9. Nexus Between Climate Change and Pastoralist–Agro-Pastoralist Border Conflicts in Eastern Ethiopia: The Case of Babili Wereda of Fafan Zone in the Somali Regional State and Babile Wereda of East Hararghe Zone in Oromia Regional State

Ashenafi Mebratu Bahiru

Abstract

This study examines the nexus between recurrent droughts induced by climate change and pastoralist-agro-pastoralist border conflicts in eastern Ethiopia, focusing on Babile Wereda (Oromia Region) and Babili Wereda (Somali Region). Employing a cross-sectional mixed-methods design, primary data were gathered from 395 household heads via structured questionnaires and 21 key informant interviews across five drought-vulnerable kebeles, complemented by secondary sources and analyzed using SPSS for quantitative insights and thematic analysis for qualitative depth. Findings reveal intensified rainfall variability, with 100% of respondents reporting altered patterns delayed onsets, erratic distribution, and annual drought recurrence (56.5%)—leading to severe water and pasture shortages, 100% livestock access difficulties, and widespread herd losses. These stressors exacerbate inter-kebele tensions across regional boundaries, with 100% attributing heightened conflicts to resource competition, though 73.4% describe inter-community relations as "good" amid fragile cooperation. Livelihood disruptions, including 77.7% severe household income declines and gendered burdens on women for water fetching, amplify vulnerabilities, disrupting traditional mobility and social accords.The climate-conflict pathway operates indirectly through resource scarcity, administrative barriers, and socio-political marginalization,

aligning with climate-security and gendered conflict theories. Traditional elder-mediated resolutions persist but strain under drought frequency and militarization risks.Integrated interventions through community-based resource governance, cross-border cooperation, and gender-sensitive resilience-building are essential to mitigate escalatory dynamics and foster adaptive peace in these borderlands.

Keywords: Border Conflict, Climate Change, Drought, Pastoralism, Agro-pastoralism

1. Introduction

The Horn of Africa experiences significant impacts from climate change, especially through extreme weather events such as droughts and floods, which indirectly drive conflicts over natural resources. These climate effects amplify existing causes of intercommunal conflicts by worsening resource scarcity and disrupting traditional livelihoods. Due to climatic stress, communities, particularly pastoralists, modify their migration and land use patterns, which can result in trespassing and clashes over contested resources across borders. The relationship between climate change and conflict is indirect and multifaceted, involving multiple causal pathways. These include increased competition for scarce resources that leads to inter-group violence, altered pastoralist transhumance routes raising the chance of boundary disputes, climate-induced migration that fuels land grabbing, and livelihood shifts that heighten inter-community rivalry (Albert, 2024).

Pastoralism developed as a livelihood strategy to adapt to climate conditions. In Ethiopia, pastoralists and agro pastoralists make up about 13 percent of the population and traditionally move across nearly 60 percent of the land searching for pasture, water, and saltlicks to sustain their livestock. Ethiopian pastoralists face significant challenges that threaten their traditional ways. Pastoral leaders report that the loss of traditional territories and restrictions on movement imposed by administrative borders have weakened social coping strategies and complicated traditional dispute resolution mechanisms. Climate change-related patterns like more frequent droughts, floods, irregular rainfall,

and rising temperatures add further pressure. Ethiopia ranks among the African countries most at risk from climate hazards, largely due to its strong reliance on rain-dependent subsistence farming. Water scarcity affects many regions of Ethiopia, though its distribution varies greatly across the country, mirroring the uneven rainfall patterns. The arid and semi-arid zones in the south and east experience severe water stress and scarcity, with considerable variability from year to year and within each year. Intense competition for limited water resources among different users and purposes is especially severe in these dry areas (Stark et al, 2011).

The nexus between recurrent droughts and conflicts, particularly among pastoralist and agro-pastoralist communities in eastern Ethiopia, constitutes a complex interplay of environmental, social, and political factors. This research focuses on understanding how persistent drought conditions exacerbate resource scarcities, thereby fueling conflicts in borderland areas where communities navigate shared natural resources amidst fluctuating ecological and socio-economic conditions. The case study encompasses selected drought-affected kebeles in Babile and Babili Wereda of both the Oromia and Somali regions respectively, emphasizing the interconnectedness of these areas both geographically and socially.

Ethiopia is characterized by high climate variability, with recurrent droughts threatening the livelihoods of millions, especially in pastoral and agro-pastoral regions (Rift Valley Institute, 2022). These droughts are increasingly intensive and unpredictable due to climate change, which has heightened the frequency and severity of water and pasture shortages (Albert, 2024). The Somali and Oromia regions are among the most affected, where pastoralists rely heavily on mobile resources for their livelihoods (Rift Valley Institute, 2022).

Historical patterns reveal that droughts often escalate tensions in borderland communities, where access to dwindling resources becomes a source of conflict rather than cooperation (Mercy Corps, 2021). Conflict scenarios are compounded by factors such as land degradation, population pressure, and political marginalization, which further distort resource distribution (ACCORD, 2022). The intertwined nature of drought and conflict is particularly evident in areas like Babile Wereda, where border communities have long navigated complex resource-sharing arrangements that become

strained during drought episodes.

The relationship between climate variability and conflict has attracted scholarly attention over the last two decades, with various theoretical models highlighting different mechanisms. The climate-security nexus suggests that resource scarcity, driven by climate shocks like droughts, can result in competition, social unrest, and violence (Hsiang et al., 2013; Hsiang & Burke, 2014).

In the Horn of Africa, research demonstrates that environmental shocks destabilize pastoral communities' coping mechanisms, leading to increased vulnerabilities and violent confrontations over resources. Further, gendered dimensions of climate-induced conflict suggest that women and marginalized groups experience heightened risks during droughts, affecting social cohesion and conflict dynamics (Albert, 2024). Climate change tends to disproportionately impact marginalized communities, amplifying existing inequalities and fueling social and political tensions (Destrijcker et al, 2023). The gendered conflict theory emphasizes that drought-related conflicts are not solely about resource scarcity but also about the deeper social inequalities that influence access and control over vital resources.

Empirical research underscores that recurrent droughts are not isolated environmental phenomena but are intricately linked to conflict escalation in Ethiopia and neighboring countries. Studies reveal that drought episodes have historically triggered cross-border resource competition, leading to localized violence and displacement (Rift Valley Institute, 2022). In Somali Region, drought has compelled pastoralists to seek alternative livelihoods or migrate across borders, thereby heightening tensions with host communities and authorities (Destrijcker et al, 2023).

Addressing the complex nexus between droughts and conflicts requires integrated strategies that consider ecological, social, and political dimensions. Promoting community-based resource management, conflict resolution mechanisms, and resilient livelihood systems can mitigate the impact of recurrent droughts (ACCORD, 2022). International organizations and local governments must prioritize cross-border cooperation and conflict-sensitive drought response initiatives to foster resilience among vulnerable communities (Rift Valley Institute, 2022).

