

**SOCIO-ECONOMIC AND ENVIRONMENTAL IMPACTS CONFLICT
AND ITS MANAGEMENT MECHANISM IN THE GUMBI-BORDEDE
AND AMIBARA DISTRICT, ETHIOPIA**

MA THESIS

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**Socio-Economic and Environmental Impacts Conflict and Its Management
Mechanism in the Gumbi-Bordede and Amibara District, Ethiopia**

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ARTS IN CLIMATE CHANGE AND DISASTER RISK MANAGEMENT**

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This thesis is heartily dedicated to my beloved Family

STATEMENT OF THE AUTHOR

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BIOGRAPHICAL SKETCH

The author of this Thesis, Mr. Abraham Ali, was born on September 21, 1987 in West Hararghe Zone of Oromia National Regional State, Mieso District from his father Ali Rare and his mother Halo Ali. When he was reached school ages he was attended primary and Junior School in Mieso from 1995-2002 and Secondary School from 2001-2002 at Chercher high School. After completed secondary school the author joined Kombolcha, TVET College in 2003 and awarded by Dipiloma in Plant Science in July, 2006, then he joined Jimma University in 2008 and awarded Degree Horticulture in July 2009

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ACRONYMS AND ABBREVIATIONS

ARZ3FEDO	Afar Region Zone 3 Finance and Economic Development Office
CBMs	Confidence Building Measures
CFRN	Constitution of the Federal Republic of Nigeria
CMM	Conflict Management Mechanism
COW	Correlation of War
DFID	Department for International Development
DPCs	District Peace Committees
FAO	Food and Agricultural Organization
FGD	Focus Group Discussion
FIRST	Facts of International Relations and Security Trends
GBWANO	Gumbi Bordede wereda Adimenstration office
GBWANRO	Gumbi Bordede wereda Agriculture and Natural Resource office
GBWCTO	Gumbi Bordede wereda Culture and Turism Office
ICRM	Indigenous conflict Resolution Mechanisms
IK	Indigenous Knowledge
JTF	Joint Task Force
NGOs	Non-Governmental Organizations
OII	Office of International Initiatives
PSNP	Productive Safety Net Program
SALF	Somali Abbo Liberation Front
SIPRI	Stockholm International Peace Research Institute
UCDP	Uppsala Conflict Data Program
UN	United Nation
UNDP	United Nation Development Program
USAID	United States Agency for International Development
WHZEDO	West Hararghe Zone Economic and Development Office
WHZPED	West Hararghe Zone Planning and Economic Development Office
WWW	World Wide Web

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ABSTRACT

This study aimed to assess the socio-economic and environmental impacts conflict and its management mechanism in the Gumbi-bordede and Amibara district, Ethiopia,. A mixed-method design was utilized to collect both quantitative and qualitative data, employing a combination of triangulation and multistage stratified random sampling techniques. Accordingly, a total of 335 sampled households were selected. Various data collection methods such as survey questionnaires, FGDs, KIIs, and pon field observations were used. Descriptive statistics like mean, standard deviations, and frequencies, as well as inferential statistics like chi-square, were employed for data analysis. Additionally, content and thematic analysis was used for qualitative data analysis. The analysis revealed that conflicts in the study area reduced from factors such as competition for economic resources, limited Land control over custom posts, unclearly defined boundaries between the Oromo and Afar regions, poor inter-regional institutional arrangements for conflict management, livestock encroachment and limited access to natural resources. Moreover, the findings of the study revealed that the social effects of conflict included the breakdown of social cohesion, heightened mistrust among conflicting parties, increased displacement, physical harm, loss of life, and disruption of public services. On the economic front, the conflict led to decreased household income, loss of assets, property destruction, limited access to food for both humans and livestock, and high levels of unemployment or underemployment. The research highlighted the key role of local community leaders in conflict resolution, with participants expressing satisfaction with their involvement. The study recommended various strategies to address conflicts, such as enhancing interregional institutions, boosting the economy and resource allocation, empowering local mediators, fostering cross-cultural cooperation, and promoting collaboration across borders. These suggestions aim to mitigate conflict impacts and foster peace and stability in the area.

Keywords: Environmental Impacts, Conflict, Management Mechanisms, Socio-Economic,

1. INTRODUCTOIN

The impacts of disasters include loss of lives and livelihoods, damage to infrastructure and communication, increased risk of disease outbreaks. In many places the impacts are worsened by conflict, poverty, marginalization, and overcrowding. Inadequate, old and deteriorating infrastructure and lack of economic security to provide for times of hardships also compromise people's coping capacities and therefore magnify the impacts of disasters (FAO, 2001). Africa is prone to natural and man-made disasters.

1.1. Background of the Study

Conflicts, according to Fisher (2000) are facts of life, inevitable and often creative. Fisher also points out that in our day-to-day interaction with others, we either observed or pass through conflicts which range from the very interpersonal quarrel, family and neighbors dispute, ethnic and inter-state conflicts to the global war. He further explains that conflicts can destroy existing relationships and bring disaster. He also indicates, conflict could create opportunities for new relationships and change (Fisher, 2000).

A conflict has generally been defined as a situation in which two or more parties strive to acquire the same scarce resources at the same time (Peter Wallensteen, 2002). Scholars generally agree that there needs to be more than one part to have a conflict, and that the time factor is important. What does cause concern is the term scarce resource. The central point in this argument is scarcity, but resources need also be included in the discussion. Peter Wallensteen (2002) has pointed out that resources are not only economic in nature, and that the terminology might miss conflicts involving economic orientation, human security, environment, historical issues, etc. Such conflicts are not necessarily about resources, and when they are, these resources are, more importantly, not necessarily scarce. A conflict is, moreover, in many cases based on perceptions, rather than on attitudes or behavior as it has generally been defined. Traditionally, conflict has been defined as opposing interests involving scarce resources and goal divergence and frustration (Fisher, 2000).

Conflict management is the deliberate action to deal with conflictive situations, both to prevent or to eliminate them. To Best. SG, (2012), conflict management is a process of reducing the negative and destructive capacity of conflict through a number of measures and by working with and through the parties involved in that conflict. It is sometimes used synonymously with conflict regulation and covers the entire area of handling conflicts positively at differently stages, including those efforts made to prevent conflict by being proactive. It also involves negotiation, mediation, arbitration and reconciliation. Generally, conflict management involves a process of limiting the negative aspects of conflict while increasing the positive aspects of it (Osisioma, 2016).

According to Swanstrom, (2012) conflict management mechanism can thus be defined as an institutionalized instrument under which the information is coded and decoded to offer a solution to a problem. Further, he distinguishes between formal and informal conflict management mechanisms. Accordingly, formal conflict management mechanism are institutionalized structures aimed at minimizing disputes through rule-based regulations whereas informal conflict management mechanisms are institutionalized structures aimed at minimizing disputes through negotiations in a power or consensus-based way. The same structure will apply for conflict resolution, with the exception that conflict resolution is always rule based. Thus, it would not be possible to operationalize an informal conflict management mechanism since no disputing parties would accept conflict management mechanism without any predictability or formality.

A number of characteristics according to the aspect of conflict to which they refer: the factors that affect whether conflict will arise (occurrence); the specific causes of conflict (causes); the role that conflict may play in group interactions (utility); the processes involved in an individual conflict episode (development); approaches to handling conflict, including conflict management mechanisms; and the outcomes and long-term effects of conflict (results). These characteristics are not intended to be exhaustive, nor even clearly defined, but simply provide a convenient way of organizing our discussion of different aspects of conflict (Wall, V. D., and L. L. Nolan (1987). *Small group conflict: A look at equity, satisfaction, and styles of conflict management. Small Group Behavior*. Management of conflict is crucial for day-to-day coexistence as human societies are in constant search of conflicts management mechanism

(Pankhurst and Getachew, 2008). Hence, different societies of the world have developed their own mechanisms to resolve conflict. Like in other part of the world, in Africa, people with different backgrounds, culture, class, age and other come into conflict. The conflicting parties may be individuals, groups, families, clan's or ethnic group.

In the Ethiopian context as well, Mellese (2008) states that, as a multicultural society, there are various social groups that live together in harmony, cooperation and sometimes in conflict. On the circumstance when conflict arises within or between social groups, Abera (2000) notes that, various types of conflict resolution methods were applied in different parts of the country and among different sections of the population. For instance, Assefa (2001) has made a study on indigenous mechanisms of conflict resolution between Oromo and Afar. He defined some of the mechanisms in different categories. Oromo's customary law include manguduma, ilafi-ilame, Jarsumma, Weifang, geda, Sinqee, compensation and Afar's customary law include madaa, billiarri, compensation. According to this study, these mechanisms have been practiced by the Oromo and Afar communities were mainly in order to resolve conflicts found between them.

The *madaa* was able to effectively manage conflicts between Afars and some of their neighbors in the past (Bekele Hundie, 2010). For example, Afar and Karrayyu used to share institutions that them to exchange fugitives, pay compensation, and reduce tensions; i.e. if an Afar murdered a Karrayyu (or vice versa), a traditional jury composed of both ethnic groups would handle the case. However, though they still exist to some extent, these shared institutions are no longer influential.

So far different studies has done by different researchers on Conflicts between Afar Pastoralists and their Neighbors specifically Afar-Issa case: by giving due attention from different intellectual Angles like Yakob and Getachew focused on the economic and political marginalization, administrative penetration and expropriation of pastoralists and their resources for huge non-pastoralist production systems by successive governments central to lively hood explanation, Ayele, the conflict is mainly characterized as common pastoralist conflict over scarce natural resource, fueled by violence promoting cultural values, environmental degradation and the transhumant nature of pastoralist mode of production that require vast area and multiplicity of ecosystems, Issa-Afar conflict relates it to the nature

mainly to the nature of the Ethiopian state. Others relate the conflict dynamics with scarcity and demographic Pressure (Bulcha and Tesfay, 2003).

Bamlak *et al.* (2014) was conducted research on “The Dynamics of (Agro) Pastoral Conflicts in Eastern Ethiopia “in areas where various ethnic groups belonging to the different regional states amidst existence of fluid and contested regional boundaries. This research was done in the pastoral and agro-pastoral conflict prone areas of eastern Ethiopia particularly in the Meiso-Mullu, Meiso and Amibara districts where it is inhabited by multiethnic/clans’ pastoral groups in the form of rivalries and competitions for resources. The primary objective of the study was only assessing the different kinds of causal factors for the occurrence of violent forms of recurrent conflicts among the various ethnic groups in the study area (Oromia, Somali and Afar)

1.2. Statements of the Problem

Because of limited natural resource, lack of forage and drink water due to impact of climate change and variability, and political events pastoralists in the study area have been made a conflict and which cause to loss of properties and human life . Like others, Africans have their own means of addressing and resolving conflicts since the remote past (Zartman, 1989). Tirsit (2002) also notes that traditional approaches of conflict management are an important component of the cultural heritage of African societies. According to Rabar and Karimi (2004), indigenous conflict management mechanisms in Africa are generally closely bound with socio-political and economic realities of the lifestyles of the communities. These mechanisms are rooted in the culture and history of the African people, and are in one way or another unique to each community. As part of Africa, Ethiopia has also developed its own means to address conflict. Ethiopia is believed to be the country of more than eighty ethnic groups, who have their own languages, and cultures. These diverse ethnic groups have developed their own distinctive political, administrative, economic, social and judicial systems. These diverse groups had been living in cooperation and conflict for a long period of time. They have also developed and employed their own mechanisms to solve different conflicts that arise due to divergence of interest and other factors (Assefa, 2001).

The causes of conflict in Ethiopia are both multidimensional and complex. They include historical, political, economic, social and cultural causes (UNDP, 2011). Recently some research nearby the study area has been done on Socio-Economic Effects and Prospects of Oromo-Somali Conflicts: The Case of Miesso District of Oromia, and Mullu District of Somali Regional States, Eastern Ethiopia Published by Abduraman et.al (2021) that focus on the primary resource users in the Miesso/Mullu area are Oromo and Somali ethnic groups.

Though, currently there are large numbers of literatures on the issue under investigation, most of the existing works are old and done before decades and hence does not reflect the up-to-date status of the existing problems. This is merely due to several emerging national and regional issues took place and could change the political landscape of the area. Since the current crisis could not be addressed through the old works, we need to conduct the research encompassing the emerging factors in the area.

There have not been any related researches done in the study area since Gumb-Bordede woreda have been separated from Mieso woreda. Thus, this study was to assess socio-economic impacts and its conflict management mechanisms of pastoralist in the study area. As such, this research will have a great significance in bridging the gaps of conflicts with its socio-economic impacts and the existing conflict management mechanisms.

Eventhood many households were displaced from this area from year to year and huge loss of asset and human life, there is no research have been conducted in Gumbi Bordede woreda that were related to this research titles. Therefore, the general purpose of this study aimed at assess socio-economic impacts and conflict management mechanisms in handling conflict found in the study area and reduce economic and human life loss due to conflict in the study.

1.3. Objective of the Study

1.3.1. General objective

The general objective of this study was to assess socio-economic and environmental impacts of conflict and its management mechanisms in the–case of Gumbi-Bordode and Amibera districts of Eastern Ethiopia.

