving the way for an independent Eritrea (Lyons 2018). The fall of the derg regime in 1991 culminated in the rule of the Ethiopian Peoples' Revolutionary Democratic Front (EPRDF), a broad political movement dominated by the TPLF and characterised by ethnic-based opposition parties and a decentralised constitution with a commitment to federalism (ICG 2009; UCDP 2022). Among Ethiopians there remains no consensus concerning the effectiveness of ethnic federalism, particularly because under TPLF rule it had been grafted onto a history of centralised statecraft that worked to undermine disparate elements of self-rule within the federation (Yusuf 2019; ICG 2019). A major conflict faultline remains within Ethiopian politics and society, revolving around the level of autonomy given to ethnic groups, which needs to find a balance between opposing sentiments of Ethiopian nationalism and ethnic nationalism (Yusuf 2019).

From mid-2010, competing ethno-nationalism led to a weakening of party and state structures, leading to intensified ethnic mobilisation (Yusuf 2019). After four years of street protests, and following the resignation of Hailemariam Desalegn, the EPRDF elected Abiy Ahmed Ali as prime minister, (ICG 2019; UCDP 2022). The new political dispensation under Ahmed Ali came at the cost of bringing long-simmering conflicts, which had been under the tight 27-year grip of the EPRDF, to the surface (Yusuf 2019). Inter-communal violence significantly increased from November 2020 due to a dispute between the federal and TPLF leadership, which escalated into civil war, mainly concentrated in the northern Tigray region (ICG 2022a). In November 2022, following peace negotiations sponsored by the African Union, both parties signed the Pretoria Deal, initiating a reconciliation process focused on the facilitation of humanitarian aid delivery and protection of civilians (ICG 2022b; UNICEF 2022).

Socio-Economic Profile

Situated in East Africa, Ethiopia is sub-Saharan Africa's second-most populous state (UNFCCC 2015). Production in the primary sector of agriculture is key to Ethiopia's economy, contributing around 44 percent of the national GDP, 73 percent of employment and 90 percent of total export earnings, linked to the commercialization of livestock products: skins and hides, coffee as well as pulses and seeds (CIAT and BFS/USAID 2017; CGIAR 2018). Agriculture is the sector most vulnerable to the impacts of

climate change, as it is predominantly dominated by small-scale subsistence farmers dependent on rain and traditional technology (CIAT & BFS/USAID 2017; CGIAR 2018; WBG 2011). The negative effects of climate change on the national economy are expected to reduce GDP by up to 10 percent by 2045 (UNFCCC 2015). Likewise, Ethiopian agriculture is predicted to decline by 6 to 32.5 percent between 2030 to 2050, making the country more dependent on food aid (Belay et al. 2021). Combined with declining soil fertility and lack of financial resources to adopt technologies, increased pressure over natural resources, mainly driven by a growing population and food demand trend, is one of the biggest challenges faced by the agricultural sector (CIAT & BFS/USAID 2018). Further compounding the challenges faced by the country, population growth has exacerbated Ethiopia's land tenure system, characterised by state ownership of land, leading to increased insecurity of tenure and fragmentation of landholdings (FAO 2021a).

While unemployment rates remain low (3.4 percent) and food consumption has improved in recent decades, poverty and food insecurity remain a problem in the lowlands, as well as in the pastoral and drought-prone highlands (FAO 2021a; WB 2021). Recent survey data indicates that 68.7 percent of the total population in Ethiopia is multidimensionally poor (UNDP 2022). The prevalence of food insecurity across the country remains high and figures indicate one in every three children under five years old is undernourished and, even in wetter, more favourable times, up to 10 per cent of households still experience food insecurity and rely partly on food aid (FAO 2021b; FAO 2016; ODI 2015). Access to food remains limited, with figures indicating 48 percent of household budgets are spent on food and only 14 percent of roads are paved (CIAT & BFS/USAID 2017). In 2022, prolonged drought, together with conflict and cholera outbreaks, severely undermined household food security, leading to a deteriorating humanitarian situation with 29.7 million people in need of assistance and 4.51 million people internally displaced (UNICEF 2022).

2. CLIMATE SECURITY PATHWAYS

Ethiopia is ranked 161 out of 182 nations by the Notre Dame Global Adaptation Initiative (ND-GAIN) Climate Vulnerability Index for 2022, indicating current vulnerability to climate disruptions. Climate variability and extreme events are exacerbating inter-communal competition over natural resources and are having detrimental effects on rural livelihoods, which both contribute towards violent conflict in the country. The connection between climate and conflict are being identified through the I) Livelihood and Food Insecurity Pathway, and the II) Resource Access and Availability Pathway.

The identified pathways represent logical mechanisms of how the climate-security nexus may operate in Ethiopia, based on an approach combining: I) systematized search and interpretation of existing understanding in academic and grey literature; II) verification of identified linkages and key points of discussion emerging from the "IGAD–CGIAR: Climate Vulnerability and Impact Pathway Analysis Workshop" with participation by several governmental and non-governmental stakeholders from Ethiopia (March 2023, online).

