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How does climate exacerbate root causes of conflict in Ethiopia?

An impact pathway analysis

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

1. Resource Access and Availability: Climate variability and extreme events are depleting Ethiopia's land and water resources, exacerbating resource-based conflicts. Resource conflicts over land are often the basis for ethnic violence between communities competing for territory and power in the Ethiopian federal system. Intertwined with resource conflicts between pastoralists and farmers are policy decisions about different land use options and the shift to large-scale agriculture and conservation programs. Resource conflicts over water are found at the local, national, and regional levels, in access to borehole water, in the unequal distribution of water between industry and rural communities, and in water security among the riparian states of the Nile.

2. Livelihood and Food Security: Most of Ethiopia's land is vulnerable to climate extremes that affect food availability. Local food insecurity hotspots in Tigray, Somali, and Afar correlate with higher conflict frequency, making them vulnerable to climate security risks. Vulnerability to climate and conflict risks also differs by gender and age, while pastoralist livelihoods are particularly affected by the combined pressures of climate impacts and political marginalization. Natural disasters and biophysical changes have led to displacement of people, which is reflected in the large number of internally displaced people due to conflict and leads to further tensions with host communities in the areas to which they retreat.

This publication is part of a factsheet series reporting on the findings of the CGIAR FOCUS Climate Security Observatory work in Africa (Kenya, Mali, Nigeria, Senegal, Sudan, Uganda, Zimbabwe). The research is centered around 5 questions*:

1 How does climate exacerbate root causes of conflict?

Impact pathways

[Kenya](#) [Mali](#) [Nigeria](#) [Senegal](#) [Sudan](#) [Uganda](#) [Zimbabwe](#)

Econometric analysis

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[Scopus analysis**](#)

2 Where are the climate insecurities hotspots?

Spatial analysis

[Kenya](#) [Mali](#) [Nigeria](#) [Senegal](#) [Sudan](#) [Uganda](#) [Zimbabwe](#)

3 What is the underlying structure of the climate, conflict, and socio-economic system?

Network analysis

[Kenya](#) [Mali](#) [Nigeria](#) [Senegal](#) [Sudan](#) [Uganda](#) [Zimbabwe](#)

4 Are climate and security policies coherent and integrated?

[Policy coherence analysis](#)

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.

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PATHWAY#1:

Resource Access and Availability

Climate variability and extreme events are depleting Ethiopia's land and water resources, exacerbating resource-based conflicts. Resource conflicts over land are often the basis for ethnic violence between communities competing for territory and power in the Ethiopian federal system. Intertwined with resource conflicts between pastoralists and farmers are policy decisions about different land use options and the shift to large-scale agriculture and conservation programs. Resource conflicts over water are found at the local, national, and regional levels, in access to borehole water, in the unequal distribution of water between industry and rural communities, and in water security among the riparian states of the Nile.

PATHWAY#2:

Livelihood and Food Security

Most of Ethiopia's land is vulnerable to climate extremes that affect food availability. Local food insecurity hotspots in Tigray, Somali, and Afar correlate with higher conflict frequency, making them vulnerable to climate security risks. Vulnerability to climate and conflict risks also differs by gender and age, while pastoralist livelihoods are particularly affected by the combined pressures of climate impacts and political marginalization. Natural disasters and biophysical changes have led to displacement of people, which is reflected in the large number of internally displaced people due to conflict and leads to further tensions with host communities in the areas to which they retreat.

1. CONTEXT

Climate Profile

Ethiopia is characterized by its climate and topographic heterogeneity. The climate varies from semi-arid desert conditions in the northeast, east, and southeast of the country to high rainfall and high humidity in the equatorial rainforests in the south and southeast of the country (UNFCCC 2015). It has a high degree of inter-annual variability characterized by three rainy seasons: June-September (Kiremt), October-January (Bega), and February-May (Belg), with the first accounting for 50 to 80 percent of total annual rainfall (UNFCCC 2015). Mean average temperatures range from above 25 degrees in the lowlands to below 15 degrees in the highlands (UNFCCC 2015). Since 1960, there has been an increasing trend in average temperatures and the number of hot days, indicating an increase of 1°C on average, particularly from July to September, and 20 percent, respectively (WBG 2021). Annual trends in total precipitation also show that spring and summer precipitation has decreased by up to 20% in areas in southern and central Ethiopia (UNFCCC 2015).