1.3.2. Specific objectives

1. To assess the major characteristics of conflict in the study area
2. To analysis the impact of climate change and variability as a source of conflict.
3. To assess the impact of conflict on socio- economic in the study area
4. To identify conflict management system in the study area.

1.4. Research Questions

In order to investigate and address this problem, the following research questions were addressed.

1. What are the primary causes of the Oromo-Afar conflict in Gumbi-Bordode and Amibara districts?
2. How has the conflict affected socio-economic conditions in Gumbi-Bordode and Amibara districts?
3. What specific environmental impacts have arisen from conflicts in Gumbi-Bordode and Amibara districts?
4. What conflict management strategies are currently being utilized in these areas, and how effective have they been in mitigating tensions?

1.5. Significances of the Study

Therefore, this research will come up with the up-to-dated information on the ground by driving comprehensive and full understanding of the ongoing crisis in the study area. As such, this research will have a great significance in bridging the knowledge gap in the country regarding Oromo-Afar pastoral conflicts in the study area with its socio-economic impacts and the existing conflict resolution mechanisms thereof. It will bring the real pictures of why the two communities are in intense conflict for decades. Finally, this research will have a paramount importance for students of higher learning and future researchers.

1.6. Scope of the Study

The methods were used in the collection of both quantitative and qualitative data, that is, triangulation. The data was collected by different methods provided a reliability check. Qualitative methods provided an insight into reasons for some issues arising from the quantitative methods. Both primary and secondary data will collect during this study.

Secondary data sources include documentary materials (government reports, research reports, village records and various publications) obtained from libraries and district offices. Primary data will obtain from selected study villages and households through household surveys and informal discussions with local people. Surveys, formal interviews, focus group discussions, informal interviews and participant observation will employ for the data collection.

Geographically, this study was focused to Oromo-Afar conflicts, its socio-economic impacts and resolution mechanisms only in *Gumbi Bordede woreda and Amibera woreda*. Thematically, although conflict resolution issue includes many variables that directly or indirectly contribute to Oromia and Afar regions and it is concerned with the identification of the conflict, socio-economic impacts and the existing conflict resolution mechanisms of the Oromo-Afar conflicts only in the study area.

1.7. Definition of Key Terms

Conflict: Is a natural part of human interaction and is necessary for social change. However, if societies have no effective ways to manage disputes, conflict may become violent and destructive. The human development process is complex and generates conflicts, resource reallocation, new priorities and changing coalitions of participants. Countries need capacities to manage these changes (UNDP, 2011).

Conflict management mechanisms: The systematic management of administrative decisions, organization, operational skills and abilities to implement policies, strategies and coping capacities of the society or individuals to lessen the adverse impacts of conflict (UN/ISDR, 2004).

Traditional Conflict management:- traditional peace-making was a comprehensive umbrella term for those conflict resolution mechanisms that combine the characteristics of considerable longevity, historical evolution within a society, locally inspired and locally driven, custom-based, informal & open to community, process-oriented non-state, pre-state and/or autonomous of the state centrality of relationships and key person (Boege 2004 and 2011, Horne 2014, Mac Ginty2011, Zartman 2000 and 2002)

Modern Conflict Management: - are those mechanisms that are state-based, which means developed and implemented by national institutions on various levels of a state and regulated through official legislation.

Integrated Conflict Management System:- Integrated Conflict Management Systems (ICMS) are a systematic approach to preventing, managing and resolving conflict within the organization and represent an advanced form of conflict management (Gosline *et al.* 2001).

2. REVIEW OF RELATED LITERATURE

2.1. Concepts of Conflicts and its Management Mechanisms

2.1.1. Concepts of conflicts

Recent times have witnessed a growing body of literature and a relatively new as well as systematic approach to conflict, disaster, disaster management and other related concepts. There are a number of key concepts that should warrant attention. An overview of conflict, disaster, human-induced disaster and disaster risk management, inter-alia, is basic concepts that quite frequently appear as follows

Conflict is a disagreement or an argument. The Cambridge English dictionary defines conflict as an active disagreement between people with opposing opinions or principles. A conflict has generally been defined as a situation in which two or more parties strive to acquire the same scarce resources at the same time. (Peter Wallensteen, *Understanding Conflicts, conflict management mechanisms, Peace and The Global System* (London: Sage Publishing, 2002). Scholars generally agree that there needs to be more than one part to have a conflict, and that the time factor is important. What does cause concern is the term scarce resource. The central point in this argument is scarcity, but resources need also be included in the discussion. The normative disputes (often subjectively defined) are also left out of the rational definitions. These disputes involve religion, values and beliefs and do not always have a military outcome. Traditionally, conflict has been defined as opposing interests involving scarce resources and goal divergence and frustration (Okojie, 1997). Society is in a state of perpetual conflict because of competition for limited resources (Okojie, 1997).

Conflicts can originate within an entity resulting in intra-personal, intra-group or intranational conflicts; or they could reflect incompatible actions between contrasting groups or persons leading to interpersonal, intergroup or international conflicts. Depending on how they are handled, conflicts can serve a constructive role leading to a reexamination of basic assumptions and practices, or in the alternative, to a disruption of life and general wellbeing of a people. The challenge for leaders and managers is how to make conflicts constructive rather than destructive, overt rather than covert, marginal rather than fundamental, peripheral rather than pivotal. (Osisioma, 2016).

2.1.2. Conflict management

Conflict management is the deliberate action to deal with conflictive situations, both to prevent or to eliminate them. To Best. SG, (2012), conflict management is a process of reducing the negative and destructive capacity of conflict through a number of measures and by working with and through the parties involved in that conflict. It is sometimes used synonymously with conflict regulation and covers the entire area of handling conflicts positively at differently stages, including those efforts made to prevent conflict by being proactive. It also involves negotiation, mediation, arbitration and reconciliation. Tanner (2000) has defined conflict management as the limitation, mitigation and or containment of as conflict without necessary resolving it. Wallensteen (1981) has also defined conflict management as a change in the mode of interaction from destructive to constructive.

2.2.3. Conflict management mechanisms

Conflict management mechanisms, as defined by Swanstrom (2012), serve as institutionalized tools for encoding and decoding information to resolve issues. These mechanisms are categorized into formal and informal types. Formal conflict management mechanisms consist of structured systems designed to reduce disputes through established rules and regulations, while informal mechanisms focus on minimizing conflicts through negotiation, relying on power dynamics or consensus. The same framework applies to conflict resolution, which is inherently rule-based. Consequently, informal conflict management mechanisms cannot be effectively implemented, as disputing parties are unlikely to accept a resolution process that lacks predictability and formality.

2.2. Major Characteristics of Conflicts and Management Mechanism

2.2.1. Major characteristics of conflicts

Conflict can be characterized by its nature and consequences, encompassing various dimensions. Affective conflict arises from individual emotions and feelings that are provoked during discussions of contentious issues. Conflict of interest typically emerges from differing perspectives between parties regarding the allocation of limited resources. Additionally, conflict of values stems from fundamental differences in personal or cultural values (Rahim, 2011). These characteristics can be categorized into several aspects: the factors influencing the

occurrence of conflict, the specific causes behind it, the role of conflict in group dynamics, the processes involved in individual conflict episodes, strategies for conflict management, and the resulting outcomes and long-term effects. While these characteristics are not exhaustive or rigidly defined, they serve as a useful framework for understanding the multifaceted nature of conflict (Wall and Nolan, 1987).

2.2.2. Major characteristics of conflict management mechanisms

Conflict management involves tactics that are enforced when violent conflict is deemed likely. Conflict management can be enforced, as soon as the conflict has been identified by the actors, as an effort to reduce tension and prevent further escalation. Direct measures, such as reduction of military forces, third party intervention, informal and formal communication. (Peter Wallensteen, 2002). Confidence-building measures (CBMs) are crucial as they serve to strengthen the conflict management process by increasing trust between the actors. This is true both in the case of formal and informal conflict management. It should indeed be noted that the best result often is achieved by combining informal and formal conflict management. The importance of using both formal and informal mechanisms can for example be seen in the negotiations regarding the Korean Peninsula, negotiations which would not have taken place without the use of both formal and informal measures and mechanisms (Niklas L.P 2004).

2.3. Conflict Indices and Its Socio-Economic Impacts

2.2.3. Conflict indices or measurement tools

Conflict indices serve as essential tools for quantifying and analyzing the dynamics of conflict within various contexts. These indices provide a systematic approach to measuring the intensity, frequency, and impact of conflicts, enabling researchers and policymakers to assess the underlying factors contributing to discord. By employing a range of quantitative and qualitative methodologies, conflict indices can capture the multifaceted nature of conflicts, including social, political, and economic dimensions. The development of these indices has been pivotal in understanding the escalation and resolution of conflicts, as they facilitate comparative analyses across different regions and time periods. For instance, the Conflict Barometer, developed by the Heidelberg Institute for International Conflict Research, offers a comprehensive overview of global conflict trends, highlighting the importance of systematic

data collection in conflict studies. Furthermore, as noted by Gleditsch (2006), the integration of conflict indices into empirical research enhances the robustness of findings and supports evidence-based policy formulation. The application of these indices extends beyond academic research; they are instrumental in informing international organizations and governments in their conflict prevention and resolution strategies.

2.2.4. Socioeconomic impacts of conflicts

The sustainable use of pastoral rangelands depends in large measure on mobility, which allows for rotational use of wet and dry season grazing areas. Mobility is the first and major casualty of conflict as the resulting insecurity forces the community to concentrate livestock within a fraction of its former territory. Loss of access to grazing land and water sources puts the pastoral system under pressure and gradually reduces its self-sufficiency. This means that the land use system is no longer able to respond to ecological and climatic variability resulting in ecological degradation.

The increased ecological degradation is evident in the level of bush encroachment, which in turn changes the structure and composition of the herbaceous vegetation. The aggressive encroachment of undesired thorny and woody species on grazing areas results in an imbalance in the grass bush ratio and a decrease in biodiversity and carrying capacity causing severe economic and ecological losses to pastoral communities. According to Amsalu (2010) about 90 percent of households in Borana and Guji indicated that they have noticed changes in the condition of rangelands over time. Most of the high potential grazing areas are heavily degraded. In the course of this study, key informants asserted that bush encroachment is the single most important factor degrading rangeland resources. These changes have had adverse impacts on the quality of livestock and their productivity. Many families in Borana are no longer able to depend entirely on livestock keeping as the basis of their livelihoods. Instead, they are converting grazing lands into farmlands and communal land into private pasture reserves in order to ameliorate increasing grazing pressure and food insecurity.

The socioeconomic impacts of conflicts in Ethiopia are profound and multifaceted, affecting various dimensions of life, including economic stability, social cohesion, and public health. Conflicts, particularly those rooted in ethnic tensions and political disputes, have led to significant disruptions in agricultural production, which is the backbone of the Ethiopian

economy. As noted by Assefa (2006), the agricultural sector has suffered from both direct violence and the displacement of communities, resulting in decreased food security and increased poverty levels. The destruction of infrastructure, such as roads and markets, further exacerbates these issues, limiting access to essential services and hindering economic recovery.

The socioeconomic impacts of conflicts in the Borena zone are multifaceted and deeply intertwined with the region's historical, cultural, and economic contexts. Conflicts in this area, often driven by competition over resources such as land and water, have led to significant disruptions in local economies. The agricultural sector, which is the backbone of the Borena zone's economy, has been particularly affected. Farmers face challenges such as displacement, loss of livestock, and destruction of crops, which not only threaten their livelihoods but also exacerbate food insecurity in the region. As noted by Tigist (2014), the cyclical nature of violence in pastoral communities often leads to a breakdown of traditional social structures, further complicating recovery efforts and economic stability.

According to Bamlak et al. (2015) the trend of violent conflicts is increasing because of increased resource scarcity, absence of property rights, and weak customary institutions. The new political and administrative arrangements following the introduction of ethnic based federalism gave the existing conflicts new a dimension. Moreover, the conflicts have profound implications for social cohesion and community dynamics. The displacement of populations due to violence has resulted in increased competition for limited resources among both displaced and host communities. This competition can lead to heightened tensions and further conflict, creating a vicious cycle that undermines peacebuilding efforts. According to Abebe (2010), the erosion of trust among community members can hinder collaborative initiatives aimed at resource management and conflict resolution, thereby perpetuating a state of instability. The psychological impacts of conflict, including trauma and loss, also contribute to a decline in community resilience, making it more challenging for affected populations to recover economically and socially.

In addition to immediate economic and social consequences, the long-term effects of conflict in the Borena zone can hinder development prospects. Infrastructure, such as roads and schools, often suffers from neglect or destruction during conflicts, limiting access to essential

services and economic opportunities. As highlighted by Girum Kinfemichael (2014), the lack of investment in human capital and infrastructure due to ongoing instability can trap communities in a cycle of poverty and underdevelopment. Addressing these socioeconomic impacts requires a comprehensive approach that includes conflict resolution, community engagement, and investment in sustainable development initiatives to foster resilience and promote peace in the Borena zone.