PATHWAY #1: Livelihood and Food Insecurity

The majority of Ethiopia's land is vulnerable to climate extremes, which affect the availability of food. Local hotspots of food insecurity in the Tigray, Somali and Afar regions correlate with a higher occurrence of conflict, making them prone to climate security risks. Vulnerability to climate and conflict also differs along gender and age lines, while pastoralist livelihoods are particularly affected by the compounded pressure of climate effects and political marginalization. Natural disasters and biophysical changes have led to the displacement of people, adding to the large number of internally displaced people due to conflict, which are leading to further tensions with host communities in the areas of refuge.

Agriculture constitutes a crucial role in Ethiopia, with around 85 percent of the population living in agrarian areas relying on agricultural production to sustain their livelihood (Zewudie et al. 2021). The major crops grown in the country are teff (22.9 percent of crop area / 16.8 percent of grain production), maize (16.9 percent / 26.8 percent), sorghum (14.8 percent / 16.2 percent), wheat (13.3 percent / 15.8 percent) and barley, which together form the core of Ethiopia´s agriculture and food economy, accounting for around three-fourths of the total cultivated area (Evangelista et al. 2013; Taffesse et al. 2011; Yang et al. 2020). Even though most arable land is already used for agriculture and Ethiopia being one of the largest cereal producers in Africa, it is not self-sufficient and needs to fill the large gap remaining between crop production and domestic demand with high investments in food imports (Zewudie et al. 2021; Yang et al. 2020). Given Ethiopia´s diverse geographic, topographic and climatologic conditions, climate variability has different agricultural impact in different regions. As a general contrast, in water-abundant western Ethiopia crop yields are positively correlated with solar radiation and maximum temperature, while yields are negatively correlated with these factors in water-scarce eastern and southeastern Ethiopia, with the correlation between crop yields and precipitation showing the opposite pattern (Yang et al. 2020). Ethiopia is extremely exposed to the impacts of climate change and variability, with close to 90 percent of its surface area is vulnerable to severe or extreme climate stress and nearly all of the country's agriculture dependent on rainfall (Pacillo et al. 2021; Evangelist et al. 2013). Effects of climate impact on agricultural production within the three rain seasons are diverse and pose several further implications.

The most prevalent drying trends can be witnessed in the belg season, due to a reduction in rainfall and temperature-induced soil drying (Temam et al. 2019). Agriculturally the belg season is important to grow the staple crop teff as well as for long-cycle crops such as corn and sorghum, with drought in this season having profound implications for food security (Temam et al. 2019). Aside from drought induced by a lack of rain, Ethiopia also experiences what is known as 'green famines', which describes unfavourable seasonal shifts in rainfall patterns leading to crop failure due to disruptions in the critical germination periods (Evangelist et al. 2013). Teff is strongly affected by climate change, with future distribution changes and yield reductions leading to an average loss of about 24 percent of the current suitable cropping area by 2050 (Kiambi and Yao 2014). Given the estimation that 'enjera', a food staple made from teff, provides up to two-thirds of food consumed in Ethiopia, this has considerable implications for food security (Zewudie et al. 2021). The already huge deficit between teff production and national demand are further exacerbated by the effects of climate change and population growth, leading to increases in the price of Ethiopia´s staple food (Zewudie et al. 2021).

The main rain season, kiremt, which is dependent on location of the intertropical convergence zone (ITCZ), is important for the main season 'meher' cultivation period, when most crops are grown (Temam et al. 2019). Here also, worrying trends both from rainfall declines as well as seasonal warming, are found in most parts of the country and pose a threat to the production of cereal crops such as barley, teff and wheat (Temam et al. 2019). Particularly during El Niño years, summer rainfall in some parts of the country is low, which has often led to food security crises (Lewis 2017). Extreme drought conditions, like that in 2015 during an El Niño event, affect the crop health of barley, corns, millet, sorghum and wheat (Qu and Hao 2018). The reduction in crop production caused by these extreme events amplifies existing stress on food insecurity and imposes significant demographic, social, economic, physical and psychological challenges on households that rely on agriculture for their livelihood (Gebre and Rahout 2021). Erratic crop production caused by unpredictable and unfavourable rainfall and other shocks is combined with the steady growth of human population and an increasing demand for food (Mekuria et al. 2018). Different exposure to drought between regions of Ethiopia suggests that the availability of food is not the only factor for food insecurity, as drought incidents are, in many cases, local (most often reported in Tigray, Afar and Somali), while national cereal production during the same years has been stable, suggesting challenges in the distribution of food (Lewis 2017).

Effects on cash crops, such as coffee, further impacts the economic livelihood of farmers as well as the national economy in general. Coffee contributes to around one-quarter of Ethiopia's total export earnings and its cultivation provides a livelihood income for around 16 percent of the population (SCIP 2017). Rapidly increasing temperatures in Ethiopia are destroying coffee plants at an alarming rate and land suitable for the prominent Arabica coffee is projected to reduce by 65 percent due to climate change (Iscaro 2014). Some of the current growing areas are already poorly suited for the cultivation of coffee and are markedly impacted by climate change. However, substantial areas that were previously unsuitable will become suitable under current climate projections, which would make assisted migration to new areas a key component for ensuring the resilience of Ethiopia's coffee economy, as existing adaptation options for smallholder coffee farmers are overburdened (SCIP 2017; Eshetu et al. 2021). As coffee production is decreasing, many farmers are choosing to grow 'khat' (a mildly psychoactive leafy shrub) as a cash crop to generate income (IGAD-CGIAR 2023).