Future projections of precipitation and temperature patterns in Ethiopia remain highly uncertain (FDRE 2011). Climate projections indicate a temperature increase of between 1.5 and 3 °C by 2050 (UNFCCC 2015). Precipitation is even more uncertain to increase or decrease, with projections ranging from a 30 percent increase to a decrease of up to 25 percent (FDRE 2011). Overall, precipitation projections indicate a substantial decrease in precipitation (-30 to -50 mm) in the eastern portions from the southeast to the northeast, with the southern regions experiencing the largest decreases of -100 to -50 mm (UNFCCC 2015). A decrease in rainfall of more than 150 mm per year in Belg and Kiremt is expected to have a major impact on the southern and western regions of Somali and Oromia, which are characterized by being the most densely populated and largest cereal producing regions in Ethiopia (UNFCCC 2015).

Conflict and Fragility

Never colonized and ruled by various emperors until 1974, Ethiopia is considered one of the oldest countries in the world (UCDP 2022). Ethiopia's population is diverse and consists of more than 70 ethnolinguistic groups, many of which have a long history of separatist sentiments (UCDP 2022). The country has a long history of interethnic tensions and conflicts, often within and between different pastoralist communities and farmers over land ownership (UCDP 2022; Lavers 2018).

Replaced by a pro-Soviet Marxist-Leninist military junta known as the Derg, the last emperor, Haile Sellasie, was overthrown in 1974 (UCDP 2022). Numerous opposition groups-including the Western Somali Liberation Front, the Oromo Liberation Front, the Eritrean People's Liberation Front, and the Tigrayan People's Liberation Front (TPLF)-joined forces to coordinate their military efforts and organize government offensives to overthrow the junta regime (Fullerton Joireman 1997). Following the mismanagement of the 1984-5 famine and the increasing international credibility of the Derg due to its efficiency in handling aid funds, the autocratic ruler Mengistu fled to Zimbabwe on May 21, 1991 (Fullerton Joireman 1997; ICG 2009). From 1976 to 1991, Ethiopia was in a state of internal conflict that culminated in new rule by the Ethiopian People's Revolutionary Democratic Front (EPRDF), dominated mainly by the TPLF and heavily influenced by ethnic-based opposition parties and a

decentralized constitution with a commitment to federalism (ICG 2009; UCDP 2022). Over the past two decades, federal and regional elections have been followed by outbreaks of protests, escalation of ethnic violence, and state repression (ICG 2019). The TPLF's dominance in government was lost in 2019 when a state of emergency was declared following the resignation of Hailemariam Desalegn amid intercommunal tensions, and Abiy Ahmed, an Oromo politician, became chairman of the EPRDF and Ethiopia's new prime minister, forming a new cabinet with representatives of various ethnic groups in parliament (ICG 2019; UCDP 2022).

Intercommunal violence has increased significantly since November 2020 due to a dispute between the Federation and Tigray leaders that escalated into a war in the northern Tigray region (ICG 2022a). Following African Union-sponsored peace negotiations, both parties signed the Pretoria Deal on November 2, 2022, initiating a reconciliation process focused on facilitating the delivery of humanitarian aid and protecting civilians (ICG 2022b; UNICEF 2022).

Socio-Economic Profile

Located in East Africa, Ethiopia is the oldest and second most populous country in sub-Saharan Africa (UNFCCC 2015). Production in the primary agricultural sector is central to Ethiopia's economy, contributing to 46 per cent of the national GDP, 73 per cent of employment, and 90 per cent of total export earnings associated with the marketing of livestock products (e.g., hides, skins), coffee, and pulses and seeds (CIAT and FSO/USAID 2017; CGIAR 2018). Agriculture is the most vulnerable sector to climate change impacts as it is predominantly dominated by smallholder farmers who rely on rain-fed agriculture and traditional technologies (CIAT & FSO/USAID 2017; CGIAR 2018); WBG 2011). Combined with declining soil fertility and lack of financial resources for technology adoption, increasing pressure on natural resources, mainly caused by a growing population, and rising food demand is one of the main challenges for the agricultural sector (CIAT & BFS/USAID 2018). Against this backdrop, population growth has worsened Ethiopia's land tenure system, characterized by state ownership of land, leading to increasing tenure insecurity and fragmentation of land ownership (FAO 2021a).

Although the unemployment rate remains low (3.4 per cent) and food consumption has improved in recent decades, poverty and food insecurity remain a problem, particularly in the lowlands, pastoral lands, and drought-prone highlands (FAO 2021a; WB 2021). The most recent data collection shows that 68.7 per cent of the total population in Ethiopia is multidimensionally poor (UNDP 2022). The prevalence of food insecurity across the country remains high (FAO, 2021b). Figures show that one in three children under the age of five is malnourished and that even in non-drought periods, up to 10 per cent of households are still food insecure and partially dependent on food assistance (FAO 2021b; FAO 2016; ODI 2015). Access to food remains limited, with 48 per cent of household budgets spent on food and only 14 per cent of roads paved (CIAT & FSO/USAID 2017). In 2022, prolonged droughts combined with cholera outbreaks significantly worsened household food security and the humanitarian situation, with 29.7 million people registered as needy and 4.51 million internally displaced (UNICEF 2022).