2.4. Major Mechanisms of Conflict Management

2.4.1. Traditional mechanisms

Efforts aimed at managing the conflicts include both traditional and modern approaches. Traditional institutions and systems of conflict resolution were noted to be functioning with relative effectiveness. Indeed, at the time of visit to the area it was reported that elders from the Boran community in Merti had been sent to Samburu East to negotiate for grazing rights (Endalew Lijalem Enyew, 2014). Borana elders are said to retain considerable influence over their youth. However, Samburu and Rendille elders are reported to have lost control of their youth. Where traditional institutions have lost their influence, this is blamed on interference and watering down of their authority by the influence of educated youth, District Peace Committees, government and politicians (Michael Ochieng Odhiambo, 2012). In addition, grassroots communities, particularly youth, women, and herders, who are most affected by conflict often find themselves excluded from resolution processes.

This exclusion is exacerbated when the government appears to favor certain communities over others. Additionally, NGOs have been criticized for commercializing the role of elders in traditional institutions by introducing monetary incentives for participation in meetings and events. Such practices risk corrupting these traditional systems and undermining the authority of elders. Plans are underway to establish community-negotiated grazing committees in the Kisima Hamsini/Kom area to support District Peace Committees (DPC). While this initiative aims to develop rules for grazing resource access, it may inadvertently interfere with traditional institutions if not implemented thoughtfully. Furthermore, a proposal suggests that herders migrating to dry grazing reserves should do so with their local chiefs; however, concerns arise regarding the recruitment of these chiefs and the implications for their home jurisdictions during such migrations.

2.4.2. Modern mechanisms

Modern approaches to conflict management and peace building involve institutions and structures established by government either on its own or in collaboration with other peace actors such as development partners and NGOs. DPCs are probably the most important such institution. Under the direction of the National Steering Committee on Peace-building and Conflict Management, the DPCs are local mechanisms that bring together different stakeholders to work with government agencies, including those in charge of law enforcement and security to spearhead conflict management and peace-building initiatives through elaborate networks at the community level that provide a basis for early warning and rapid response. While the DPCs face numerous operational challenges, the most severe being under resourcing, they are doing a commendable job in close collaboration with local administrators.

2.4.3. Integrated mechanisms

Traditionally, conflicts were viewed as harmful and dysfunctional resulting from poor communication, a lack of openness and trust between people and the failures on the part of managers to be responsive to the needs and aspirations of the employees. Conflicts may result in loss of productivity because of non-cooperation between groups. Conflicts also result in distraction from work and reduction in concentration on work. Hence, as per traditional view conflicts should be avoided. Properly framed tasks, rules, regulations, procedures and authority relationships can identify and correct problems of conflict. Modern view point view conflict as a positive force in a group. As per this view, conflicts are necessary for a group to perform effectively. This approach encourages conflict. There should be a minimum acceptable level of conflict between the group to make it viable, self critical and creative; otherwise, the group will never strive for changes and innovations. This type of conflict is called functional conflict. On the other hand, conflicts that hinder group performance, these are dysfunctional conflicts.

2.5. Empirical Studies of Conflict and Management Mechanisms

2.5.1. Global

The United Nations (UN) to which almost all countries belong is premised on the concept of collective security. The idea is that a threat to peace anywhere should be considered a threat to peace everywhere and should be met with collective response based on global solidarity.

In reality, however, the record of international community in conflict management and conflict resolution is mixed. On the positive side, there has been a 40 per cent decline in violent conflicts since 1992, according to a recent Human Security Report. The report attributes this, in part, to the efforts made by UN peace-making. Indeed, since the end of the Cold War, more conflicts have ended through negotiations than ever before, with the UN being called upon to engage in all continents (Ibrahim A. Gambari 2013). We need to better understand the reasons why and adapt our strategies and capacities in order to produce negotiated and durable solutions. We need to recognize that the nature of conflicts has changed: the root causes are broader and the actors are more varied. In this regard, three changes stand out clearly:

(i) There are now more intra-state conflicts than inter-state conflicts;

(ii) We now have more non-state actors involved in conflicts; and

(iii) The root causes are broader and deeper when there are more non-state actors involved. The starting point should be to understand and address the root causes of conflict. This includes domestic variables and economic and social factors, as well as critical elements, such as which the parties are, the degree of political will to resolve the conflict and the external dynamics that may positively or negatively affect any conflict management efforts (Ibrahim A. Gambari, 2013). We must also address the question of why efforts fail, what lessons can be drawn and the various approaches to conflict management and resolution. Both in academia and among diplomats, there are choices and preferred approaches. What then is it that makes a conflict seemingly intractable and mediation fails? Aside from the fact that parties to a conflict adopt a “zero-sum” game, there is also the tendency to prescribe a “one size fits all” solution. Most conflicts, however, feature “complex interactions of different forces, with each requiring well-designed structures that are purposely oriented to the needs of the specific situation.” Furthermore, there is the issue of dealing with spoilers in a peace process Africa has the most developed regional organization in the developing world for conflict resolution and peace-keeping. It is the African Union (AU), established in 2003 as a successor to the Organization of African Unity (OAU) which came into being in 1963, almost 50 years ago.

2.5.2. Regional

The Ethiopian case study reports on the on-and-off conflicts in Borana that have pitted the Borana against the Garre, the Guji and the Konso. The Borana community inhabit Borana administrative zone, parts of Guji zone and wide areas of northern Kenya. The Guji, Gabra, Garri and Konso inhabit the Borana lowlands. Some of these latter groups like the Guji and the Gabra have strong historical and ethnic links with the Borana, as well as regular, present day social interchanges. They have long coexisted with Borana under the traditional negotiated system of shared management of natural resources, resolving conflicts between them through traditional conflict resolution mechanisms (Michael Ochieng Odhiambo 2012).

The Ethiopia case study area was the conflict inhabited by the Garre and Borana in South Eastern Ethiopia bordering Borana Zone and Somali Region. Administratively these areas are bounded by Udet and Moyale Region 5 districts and Arero, Dhas, Moyale and Miyo districts of Borana Zone. It is a vast wet season grazing area commonly grazed by Borana, Gabra, Guji and Garre. It is also the dry season grazing area for Borana and Guji pastoralist of Guji Zone. During dry season pastoralist of Liban and Saba Boru district of Guji Zone cross Dawa River and use this same area.

The area is renowned for the quality of its grass and shrubs species that are most nutritious for both cattle and camels. Its soils and temperature are said to improve cattle fertility and increase milk yield. The area is also rich in incense and bees for honey. In recent times, the area has been identified by the Oromia Regional Government for its potential irrigable lands. There are at least fifteen different pastoral groups living in Borana Zone. The dominant groups are the Oromo and the Somali. Following the implementation of the decentralization program, the boundaries of the region were redrawn. The area to the west, which is mainly inhabited by the Oromo, is Borana Zone and part of Oromiya, while the area to the east, which is mainly inhabited by the Somali, is part of the Somali Nation. Of the Oromo groups, the Borana are by far the most dominant.

The Kenyan case study investigates and analyses conflict within the dry season grazing area around KisimaHamsini/Kom situated at the convergence of Samburu East, Wajir, Isiolo and Marsabit districts access to which is claimed by Borana, Samburu, Rendile and Somali

pastoralists. The case study seeks to clarify the link between conflict over grazing land in Kisima Hamsini/Kom and similar conflicts around Koya on the border between Laisamis and Samburu East, and how the two conflicts are impacted upon by the establishment of conservancies in the area by the Northern Rangelands Trust. The Ugandan case study investigates and analyzes recurrent conflict along the border between Katakwi district in Teso and Napak district in Karamoja, which has rendered what used to be dry season grazing areas for Karamoja pastoralists inaccessible to them. The conflict and its manifestations are further complicated by government policy which views the area as a green belt and seeks to promote large scale agricultural production there. The case study examines the implications of this government policy for the way authorities have managed the conflict (Michael Ochieng Odhiambo 2012).

2.5.3. National

Although occasional conflicts between the Borana and neighboring communities have been part of the history of inter-community relations in the past, the frequency and severity of inter-community conflicts has increased in recent years. In the past decade, the Borana and Gabra have engaged in violent conflicts over the past decade. Such conflicts, though manifesting themselves at local levels, end up into a complex web of social, legal, political and economic dynamics that extend from local to national and regional dimensions. Even where no direct clashes have occurred between the communities, cases of intermittent killings across the communities have been reported. This has created insecurity that has forced a significant number of Gabra households to move with their livestock from Borana Administrative Zone in Oromia Regional State to Udet and Moyale Districts of the Somali Regional State (Michael Ochieng Odhiambo 2012).

These conflicts have rendered certain areas of grazing land along the disputed areas inaccessible, creating tensions and insecurity. The conflicts pose significant difficulties to traditional grazing patterns. They disrupt nomadic grazing movement patterns and restrict the communities' coping strategies against adversity and drought, thereby increasing their vulnerability to shocks.

2.5.4. Local

Historical relationships between the Garre and the Borana are long and complex. There have also been serious tensions and sporadic violent conflicts between the two groups. In recent times the relations between the Borana and the Garre have been characterized by conflict, caused largely by disputes over regional borders. The two communities are in disagreement over the south eastern border of Oromiya Region (which is also the Border of Borana lowlands and the adjacent Somali Region). The Borana claim to have lost land that includes important traditional wells as a result of recent changes to regional borders. The Garre claim that the land originally belonged to them (Michael Ochieng Odhiambo 2012).

These conflicts have rendered certain areas of grazing land along the disputed areas inaccessible, creating tensions and insecurity. The conflicts pose significant difficulties to traditional grazing patterns. They disrupt nomadic grazing movement patterns and restrict the communities' coping strategies against adversity and drought, thereby increasing their vulnerability to shocks. Conflict between the Borana and Somali groups dates back to the period of Italian occupation. The Italian army employed and armed Somali 'irregulars' who following the defeat of the Italians turned their guns on the Borana, literally threatening the Borana in Liben with extermination. Borana land use strategies contributed significantly to the success of Somali encroachment into and occupation of Borana land. Whereas the Somali move as families, the Borana make use of land on and off. When the Borana moved out of the wet season and into the dry season rangelands, the Somali groups occupied the wet season rangelands, resisting the return of the Borana.

2.6. Application of Conflicts Indices for Management

2.6.1. Indices of conflicts

With the advent of the World Wide Web (WWW), there has been a proliferation of readily accessible and open-source databases of indicators and indices quantifying many aspects of conflict and security. From the number of battle deaths in conflicts to infant mortality rates in such areas, the indicators provide insights into the state of peace and security in conflict-ridden areas as well as the world more generally. Indices further aggregate these indicators to provide an even more general sense of conditions in such areas. Fortunately, most of this indicator and

index information is freely available on the WWW and has been a frequently used resource for international investors, official aid donors, policy makers, analysts, academia and other information seekers. Since the onset of the systematic study of war in the 1940s, with the pioneering work by Quincy Wright (1942), a few prominent and large-scale data-collection projects have emerged and set a precedent for the multitude of smaller projects that have followed. The Correlates of War (COW) project, established by J. David Singer in the 1960s, is an early example. Singer, together with historian Melvin Small, began by collecting and cataloguing information concerning inter- and extra-state post-Neopolic wars with a focus on temporal and spatial variation.

2.6.2. Indices of conflict management mechanisms

Equally reputable by current standards is the Armed Conflict and the Conflict Management Program at the Stockholm International Peace Research Institute (SIPRI). Founded in 1966 and funded primarily by the Swedish government, the institute aims to promote conflict prevention and resolution through greater transparency surrounding arms control and security issues. Each year, SIPRI publishes a compendium of data summarizing findings on analytically themed conflict and security issues around the world. Their website provides access to several data bases containing information on Peace Operations, Military Expenditure and Arms Transfers. They also house the exceptionally useful Facts on International Relations and Security Trends (FIRST) database of databases, which integrates data from approximately 30 leading institutes around the world.

The well-known Uppsala Conflict Data Program (UCDP) at Uppsala University in Sweden is another prominent government-funded data collection program out of Sweden. Active in conflict research since the mid 1980s, UCDP collaborates with both the United Nations (UN) and the International Peace Research Institute in Oslo (PRIO) in collecting and analyzing an expansive array of post-World War II conflict data. Some of their projects are specifically aimed at informing issues surrounding the termination and resolution of war. In addition to being featured in the SIPRI yearbook, their work has been published annually in *Journal of Peace Research* since 1993. The sheer proliferation and diversity of information sources, however, demands an increasing level of knowledge management in order to maximize the utility of the available information for end users.

Part of that function involves discovering what data and information sources currently exist. At a deeper level, the knowledge management involves classifying those information sources in such a manner that not only allows users to find what they are looking for more effectively, but also assist them in selecting the indicator(s) most appropriate for their purposes. There have been numerous attempts to document and classify open-source databases pertaining to conflict and security, however most are not comprehensive and provide a limited overview of what is actually available.

2.7. Conceptual Framework

A conflict has generally been defined as a situation in which two or more parties strive to acquire the same scarce resources at the same time. (Peter Wallensteen,, 2002) Scholars generally agree that there needs to be more than one part to have a conflict, and that the time factor is important. What does cause concern is the term *scarce resource*. The central point in this argument is scarcity, but resources need also be included in the discussion. Peter Wallensteen has pointed out that resources are not only economic in nature, 13 and that the terminology might miss conflicts involving economic orientation, human security, environment, historical issues, etc. Such conflicts are not necessarily about resources, and when they are, these resources are, more importantly, not necessarily scarce.