The bega season, while having the lowest amount of rainfall compared to the other two seasons, is crucial for on-farm soil moisture as well as for maintaining grasses in rangelands (Temam et al. 2019). Projected drought intensification rates of 10 percent per decade will have devastating impacts on both farmers and pastoralists (Temam et al. 2019). With more than 80 million head, Ethiopia has the largest livestock population in Africa (Gashaw et al. 2014). Changes in temperature and patterns of rainfall indirectly affect livestock through factors such as feed availability, grazing ranges, feed quality as well as directly due to heat stress and disease incidents (Gashaw et al. 2014). Rhodes and buffel grasses remain the most suitable species for forage grass production under future climate scenarios, but Ethiopia has a negative feed balance and cannot meet future feed demand as land availability for natural pasture has been substantially decreased in favour of agricultural land (Brychkova et al. 2022). Most livestock production is already located in marginal lowland ecosystems, where climate-induced disasters, such as increasingly recurrent drought, floods, erratic rainfall patterns and high temperatures add significant stress on viable grazing areas, making pastoral communities highly

vulnerable to these disaster risks (Gashaw et al. 2014). Decision-makers are sometimes unaware of the specific challenges faced by pastoralists in Ethiopia in achieving and maintaining their livelihood, due to there being only a few mechanisms for local communities to transmit their knowledge (Chinasho et al. 2017). Pastoral systems have over centuries gone through cycles of coping and adaptation to extreme weather condition in semi-arid lands but the fragility of their systems becomes more apparent in severe droughts when crop failure and massive livestock death lead to famine, such as in the early 1970s and 1980s (Gebeyehu et al. 2021).

> *"Climate change is affecting each and every sector, especially the livelihood sector with food security, but also education, health and everything fundamental to human wellbeing. Most of our people are living in rural areas, and the current drought is affecting people, livestock and nearly all regions. Many have lost their livelihood and are moving to IDP camps or towns."*
> (IGAD-CGIAR Workshop participant 2023)

Livelihoods are threatened by major droughts and floods that reduce agricultural productivity, decrease food availability and increase food prices (Milman and Arsano 2013). The impact of climate change on rural livelihoods becomes visible through a decline in crop yield, diminishing livestock productivity, livestock and human disease outbreaks, reduction in water availability and conflict over resource competition (Mihiretu et al. 2021). In addition to the impact of climate variability on food security, droughts and floods disrupt transportation and other infrastructure, leading to a loss of household assets and negatively affecting the Ethiopian economy (Milman and Arsano 2013). Drought frequency is coupled with other environmental challenges, such as land degradation, deforestation and loss of biodiversity (Mekonen and Berlie 2021). Household vulnerability is increased due to low education level, limited infrastructure and lack of access to the enablers of adaptive capacity, such as information, technology or economic resources (Mihiretu et al. 2021; Mekonen and Berlie 2021). Land in Ethiopia is allocated by the state to farmers but as almost all land is occupied, scarcity of arable farmland and landlessness are increasing, particularly in the highlands (Yigezu Wendimu 2021). The fragmentation of small farmlands through inheritance by children further increases household poverty, leading to greater food insecurity and vulnerability, particularly of youth who have to rely on decreasing land quantity and quality (Yigezu Wendimu 2021). Ethiopia has made strong commitments to strengthen its social protection system and support to food insecure households through: 1) boosting agricultural productivity; 2) assisted resettlement on voluntary basis; 3) income diversification; and 4) employment creation offering credit access to poor households. However, the programme faces significant challenges in implementation (Lemma and Cochrane 2019). Climate change and variability compounds these existing socioeconomic risks connected to food security, which generates insecurities over multiple dimensions of poverty, inequality, agricultural productivity, conflict and crisis exposure (Pacillo et al. 2021).

In the local hotspots of Tigray, Afar and Somali, the persistent dry climate conditions co-occur with moderate to severe conflicts and different socioeconomic vulnerabilities, making them the regions most exposed to climate security risks (Pacillo et al. 2021). Discontent with food prices, exacerbated by insufficient rainfall, encourage citizens to challenge authorities through protest, particularly in already historically marginalized communities in the regions of Oromia, Somali and Afar (Yishak 2019). The governmental agenda to shift the economy away from an agricultural to a manufacturing base

has gained little traction for most of the rural population and grievances have arisen against foreign investors and state-led projects that did not generate enough jobs (ICG 2019). The widespread poverty of the unskilled labour force who did not profit from Ethiopia´s impressive growth in GDP contributed to the buildup of protests in 2015 that led to further inter-communal violence in the following years (Yusuf 2019). Pastoralists are among the most affected by climate impacts, and are also one of the most disadvantaged groups regarding the provision of formal education. This significantly limits their participation in the labour market and lowers the opportunity to transition their livelihood (Debebe 2016). Efforts to mobilize ethnic groups to protest and take part in violent confrontations in various parts of the country gained resonance among angry youth who are lacking opportunities in a still largely agriculture-dominated economy, which is heavily impacted by climate change (Yusuf 2019).