Furthermore, incorporating gender-sensitive approaches and empowering marginalized

groups can enhance social cohesion and adaptive capacity, helping communities better withstand environmental shocks (Albert, 2024). The research in these borderland communities highlights the need for context-specific interventions that recognize the social fabric and ecological realities of pastoralist-agro-pastoralist livelihoods in eastern Ethiopia.

2. METHODS

2.1 Study Area and Population

The study is situated in Babile and Babili Wereda, a district straddling two regional states in Eastern Ethiopia: Oromia Regional State's East Hararghe Zone and the Somali Regional State's Fafan Zone. This area lies within the agro-ecological zone characteristic of the Ethiopian lowlands, where recurrent drought and harsh climatic conditions are prevalent. The Babile Wereda in Oromia includes 21 kebeles, among which two drought-prone kebeles—Awsherif and Derera Arba—were purposively selected for this research based on their heightened vulnerability to drought and resource conflicts.

On the other hand, Babili Wereda in the Fafan Zone of Somali regional state comprises 17 kebeles noted for drought susceptibility and pastoralist livelihoods. For this study, three kebeles—Halo Biyo, Biqo, and Dendema—were selected due to their exposure to recurrent drought stress and their bordering proximity to the selected Oromia kebeles. These kebeles form a contiguous socio-geographic cluster where inter-regional interactions over resources are frequent, often escalating tensions between pastoralist and agro-pastoralist groups.

Livelihoods are highly susceptible to climate shocks, especially drought, which frequently results in livestock mortality, crop failure, and consequent food insecurity. Pastoralism remains the primary economic activity, supplemented by subsistence cultivation where feasible, especially during the wetter months (Mercy Corps, 2022). The dual dependency on pastoral and agro-pastoral systems under drought conditions creates complex dynamics of resource utilization and competition (Rift Valley Institute, 2022).

2-2 Research Design and Approach

This study adopted a cross-sectional research design to collect data from participants at a single point in time. Such a design is particularly useful for capturing a snapshot of prevailing conditions within a defined population, facilitating the exploration of relationships among variables without the need for longitudinal follow-up. As Creswell (2014) notes, the cross-sectional approach enables efficient data capture within a specific timeframe, allowing simultaneous examination of multiple variables. Moreover, this design is both cost-effective and less time-intensive than longitudinal studies, thereby suitable for research objectives requiring timely and resource-efficient data collection. The chosen design thus aligns with the research aim of identifying relationships and patterns within the study population through a one-time data collection process.

2-3 Data Types and Sources

To comprehensively address the study objectives, both primary and secondary data sources were utilized. Primary data were collected through questionnaires and interviews, serving as the principal source of information. Secondary data, drawn from relevant literature, published and unpublished reports, books, articles, and journals, were used to complement and substantiate the primary findings. Employing both qualitative and quantitative approaches ensured methodological triangulation, thereby enhancing the validity and reliability of the findings. The secondary data were analyzed through document review.

The primary data collection instrument was a structured questionnaire containing both closed- and open-ended items, designed to elicit a comprehensive range of responses. The survey was administered to 395 participants, achieving a full response rate. Prior to the main data collection phase, a pilot test involving 40 participants (10% of the total intended sample) was conducted to refine the questionnaire in terms of clarity, relevance, and accuracy. Additionally, key informant interviews were conducted with kebele and wereda administrators, as well as community elders from the selected kebeles in the two weredas. This method allowed the collection of diverse perspectives, facilitating a deeper understanding of the relationship between drought and conflict.

2-4 Sample Size and Sampling Methods

The target population comprised household heads residing in Dire Dawa city. The quantitative sample size was determined using Taro Yamane's (1967) formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where n represents the sample size, N is the total population, and e is the margin of error. Based on this formula, with a total population of 34,510 and a 5% margin of error, the resulting sample size was 395. Additionally, 21 key informants were selected for the qualitative component, producing a total sample of 416 participants. Survey respondents were proportionally distributed across the selected five kebeles in the two weredas based on the number of households in each.

A mixed sampling approach was employed, combining probability and non-probability techniques. Simple random sampling, a probability method, was used to select household respondents, ensuring representativeness. Purposive sampling, a non-probability technique, was applied to identify key informants with relevant knowledge and experience, aligning with the study's qualitative objectives. This hybrid approach ensured both depth and generalizability in the findings.

2-5 Data Analysis Methods

Quantitative data obtained from the questionnaires were first reviewed for completeness and consistency, then entered into SPSS version 24 for statistical analysis. Descriptive statistics including frequencies, percentages, and summary measures were employed to characterize the study population and describe patterns across key variables. The findings were presented in tables, charts, and graphs to enhance interpretability. Qualitative data from interviews were analyzed thematically, providing contextual depth to the quantitative results.

A pilot test involving 40 respondents from Gemechu Kebele in Babile Wereda, Oromia Region, was conducted to assess the reliability and validity of the instruments. This preliminary exercise helped

identify and eliminate ambiguities, thereby improving the precision of the tools. Throughout the research process, ethical considerations were strictly observed. Participants were treated respectfully, and confidentiality, anonymity, and safety were fully ensured.

3. Results and Discussions

3-1 Profile of the Respondents

As shown in table 1 below the profile of the respondents in the study reflects a diverse cross-section of communities in both Babili Wereda of Fafan Zone in Somali Region and Babile Wereda of East Hararghe Zone in Oromia Regional State. The majority of respondents fall within the age range of 36–50, accounting for 259 individuals out of the total sample, followed by those over 50 years (93 respondents), and a smaller proportion aged 18–35 (43 respondents). This age distribution suggests that most participants are mature adults likely to be well experienced with livelihood challenges and conflicts linked to recurrent droughts.

Participants were drawn from five kebeles, with Derera Arba and Dhendema each contributing 108 and 103 respondents respectively. Awsherif (89), Biqo (69), and Hallo Biyo (26) also feature as important localities in the data, with representation from both genders in each kebele.

Table 1: Profile of respondents

Variable	Category	Male	Female	Total
Age of Respondent	18-35	20	23	43
	36-50	153	106	259
	> 50	76	17	93
Kebele of Respondents	Awsherif	56	33	89
	Biqo	44	25	69
	Derera Arba	65	43	108

	Dhendema	68	35	103
	Hallo biyo	16	10	26
Respondents Livelihood	Pastoralist	101	53	154
	Agro-Pastoralist	148	93	241
Family Size	< 5 Member	24	21	45
	6-10 Member	225	125	350

(Source: Survey, 2025)

In terms of livelihood, agro-pastoralists form the largest group with 241 respondents (148 males and 93 females), while pastoralists account for 154 (101 males and 53 females). This balance highlights the dual livelihood system prevalent in the study area, crucial for understanding the dynamics between drought and conflict.