Conflicts can originate within an entity resulting in intra-personal, intra-group or intra-national conflicts; or they could reflect incompatible actions between contrasting groups or persons leading to interpersonal, intergroup or international conflicts. Depending on how they are handled, conflicts can serve a constructive role leading to a reexamination of basic assumptions and practices, or in the alternative, to a disruption of life and general wellbeing of a people. The challenge for leaders and managers is how to make conflicts constructive rather than destructive, overt rather than covert, marginal rather than fundamental, peripheral rather than pivotal. (Osisioma, 2016).

Conflict management is the deliberate action to deal with conflictive situations, both to prevent or to eliminate them. To Best. SG, (2012), conflict management is a process of reducing the negative and destructive capacity of conflict through a number of measures and by working with and through the parties involved in that conflict. It is sometimes used synonymously with conflict regulation and covers the entire area of handling conflicts

positively at differently stages, including those efforts made to prevent conflict by being proactive. It also involves negotiation, mediation, arbitration and reconciliation. Generally, conflict management involves a process of limiting the negative aspects of conflict while increasing the positive aspects of it (Osisioma 2016).

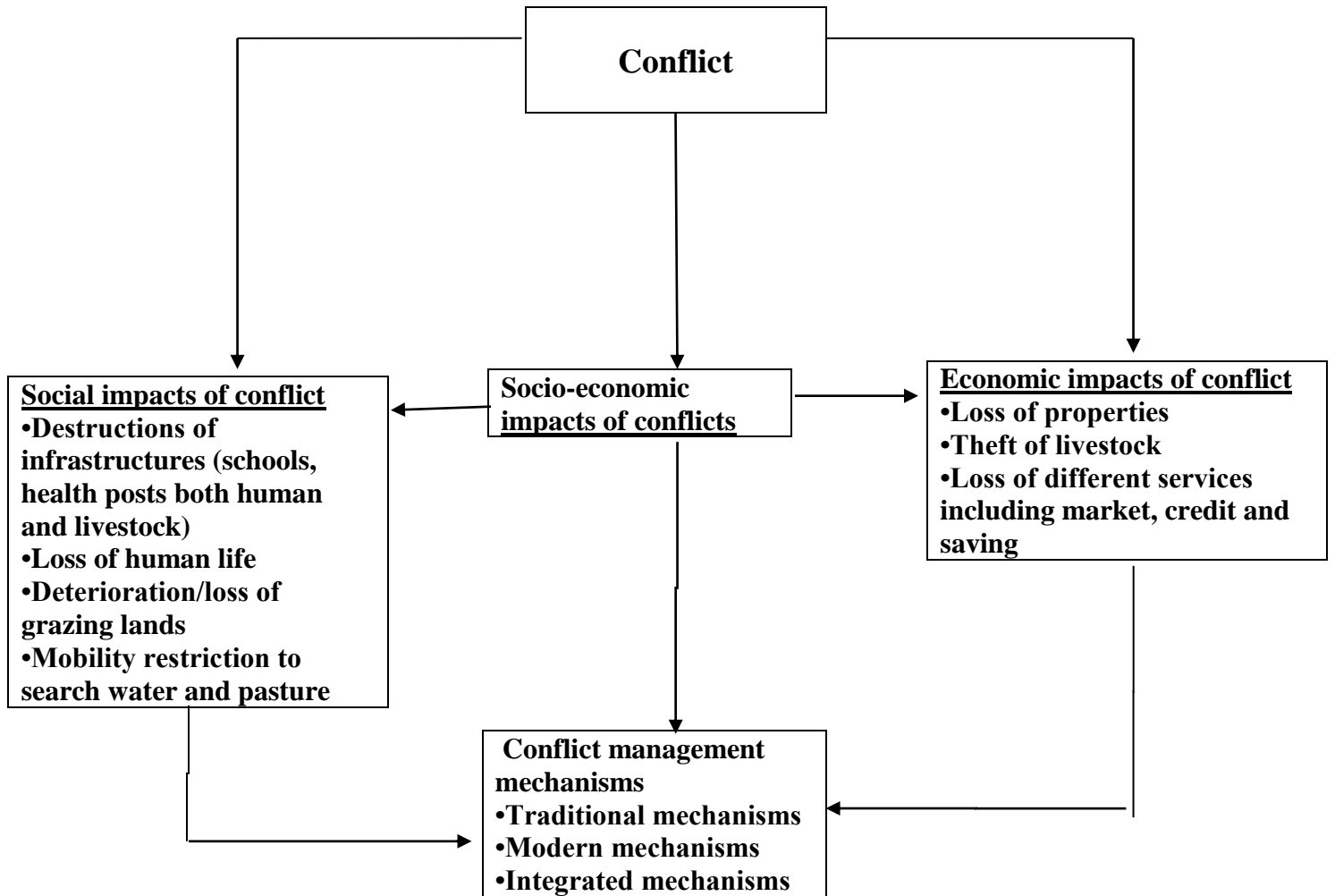


Figure 1: Conceptual Framework

Source: Own design (2023)

3. RESEARCH METHODOLOGY

3.1. Description of Study Area

3.1.1. Location and Area

The study area is found in the eastern portion of the Ethiopian Great Rift-Valley, in western Hararghe zone of Oromia Regional state. Geographically, the study area is located between $9^{\circ}09'49''$ and $9^{\circ}37'20''$ N latitude; and longitudes $40^{\circ}18'39''$ and $40^{\circ}38'01''$ E longitudes (Fig. 2). The study area is located at 275 Km East of Addis Ababa. The *woreda* connect three regions of Ethiopia, namely; *Oromia*, *Afar* and *Somali*. The study area is bordered by Meiso *woreda* in East, Aanchar *woreda* in west, Guba Qoricha *woreda* in south and Amibera *woreda* of Afar region in north direction (WHZPED, 2017).

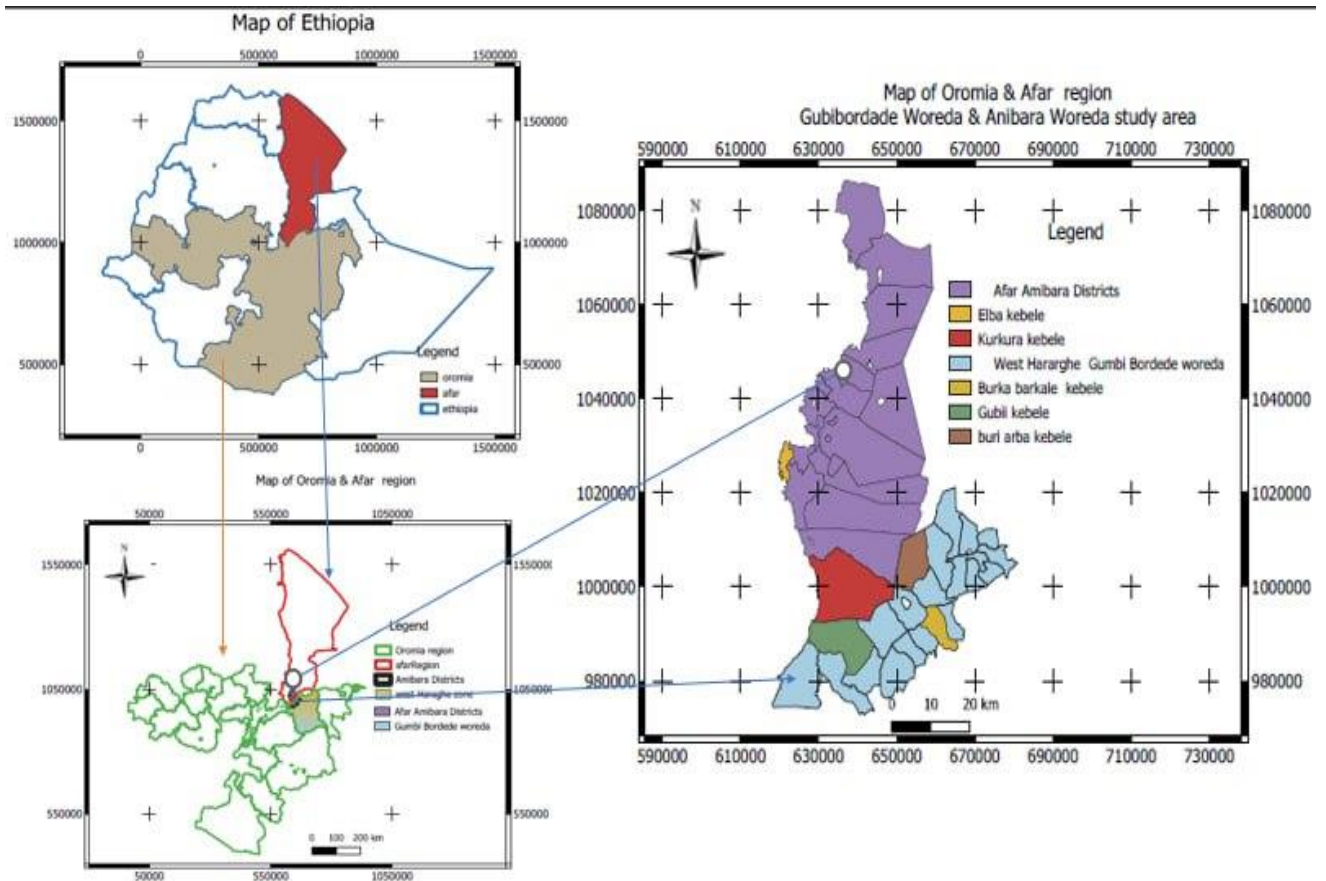


Figure 2: Location Map of the Study Area.

Source- West Hararghe Zone Planning and Economic Development Office (2017)

3.1.2. Relief and soil

Altitudes of the study area ranges from 740 m.a.s.l (Amibera district) to that of 2580masl (Gumbi-Bordede district). The relief of the study area is characterized by undulating plains of flat land on its low land areas. Based on data obtained from the districts, the major soil types are Sand (10%), Clay (75%) and mixed (15%). In addition to these, there are also other soil types like black soil 75%, sand soil 10% and mixed soil 15% covers different parts of the districts. However, livestock production depended on grazing lands, rapid soil erosion and grazing land degradation due to over grazing and high rate of deforestation are the main problems of the district (WHFEDO, 2016). According to FAO/UNESCO soil Classification system, the major soil types of the study area are VerticCambisol soil (orthic and ferralic), HaplicLuvisol (Orthic) and Eutric Cambisol (Orthic). Accounting for 50%, 16% and 11%, respectively.

3.1.3. Climate and drainage

Minimum and maximum temperature of the study area is range between 19°C and 37°C. The average annual rainfall of the study area is range between 400- and 900-mm. Rainfall is a major limiting factor for livestock and agricultural production in the study area. Agro-ecologically, the study area is classified as Kolla (Low land). The mean annual temperature and rainfall of the district is about 26 °c and 650 mm respectively. Most of the rain is received only few months, and most of the months are dry. As a result, relief aid is a regular source of livelihood for many rural families (WHPEDO, 2017).

The rainfall pattern is un-modal with one season. Mainly rains occur during June 15 – September 15. The months October to January are the coolest while the warmest temperature prevails during May and June (GBWANO, 2021). As the drainage of the study area's major rivers such as Kurkura, Hardim, Aware Berkele, LegaEba and Lega Aba are drained to Awash River. These rivers are used as sources of traditional irrigation (WHFEDO, 2016).

3.1.4. Vegetation and wildlife

The most part of the study area's features, include grassland, bare land, scatter grass and tree land (shrub land), bush land, woodland and Afro-alpine Forest. The overall vegetation type that covers the largest part of the area is classified as grassland plains with savannah woodland and Acacia species and bush land. The vegetation of the area is *Acacia* dominated with some under growth of grasses. From the total land area, 11.5 % is arable land, 9 % is grazing land, 29 % forest and bushes, 24 % is potentially cultivable, 25 % uncultivable land (hills) and 2 % is homestead (WHFEDO, 2016). The study area is predominantly invaded by *Prosopis geliflora* tree and *Partinum* weed species which invade all grazing lands and affect the livelihood of the communities (GBANO, 2021). Lion, wild ass, ostrich, tiger, Biera antelope, monkey spp. Hyena spp., serval cat, Zebra, Warthog, Tortoise, different snake spp., and different bird spp are the major wildlife exist in the study (WHFEDO, 2016).

3.1.5. Population characteristics

According to the GBWAO, (2020-21) population report, the total number of households in the study area is 20364 with a total population of 100583 (51306 male & 49277 females). Accordingly, the population density is 137person/sq.km with average family size of six people per household.

Table 1: Population Characteristics

Population by category	Male	Female	Total
Agro pastoral population	23, 737	16,280	40,017
Pastoral population	47,246	12,120	59, 366
Total population	72,183	28,400	100,583

(Source; GBWAO, 2022)

According to the ARZ3FEDO, (2016). Population report, total population of Amibara district was 63,378 of which 35,374 were male and 28,004 were female. In Amibara district all communities are pastoralist. Amibera district has 19 kebeles which were the least administrative units (ARZ3FEDO, 2016).