Livelihood and Gender

The impact of both climate change and conflict is not equally distributed across society and differs according to gender and age, among other factors. Ethiopia has a patriarchal society with gender norms biased in favour of men, though variations exist between different ethnicities (Mersha and Van Laerhoven 2016). Being two-thirds poorer, less educated, and mostly not involved in political and household decision-making, women are inevitably more vulnerable to climate impacts (Herman 2016). Women are also more likely to be killed by climate-related hazards and experience hunger after such events, which is partly because they are culturally expected to eat only after they have fed their families (Devonald et al. 2022; Herman 2016). Furthermore, during times of drought, when mobility increases, gender-based violence increases (IGAD-CGIAR 2023). It has also been found that the barriers to adaptation in Ethiopia are much higher for women engaged in agriculture (Mersha and Laerhoven 2016).

Restrictive norms against women ploughing leads to their de facto exclusion from reciprocal labour support systems. The reliance on sharecropping arrangements makes on-farm adaptations almost unattainable for female-headed households given their low bargaining power (Mersha and Laerhoven 2016). Conflict further affects women disproportionately, with an increased risk of violence during climate-related conflict and displacement and being highly insecure while collecting water or firewood (Devonald et al. 2022). Adolescents and youth are also highly vulnerable to climate impacts as climate-related hazards disrupt services needed for their long-term development and education (Devonald et al. 2022). Droughts can triple the time needed for the collection of water, and as fetching water is predominately a task of girls this can affect their ability to remain in school (Gemechu 2022). Youth are often also unable to voice their concerns and ideas in community discourses due to age barriers (Devonald et al. 2022).

Livelihood and Mobility

Ethiopia's population can be divided into the central highlands, where the majority live; the relatively unpopulated and arid south; and the northern and central areas with moderate population density (Comenetz and Caviedes 2002). Long droughts, especially those associated with El Niño events, have historically contributed profoundly to the distribution of Ethiopia's population, both through voluntary migration and government responses to emerging famine-induced political crises. A notorious example of latter came in 1978 in the form of relocations to poorly planned and hastily implemented agricultural villages, which later became known as the first process of villagization (Comenetz and

Caviedes 2002). In 1983, the practice was repeated, this time in the form of forcible resettlement from the highlands towards remote areas, in which violent encounters occurred between local communities and resettled families (Comenetz and Caviedes 2002). 1973 to 1984 was also the period when many people migrated from the densely populated northern regions of Ethiopia, where they faced extreme hardships and few opportunities, to the southwest where they could access arable lands. Here, the lack of enforcement of land resources protection laws created tensions (Tolessa et al. 2019). A combination of droughts in 1997-98 and border conflicts with Eritrea, led to another wave of rural migration towards cities (Comenetz and Caviedes 2002).

Internal displacement in Ethiopia has been rapidly increasing in recent years, with 3.6 million internally displaced people (IDP) recorded in 2021 (IDMC 2022). The main drivers of displacement are natural disasters (droughts, floods, landslides), famine, conflict and ethnic violence, as well as development-induced resettlements (IDMC 2022; Yigzaw and Abitew 2019). The scale of climate induced displacement is projected to increase further, with East Africa as a whole predicted to see an average of 10.1 million climate migrants by 2050 (World Bank 2018). Within these projections, the northern parts of Ethiopia's highlands are seen as a hotspot for climate out-migration, while the southeastern highlands will be an in-migration hotspot (World Bank 2018). The current drought has wrought devastating effects on pastoralists, which contributes to displacement of people as their livelihoods deteriorate (CGIAR-IGAD 2023). The adaptive capacities of pastoralists, who have traditionally relied on sharing mechanisms in times of crises, have eroded, as most have seen significant loss of their livestock and are increasingly reliant on food aid, particularly in the Somali, Oromia and Afar regions, leading many to relocate to IDP camps (IGAD-CGIAR 2023). As IDPs unexpectedly find themselves stripped of their means of survival, facing the breaking up of family and community support networks, they are extensively exposed and vulnerable to Ethiopia's natural hazards, long-standing ethnic conflicts, climate impacts, land issues and resource competition, with access to limited infrastructure and social services (Yigzaw and Abitew 2019).