The family size data shows that most respondents come from households with 6–10 members (350 in total: 225 males and 125 females), and a smaller share from households with fewer than five members (45 in total: 24 males and 21 females). This indicates that larger families are common, which may influence both the vulnerability to drought and the potential for livelihood-based conflict. Overall, these respondent characteristics provide a solid demographic and social foundation for assessing the nexus between recurrent droughts and pastoralist–agro-pastoralist conflicts in eastern Ethiopia.

3-2 Recent Changes in the Rainfall Pattern in the Study Area

Recent changes in the rainfall pattern in Babili Wereda of the Fafan Zone (Somali Region) and Babile Wereda of East Hararghe Zone (Oromia Regional State) indicate significant variability and challenges. The area has experienced delayed onset of rains, poor rainfall distribution, and mixed rainfall performance with some areas receiving below-normal precipitation. Specifically, the 2025 rainy season saw delayed onset and poor distribution with many parts of Fafan Zone, including Babili Wereda, affected by rainfall deficits that worsened water shortages and pasture deterioration. Similarly, The Babile wereda in East Hararghe Zone is characterized by erratic rainfall with recurrent droughts,

exhibiting seasonal and annual meteorological droughts of varying severity. The frequency of drought events has increased over recent decades, intensifying stresses on natural habitats and livelihoods in these zones.

This finding complements with broader scientific evidence showing the intensification of rainfall variability and increased drought frequency in eastern Ethiopia due to climate change (Mengistu, 2024). The El Niño Southern Oscillation (ENSO) phenomena have contributed to the irregular and unstable rainfall patterns, causing delayed rainy seasons and droughts that severely affect agro-pastoralist livelihoods (Gitima & Mersha, 2020).

The survey data showing 100% of respondents reporting changes in rainfall patterns aligns with this broader climatic experience of variability and irregularity in rainfall, contributing to the nexus of recurrent drought and conflict in these pastoralist and agro-pastoralist communitiess.

Such unanimous local perception of changing rainfall patterns is consistent with findings among pastoral communities in Ethiopia, who report tangible impacts of climate variability on natural resource availability, livelihood stability, and social tensions (Tamire et al., 2025). Studies emphasize that pastoralists' local knowledge reliably reflects ongoing climate trends, where decreased rainfall reliability intensifies competition over dwindling resources, often escalating conflicts (Michael & Getachew, 2023).

The result of the study also pronounced shift in rainfall patterns and drought frequency in the Babili areas of Fafan Zone (Somali Region) and Babile wereda of East Hararghe Zone (Oromia Region). Over half of the respondents (56.5 percent) reported that drought now occurs every year, while the remaining 43.5 percent noted its recurrence every two years. This pattern strongly suggests that the traditional cyclical nature of rainfall—once marked by distinct wet and dry seasons—has become increasingly erratic and unreliable. The rise in annual drought occurrence points to a clear trend of rainfall reduction and increased variability, consistent with broader regional evidence of climate change impacts in eastern Ethiopia. Communities in these areas, pastoralists and agro-pastoralists, are experiencing shorter rainy seasons, delayed onset of rains, and extended dry spells, leading to recurrent water shortages, reduced pasture availability, and crop failures. The cumulative effect of these changes is heightened vulnerability and competition over dwindling natural resources, which often manifests in

livelihood stress and localized conflicts between resource-dependent groups.

The Babili Woreda official reported that only 4 of 17 kebeles currently have water access, with severe water scarcity affecting pasture and crops. The drought is worsening with declining groundwater and disrupted grazing cycles. The Halo Biyo Kebele official described recurrent droughts, water scarcity forcing long round-trip migrations (up to 6 hours), with devastating effects on education and livelihoods.

These findings corroborate empirical research in pastoral Ethiopian areas showing critical water shortages due to declining groundwater levels intensified by frequent droughts and over-extraction. Prolonged water insecurity has cascading effects, including disrupted grazing cycles and forced migration for water access, which negatively impact community structures such as education and livelihoods (Gebisa, 2023). The burden on women and children to travel long distances for water is a well-documented social consequence of climate-induced water scarcity in semi-arid regions (Musau, 2021; Rao, 2017).

A disaster risk management official from Babile wereda of Orimia region detailed Babile's arid to semi-arid environment, erratic rainfall, insufficient to support main crops (sorghum, maize, sesame), causing severe economic hardship, livestock deterioration, and forced migration.

Derera Arba Kebele Official described a late start of rains followed by erratic cessation causing massive crop failures, with over 75% yield reduction, dried ponds, and urgent water scarcity forcing women and children to travel long distances for water. This kebele faces one of the most severe drought and water challenges in the woreda. He said “"Rains arrived late and stopped abruptly. Over 100 hectares of crops never emerged, and those that did eventually died. Water ponds dried up. Our girls and women travel 12 hours round trip just to fetch water."

Awsherif Kebele reports three successive ploughing attempts due to erratic rains stopping prematurely, resulting in crop failures and community migration to neighboring Somali region areas in search of pasture and water. He added "The rainfall has become increasingly erratic. People ploughed three times, but each time the rain stopped early, leading to crop failures. Many are forced to cross into Somali kebeles to search for pasture and water."

Local elder testimonies and officials uniformly emphasize the increased frequency and severity

of drought episodes, shorter and less reliable rainy seasons, and the resulting livelihood disruptions.

3-3 Nature of Drought Circumstances in the Study Area

The findings shown in figure 1 below indicate that drought conditions in the study area have become a frequent occurrence over the past five years. A majority of respondents, accounting for 56 percent, reported experiencing drought every year, while 44 percent stated that drought occurs once every two years. This pattern suggests that drought has become a recurring and almost annual phenomenon in both Babile woredas of the Fafan (Somali) and East Hararghe (Oromia) zones. The high frequency of droughts reflects increasing climate variability and declining rainfall reliability across the region. Such recurrent droughts likely intensify competition over scarce pasture and water resources, heightening tensions between pastoralist and agro-pastoralist communities. Overall, the data imply a growing severity and persistence of drought conditions, with minimal recovery periods between episodes, posing serious implications for livelihoods and local peace dynamics.