3.1.6. Socio-economic features

Gumbi Bordede woreda is one of the woredas of West Hararghe Zone and its livelihood most depends on pastoralists as well as on livestock–crop mixed production system. About 75% of the population depends on pastoralist for their livelihood. Now, the population density is 50.1/km². There are two types of farming system found in the woreda; crop/livestock and pastoral production system. From the total land area coverage, only 12 % are suitable for crop production.

The livestock population is estimated to be Cattle 198,120, Goat 261,200, Sheep 88,410, Camel 57,186, Donkey 38,841, Poultry 85,640 and Beehives 3,858 (GBANO, 2021). This shows that the area is much of a rangeland where livestock rearing is the major activity. The rainfall pattern is unimodal with one distinct season. Mainly rains occur during June 15 to September 15. The months October to January are the coolest while the warmest temperature prevails during May and June (GBWANO, 2021). Amibara district, Zone three of afar regional state and its livelihood most depends on pastoralists; the livestock population is estimated to be Cattle 103,959, Goat 122,576, Sheep 48,043, Camel 39,995, and Donkey 3,888. This shows that the area is much of a rangeland where livestock rearing is the major activity. The rainfall pattern is un-modal with one distinct season. Mainly rains occur during June 15 to September 15.

3.2. Research Design

The research design allows us for the collection of data from more than one point in time for comparison purposes. The design considered as the most appropriate for this study taking into consideration the mobile nature of the pastoralists, and conflict. Furthermore, a combination of methods was used in the collection of both quantitative and qualitative data, that is, triangulation. The data was collected by different methods provided a reliability check. Qualitative methods provided an insight into reasons for some issues arising from the quantitative methods. They particularly, answered the questions of why and how by respondents.

The study was carried out in two phases. Phase one involved inspection surveys of the study area. During this phase, the researcher will obtain research permit to conduct research in the study area of West Hararghe. The study area is selected purposively for this study. At this stage, the researcher will familiarize with the social settings of the study areas, and a total of five PAs was selected (three from Gumbi Bordode woreda and two from Amibara woreda) based PAs which border the two woredas using stratified random sampling. The questionnaires will pre-tested during this phase, in order to identify weaknesses, ambiguities and/or omissions before they were administered. Ten households, from five PAs of the study area were selected for pre-testing the questionnaire. During the second phase, the detailed formal questionnaire surveys will carry out.

3.3. Target Population

The target population was the households from Gumbi Bordode woreda of West Hararghe and Amibara Woreda of afar region Zone kebeles which have been affected by conflict between two ethnic groups.

3.4. Sampling Technique

This study defines the survey population at the household level. As the study population could not be homogenous in any community, the researcher was used a multi-stage stratified random sampling procedure with a combination of purposive and random sampling procedures. At the first stage, out of 15 woredas in west Hararghe Zone, the current study Gumbi Bordode and Amibara woreda of Afar Region was selected purposively because these woredas are frequently affected by the conflict (West Hararghe Disaster Risk Management Office, 2021). In the second stage, the sample 5 kebeles (3 from Gumbi Bordode and 2 from Amibara) was selected from respective border according to their size by using random sampling techniques. Finally, the lists of households for the study were selected from 5 study kebeles based on their probability proportional to the size of the population (PPS) by using also random sampling techniques.

3.5. Sample Size

Sample size was determined by the use of proportionate to size sampling methodology as specified by (Kothari, 2004) as follows for a finite population;

Equation..... 1.

$$n = \frac{Z^2 \cdot p \cdot q \cdot N}{e^2(N-1) + Z^2 \cdot p \cdot q}$$

Where: N = the population size = sample size = the sample proportion (q = 1-p), Z= the standard variate at a given significance level ($\alpha=95\%$) and e= acceptable error (precision). n: sample size; p: the sample proportion 0.5, (q = 1-p); Z: the standard deviation at 95% C.I. ($\alpha= 1.96$); and, e: acceptable error (precision); 0.05, Required: n =?, Soln: $n = (Z)^2 \cdot p \cdot q \cdot N / (e)^2(N-1) + (Z)^2 \cdot p \cdot q$ $n = 1.96 \times 1.96 \times 0.5 \times 0.5 \times 1775 / (0.05 \times 0.05) \times (1775-1) + (1.96 \times 1.96) \times 0.5 \times (1-0.5)$, n= 335

Table 2: Sample kebeles for study, number of households and sample size

N	Kebeles	Regional State	Number of households	Proportion	Sampledhousehol
1	Gumbi	Oromia	383	22	68
2	Burka Anani	Oromia	272	15	48
3	BuriArba	Oromia	360	20	64
4	Kurkura	Afar	440	25	88
5	Der Ebi	Afar	320	18	67
Total			1775	100	335

Source; GBWAO, 2022 and ARZ3FEDO, (2016).

3.6. Type and Sources of Data

Both primary and secondary data was collected during this study. Secondary data sources include documentary materials (government reports, research reports, village records and various publications) obtained from libraries and district offices. Primary data was obtained from selected study villages and households through household surveys and informal discussions with local people. Surveys, formal interviews, focus group discussions, informal interviews and participant observation were employing for the data collection. This study was utilized the qualitative based evidence of both primary and secondary data. Sources from which the data relating to address conflict between pastoralist communities, its socio-economic effects on household income and opportunities

were drawn through questionnaire, face-to-face interview and document review. A semi-structured face-to-face interview was conducted with officials including experts in the study area. This represents the entire population of respondents within the area of study that were considered as unit of study.

Climate data: The meteorological data, including detailed local temperature and rainfall measurements, was collected from the Mieso weather station operated by the National Meteorology Agency of Ethiopia (NMAE, 2018). Many agro-hydrological models necessitate climate data for effective operation. A significant challenge in climate data analysis is the absence of observed daily data. To address these gaps, various interpolation techniques are employed. For the purposes of this study, the arithmetic mean method was utilized.

3.7. Methods of Data Collection

3.7.1. Questionnaire

Questionnaires comprising of household demographic characteristic, socioeconomic activities, and other issues related to the effects of conflict and vulnerable groups of the conflict, was developed in order to collect data. Questionnaires was prepared in English and then translated to local language (Afaan Oromo) and (afar language) in order to get accurate information from the households since this language is used by all of the residents in this district. The prepared questioner was collected by development agent assigned in selected PAs. two-hour orientation was given to data collectors about the purpose of the study, the contents of the questionnaire, how they are going to approach and treat respondents and other related issues (local languages and culture). To this end 335 survey, questionnaires do in English language and were translated to Afan Oromo language when survey is collected

3.7.2. Key informant interview

Interview was used as a data collecting instrument to get the views and opinions of sample respondents. Key informants' interviewees were purposively selected from different community representatives, like ethnic leader, aba gEDA, religious leader and experts. The interviewees give the need information verbally in face- to face situation. Key informant

interview was carried out with 13 informants as one of data collecting methods with four knowledge and experience-rich households from each kebeles and development agent (DA).

3.7.3. Focused Group Discussion

Focus Group Discussions (FGDs) were strategically conducted to enhance the effectiveness of data collection for the study on socio-economic and environmental impacts of conflict in the Gumbi-Bordode and Amibara districts of Eastern Ethiopia. The discussions were meticulously organized among diverse groups, classified by key demographic factors such as sex, age, education level, and economic status. This classification was essential to ensure that a wide range of perspectives was captured, reflecting the varied experiences and opinions within the community.

A total of five FGDs were held with household heads who were likely to represent the broader community's views. These participants were selected through a simple random sampling method, which helped mitigate biases and ensured that every individual had an equal opportunity to contribute to the discussions. Careful attention was given to avoid the dominance of any particular group during these discussions; this was crucial in fostering an inclusive environment where all voices could be heard.

Facilitators employed various techniques to encourage participation from all discussants, ensuring that quieter members had opportunities to share their insights without being overshadowed by more vocal participants. The structured yet flexible format of the FGDs allowed for a rich exchange of ideas while also enabling facilitators to capture disaggregated data effectively. This approach not only enriched the quality of information gathered but also provided a nuanced understanding of how different segments of the population experienced and perceived conflict and its impacts in their lives. Overall, the FGDs served as a vital tool in gathering qualitative data that complemented quantitative findings from questionnaires, thereby offering a comprehensive view of the socio-economic dynamics at play in these districts.

3.8. Methods of Data Analysis

As usual, the collected was analyzed by using different analytical techniques after coding and entry into computer program of statistical packages. Qualitative data generated from

household survey, FGDs, KIIs, field observation and secondary sources were analyzed by using tabulation, triangulation, and interpretation of situations, perceptions and explanations of themes based on the objectives of study. Both descriptive and inferential statistics were adopted to facilitate processes of data analysis and interpretation results. Secondary data were also incorporated to augment the results of analysis for primary data in each step as required. The following sub-subsections briefly discuss the statistical and analytical tools used in the study.

3.8.1. Descriptive statistics

Descriptive statistics tools such as mean, standard deviation and percentages was used to analyze and present socio-economic characteristics, perception of climate change and its adverse effects and climate change adaptation strategies. To this end, IBM SPSS version 20.0 soft- was employed. The analyzed data displayed with the help of tables, graphs and charts. The qualitative data was analyzed by thematic coding and narrating the response of the key informants obtained from interview and FGD In this study, descriptive statistics was used to reduce quantitative data collected into summary formats by tabulation in order to facilitate for comparisons between groups or variables involved in the study. In this regard, the researcher will employ frequency of occurrences, means, range, percentages, figures, graphs and tables.

3.8.2. Climate change and variability analysis

3.8.2.1. Mann–kendall trend test

To assess trends in rainfall and temperature data, the Mann–Kendall trend test was implemented (Mann, H.B. 1945; Kendall, M.G. 1975). This non-parametric method is advantageous due to its reduced sensitivity to outliers and its ability to detect trends in climatic variables without the need to define the nature of the trend as linear or non-linear. The Mann–Kendall test has been widely adopted in numerous trend detection studies (Asfaw et al., 2018; Ketema, A., 2020). The test statistic for Mann–Kendall is calculated as follows:

$$S = \sum_{i=1}^{N-1} \sum_{j=i+1}^N \text{sgn}(x_j - x_i)$$

The sign function is given as

$$\begin{cases} +1 & \text{if } (x_j - x_i) > 0 \\ 0 & \text{if } (x_j - x_i) = 0 \\ -1 & \text{if } (x_j - x_i) < 0 \end{cases}$$

Where S is the Mann–Kendal’s test statistics; x_i and x_j are the sequential data values of the time series in the years i and j ($j > i$) and N is the length of the time series. A positive S value indicates an increasing trend and a negative value indicates a decreasing trend in the data series. The variance of S , for the situation where there may be ties (i.e., equal values) in the x values, is given by

$$\text{var}(S) = \frac{n(n-1)(2n+5) - \sum_{i=1}^m t_i(t_i-1)(2t_i+5)}{18}$$

where m is the number of tied groups in the data set and t_i is the number of data points in the i_{th} tied group. For n larger than 10, Z_s approximates the standard normal distribution and computed as

$$Z_s = \begin{cases} \frac{s-1}{\sqrt{\text{var}(s)}} & \text{if } S > 0 \\ 0 & \text{if } S = 0 \\ \frac{s+1}{\sqrt{\text{var}(s)}} & \text{if } S < 0 \end{cases}$$

The presence of a statistically significant trend will be evaluated using the Z_s value. In a two-sided test for trend, the null hypothesis H_0 should be accepted if $|Z_s| < Z_{1-\frac{\alpha}{2}}$ at a given level of significance.

$Z_{1-\frac{\alpha}{2}}$ Is the critical value of Z_s from the standard normal table e.g., for 5% significance level, the value of $Z_{1-\frac{\alpha}{2}}$ is 1.96.

3.8.2.2. Sen’s Slope Estimator Test

The non-parametric method described by Sen, P.K (1968) was also used to estimate the magnitude of trends in the data time series. The slope of “n” pairs of data estimated by using the following formula

$$\beta = \text{Median} \left(\frac{x_j - x_i}{j - i} \right)$$

$$\beta = \begin{cases} \beta_{\left[\frac{(n+1)}{2}\right]}, & \text{if } n \text{ is odd} \\ \frac{1}{2} \left\{ \beta_{\left[\frac{n}{2}\right]} + \beta_{\left[\frac{n+2}{2}\right]} \right\}, & \text{if } n \text{ is even} \end{cases}$$

A negative b value represents a decreasing trend; a positive b value represents an increasing trend over time.

3.8.2.3. The rainfall variability analysis by coefficient of variation (CV%)

The coefficient of variation is used to evaluate the variability of rainfall data relative to its standard deviation and is normally presented as a percentage Shree & Kumar (2018) and Bharath et al. (2023).

$$CV = \frac{\sigma}{\mu} * 100 \dots \dots \dots \text{eq(5)}$$

Where CV is the coefficient of variation; σ is the standard deviation and μ long term mean rainfall. According to the values of CV (<20) consider less variable, (20–30) moderately variable, and (>30) highly variable.