2. CLIMATE SECURITY PATHWAYS

In Ethiopia, high vulnerability to climate variability and extreme weather events exacerbates competition among communities for natural resources and adverse impacts on rural livelihoods, both of which contribute to violent conflict in the country. The link between climate and conflict is identified through two pathways: (I) resource access and availability and (II) livelihood and food security.

PATHWAY #1: Resource Access and Availability

Climate variability and extreme events are depleting Ethiopia's land and water resources, exacerbating resource-based conflicts. Resource conflicts over land are often the basis for ethnic violence between communities competing for territory and power in the Ethiopian federal system.

Ethiopia is one of the most vulnerable countries to climate change due to its high exposure to climate variability and extreme weather events and strong dependence on natural resources and rainfed agriculture (CIAT & FSO/USAID 2017). Rising sea surface temperatures in the Indian and Pacific Oceans have been linked to decreasing rainfall in East Africa, increasing the frequency and severity of droughts in the region (van Weezel 2019). Normally, Ethiopia expects long rains between March and May and short rains between September and October, and as rainfall patterns have become more variable, the availability of water and pasture varies from season to season (Temesgen 2010).

Conflicts over natural resources arise primarily in relation to the availability of land or water, both of which are analyzed in more detail below.

In recent years, Ethiopia has seen high rates of interethnic violence between communities in different regions, including Somali, Oromia, SNNPR (Southern Nations, Nationalities and People), Gambella, Afar, and Benishangul-Gumuz, with resource availability impacted by climate change (Devonald et al. 2022). While the Ethiopian federal system has given ethnic communities more regional autonomy, this has contributed increased conflicts over the use and sharing of pasture and water resources between ethnic groups, particularly in areas affected by drought, such as in the Somali - Oromo and Somali - Afar border regions (Mohamed 2018). In eastern Ethiopia, communal conflicts, and clashes with sedentary farmers and between pastoralist groups, such as between the Afar and the Ise Somali, tend to occur more frequently and with higher intensity when rainfall in the districts decreases during the long rainy season (van Weezel 2019; Markakis 2015). Resource scarcity, which increases hostilities in the region, is exacerbated by the increasing population and livestock, which is not matched by an equivalent expansion of social services and is exacerbated by the influx of refugees (Mohamed 2018). These conflicts, rooted in traditional cattle rustling and competition for resources, have morphed into border conflicts where boundaries between regions are contested (Markakis 2015; Mohamed 2018).

Resource conflicts over land are exacerbated by land use policies which favor the private acquisition of land and marked development pathways over communal use of land, leading to resource depletion for pastoralists after the annexation of important rangelands (Mohamed 2018; Temesgen 2010). This consequently disrupts the open access arrangements that manage resources through complicated mechanisms based on procedural rules where water and pasture are negotiated through traditional governance structures that are important for conflict resolution and adaptive capacity (Tadie and

Fischer 2017). Competition between different land use options is a major concern, especially in the highlands of Ethiopia, where increasing demand for crop and livestock production collide (Mekuria et al. 2018). Land use has changed significantly over the past 40 years, with wetlands, grasslands, and scrublands rapidly having declined, and settlements, croplands, and large-scale commercial farms having increased many times over (Tolessa et al. 2019). Ethnic federalism has intensified competition among indigenous groups for the use and control of land and water resources, while the federal government's goal of transforming pastoralism and shifting cultivation into a sedentary, market-oriented way of life undermines the adaptive capacity of movement between high and low rangelands to cope with drought and erratic rainfall (Milman and Arsano 2013).

Conflicts over natural resources have taken on an international dimension in the Horn of Africa, as pastoralists cross borders to neighboring countries in search of pasture and water (Temesgen 2010). Border communities between Kenya and Ethiopia are in a complex relationship of cooperation and conflict. They migrate to Kenya for grazing in the rainy season, when surface water sources are still available, and to the Ethiopian highlands for grazing in the dry season, which is generally wetter and has complex deep wells (Temesgen 2010). Areas such as the vast grazing lands of the Ilemi Triangle are constantly contested between indigenous pastoralist groups from Ethiopia, Kenya, and South Sudan (Gebeyehu et al. 2021). Furthermore, Somali competition with other ethnic groups in Ethiopia for resources fuels Somali nationalism, which is linked to aspirations for the creation of a Greater Somalia that would unite large areas of Somali-speaking populations in Somalia, Djibouti, Ethiopia, and Kenya (Mohamed 2018).