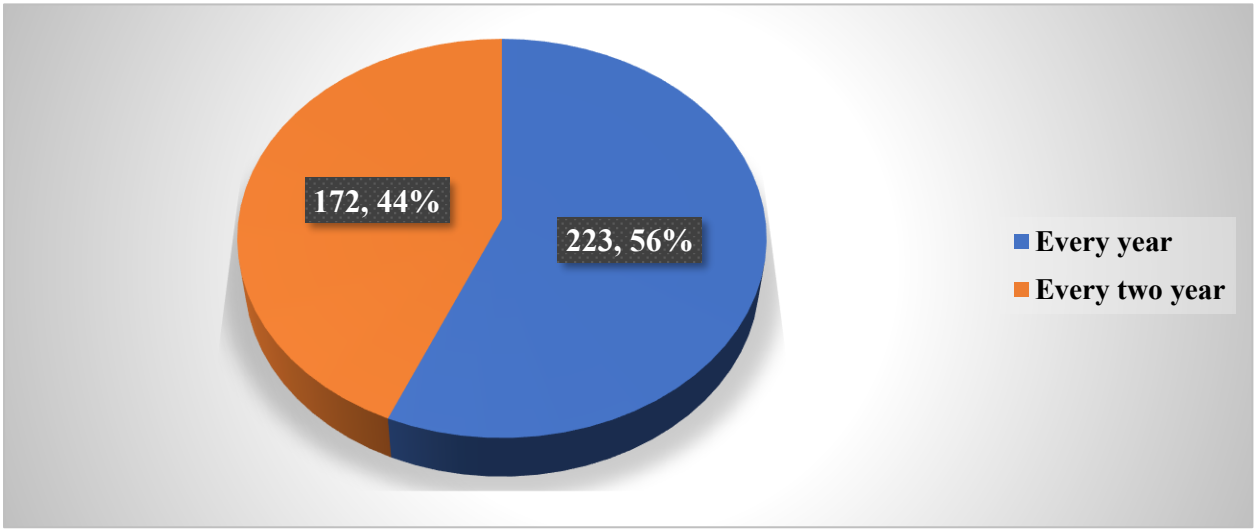

Figure 1: Drought prevalence frequency in the study area

(Source: Survey, 2025)

Interviewees consistently describe drought as a recurring, almost annual event that has intensified over recent years, confirming the survey data that 56.5% of respondents experience drought every year. For example, an official from Babile Wereda in Oromia emphasizes the severity of recent droughts:

"It has been almost two months since the last rain. Even the drought-resistant crops have suffered losses this year. The livelihood of the community, which mainly depends on agro-pastoralism, has been heavily affected".

Similarly, in Somali Region, the official of Babili Woreda reports that only four kebeles currently have water access, with many suffering from severe scarcity, leading to near-total crop failures and livestock losses. He states, *"The drought this year is very severe. The amount and distribution of rainfall were minimal, leading to no meaningful harvest"*.

These finding complements and is supported by recent studies in eastern Ethiopia and neighboring pastoral regions, which document an increasing frequency of droughts and climate variability leading to heightened environmental stress. Research in Ethiopia's Bale Zone found that pastoralists experienced consecutive years of severe drought, with a 4-year drought cycle becoming common, reflecting rising temperatures and declining rainfall reliability (Gabisa et al, 2023; Abdela, 2024). The recurrent droughts in these areas have led to crop failures, livestock deaths, and food insecurity, driving intensified competition for pasture and water, which subsequently increases conflict risks among pastoralist and agro-pastoralist communities (Abdela, 2024; Temesgen et al., 2010). This external evidence confirms the finding that drought has become an almost annual and severe stressor in the Fafan and East Hararghe zones, deepening vulnerabilities and conflict potential.

3-4 Impacts of drought on Pastoral and Agro Pastoral Communities

Over the past five years, recurrent droughts have had a severe and escalating effect on household income in both the pastoralist and agro-pastoralist communities of Babile Wereda, spanning the Fafan Zone in the Somali Region and the East Hararghe Zone in the Oromia Regional State. Based on your survey data, a vast majority of households (77.7%) reported that drought very severely affected their income, with only 22.3% indicating a moderate impact, and virtually none escaping income loss entirely. These results align sharply with broader empirical findings from the region. Studies confirm that

drought results in substantial water deficit, diminished agricultural productivity, and deeply entrenched poverty among rural agrarian communities. For example, Gebrehiwot and Van der Veen (2013) demonstrate that minor rainfall deficits can cause crop failures and severe food insecurity in drought-prone Ethiopian regions, a dynamic that directly undermines household income from farming activities. This finding complements the study's report of 77.7% of households experiencing very severe income losses due to drought, reinforcing the widespread and critical nature of drought's economic impacts in such settings.

Drought-induced shocks have consistently led to diminished agricultural productivity, extensive livestock losses, and a marked reduction in economic resilience. In practice, pastoralist households saw reductions in income of up to 35%—primarily due to livestock deaths, pasture degradation, and water scarcity—while crop farmers experienced a 25% drop in household income due to poor harvests and crop failures. These income losses forced households to adopt emergency-level coping strategies, such as selling assets, reducing food consumption, and reallocating labor away from agricultural activities towards off-farm or wage labor, often with limited opportunities for recovery. Research focusing on the Somali Region confirms that climate change and recurrent droughts have drastically lowered crop yields and reduced pastoralist grazing resources, intensifying food and livelihood insecurity (Moyo, 2024).

The compounding effects of drought include rising food prices, increased food scarcity, diminished access to basic services, and disruption of local economies. Many families, facing recurrent droughts, endure high rates of poverty as their income streams from farming and livestock are repeatedly undermined. Particularly in the Somali and Oromia regions, drought is further linked with social problems such as school dropout, internal migration, and even heightened resource-related conflicts, as livelihoods become increasingly precarious and competition over water and pasture intensifies. This is supported by studies highlighting the vulnerability of rain-fed agriculture and livestock-dependent livelihoods to climate variability, where prolonged dry spells critically diminish both crop and livestock productivity (Demem, 2023; Temesgen et al., 2010).

Therefore, the findings of this study and regional research confirm that drought exposure in these zones is not only widespread but increasingly severe, placing a heavy burden on rural households

and undermining their ability to recover economically, diversify income sources, and maintain basic welfare.