3.8.3. Rainfall variability in Anomaly and Precipitation Concentration Index

In the present study the monthly, seasonal and annual rainfall variability was analyzed using various indices. Observed monthly, seasonal and annual rainfall variability has been investigated using normalized rainfall anomalies index (AI), precipitation concentration index (PCI) and rainfall trend Analysis. In this study, the rainfall anomaly and precipitation concentration index were calculated using precintcon package in R software.

For inter-annual rainfall variability, the PCI method is expressed as;

$$PCI = \frac{\sum_{i=1}^{12} p_i^2}{(\sum_{i=1}^{12} p_i)^2} * 100 \dots \dots \dots \text{eq(4)}$$

Where, PCI is precipitation concentration index, P_i is the rainfall amount of the i th month; and Σ = summation over the 12 months for annual rainfall variability while 4 months for seasonal variability

PCI Value below 10 indicates uniform distribution (low precipitation concentration), values from 11 to 15 denotes seasonality in rainfall distribution (indicates moderate precipitation concentration); PCI between 16 and 20 indicates irregular distribution and finally, $PCI > 20$ indicates a strong irregularity (i.e., high precipitation concentration) (Oliver, 1980; De Luis, et al., 2011; Valli et al., 2013).

From the precipitation data, the Annual Rainfall Anomaly Index (RAI) was calculated to analyze the frequency and intensity of the dry and rainy years in the studied area. In addition, the monthly RAI was calculated for specific years of the historical series aiming to analyze the distribution of rainfall in the years of greatest anomaly. RAI, developed and firstly used by Rooy (1965) and adapted by Freitas (2005), constitutes the following equations:

$$RAi = \frac{pt - Pm}{\sigma} \dots \dots \dots \text{eq(12)}$$

The equation $RAI = (Pt - Pm)/\delta$ represents the normalized rainfall total for station i in year j. Positive anomalies suggest above-average rainfall, and negative suggest below-average.

$$RAI = 3 \left[\frac{N - \widehat{N}}{\widehat{M} - \widehat{N}} \right], \text{ For positive anomalies}$$

$$RAI = -3 \left[\frac{N - \widehat{N}}{\widehat{MX} - \widehat{N}} \right], \text{ For negative anomalies}$$

Where: N = current monthly/yearly rainfall, in order words, of the month/year when RAI will be generated (mm); \widehat{M} = monthly/yearly average rainfall of the historical series (mm); \widehat{N} = average of the ten highest monthly/yearly precipitations of the historical series (mm); \widehat{MX} = average of the ten lowest monthly/ yearly precipitations of the historical series (mm); and positive anomalies have their values above average and negative anomalies have their values below average.

Table 3: Classification of Rainfall Anomaly Index Intensity

	RAI range	Classification
Annual Rainfall Anomaly Index (RAI)	Above 4	Extremely humid
	2 to 4	Very humid
	0 to 2	Humid
	-2 to 0	Dry
	-4 to -2	Very dry
	Below -4	Extremely dry

Source: Freitas (2005) adapted by Araújo et al. (2009)

3.8.4. Inferential statistics

Inferential statistics allows inferring from data through analysis the relationships between two or more variables, and how several independent variables might explain the variance in a dependent variable (Sekaran, U. 2000).

To identify the effects of root causes of conflicts on socio-economic of household's, which a continuous variable is, a chi-square test was used.

This study employs specific variables aligned with its objectives and research design, including the trends of conflict, the factors and causes underlying conflict, and the socio-economic impacts associated with these phenomena

3.8.5. Ethical considerations

Research ethics is the moral principle guiding research; which has an obligation to respect the rights, needs and desires of the informant(s) (Creswell, 1994). This research will conduct through observance of the dully recognized ethical standards among the research communities, among others through unanimous documentations of data providers except when the revealing is necessary and true consent of the subject obtained before hands. Thus, the researcher will collect data after proper information of target groups and the purpose for which he will collect data. He will also never use the data obtained for research purpose other than the objects for which it is obtained.

4. RESULTS AND DISCUSSIONS

4.1. Descriptions of Socioeconomic Characteristics of Households

4.1.1. Descriptions of continuous variables

The results of continuous variables of the data collected from 335 households as presented in the table 3., were analyzed, and the results are presented in terms of mean and standard deviation for each variable. The variables examined include the age of the household, farm size, family size, distance to the nearest market, and total livestock unit.

Table 4: Results of household characteristics in terms of continuous variables

Countinous variables	N	Mean	Std. Deviation	Minimum	Maximum
Age of household	335	48.02	11.524	18	85
Farm size	335	.7690	.61306	.20	3.20
Family size	335	6.41	1.839	3	11
Distance to nearst market	335	5.0209	1.35015	1.00	9.00
Total livestock unit	335	4.60	1.905	1	9

Age of househilds: the mean age of the households was found to be 48.02 years, with a standard deviation of 11.524. This indicates that the average age of the households in these districts is relatively high. The standard deviation suggests that there is some variation in the age distribution, with some households having older members and others having younger members. This information is crucial for understanding the demographic characteristics of the households and can have implications for various socio-economic factors. For instance, an older population may have different needs and priorities compared to a younger population, which can influence the demand for certain services and resources.

Farm size: the mean farm size was found to be 0.7690, with a standard deviation of 0.61306. This suggests that the average farm size in these districts is relatively small. The standard deviation indicates that there is considerable variation in farm sizes among the households, with some having larger farms and others having smaller ones. The size of the farm can have significant implications for agricultural productivity and income generation. Smaller farms may face challenges in terms of economies of scale and may struggle to meet the food and income needs of the households. Understanding the distribution of farm sizes can help policymakers and development practitioners design targeted interventions to support smallholder farmers and improve their livelihoods.

Family size: the mean family size was found to be 6.41, with a standard deviation of 1.839. This indicates that the average household in these districts consists of approximately 6 members. The standard deviation suggests that there is some variation in family sizes, with some households being larger and others being smaller. The size of the family can have implications for various socio-economic factors, including education, healthcare, and resource allocation. Larger families may face challenges in terms of providing adequate resources and services to all members, while smaller families may have different needs and priorities. Understanding the distribution of family sizes can help inform policies and programs aimed at improving the well-being of households in these districts.

Distance to the nearest market: the mean distance to the nearest market of 5.0209 with a standard deviation of 1.35015 indicates that, on average, households in these districts are located relatively close to markets. This proximity to markets can have significant implications for the livelihoods of the residents, as it may facilitate access to essential goods and services, as well as opportunities for economic activities such as selling agricultural produce or handicrafts. However, the standard deviation suggests that there is variability in the distance to markets among households, which could be due to factors such as geographical location, infrastructure, or transportation options.

Total livestock unit: the mean total livestock unit of 4.60 with a standard deviation of 1.905 highlights the importance of livestock in the livelihood strategies of households in the study area. Livestock play a crucial role in the economy of many rural communities in Ethiopia, providing a source of income, food security, and social status. The variability in the total livestock unit among households, as indicated by the standard deviation, could be attributed to factors such as land availability, access to grazing areas, and cultural practices related to livestock ownership. Understanding the distribution and management of livestock units among households is essential for designing effective interventions to improve the socio-economic well-being of the residents.

4.1.2. Descriptions of Categorical variables

The results of the data presented in the table 4, described households characteristics in terms of categorical variables for the Gumbi-Bordede and Amibara districts of Eastern Ethiopia provide valuable insights into the socio-economic dynamics of these regions. These include

the mean values for the sex of households, education level, access to grazing and pasture, and training on conflict management reveal important aspects of the communities living in these areas.

Table 5: Results of household characteristics in terms of categorical variables

Variables	Number	Mean	Std. Dev	Range	Minimum	Maximum
Sex of Household	335	0.79	0.405	1	0	1
Education level	335	0.63	0.483	1	0	1
Access to grazing	335	0.66	0.476	1	0	1
Training on conflict	335	0.31	0.462	1	0	1
Membership to coop.	335	0.31	0.463	1	0	1
Access to credit	335	0.37	0.483	1	0	1

Sex of households: the mean value of 0.79 for the sex of households indicates that a significant majority of households are likely headed by males. This could have implications for decision-making processes within the household and the distribution of resources. The standard deviation of 0.405 suggests that there is some variability in the distribution of male-headed households in the sample.

Education level: the mean value of 0.63 for education level highlights the importance of education in these districts. A higher mean value indicates that, on average, households have attained a moderate level of education. This could have positive implications for the socio-economic development of the region, as education is often linked to increased opportunities for employment and income generation. The standard deviation of 0.483 suggests that there is some variability in the educational attainment of households, with some households having higher levels of education than others.

Access to grazing and pasture: the mean value of 0.66 for access to grazing and pasture is crucial in the context of these districts, where agriculture and livestock rearing are likely significant sources of livelihood. A higher mean value indicates that, on average, households have relatively good access to grazing and pasture lands. This could have implications for food security and income generation, as access to grazing and pasture is essential for livestock production. The standard deviation of 0.476 suggests that there is some variability in the access to grazing and pasture among households, with some households having better access than others.

Training on conflict management: the mean value of 0.31 for training on conflict management is particularly noteworthy, as conflicts can have significant socio-economic impacts in these districts. A lower mean value indicates that, on average, households have limited training on conflict management. This could have implications for the resolution of conflicts within communities and the overall stability of the region. The standard deviation of 0.462 suggests that there is some variability in the level of training on conflict management among households, with some households having more training than others.

Membership to cooperative: The mean value for membership to cooperative is 0.31, with a standard deviation of 0.463. This indicates that, on average, households in the Gumbi-Bordede and Amibara districts have a relatively low level of membership to cooperatives. The standard deviation suggests that there is a considerable variation in the level of membership among households. Some households may have a higher level of membership, while others may have little or no membership at all. The implications of these findings is that membership to cooperatives can have various socio-economic benefits for households. Cooperatives provide a platform for collective action, enabling members to pool their resources and engage in joint economic activities. This can lead to increased access to markets, improved bargaining power, and enhanced productivity. However, the low mean value suggests that a significant proportion of households in these districts are not taking advantage of these benefits. This could be due to various factors, such as lack of awareness, limited resources, or inadequate support from the cooperative organizations.

Access to credit: The mean value for access to credit is 0.37, with a standard deviation of 0.483. This indicates that, on average, households in the Gumbi-Bordede and Amibara districts have a moderate level of access to credit. The standard deviation suggests that there is a considerable variation in the level of access among households. Some households may have better access to credit, while others may face significant challenges in obtaining credit. The implications of these findings are also noteworthy. Access to credit is crucial for households, especially in rural areas, where income-generating opportunities may be limited. Credit can be used to invest in agricultural inputs, start or expand small businesses, or cope with unexpected expenses. The moderate mean value suggests that a significant proportion of households have some level of access to credit. However, the standard deviation indicates that there are

households that face barriers in accessing credit. This could be due to factors such as lack of collateral, limited financial literacy, or stringent lending policies.

4.1.3. Social capital and networking

The results of the study presented in the table 5, on social capital and networking in the Gumbi-Bordede and Amibara Districts of Eastern Ethiopia reveal interesting insights into the perceptions of households in these communities.

Table 6: Results of household characteristics for social capital and networking variables

Social capital variables	Number	Mean	Std. Dev	Range	Minimum	Maximum
Trust each other	335	4.93	0.40	3	2	5
Most people honest	335	4.15	0.35	1	4	5
Fairness	335	4.12	0.41	3	2	5
Help each other	335	4.06	0.54	3	2	5
Contribute time and mone	335	4.03	0.57	3	2	5
Leaders capablity	335	3.97	0.60	3	2	5
Local leaders in managing	335	3.91	0.67	3	2	5

Trust among community members: The high mean score of 4.93 for the question on trust among community members indicates a strong sense of trust and cohesion within the villages. This suggests that people in these districts have a high level of confidence in each other when it comes to matters concerning their community relationships. The low standard deviation of 0.40 further supports the consistency of responses, indicating a general consensus among the respondents.

Honesty among villagers: the mean score of 4.15 for the question on honesty among villagers reflects a slightly lower but still positive perception of the integrity of most people in the community. The standard deviation of 0.35 suggests a relatively consistent view among respondents regarding the honesty and trustworthiness of their fellow community members. This finding highlights the importance of honesty as a fundamental value in these societies, contributing to the overall social fabric and cohesion within the villages.

Fairness: the results show a mean score of 4.12 for the question on fairness, indicating that most people in the villages are perceived to strive for fairness when given the opportunity. The standard deviation of 0.41 suggests a moderate level of variation in responses, implying that

while there is a general consensus on the fairness of individuals in the community, there may be some differing opinions among respondents.

Willingness to help: the mean score of 4.06 for the question on the availability of help within the community indicates a positive perception of the willingness of community members to assist each other in times of need. The standard deviation of 0.54 suggests a slightly higher level of variability in responses compared to the other questions, indicating some diversity in opinions regarding the availability of help in the villages.

Villagers contribute their time and money: This variable assessed the extent to which people in the villages contribute their time and money towards common goals. The mean score of 4.03 indicates a relatively high level of contribution, with individuals showing a positive inclination to invest their resources for the betterment of the community. The standard deviation of 0.57 suggests that there is some variation in the responses, indicating that while the majority of individuals contribute significantly, there are some who may contribute less or not at all. This finding highlights the importance of fostering a sense of collective responsibility and encouraging active participation in community initiatives.