Climate change mitigation is essential at the global level to address climate change, including in Ethiopia, where only one-tenth of the natural forest cover remains from the early 20th century. However, approaches such as climate-financed forestry projects must be implemented in a conflict-sensitive manner to avoid local discontent and violence. Ethiopia's shift toward green economy policies has introduced programs such as the Bale Mountain REDD+ project and the Humbo CDM project to conserve forests while offering various cooperative approaches for the financial benefit of local communities (Kemerink-Seyoum et al. 2018). These neo-institutional sustainable forest resource management projects, regardless of their organizational form, have demonstrated forms of elite capture, land grabbing, and de facto exclusion of a previously shared resource, resulting in conflict and organized gangs of mainly excluded youth engaged in illegal timber trade (Kemerink-Seyoum et al. 2018).

Resource conflicts over water exist in Ethiopia at the local, national, and international levels. Local water points in the form of ponds, wells, or boreholes are critical for agricultural and pastoral communities to sustain their livelihoods, especially during dry periods. However, the viability of rural water supplies is not always maintained and declines with the frequency of conflict and without local ownership, limiting access to safe drinking water supplies (Gurmessa and Mekuriaw 2019). Many households, therefore, rely on unprotected water sources such as rivers, lakes, springs, and traditional wells to meet their needs (Chinasho et al 2017). Deep wells are a popular source of water for pastoralists during the dry season, and access is often managed by "clans of well owners" who do not tolerate trespassing on these resources without prior consultation with elders (Temesgen 2010). Prolonged droughts and environmental degradation are causing tensions in these deep wells and the surrounding rangelands (Temesgen 2010).

Nationally, inequality in the availability of water resources is increasing between the private sector, which has a more sophisticated infrastructure of boreholes and water treatment technologies, and rural and urban households, which rely on government water supplies that do not have the same capacity and provide poor quality water (Grasham et al. 2022). In the Awash River basin, rural communities experience severe losses in agricultural production and are unable to meet their needs due to floods, droughts, and chronic water shortages, while their geographic location is critical to their proximity to water resources and exposure to water-related hazards (Grasham et al. 2022). In the face of population growth, urbanization, and climate change, water trade-offs that do not explicitly address equity, risk, and value continue to marginalize the poor, leading to grievances (Grasham et al. 2022).

The Nile River has long been a source of conflict between downstream and upstream riparian states, with Egypt historically the dominant user of Nile water and Ethiopia more recently pursuing its own claim to water resources by building storage infrastructure to.... (Whittington 2014). The narrow gorges of the Blue Nile, which lend themselves well to dams construction, have been used to undermine Ethiopia's new economic power by building the Grand Ethiopian Renaissance Dam (GERD) near the Sudanese border, with the goal of becoming a major exporter of electricity through hydropower (Whittington 2014; Mohammad 2020). Climate change has further implications for regional security among Nile Basin countries. Rising temperatures are expected to increase evaporation and evapotranspiration by 9 per cent by 2050, severely affecting water supplies in the upper reaches of the Nile (Mohammad 2020). Reduced water supply to the Nile makes Egypt particularly alert to projects such as GERD, which pose a potential threat to the water supply downstream, making the Nile a hotspot for climate change and international water management (Mohammad 2020).

PATHWAY #2: Livelihood and Food Security

Ethiopia is highly exposed to the impacts of climate change and variability, with nearly 90 per cent of the country's land area vulnerable to severe or extreme climatic stresses (Pacillo et al. 2021). About 84 per cent of Ethiopia's population lives in rural areas and relies on agriculture and natural resources for their livelihoods, which is threatened by major droughts and floods that reduce agricultural productivity, limit food availability, and increase prices (Milman and Arsano 2013). During El Niño years, some parts of the country receive little rainfall in the summer, often leading to food security crises (Lewis 2017). Ethiopia's vulnerability to climate change impacts also stems from a lack of access to adaptive capacity in terms of components such as information sources, capital, and technology, while the impacts of climate change on rural livelihoods are visible through a decline in crop yields, declining livestock productivity, outbreaks of livestock and human diseases, reductions in water availability, and conflicts over competition for resources (Mihiretu et al. 2021). In addition to the impact of climate variability on food security, droughts and floods disrupt transportation and other infrastructures, leading to declined access to resources, loss of household assets, and a negative impact on the Ethiopian economy (Milman and Arsano 2013).