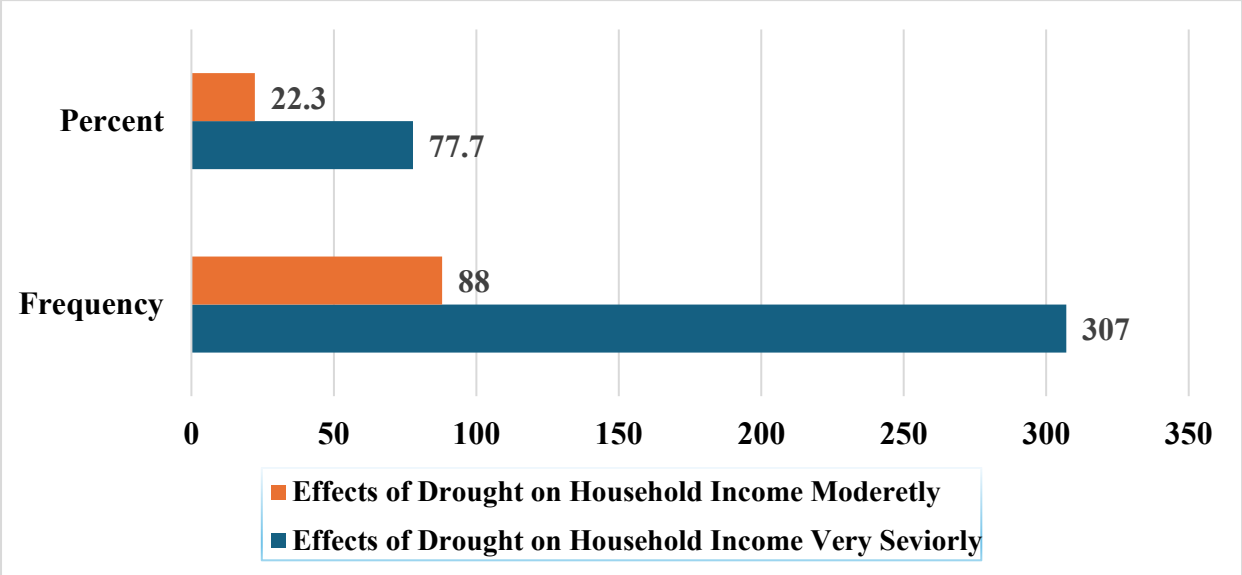

Figure 2: Effects of drought affecting household income

(Source: Survey, 2025)

Similarly, key informant from Babile wereda disaster risk management office of Oromia region said "*The drought has caused serious economic hardship. Many households are forced to migrate in search of alternative livelihoods such as charcoal production and firewood sales. Livestock conditions deteriorate severely due to pasture and water shortages, leading to poor market prices and a drastic decline in milk production. Psychological stress among community members is increasing as families struggle to sustain themselves*."

Another key informant from Derera Arba Kebele said;

> *"The drought's impact on food security is very severe. Over 100 hectares of crops died, and the yield reduction rate exceeded 75%. Many farmers moved to nearby Somali region areas engaged in laborious work like firewood and charcoal sales. The government support system is insufficient, with many expressing frustrations over superficial assistance amid their serious losses."*

Local elder key informant from Derera Arba Kebele also said "*The drought has devastated the local economy. Many livestock have died, and the few remaining ones are weak and fetch low prices at market. People increasingly rely on firewood and charcoal production for income, which sometimes results in conflicts over land. Water scarcity is critical; people travel long distances to fetch water, causing disruptions to education and health issues particularly affecting women and children.*"

According to Babili wereda official from Somali region many households migrate due to reduced pasture and water availability, further destabilizing livelihoods. He added "The drought has severely reduced our livestock; milk production has dropped, forcing us to sell our animals at low prices. We resort to firewood and charcoal sales to survive". Halo Biyo Kebele Official, Somali Region said that livelihood options are limited; the community depends almost entirely on livestock and small-scale farming. This year, there was no meaningful agricultural production due to recurrent drought. Water scarcity forces households to travel for hours to fetch water, disrupting education and daily life. Many migrate temporarily to charcoal and firewood sales to sustain their families." In addition, Biko Kebele Official from Somali Region felt that "There is severe hunger and water scarcity. People travel long distances to fetch water. Livestock diseases have increased, impacting economic productivity. Conflicts with neighboring Oromia kebeles occasionally arise during water and grazing search, adding further stress to household incomes."

As shown in figure 3 below the study found that drought has had a severe and far-reaching impact on the livelihoods and mobility of both pastoralist and agro-pastoralist communities in the study areas. All respondents (100 percent) reported experiencing difficulty in accessing water for livestock and crops, clearly indicating that water scarcity has become a persistent feature of drought episodes. The total lack of water accessibility has led to drying of traditional wells, ponds, and shallow groundwater, forcing households to travel long distances in search of water sources—often crossing administrative and regional boundaries.

Across multiple kebeles in Babile Wereda, Oromia, officials reported severe drought impacts on crop yields, consistent with survey data showing crop failures and reduction in agricultural productivity. For example, from Derera Arba Kebele (Oromia region), a kebele official explained the failure of long-

term crops like sorghum, maize, and groundnuts due to erratic and insufficient rainfall:

> *"The rain stopped abruptly and was erratic. About 127 hectares were not ploughed, and most crops failed to emerge or died at early stages. The yield reduction rate exceeded 75%" (Derera Arba Kebele Official, Oromia).*

Agricultural assistance such as fertilizers and improved seed varieties were distributed but largely unsuccessful, underscoring the severity of drought effects. Similarly, reports from Babili Wereda in Somali Region confirm nearly no meaningful agricultural harvest this year due to lack of rainfall. Similarly, every respondent (100 percent) identified shortage of pasture and grazing land as a major challenge during drought periods. This pattern suggests that recurrent droughts have degraded rangelands, reduced vegetation cover, and intensified competition over the remaining grazing areas. With natural pastures depleted, livestock face poor body condition, reduced productivity, and increased mortality.

The problem is further exacerbated by the reported dearth of livestock within the last twelve months, also cited by all respondents. This total consensus reflects a widespread loss of herds—an outcome that undermines household wealth, food security, and traditional coping mechanisms. In pastoral economies, livestock serve as both economic assets and social capital, so their loss directly translates into growing vulnerability and dependence on humanitarian aid.

Livestock conditions deteriorated due to lack of pasture and water; milk production dropped; market prices fell drastically. For instance, in Awsherif Kebele (Oromia), elders highlighted substantial livestock mortality due to drought and water scarcity, with people frequently crossing into Somali region kebeles seeking pasture and water. Another official from Babili Wereda mentioned the reduction of available pasture and the vulnerability of livestock to disease in diminished water and grazing conditions. The widespread death of livestock and diminished herd sizes have created acute livelihood vulnerabilities and increased reliance on humanitarian aid.

According to Awsherif Kebele Elder:

"Livestock deaths have increased drastically due to lack of water and feed. Families depend on cattle, goats, and sheep, but this drought has led to severe pasture shortages, forcing animals to roam long distances, weakening them before death." This confirms survey patterns indicating high livestock mortality and reduced productivity.

Accoding to Halo Biyo Kebele Official:

"Water scarcity is a recurring problem. Animals are weak and susceptible to disease. Milk output has dropped, affecting both nutrition and income. People move with their herds to distant areas but face conflict over scarce resources.

Furthermore, 98.7 percent of households reported facing movement restrictions across borders during drought-induced migrations. Such restrictions, often related to regional boundary controls, resource-based disputes, or insecurity, limit the mobility that traditionally allows pastoralists to adapt to climatic stress. This immobility aggravates the drought's effects by trapping communities in depleted and degraded environments.