Intra-group conflicts among hosting communities and, to some extent, with refugees, can also be a significant determinant of the social impact of displacement, particularly in the Gambella, Benishangul-Gumuz, and Somali regions, where there are pre-existing tensions among various ethnic groups, as well as between residents treated as indigenous and those perceived to be migrants from the highlands (Vemuru et al. 2020). This corresponds with experiences shared in the workshop regarding mobility in the Somali region. It was observed that IDP camps emerged around water spots, first through the movement of the rural population who had lost their livelihood due to droughts, gaining momentum later through the institutionalization of camps by government aid agencies (IGAD-CGIAR 2023). Initially, locally displaced Somalis were welcomed in the village. However, as migrants started arriving from other regions and the IDP camps began to expand, conflicts arose with the host communities, which already faced resource scarcities and poor social services. Also, during extended droughts, pastoralists and migrants from different districts of the Somali region tend to settle along road networks where help or aid from the government and NGOs is more accessible, leading to a growing number of informal settlements, creating challenges in providing education and health services, among others (IGAD-CGIAR 2023). The spontaneous mushrooming of these roadside settlements occupied by non-locals raises concern among local host communities, not least for the long-term implications for their land (IGAD-CGIAR 2023).

More gradual trends of migration due to growing levels of poverty, malnutrition and the lack of opportunities are also feeding rural-urban movement in Ethiopia (Atnafu et al. 2016). Official policies aim to keep the rates low, as migration that is not government organised is often framed as a challenge that needs to be controlled, for example, through maintaining land tenure policies that prohibit landowners to sell, exchange or mortgage their land (Atnafu et al. 2016). However, Ethiopia is still experiencing rapid urbanisation and demographic transition, with the urban labour force expected to reach 82 million by 2030 (Alemayehu 2019). Urban services, providing sewerage, waste management, roads and water, fail to keep up with this trend (Alemayehu 2019). While trying to escape rural poverty, many migrants report that they continue to remain poor. For example, job opportunities in construction are limited and dependent on specific areas and seasons (Atnafu et al. 2016). Many seek to settle and integrate permanently in urban areas, which overburdens existing community services, jobs, resources and economic livelihood opportunities, leading to tension with the host communities (Yigzaw and Abitew 2019). Urban unemployment rates are at 18 percent, increasing to 28 percent for people in the 20 to 24 years of age group (Lemma and Cochrane 2019). Disappointment and frustration are particularly high among job-seeking youth who are without meaningful prospects (ICG 2019). This can contribute to a general atmosphere of dissatisfaction with the authorities and an increase in conflict (Yishak 2019).

PATHWAY #2: Resource Access and Availability

Climate variability and extreme events are putting pressure on Ethiopia's natural resources of land and water. This is leading to an increase in conflict rooted in resource competition, particularly in border regions. These conflicts, particularly those around land, exacerbate ethnic violence between communities as they vie for territory and power within the context of ethnic federalism. Complicating matters further are conflicts arising between pastoralists and farmers over different land use options, including the transition towards large-scale farming and conservation programmes. These affect the availability and accessibility of pasture and water. Conflicts around water manifest at local, national and international levels. Such conflicts can concern issues related to access to water at boreholes, unequal distribution of water among industries and rural communities, as well as national water security among the riparian countries of the Nile River Basin.

Ethiopia is one of the countries most vulnerable to climate change due to its strong dependence on natural resources and rainfed agriculture (CIAT & BFS/USAID 2017). The increases in sea-surface temperatures in the Indian and Pacific Oceans have been linked to decreasing precipitation in Eastern Africa, which is augmenting the frequency and severity of droughts in the region (van Weezel 2019). In regular years, Ethiopia expects long rains between March and May and short rains between September and October, but as precipitation patterns have become more variable, the availability of water and pasture differs from season to season (Tesmesgen 2010). The lack of rainfall in certain years and the significant seasonal variabilities make many regions of Ethiopia highly vulnerable to extreme ecological stress brought about by scarcity (Flintan and Tamrat 2002). Natural resource-based conflicts occur mainly on issues around the availability of land or water, both of which shall be analysed more closely in this section.

In recent years, Ethiopia has seen a high incidence of ethnic violence between communities in different areas, including the Somali, Oromia, SNNPR (Southern Nations, Nationalities and Peoples'), Gambella, Afar and Benishangul-Gumuz regions, in which resource scarcity has been one of the root causes (Devonald et al. 2022). The southern and eastern borders of Ethiopia in particular are seeing reoccurring competition over scarce resources between transboundary pastoralist groups, and are currently a hotspot for such conflicts (Flintan and Tamrat 2002; CGIAR-IGAD 2023). Conflicts between pastoralist groups over the control of grazing lands and water increase particularly during droughts and due to insufficient rainfall (NUPI / SIPRI 2022; Devonald et al. 2022; Flintan and Tamrat 2002). Conversely, Regional studies of Ethiopia, Kenya and the Karamoja cluster have shown only moderate effects of lower precipitation levels towards more reported conflict events (van Weezel 2019) but point to a correlation between vegetation and incidents of organized raids (Meier et al. 2007).