Extreme drought conditions, such as those experienced in July 2015 during the El Niño event, affect the health of barley, maize, millet, sorghum, and wheat crops (Qu and Hao 2018). The decline in crop production caused by these extreme climatic events exacerbates existing food insecurity stress and poses significant demographic, social, economic, physical, and psychological challenges

to households that rely on agriculture for their livelihoods (Gebre and Rahout 2021). Agricultural production affected by erratic rainfall and other shocks can increase crop yields in years of favourable weather and experience crop losses in years of severe drought (Mekuria et al. 2018). The variation in vulnerability to drought across regions of Ethiopia suggests that food availability is not the only driver of food security crises, as drought events are in many cases localized (most common in Tigray, Afar, and Somali), while national cereal production has been stable in the same years (Lewis 2017). Even when overall national food production is not affected, food insecurity occurs in regions that do not receive sufficient rainfall because they cannot access food in markets (Lewis 2017). Climate variability is a threat multiplier that amplifies existing socio-economic risks related to food security, leading to uncertainties related to multiple dimensions of poverty, inequality, agricultural productivity, conflict, and crisis vulnerability (Pacillo et al. 2021). In the local hotspots of Tigray, Afar, and Somali, persistent dry climate conditions are associated with moderate to severe conflict and various socio-economic vulnerabilities, making them particularly susceptible to climate security risks (Pacillo et al. 2021).

Exposure to climate change and conflict differs by gender and age. Women are more likely to be killed during climate-related hazards and to suffer from hunger after such events, while they are at increased risk of violence during climate-related conflict and displacement and are exposed to gender-based violence when collecting water or firewood (Devonald et al. 2022). Youth are particularly vulnerable to the impacts of climate change, as climate-related hazards interfere with services needed for their long-term development, while age barriers prevent them from voicing their concerns and ideas in social discourse (Devonald et al. 2022).

Pastoralists in Ethiopia face unique challenges in achieving and sustaining their livelihoods that decision-makers are sometimes unaware of because there are few mechanisms for local communities to share their knowledge (Chinasho et al. 2017). Pastoral systems have gone through cycles of coping and adapting to extreme weather conditions in semiarid areas over the centuries, but the fragility of their systems becomes evident during severe droughts when crop failures and massive livestock deaths lead to famine, as in the early 1970s and 1980s (Gebeyehu et al. 2021). During dry seasons, when access to water and availability of pasture is scarce, pastoralists divide their herds among different locations to diversify their risk, as their livestock become increasingly susceptible to disease due to their physical weakness (Chinasho et al. 2017). Territorial expansion and herd mobility are used as coping mechanisms to reduce drought-induced resource scarcity which leads to competition with other agropastoral groups, especially as migration to more distant grazing areas increases the risk of resource-based ethnic conflict during prolonged dry periods (Gebeyehu et al. 2021). Alternative livelihood strategies to withstand pastoral pressures may have further negative impacts on the occurrence of suffering and conflict, as in the case of the Dasanech pastoralists. The Dasanech, pressured by the ecological degradation of their rangelands in southwestern Ethiopia and political decisions to restrict their movement, have gradually shifted their livelihoods from pastoralism to flood-recession agriculture and fishing along the Omo River and Lake Turkana (Carr 2017). However, flood-recession agriculture in the region is affected by insufficient flooding and large irrigated commercial farms that displace local people, while fishermen, particularly in the northernmost part of Lake Turkana, are in violent conflict over fishing grounds with Turkana pastoralists from Kenya who have undergone a similar livelihood conversion to fishing (Carr 2017).

The number of internally displaced people in Ethiopia has increased rapidly in recent years, reaching 3.6 million in 2021. The main causes are natural disasters (e.g., droughts, floods, landslides, and famine), conflicts linked to communal violence, ethnic tensions, and civil war (IDMC 2022; Yigzaw and Abitew 2019). Biophysical changes have triggered the displacement of people from the northern part of Ethiopia with less favorable opportunities due to high population density and increasing land degradation following the droughts of 1973 and 1984 to the southwest to access farmland in their target area, where less rigorous enforcement of land resource protection laws has led to tensions (Tolessa et al. 2019). Being unexpectedly deprived of their means of survival and disconnected from their family and community support networks, IDPs are highly exposed and vulnerable to Ethiopia's natural and protracted ethnic conflicts, climate impacts, land issues, and resource competition in the presence of limited infrastructure and social services (Yigzaw and Abitew 2019). Particularly in urban areas, many seek to settle and reintegrate, leading to overburdening of existing community services, jobs, resources, and economic livelihood opportunities, as well as tensions with host communities (Yigzaw and Abitew 2019).

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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.