Several interviewees from both regions emphasized long-distance travel to fetch water and pasture, reinforcing survey data that 100% of respondents reported movement restrictions and issues fetching water during drought. For example, women and children in Derera Arba Kebele reportedly travel from early morning until late afternoon (around 4 AM to 4 PM) to fetch water from distant sources, sometimes traveling 16-17 kilometers round trip, with significant social consequences including school absenteeism and health risks:

"Our girls and women begin their journey at 4 AM and return by 4 PM carrying water in donkeys, about 20 liters per jerrican, severely affecting education and health" (Derera Arba Kebele official, Oromia).

Photo taken by the researcher during the data collection period, showing a girl from Derera Arba Kebele who traveled more than 12 hours to collect water from Tullu Horo Kebele, another kebele located within Babile Wereda of the East Hararghe zone.

Movement across administrative and regional boundaries in search of water and pasture is common, sometimes causing tensions or conflict with neighboring communities, as confirmed by several respondents from both Somali and Oromia sides. Displacement and seasonal migration for labor (firewood collection, charcoal production) were also noted as coping mechanisms induced by drought pressures. Restrictions on movement due to regional boundaries and conflict have led to situations where pastoral mobility—the traditional adaptation strategy—is impeded, worsening vulnerability.

The finding of this study aligns with studies indicating that drought-induced resource scarcity leads to livelihood diversification, increased migration, and economic distress among pastoral communities (Gizaw et al., 2024). Specifically, the reported declines in livestock productivity, milk production, and psychological stress are supported by findings that drought significantly undermines pastoral resilience and household well-being (Abdela, 2024). This complements findings that drought exacerbated food insecurity and livelihood vulnerabilities in Ethiopia, particularly in the Oromia and Somali regions, where charcoal and firewood sales have become common coping strategies (Belay et

al., 2025). Such livelihood shifts increase pressure on natural resources and affect community cohesion. Overall, the finding of this study demonstrate that recurrent droughts in the study areas have systematically eroded the key pillars of pastoral and agro-pastoral resilience—water, pasture, livestock assets, and mobility—thereby deepening livelihood insecurity and contributing to growing tensions over scarce resources.

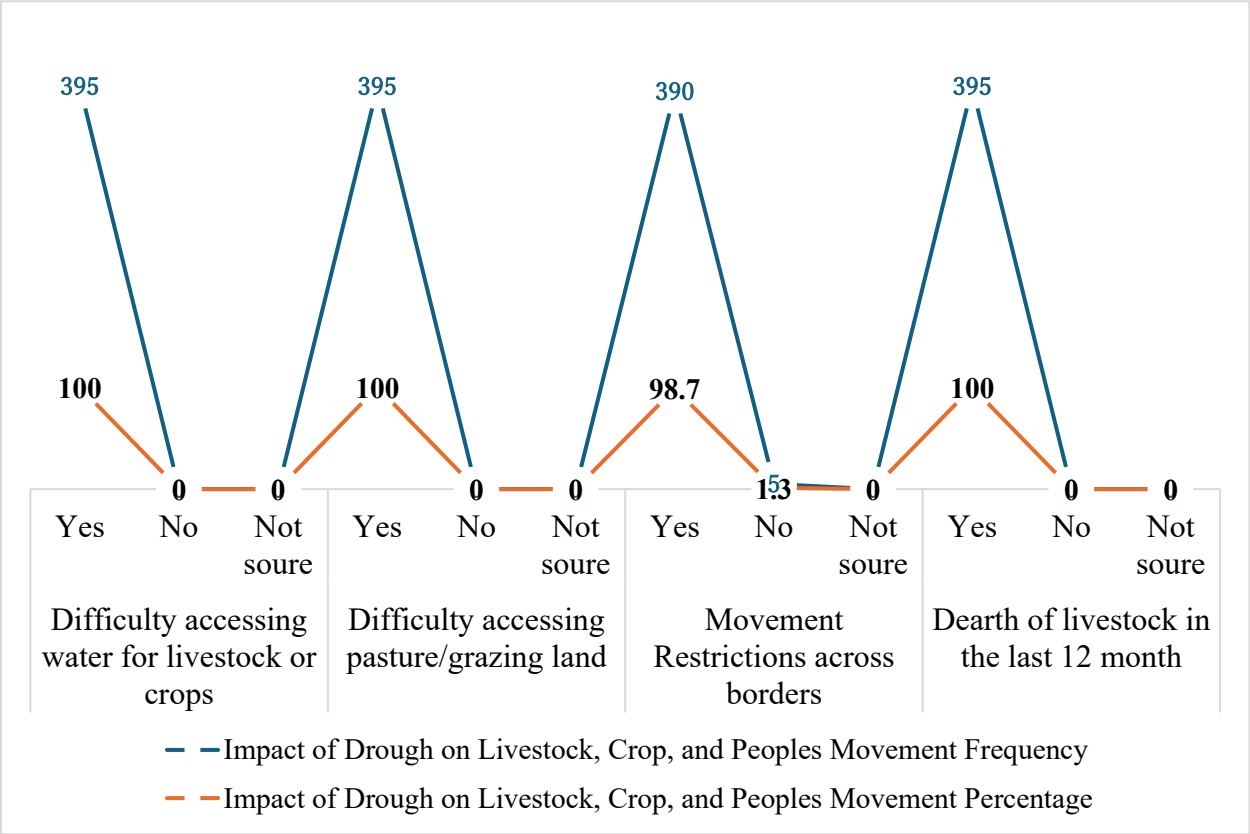

Figure 3: Impacts of drought on livestock, crop and people's movement

(Source: Survey, 2025)

3-5 Tensions and Conflicts intensified by Drought

The data in figure below show that conflicts with neighboring kebeles across regional boundaries are a recurring but not constant phenomenon in the study areas of Babile Woredas. A majority of respondents (77.2 percent) reported such conflicts occur sometimes, indicating that inter-community tensions are intermittent and often triggered by specific stressors rather than being continuous. Only a small portion (2.3 percent) stated that conflicts happen frequently, suggesting that persistent violent

encounters are relatively rare. However, the fact that one-fifth (20.5 percent) reported conflicts as rare implies that while not all communities experience frequent clashes, the potential for conflict remains present. This pattern reflects a situation where pastoralist and agro-pastoralist interactions fluctuate with environmental pressures, particularly recurrent droughts that intensify competition for scarce pasture and water resources. The cross-regional nature of these conflicts—between kebeles in Somali and Oromia regions—further underscores how administrative boundaries can exacerbate disputes over shared natural resources and mobility rights, particularly in periods of resource stress.