> *"Where there is climate change there is resource conflict. Some regions have resources and some regions which experience, for example, droughts or other climatic impacts will move to the areas where resources are. As clans are moving into other clans' areas, it is leading to clan conflict."*
> (IGAD-CGIAR Workshop participant 2023)

To successfully inhabit the arid and semi-arid areas, pastoralists need access to coping mechanisms to overcome the natural problems connected to aridity, scarcity of resources and reoccurring periods of stress induced by drought or flood disasters (Debebe 2016). During dry periods, when access and availability of water and pasture becomes a serious problem, and livestock become increasingly susceptible to diseases due to their physical weakness, pastoralists split their herds and families and move to different locations in order to diversify their risk (Chinasho et al. 2017). Mobility enables pastoralists to make wise use of limited pasture, allowing them to carefully manage and conserve rangelands (Debebe 2016). Any transformation of the pastoralist nomadic system and away from shifting cultivation to a sedentary market-based way of life undermines adaptive capacities arising from movement between high and low-grazing lands to cope with drought as well as erratic rainfall (Milman and Arsano 2013). Climate change largely affects communities by extending the necessary level of mobility far beyond their traditional routes, impacting the livelihood and health of pastoralists and their livestock (IGAD-CGIAR 2023; Lumborg et al. 2021). Using territorial expansion and herd mobility as coping mechanisms to reduce drought-induced resource scarcity is thereby leading to increasing competition with other agro-pastoralist groups, especially as migrating to more distant grazing areas during prolonged dry periods increases risks of resource-based ethnic conflict (Gebeyehu et al. 2021; Lumborg et al. 2021). Reoccurring droughts have accelerated the erosion of reciprocal grazing rights and decreased herd mobility, induced by the individualisation of resource tenure and introduction of intensive patterns of livestock production (Hagman et al. 2008). The combination of more people with more animals competing for the use of shrinking pastures and water sources produces conflict (Debebe 2016). Conflicts between pastoralists are also shaped by the different needs of herd animals, such as cattle, camels, sheep and goats (IGAD-CGIAR 2023).

Ethiopia has abundant water sources theoretically allowing for sufficient supply; however, great spatial and temporal variability challenges the management of supply and equitable distribution (Flintan and Tamrat 2002). Local conflicts, particularly in pastoral areas, tend to overlap geographically with water supplies (Flintan and Tamrat 2002). Water points in the form of ponds, wells or boreholes are crucial

for both farming and pastoral communities to sustain their livelihood especially during dry spells. However, the functionality of rural water services are not always well maintained and decrease with the prevalence of conflict. Without local ownership, access to safe drinking water supplies diminishes (Gurmessa and Mekuriaw 2019). Many households therefore depend for their needs on unprotected water sources such as rivers, lakes, springs and traditional wells (Chinasho et al. 2017). Deep wells are a popular source of water for pastoralists during the dry season, but access is often administered by well-owning clans who do not tolerate use of these resources without prior consultation (Temesgen 2010). With persistent droughts and environmental degradation, access to these deep wells and their surrounding grazing areas are the focus of tensions (Temesgen 2010). Irrigation has often been developed along banks of rivers in areas traditionally used by pastoralists, thus limiting their access to water supplies and pasture in the dry season (Flintan and Tamrat 2002). In this manner, the expansion of agricultural production has increased pressure and competition over resources (Flintan and Tamrat 2002). Resource-based conflicts around land are compounded by land tenure policies favouring the private acquisition of land and market-led paths of development over communal use of land, which causes resource depletion for pastoralists after the annexation of crucial grazing land (Mohamed 2018; Temesgen 2010). This is disrupting well-established 'open access' regimes which manage resources through intricate mechanisms based on procedural rules where access to water and pasture are negotiated through traditional governance structures, which are also important for conflict resolution and strengthening adaptive capacities (Tadie and Fischer 2017). Competition between different land-use options are a major issue especially in the highlands of Ethiopia, where increasing demand for crop and livestock production are colliding (Mekuria et al. 2018). Patterns of land use have significantly changed in the last 40 years with a rapid reduction of wetlands, grasslands and shrublands while settlements, cultivated land and large-scale commercial farms have greatly increased (Tolessa et al. 2019). Overall, the formalised property rights introduced by the state across pastoral lands and policies of large-scale land leasing have exacerbated issues of access and control of the land, often leading to conflicts (NUPI and SIPRI 2022).

Most pastoralists live in the peripheries of Ethiopia, in areas that were neglected by government for a long time and are less economically and socially integrated into the country, and where development efforts have often not considered the needs of the communities (Flintan and Tamrat 2002). The intent of decentralisation under the federal system was to prevent ethnic conflicts and encourage local and regional participation in decision-making, as well as widen regional access to state resources to ensure political stability (Flintan and Tamrat 2002). However, pastoral conflict must also be understood in the context of the historical expansion of the Ethiopian state from the highlands to more remote parts in the peripheral lowlands, and the agenda of ethnic federalism and other policies intended to foster sedentary lifestyles based on more permanent boundaries (Hagman et al. 2008). Despite its name, ethnic federalism is centred on territory not people, and included a highly conflictual process of matching ethno-linguistic groups with permanent territory, which contradicts the reliance of pastoralists on mobility and transient resource tenure, and did not consider the historic flexibility of group identities (Hagman et al. 2008). Agenda of communal property, together with the breakdown of customary institutions, have led to de facto open access tenure regimes that promote violent confrontations between multiple claims, letting groups with higher bargaining power capture strategic resources by force (Hagman et al. 2008). Ethnic federalism thereby heightened competition between indigenous groups over the use and control of land and water resources (Milman and Arsano

2013). The workshop further validated these findings, raising the need for communal management of borders between and within Ethiopian regions to prevent the escalation of grievances (IGAD-CGIAR 2023).