Capability of village leaders: this variable examined the perception of individuals regarding the capability of village leaders in managing people's problems. The mean score of 3.97 suggests that there is a moderate level of agreement among the respondents regarding the effectiveness of village leaders in addressing the issues faced by the community. The standard deviation of 0.60 indicates some variability in the responses, implying that there are differing opinions among the villagers regarding the leadership capabilities. This finding underscores the need for continuous capacity building and training programs for village leaders to enhance their skills in problem-solving and decision-making.

Local leaders' ability to manage conflict-induced disasters: this variable focused on the perception of individuals regarding the local leaders' ability to manage conflict-induced disasters. The mean score of 3.91 indicates a moderate level of agreement among the respondents regarding the effectiveness of local leaders in handling such situations. The standard deviation of 0.67 suggests that there is a considerable variation in the responses, indicating differing perspectives among the villagers. This finding highlights the importance of

strengthening the capacity of local leaders in disaster management and providing them with the necessary resources and support to effectively respond to and mitigate the impacts of conflicts and disasters.

4.2. Climate change and variability of the study area

4.2.1. Rainfall variability and trend in the study area

The results outlined in Table 6 provide a comprehensive descriptive analysis of monthly and seasonal rainfall patterns in the study area over a thirty-year span from 1986 to 2017. The average annual rainfall during this period was recorded at 661.67 mm, with a standard deviation of 156.08 mm, leading to a coefficient of variation (CV) of 23.59%. The data on rainfall exhibited a minimum of 325.66 mm and a maximum of 962.55 mm, highlighting considerable fluctuations in precipitation levels. As shown in Table 4, the summer season, locally known as Kiremit rain, was identified as the period with the highest average rainfall, totaling 273.00 mm, and demonstrated the least variability, with a CV of 27.80%. This season, which includes the months of June, July, and August, is crucial as it significantly contributes to the annual rainfall total, thus playing an essential role in the region's hydrological dynamics. In the subsequent ranking, the spring season, referred to as Belg rain and occurring from March to May, recorded the second-highest mean rainfall at 206.17 mm. Despite its shorter duration, this season is vital for the agricultural practices and livelihoods of the local population, characterized by a high variability with a CV of 52.16%. These findings highlight the necessity of comprehending seasonal rainfall trends and their implications for enhancing community resilience and adaptation strategies in response to the challenges posed by climate change.

Table 7: Descriptive statistics and Mann–Kendall of rainfall in the study area (1986–2017)

Period	Min	Max	Mean	Std	CV	CAT	Zs	β	P-value
Annual	325.66	962.55	661.67	156.08	23.59	-	-0.79	-2.99	0.43
Belgi	40.45	545.35	206.17	107.53	52.16	31.16	-0.15	-0.35	0.88
Kiremit	123.09	444.20	273.00	75.91	27.80	41.26	0.66	0.68	0.51
January	0.00	105.95	15.46	23.17	149.94	2.34	0.66	0.00	0.51
February	0.00	179.25	24.66	40.58	164.57	3.73	-2.14	-0.58**	0.03
March	0.25	198.35	70.17	52.43	74.72	10.60	-1.28	-1.39	0.20
April	7.10	237.05	84.84	52.16	61.48	12.82	1.00	0.01	0.32
May	1.70	169.70	51.16	46.87	91.60	7.73	1.41	0.96	0.16
June	6.30	93.15	35.79	22.01	61.50	5.41	2.09	0.89**	0.04
July	26.50	236.80	116.33	52.58	45.20	17.58	1.15	1.28	0.26
August	47.18	199.55	120.89	42.35	35.04	18.27	-1.61	-1.65	0.11
September	20.70	127.25	75.69	27.81	36.75	11.44	1.90	1.19*	0.06
October	0.00	286.65	35.80	55.54	155.13	5.41	0.63	0.26	0.53
November	0.00	73.50	16.69	21.74	130.28	2.52	2.47	0.43**	0.04
December	0.00	81.75	14.21	21.14	148.82	2.15	-0.08	0.00	0.94

Where Zs = Mann–Kendall test; β = Sen's slope; SD = Standard deviation; CV = coefficient of variation; CAT = Contribution to annual total; ***, **, and * = indicate significant at less 1%, 5%, and 10%.

The examination of rainfall variability indicates a range that spans from minimal to significantly high annual precipitation levels across various seasons. Concurrently, the coefficient of variation for monthly rainfall displayed a spectrum of variability from moderate to exceedingly high. The coefficient of variation (CV) is an essential descriptive statistical tool that classifies variability into specific categories: a CV of less than 20% is considered low variability, a range of 20% to 30% indicates moderate variability, a CV exceeding 30% signifies high variability, above 40% represents very high variability, and a CV surpassing 70% is deemed extremely high variability (Hare, 2003). In this analysis, August was identified as a month with relatively low variability, exhibiting a CV of 35.04%, while December was characterized by extreme variability, with a CV of 164.57%. Seasonal analysis revealed that spring (Belg) displayed very high variability at 52.16%, whereas the summer (Kiremit) season showed notably low coefficients of variation at 27.8%. These results imply that rainfall patterns during the primary sowing season are relatively stable, which is vital for effective agricultural planning and crop management. This finding aligns with the research of Gari et al. (2018) and Moges and Bhat (2021), who reported that the coefficient of variation for Kiremit is notably lower than that of the Belg and Bega seasons. The results obtained from the Mann–

Kendall test demonstrated that there was no statistically significant trend in the annual and seasonal mean rainfall for the area examined. Nevertheless, an evaluation of the monthly mean rainfall data indicated a significant reduction in February, with a p-value below 0.05. In Ethiopia, the Belg season commences in February and continues into March. Therefore, the notable decrease in mean rainfall during these months may pose serious challenges for both livestock and crop production linked to the Belg season. This decline in precipitation could result in inadequate water supply, adversely affecting agricultural productivity and the livelihoods of communities reliant on these seasonal rains for their farming activities. This is consistent with findings from studies conducted in the West Shewa Zone, where Daniel noted a decreasing trend in rainfall during the Belg season (Daniel, 2021). It is essential to comprehend these trends to formulate adaptive strategies aimed at alleviating the potential detrimental impacts on food security and economic stability within the region.

4.2.1.1. Precipitation concentration and Rainfall anomaly index

4.2.1.1.1. Precipitation Concentration Index

The data presented in Table 7 regarding the Precipitation Concentration Index (PCI) reveals that the district under examination has an average annual PCI of 15.52%. The PCI serves as an essential indicator for assessing the distribution and variability of rainfall over a designated timeframe within a specific geographic region. In the context of the study area, the PCI values recorded from 1986 to 2017 offer valuable insights into the precipitation patterns observed in the region (see Table 7). The lowest PCI value noted is 10.70, while the highest reaches 21.51, with the mean value standing at 15.52. A lower PCI signifies a more uniform distribution of rainfall throughout the year, which is typically advantageous for agricultural activities, as it promotes stable soil moisture levels and mitigates the risks associated with drought or flooding. In contrast, elevated PCI values indicate that rainfall is concentrated during particular periods, potentially leading to challenges such as waterlogging during intense rainfall or inadequate moisture during dry spells. This finding aligns with the research conducted by Fitih et al. (2020), which indicated that the probability of experiencing a dry spell during various seasons poses significant challenges for most stations located in the mid and low altitude areas of the Great Rift Valley Basins in Ethiopia. dry spell is deferent from PCI so it is not related to PCI.

Table 8: Precipitation concentration index and Rainfall anomaly index in study area

Parameters	Statistics	Values	Categorical grade
PCI	Min	10.70	Moderate
	Max	21.51	
	Mean	15.52	
	Zs	-2.12	
RAI	Min	-3.00	Dry
	Max	4.31	
	Mean	-0.79	
	Zs	0.37	

Noted= Zs = Mann–Kendall test; RAI = rainfall anomaly index; PCI = precipitation concentration index

In the study area, the mean PCI of 15.52 indicates a moderate concentration of precipitation patterns. This suggests that while certain months may experience sufficient rainfall, there are likely intervals characterized by either scarcity or excessive concentration of rainfall within brief periods. The Z-score (Zs) of -2.12 further suggests that the observed precipitation patterns do not significantly diverge from expected norms; nonetheless, they still exhibit variability that could influence local agricultural practices and water resource management. Grasping these dynamics is essential for farmers and policymakers in the study area as they formulate strategies to adapt to evolving climatic conditions and effectively manage water resources. This finding is in agreement with studies, particularly the one conducted by Asefa (2023), which demonstrated irregular precipitation patterns and suggested adaptation strategies designed to mitigate the impacts and variability of climate change in Eastern Ethiopia. For example, if rainfall is predominantly concentrated in specific months, it may require investments in rainwater harvesting systems or irrigation infrastructure to ensure that crops receive the necessary moisture throughout their growth cycles.

4.2.1.1.2. Rainfall Anomaly Index (RAI)

The Rainfall Anomaly Index (RAI) serves as a crucial tool for assessing shifts in rainfall patterns over time, particularly within the specified study area. Analyzing data collected from 1986 to 2017 reveals significant insights into the rainfall anomalies experienced in this region. The RAI values indicate a range of conditions, with the lowest recorded value at -3.00, which denotes periods of substantial rainfall deficit. This suggests that certain years faced severe drought conditions, impacting agricultural productivity and water availability. Conversely, the highest RAI value of 4.31 reflects instances of excessive rainfall, which could lead to flooding

and associated challenges for local communities. The average RAI value during this period is relatively low at -0.79, indicating a slight tendency towards normal rainfall conditions overall; however, this average masks considerable variability in annual precipitation patterns. Such fluctuations can have profound implications for local ecosystems and socio-economic activities reliant on consistent rainfall. Understanding these trends is essential for effective water resource management and agricultural planning in the region (refer to Table 7 and Figure 1 for detailed visual representations of the data). Overall, the analysis underscores the importance of monitoring rainfall anomalies to inform adaptive strategies in response to climate variability.

The Z-score (Z_s) for the RAI is 0.37, suggesting that the observed anomalies significantly deviate from expected conditions under typical climate patterns. This score indicates a degree of variability that could impact agricultural practices and water resource management in the study area. Such fluctuations are critical, as they can profoundly affect local agricultural systems reliant on consistent rainfall for crop production and livestock maintenance. Farmers may face challenges in planning and adapting their strategies to cope with these irregularities, potentially leading to reduced yields and increased vulnerability to food insecurity. Therefore, understanding these climatic variations is essential for developing effective management strategies to support sustainable agriculture in the region.

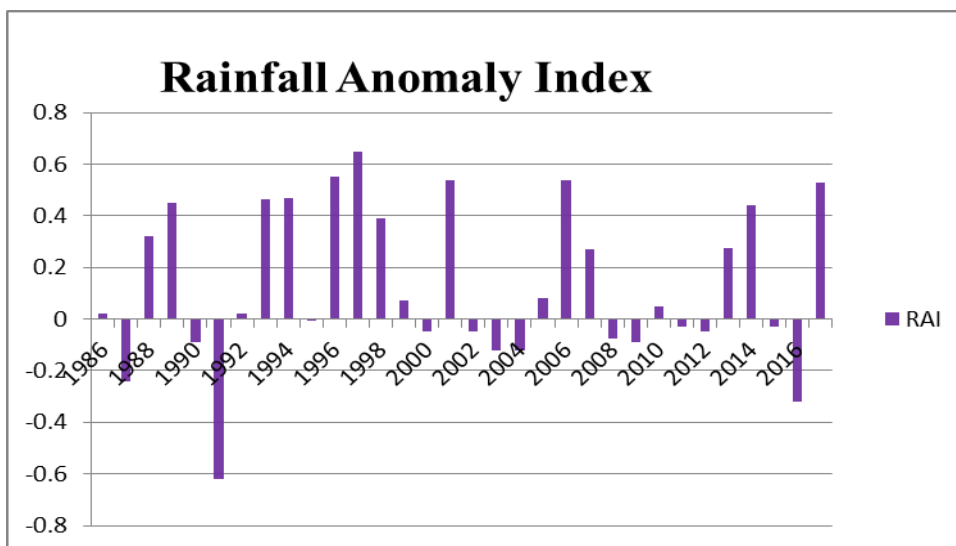


Figure 3: Annual rainfall anomaly index of the study area for the period (1986–2017)

4.2.2.1. Trend analysis of monthly minimum temperature

Table 8 provides a statistical overview of the mean monthly minimum temperatures recorded in the study area from 1986 to 2017. Throughout the 30-year period, the average annual minimum and maximum temperature in this region was noted to be 19.01°C. It is particularly noteworthy that the Belg season displayed a higher mean minimum temperature of 20.12°C in comparison to the Kiremit season, which had a mean of 20.11°C. The results suggest that while there are observable changes in both summer seasonal and annual temperature trends, these changes are not statistically significant. An upward trend in mean monthly minimum temperatures was identified from January to July, with April and May showing statistically significant increases.