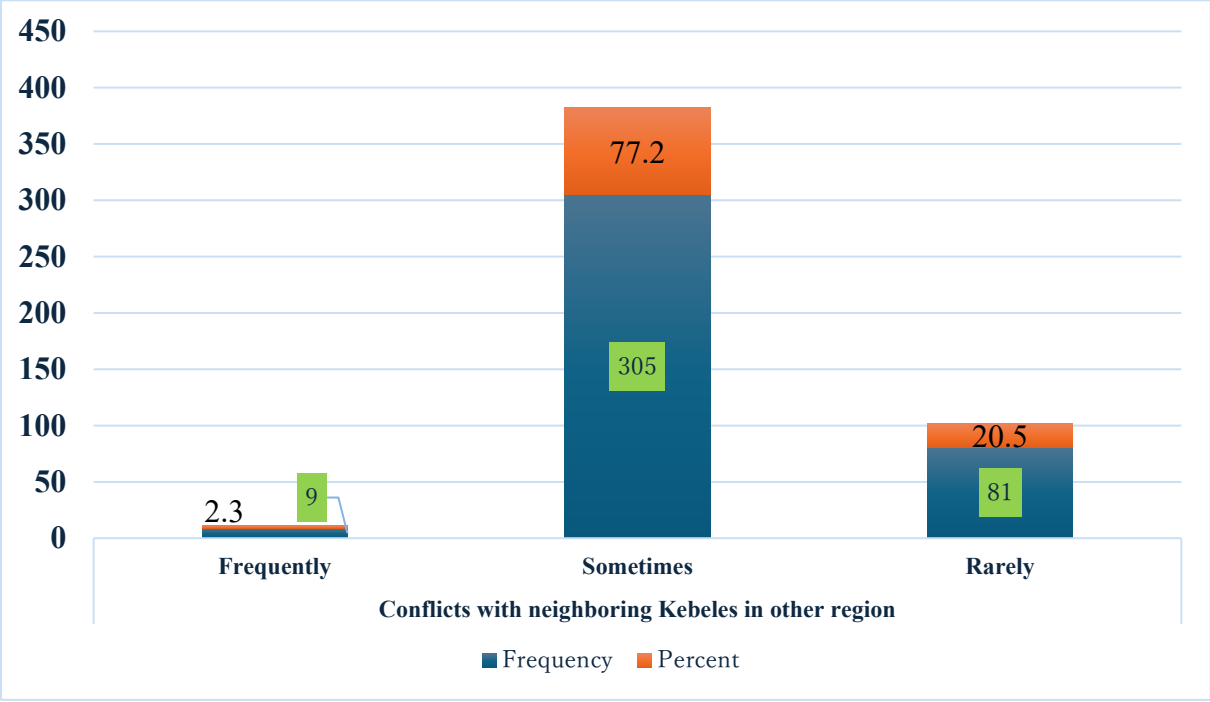

Figure 4: The prevalence of conflict among kebeles

(Source: Survey, 2025)

The conflicts often occur across the administrative boundaries of Somali and Oromia regions, making the border an area of friction intensified during droughts. The competition over dwindling water and pasture fuels disputes, as herding communities move across borders seeking resources. The traditional social accord and coexistence mechanisms become strained when drought restricts access to common pastures and water points. Interview data reflect this dynamic with accounts of pastoralists migrating into neighboring kebeles in search of grazing and water, fueling mistrust and occasional violence.

The finding of this study also shows that all respondents (100 percent) agreed that drought conditions have contributed to increased tension or conflict between kebeles on both sides of the Babile administrative border. This unanimous response indicates that drought is universally perceived as a major driver of local disputes, particularly over scarce natural resources such as water, pasture, and farmland. Recurrent droughts have reduced the availability of these essential resources, intensifying competition between pastoralist communities in the Somali Region and agro-pastoralist groups in the Oromia Region. As herds move in search of grazing land and water, boundaries that were once socially negotiated become zones of friction, leading to tension, mistrust, and sometimes violent clashes.

Studies also emphasize how recurrent droughts reduce the availability of vital resources such as water, pasture, and arable land, creating acute competition that exacerbates inter-community disputes (Bekele et al., 2024; Moyo, 2024). These shows the direct link between environmental stress from droughts and the escalation of violence, demonstrating how climatic shocks undermine livelihoods and destabilize social cohesion (Xie et al, 2024). Therefore, this reinforces the finding that drought not only intensifies competition but also disrupts traditionally negotiated boundaries, turning previously social borders into conflict-prone zones, thereby supporting the interpretation of drought as a major conflict driver in the study area.

The finding that conflicts occur predominantly across the Somali and Oromia regional boundaries, intensifying during droughts due to competition over scarce pasture and water, is well supported in the literature emphasizing the role of administrative boundaries in exacerbating resource-based conflicts. Ethnic-based regional boundaries in Ethiopia create barriers to pastoral mobility and resource access, increasing competition and fostering inter-community tensions (Bélair, 2016; van Weezel, 2019). Research on the Somali and Oromia regions confirms that droughts intensify competition over shared natural resources, heightening mistrust and violent clashes when pastoralists cross borders seeking access to grazing and water (Moyo, 2024; Stark, 2011). These findings complement the reported disruption of traditional coexistence mechanisms and social accords as drought restricts access to common pastures and water points. The specific mention of seasonal migration fueling mistrust is underpinned by evidence that resource-driven mobility challenges

established social arrangements and governance structures that traditionally moderated conflict.

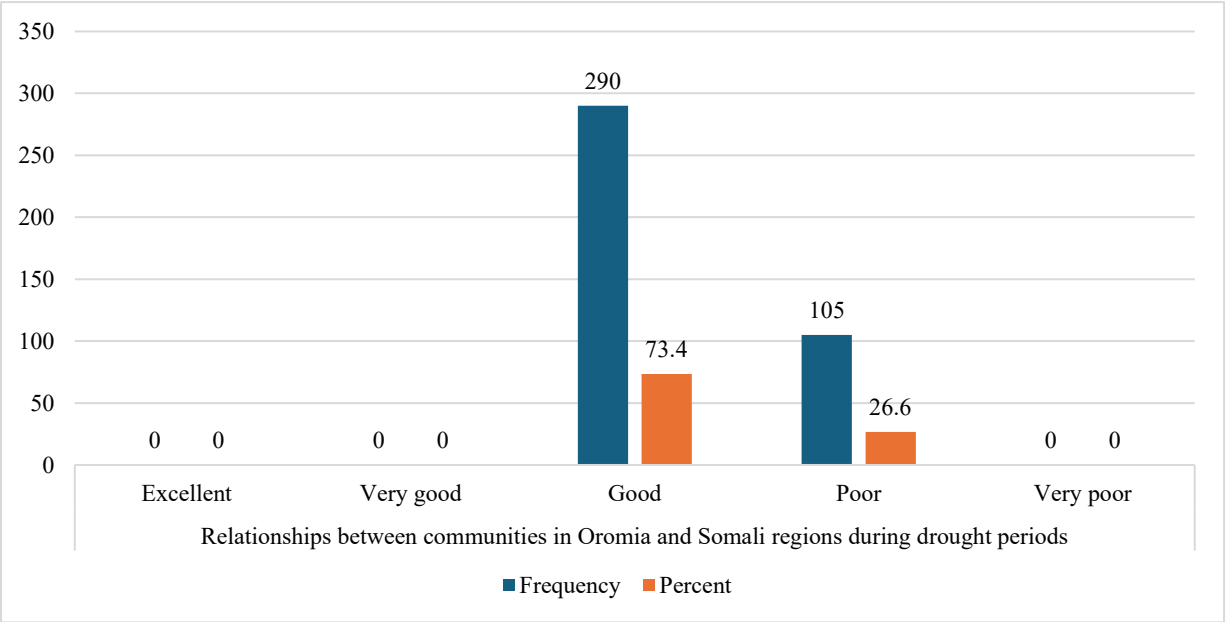

Figure 5: Relation between communities in Oromia and Somali regions drought periods (Source: Survey, 2025)