Resource Access and Availability in South Omo Zone, SNNPR

The South Omo Zone is an administrative unit of the Southern Nations, Nationalities and Peoples' Region (SNNPR) bordering Kenya and South Sudan and home to 56 ethnic groups (Debebe 2016). The diverse ethnic agro-pastoralist societies in South Omo were well adapted to the fragile semiarid environment of the lowlands but are now highly impacted by fundamental climatic and socio-political changes (Troeger 2021). The region is highly exposed to changing climatic patterns due to the considerably shortened belg rainy season and characterized by inter-ethnic conflicts of different nature (Troeger 2021; Debebe 2016). Conflict over unsettled boundaries, claims over pasture, cattle raiding, coupled with historical grievances and retaliatory killings, shape the relations of neighbouring ethnic groups such as the Dasenech, Nyangatom, Hamer, as well as the Borana and Turkana on the Kenyan side (Debebe 2016). Natural resource conflicts have taken on an international dimension as pastoralists are crossing borders deep into neighbouring countries in their quest for pasture and water (Temesgen 2010). Bordering communities between Kenya and Ethiopia are in a complex relationship of collaboration and conflict, migrating for wet-season grazing to Kenya when surface water sources are still available and for dry-season grazing to the Ethiopian highlands, which are generally wetter and have reliable deep wells (Temesgen 2010). Areas such as the Ilemi Triangle´s vast pastureland are constantly disputed between indigenous pastoral groups from Ethiopia, Kenya and South Sudan (Gebeyehu et al. 2021).

In South Omo, particularly during extended dry seasons, clashes over grazing land and water increase between rivalling Dasenech and Nyangatom people (Debebe 2016). Migration of Nyangatom pastoralists towards their dry season grazing areas needs to be carefully planned as practically all their movements towards the peripheries in search of water and grazing are characterized by rival acts and counter actions (Debebe 2016). Large-scale commercial farms and mineral and petroleum exploration further increased the pressure on pastoral production systems (Debebe 2016). Alternative livelihood strategies to withstand the pressure on pastoralism can have further detrimental effects on the occurrence of suffering and conflict. Some Dasenech have slowly transitioned their livelihood from herding to flood recession agriculture and fishing along the Omo riverine zone and Lake Turkana (Carr 2017). Flood recession agriculture in the region is, however, affected by deficient flooding and the presence of large irrigated commercial farms. Meanwhile, fisherfolk in the northernmost portion of Lake Turkana are in violent conflict over access to fisheries with Kenyan Turkana pastoralists, who have gone through a similar livelihood transition towards fishing (Carr 2017).

Resource Access and Availability in Awash River Basin, Afar

The Awash River Basin, located in the central rift valley of Ethiopia, stretches mainly through the Afar region. The Afar are the largest pastoral group in the region and traditionally have practiced transhumance migration between dry and wet season pasture in a radius of about 50 kms (Flintan and Tamrat 2002). However, expanding agricultural production along the river banks has restricted their movements as well as those of other pastoralists like the Somali Issa, bringing the groups into closer vicinity (Flintan and Tamrat 2002). Large-scale water schemes were constructed in the 1950s

to increase power generation, expand agricultural production and supply water to towns (Flintan and Tamrat 2002). However, the construction did not consider local needs and uses of key water resources (Flintan and Tamrat 2002). Inequality in the availability of water resources is increasing between private industries, which has a sophisticated infrastructure of boreholes and water treatment technologies, and local communities, who rely on government-provided water supplies that lack power and supply poor quality water (Grasham et al. 2022). In the Awash River Basin, rural communities experience severe production losses in agriculture and an inability to fulfil their needs due to exposure to floods, droughts and a chronic scarcity of water, whereas their vulnerable physical location is necessary for proximity to water resources (Grasham et al. 2022). In the context of population growth, challenging trade-offs in water security resulting from urbanization and climate change show the need to consider equity, risk and values, otherwise the poor will continue to be marginalized and suffer grievances (Grasham et al. 2022).

Resource Access and Availability in Somali Region

The Somali region in the east of Ethiopia has an arid climate with low rainfall, high temperatures and insufficient infrastructure, posing major challenges to the region's predominantly pastoralist population (IOM 2020). It is one of the regions most affected by the current drought, which has already caused the deaths of over one million livestock (IGAD-CGIAR 2023). Water resources within ponds, dams and boreholes in the Somali region have significantly declined due to low precipitation, further contributing towards pastoralist conflicts (IGAD-CGIAR 2023). Communal conflicts and clashes between and among farmers and pastoralists such as between the Issa Somali and the Afar tend to be more frequent and of higher intensity when precipitation declines in the long rainy season (van Weezel 2019; Markakis 2015). The scarcity of resources associated with hostilities in the region is aggravated by the growing population and numbers of livestock, which have not been matched by an equal expansion of social services and are being further compounded by an influx of refugees (Mohamed 2018).

Conflicts rooted in traditional cattle raiding and resource competition have transformed into frontier conflicts where the boundaries between administrative regions are contested (Markakis 2015; Mohamed 2018). The Ethiopian federal system has given greater autonomy to ethnic communities but, especially in areas aggravated by droughts, this contributes to conflict over the uses and allocations of pastureland and water resources between ethnic groups, such as in the border regions of Somali–Oromo and Somali–Afar (Mohamed 2018). Historic claims over pastures and water reignited after administrative decentralization in the early 1990s, when pastoralists aimed to expand their district boundaries and claim sole possession of disputed resources (Hagman et al. 2008). While inter-ethnic resource conflicts also existed before, they mostly involved individual clan lineages and not entire ethnic groups (Hagman et al. 2008). To the competition over scarce natural resources, new elements of conflict have been added over sources of revenue and control of markets (Hagman et al. 2018; Markakis 2015). Furthermore, the fragility of the region and the shared ethnic identity pose threats of infiltration of Al-Shabaab through its porous and ill-defined border with Somalia (Yishak 2019).

Resource Access and Availability in the Nile River Basin

The River Nile has long been a source of divergent national interest between its riparian countries both downstream and upstream, but it also forms an opportunity for integrative and cooperative management and use (Whittington 2014; Flintan and Tamrat 2002). Egypt has historically been the dominant user of Nile water and views changes in the allocation of Nile water as a matter of national security (Whittington 2014; Flintan and Tamrat 2002). Ethiopia has more recently followed up their own claim with construction of the Grand Ethiopian Renaissance Dam (GERD). Located close to the Sudanese border, the project is designed to harness the vast water potential of the Blue Nile to generate significant amounts of electricity through hydropower (Whittington 2014; Mohammad 2020). Ethiopia has been open to dialogue to appease worries of the Egyptians and to ensure an adequate flow of Nile water when filling the massive reservoirs of GERD (Bebe 1995; ICG 2019). Climate change, however, has the potential to further aggravate tensions between the Nile Basin countries. Rising temperatures are expected to increase evaporation and evapotranspiration by 9 percent by 2050, severely affecting water supplies in the Nile´s headwaters (Mohammad 2020). Meanwhile, highly unpredictable precipitation patterns and increasing dryness in both short- and long-term trends along the eastern border of Ethiopia may further exacerbate water conflict within transboundary river systems (Temam et al. 2019; Mohammad 2020).

Resource Access and Availability within the Transformation Agenda

Ethiopia has long recognized the threats that climate change poses towards livelihoods and has initiated a transformation process, including the development of the Green Economy Strategy, the National Programme of Action (NAPA), and the National Action Plan (NAP), among others (FDRE 2007; FDRE 2011; FDRE 2019). The Green Legacy Initiative, launched in 2019, demonstrates Ethiopia's commitment to a comprehensive response to the negative effects of climate change and environmental degradation (Beyene and Shumetie 2023). Climate mitigation is essential at a global scale to address climate change, also in Ethiopia, where only one tenth of the natural forest cover from the early 20th century still exists (Brown et al. 2011; Hailu et al. 2015). Although Ethiopia's contribution to global greenhouse gas (GHG) emissions stands at only 0.04 percent, it has remained committed to the UNFCCC and its Paris Agreement. Ethiopia's 2021 updated nationally determined contribution (NDC) and Climate Resilient Green Economy Strategy commit to reducing GHG emissions by 68.8 percent compared to business-as-usual projections by 2030, subject to international support in terms of capacity, technology transfers and climate finance. Ethiopia's Updated NDC 2021 includes 40 prioritized adaptation actions anchored on its NAP Framework as well as its 10-year national development plan (FDRE 2021).

However, transformative approaches, be they under adaptation agendas or mitigation projects, need to be carefully implemented in a conflict-sensitive manner to avoid generating local grievances and violence. Development activities that aim to increase climate adaptation have been found to contribute to resource conflicts in South Omo (Troeger 2021). Established committees failed to provide communities with the opportunity to articulate their own needs, leading to the promotion of rangeland enclosures that result in private land ownership. This excluded members from participating in the advantages of protected grazing areas, contributing to existing violence and grievances (Troeger 2021). Ethiopia's shift towards a green economy has introduced programmes to conserve forests while providing different cooperative approaches to generate financial benefits for the local

population (Kemerink-Seyoum et al. 2018). However, regardless of their organizational structure, these neo-institutional projects for the sustainable management of forest resources have demonstrated instances of elite capture, land grabbing and de facto exclusion of a previously shared resource. These have given rise to conflicts and the emergence of organized gangs, comprised of mainly excluded youth, engaging in illegal timber activities (Kemerink-Seyoum et al. 2018).

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About CGIAR FOCUS Climate Security

CGIAR aims to address gaps in knowledge about climate change and food security for peace and security policies and operations through a unique multidisciplinary approach. Our main objective is to align evidence from the realms of climate, land, and food systems science with peacebuilding efforts already underway that address conflict through evidence-based environmental, political, and socio-economic solutions.