The data in the figure 5 above indicate that relationships between communities in the Oromia and Somali regions during drought periods are generally positive, despite the environmental stresses these communities face. A significant majority of respondents, accounting for 73.4 percent, rated the inter-community relationships as good, while 26.6 percent considered them poor. None of the respondents described these relationships as excellent, very good, or very poor, suggesting that while cooperation and peaceful interaction exist, they are neither robust nor deeply institutionalized. The prevalence of "good" ratings may reflect practical collaboration over shared resources such as water points, grazing lands, and markets, driven by mutual dependency and longstanding social ties. However, the relatively high proportion of respondents reporting "poor" relations points to lingering tensions that can surface as competition intensifies with worsening drought conditions. Overall, the findings imply that while relations between the Oromia and Somali communities are largely functional and cooperative, they remain fragile and vulnerable to strain when scarcity deepens, highlighting the need for strengthened conflict resolution mechanisms and inclusive resource management frameworks during drought

periods.

The drought has caused devastating impacts on crop production and livestock health, worsening economic hardship and livelihood insecurity, which in turn raises the stakes over environmental resources. Interview excerpts reveal that prolonged dry periods cause crop failure and livestock losses, pushing households to more desperate measures such as crossing into neighboring kebeles and engaging in activities like firewood and charcoal sales, which themselves become sources of friction between communities. Long distances traveled to fetch water—sometimes 12 to 16 hours round trips—disrupt social life, education, and create health risks, especially to women and children, adding layers of vulnerability and stress that can fuel conflict.

Despite these tensions, traditional conflict resolution systems involving clan elders and local administrations play a critical role in mediating disputes. Interviewees mention mechanisms like elders' assemblies from the two side (e.g., *Mangudo Ido*) and peace dialogues facilitated by NGOs including IOM, which have brought some local harmony despite recurrent violence triggered by resource scarcity. However, these systems face challenges due to the increasing frequency and severity of drought, the political nature of border disputes, and the proliferation of arms among communities, signaling a militarization that threatens peace efforts. Studies also emphasize how elder assemblies, customary peace dialogues, and NGO-facilitated interventions constitute vital mechanisms that have sustained relative harmony despite recurrent violence triggered by resource scarcity and political disputes. However, these systems face mounting challenges from the increasing frequency and severity of droughts, politicization of border areas, and proliferation of arms that militarize communities, consistent with the findings that institutional resilience is being undermined by worsening climatic and sociopolitical pressures (Alemneh, 2025). Thus, the finding that traditional mechanisms remain key but are under threat is well grounded in the study.

Survey data also show that despite recurrent drought and related tensions, a majority (73.4%) rate the inter-community relations during drought as "good," highlighting ongoing social cooperation and mutual dependency based on shared livelihoods and historical ties. Yet, 26.6% reporting poor relations reveal the fragility of peace, indicating underlying mistrust that can escalate under worsening

environmental and economic stress.

Research indicates that mutual dependency founded on shared livelihoods and historical ties typically enables continued cooperation during drought, but embedded mistrust and competition linger as latent risks that can erupt under intensifying environmental and economic stress (Alemneh, 2025; Van Weezel, 2019). This nuanced coexistence of cooperation and tension under climate change supports the finding's emphasis on the fragility of peace amid recurrent drought.

4 Conclusion

This research underscores the intricate and dynamic nexus between recurrent droughts and conflicts among pastoralist and agro-pastoralist communities in eastern Ethiopia, with a focus on Babili Wereda in the Somali Region and Babile Wereda in Oromia. The findings reveal that persistent and intensifying drought episodes serve as catalysts that exacerbate resource scarcity, thereby fueling land, water, and pasture-related conflicts rooted in competition over dwindling ecological resources. The spatial overlap of socio-economic vulnerabilities, political marginalization, and environmental degradation magnifies the propensity for conflicts, especially in borderland communities where resource access is already contentious.

Theoretical insights into the climate-conflict nexus demonstrate that climatic shocks such as recurrent droughts do not merely act as environmental stressors but also interact with social and political inequalities, thereby magnifying vulnerabilities and social tensions. The gendered dimension of conflict further complicates this landscape, with marginalized groups—particularly women—bearing disproportionate burdens during drought episodes, which hampers community cohesion and resilience. Empirical evidence from the Ethiopian context aligns with broader regional studies indicating that environmental shocks frequently serve as triggers for localized violence and displacement, often spilling over borders and intensifying cross-border tensions.

Economically, drought-induced livestock mortality and crop failure have deepened livelihood insecurities, forcing communities into survival strategies including firewood and charcoal sales, further

straining social relations. Women and children bear disproportionate burdens, facing long water-fetching journeys that disrupt social and educational life, amplifying vulnerability and potential triggers for conflict.

Traditional conflict resolution systems involving clan elders and local peace dialogues remain vital in mediating disputes, yet face mounting challenges amid increased drought frequency, politicization of border disputes, and militarization risks. The findings call for strengthened, inclusive resource management frameworks and conflict resolution mechanisms that account for socio-political realities and environmental uncertainties.

Addressing this multifaceted challenge necessitates an integrated approach that combines ecological resilience, social equity, and conflict-sensitive governance. Promoting community-based resource management, reinforcing conflict resolution mechanisms, and fostering cross-border cooperation are pivotal strategies to mitigate these tensions. Equally important is the empowerment of marginalized groups through gender-sensitive interventions that bolster social cohesion and adaptive capacity. Such context-specific strategies should be informed by a comprehensive understanding of local socio-ecological realities and tailored to the unique needs of pastoralist and agro-pastoralist communities.

Ultimately, this study highlights that sustainable resolution of conflicts driven by recurrent droughts in eastern Ethiopia requires concerted efforts that transcend mere resource management—encompassing political, social, and ecological dimensions. Building resilience in these vulnerable communities' hinges on recognizing the interconnectedness of environmental variability and social inequalities, while fostering inclusive and participatory governance frameworks. Strengthening institutional capacity, enhancing cross-border cooperation, and prioritizing marginalized voices are crucial steps towards establishing enduring peace and resilience in Ethiopia's drought-prone borderland communities.

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