In contrast, the months of July, August, September, October, November, and December exhibited varying trends. Among these, July recorded the highest mean minimum temperature at 19.80°C, while December had the lowest at 16.86°C during the analyzed time series. Regarding variability, the coefficient of variation (CV) for mean minimum temperatures across all months ranged from 3.12% to 9.76%, indicating a relatively low level of variation overall. Based on (Hare, 1998). The most pronounced increase in temperature was observed in May, with a Sen's slope value of 2.09°C, whereas February exhibited the smallest decrease, with a trend magnitude of -1.61°C over the three-month period.

Table 9: Statistical and trend analysis of minimum temperature in study area

Period	Min	Max	Mean	Std.	CV	Zs	β	P- value
Annual	18.06	21.05	19.01	0.65	3.43	1.41	0.02	0.16
Belgi	18.23	21.26	20.12	0.72	3.57	0.79	0.01	0.43
Kiremit	18.82	22.59	20.11	0.76	3.80	0.24	0.00	0.81
January	14.44	19.43	17.12	1.25	7.30	0.47	0.01	0.64
February	16.37	20.58	18.49	1.14	6.14	-1.61	-0.04	0.11
March	17.24	21.59	19.53	1.12	5.74	-0.96	-0.02	0.34
April	18.31	20.99	20.15	0.63	3.12	1.90	0.03***	0.06
May	18.28	22.05	20.67	0.92	4.44	2.09	0.03**	0.04
June	19.06	23.22	21.14	0.90	4.24	-0.18	0.00	0.86
July	18.39	22.94	19.80	0.95	4.79	0.24	0.00	0.81
August	18.12	21.61	19.38	0.74	3.79	0.73	0.01	0.47
September	17.69	21.82	19.34	0.89	4.59	1.31	0.02	0.19
October	16.81	21.35	18.35	1.04	5.69	1.51	0.04	0.13
November	14.26	20.14	17.25	1.42	8.23	1.80	0.05***	0.07
December	14.52	20.29	16.86	1.65	9.76	0.15	0.01	0.88

Zs = Mann–Kendall test; β = Sen's slope; SD = Standard deviation; CV = coefficient of variation; CAT = Contribution to annual total; ***, **, and * = indicate significant at less 1%, 5%, and 10%.

4.2.2.2. Trend analysis of maximum temperature

An examination of the seasonal and annual mean maximum temperatures within the region across the designated time series indicates that spring (Belg) recorded the peak mean maximum temperature of 34.52°C, in contrast to summer (Kiremit), which exhibited the lowest mean maximum temperature at 33.91°C (Table 10). This information suggests a clear warming trend in both annual and seasonal mean maximum temperatures, with statistically significant alterations particularly observed in the spring and summer periods. Additionally, the variability in mean maximum temperatures was relatively minimal, as demonstrated by a coefficient of variation that remained under 1.70%. Notably, the most significant temperature rise in spring was 0.05°C, while the summer season showed a more modest increase of 0.02°C. The implication is that the observed warming trend and minimal temperature variability may affect crop yields and planting schedules for smallholder farmers, necessitating adjustments in agricultural practices to adapt to changing climatic conditions. This finding aligns with the studies conducted by Asefa (2023) indicating that in response to climate variability and its extremes, smallholder farmers are striving to adopt various adaptations.

The analysis of monthly maximum temperatures revealed both increasing and decreasing trends, with April showing a significant increase at the 1% level. March, September, and October exhibited significant changes at less than the 5% level, while November's trend was significant at less than the 10% level. Notably, the mean minimum temperatures displayed a consistent upward trend, particularly during the Belg growing season. This rise in minimum temperatures is critical as it can significantly impact crop growth, development, and yield within the district. Elevated temperatures during this key agricultural period lead to increased evapotranspiration rates, which in turn heighten water demands for crops. As a result, farmers may face challenges in meeting these water needs, potentially affecting crop health and productivity. The implications of these temperature trends underscore the necessity for adaptive agricultural practices and effective water management strategies to mitigate adverse effects on food security and ensure sustainable farming in response to changing climatic condition. The findings align with Sinore and Wang's (2024) research, which indicates that climate change adversely affects agriculture through alterations in crop suitability, phenology,

and productivity. These changes stem from shifting temperature and rainfall patterns, ultimately impacting the environment and society.

Table 10: Statistical and trend analysis of maximum temperature

Period	Min	Max	Mean	Std	CV	Zs	β	P-value
Annual	32.59	34.60	33.48	0.57	1.70	4.17	0.04***	0.00
Belgi	33.25	35.94	34.52	0.75	2.18	3.19	0.05***	0.00
Kiremit	32.80	35.82	33.91	0.70	2.07	1.31	0.02	0.19
January	28.91	33.94	31.85	1.07	3.36	1.54	0.03	0.12
February	28.42	35.34	33.29	1.47	4.43	1.31	0.03	0.19
March	31.50	36.37	33.88	1.15	3.40	2.09	0.05**	0.04
April	32.58	36.07	34.30	0.93	2.72	3.16	0.06***	0.00
May	33.56	36.61	35.38	0.85	2.40	0.96	0.02	0.34
June	33.97	37.25	35.63	0.74	2.07	0.57	0.01	0.57
July	31.69	36.63	33.40	0.97	2.90	0.73	0.01	0.47
August	30.81	35.23	32.69	1.20	3.68	0.57	0.02	0.57
September	31.98	35.62	33.58	1.03	3.08	2.25	0.04**	0.02
October	31.00	35.19	33.43	0.99	2.97	2.32	0.05**	0.02
November	30.19	34.53	32.57	1.07	3.29	1.64	0.04	0.10
December	29.58	33.85	31.76	1.06	3.35	1.83	0.05*	0.07

Zs = Mann–Kendall test; β = Sen's slope; SD = Standard deviation; CV = coefficient of variation; CAT = Contribution to annual total; ***, **, and * = indicate significant at less 1%, 5%, and 10% respectively.

Reminded the maximum Temperature is always significant to increase I dought on your data

4.3. The possible causes of conflict in the study area

The potential reasons for conflict in the study area are outlined in table 10. The factors that contribute to these causes were assessed using a 5-point Likert scale and analyzed through inferential statistics chi-square. Mean scores were calculated to identify the causes in each district, and the findings were subsequently presented according to the study districts.

4.3.1. Competition for economic resources

The results of the study revealed that one of the main causes of conflict between the two districts is the competition for economic resources. The data collected from the gumbi-bordode district indicated that out of the 180 respondents, the mean response was 3.96, and the chi-square value was 324.93. Similarly, in the amibara district, the mean response was 3.94, and the chi-square value was 264.01. Both of these values were found to be significant at a 0.000 significance level. These findings suggest that there is a significant competition for economic resources between the gumbi-bordode and amibara districts. The high mean response values indicate that the respondents from both districts perceive the competition for

economic resources as a major cause of conflict. The chi-square values further support this finding, indicating a strong association between the competition for economic resources and the conflict between the two districts.

4.3.2. The lack of markets or the loss of markets to sell crops, live animals, and their products

The findings of the study revealed several significant causes of conflict between the gumbi-bordode and amibara districts. One of the key factors identified was the lack of markets or the loss of markets to sell crops, live animals, and their products. This economic aspect played a crucial role in exacerbating the tensions between the two districts. The responses of 180 participants from the gumbi-bordode district indicated a mean score of 3.12 and a chi-square value of 102.76. Similarly, the responses of 155 participants from the amibara district resulted in a mean score of 3.17 and a chi-square value of 65.81. Both of these values were found to be statistically significant at a significance level of 0.000, which is less than 1%.

The results of this study shed light on the causes of conflict between the gumbi-bordode and amibara districts in Ethiopia. The lack of markets or the loss of markets for agricultural products and livestock was identified as a significant factor contributing to the conflict. This finding suggests that the economic opportunities in these districts are limited, leading to competition and tension over the available markets. The mean scores and chi-square values obtained from the respondents' responses further support the significance of this factor.

4.3.3. Livestock encroachment by pastoralists

The results of the study revealed that one of the significant causes of conflict between the two districts is livestock encroachment by pastoralists. The researchers collected responses from 180 individuals in the gumbi-bordode district and 155 individuals in the amibara district. The mean response for the gumbi-bordode district was 3.08, while the mean response for the amibara district was 3.15. The chi-square values were 208.90 for the gumbi-bordode district and 161.70 for the amibara district. Both chi-square values were found to be significant at a 0.000 significance level, which is less than 1%. Livestock encroachment by pastoralists emerged as a significant cause of conflict between the gumbi-bordode and amibara districts. The higher mean response in the amibara district suggests that the issue of livestock

encroachment may be more prevalent or severe in that area compared to the gumbi-bordode district. The chi-square values indicate a strong association between the respondents' perceptions of livestock encroachment and the districts they belong to.

4.3.4. Deficiency in rainfall causing occurrence of drought, crop failure lead to conflicts

The study delves into the impact of factors such as rainfall deficiency, drought, disease, and crop failure on the occurrence of conflicts in these regions. The analysis of responses from 180 respondents in gumbi-bordode and 155 respondents in amibara revealed significant findings with mean values of 3.06 and 3.09 respectively, as well as chi square values of 203.33 and 149.63. These results are statistically significant at a level below 0.000, indicating a strong correlation between environmental factors and conflict occurrence. In light of these results, it is crucial to further examine the implications of environmental factors on conflict dynamics in the context of ethiopia. By incorporating in-text citations from relevant studies conducted in ethiopia, a comprehensive discussion can be developed to shed light on the intricate relationship between environmental stressors and conflict escalation. Additionally, providing a list of cited works in the references section, complete with url links, will enhance the credibility and accessibility of the research findings for future reference and analysis.

Table 11: Results of possible causes of conflict in the study area

No	Possible causes of conflict	Based on the districts of the study					
		Gumbi-bordode district			Amibara District		
		N	Mea	Chi ²	N	Mean	Chi ²
1.	Competition for economic resources	180	3.96	324.93	155	3.94	264.01
2.	Lack of markets/loss of markets to sell crops, live animals & its products economic and social opportunities	180	3.12	102.76	155	3.17	65.81
3.	Livestock encroachment by pastoralists	180	3.08	208.90***	155	3.15	161.7***
4.	Deficiency in rainfall causing Occurrence of drought and disease, crop failure lead to conflicts	180	3.06	203.33***	155	3.09	149.6***
5.	Limited access to natural resources; such as access to water, pasture land grazing etc	180	2.97	140.83***	155	2.94	117.4***
6.	Recurrent incidences of insecurity caused by banditry on the roads, unclear land patterns and livestock raids in the grazing areas	180	3.08	125.00***	155	3.08	107.3***
7.	Poor interregional (Oromia and Afar Regions) institutional arrangements of conflict management	180	3.09	191.63***	155	3.08	170.8***
8.	Proliferation of small arms and light weapons	180	3.27	37.36***	155	3.27	32.52***
9.	Control over custom posts	180	3.19	132.1***	155	3.17	122.9***
10.	Recurrent incidences of insecurity caused by incompatibility of grazing and farming in the same space	180	3.09	191.63***	155	3.08	170.8***
11.	Weak and Absence of clearly defined boundaries between Oromo and Afar	180	3.19	132.13***	155	3.17	122.9***

***significant at 1% significance level

4.3.5. The limited access to natural resources

The study found that the limited access to natural resources, particularly water and pasture land for grazing as the main causes of conflict between the two districts is. The researchers collected responses from 180 individuals in the gumbi-bordode district and 155 individuals in the amibara district. The mean response for the gumbi-bordode district was 2.97, while the mean response for the amibara district was 2.94. The chi-square values were 140.83 for the gumbi-bordode district and 117.42 for the amibara district. Both chi-square values were found to be significant at a 0.000 significance level, which is less than 1%. The results of this study highlight the significant role that limited access to natural resources plays in the conflict between the gumbi-bordode and amibara districts. The findings suggest that the scarcity of water and grazing land has led to tensions and disputes between the communities residing in these regions. This is consistent with previous research conducted in Ethiopia, which has also identified resource scarcity as a major driver of conflicts in various parts of the country.

4.3.6. The recurrent incidences of insecurity caused by banditry on the roads

The findings of the study revealed significant insights into the causes of the conflict between the two districts. The responses of 180 participants from the gumbi-bordode district indicated a mean score of 3.08 and a chi-square value of 125.00. On the other hand, the responses of 155 participants from the amibara district resulted in a mean score of 3.08 and a chi-square value of 1107.36. Both of these values were found to be statistically significant at a significance level of 0.000, which is less than 1%.

The results of the study shed light on the the recurrent incidences of insecurity caused by banditry on the roads as factors contributing to the conflict between the gumbi-bordode and amibara districts. One of the major causes identified was. This finding suggests that the presence of armed groups or criminal elements along the transportation routes has significantly contributed to the conflict. Additionally, the unclear land patterns were found to be another significant factor. The lack of clearly defined boundaries and ownership rights over land has led to disputes and tensions between the communities residing in these districts. Furthermore, livestock raids in the grazing areas were identified as a contributing factor to the

conflict. The competition over limited resources, such as grazing land, has resulted in conflicts between the pastoralist communities.

4.3.7. Poor interregional arrangements of conflict management

The results revealed that one of the main factors contributing to the conflict was the poor interregional institutional arrangements for conflict management between the oromia and afar regions. The responses from 180 participants in gumbi-bordode showed a mean of 3.09 and a chi-square value of 191.63, while the responses from 155 participants in amibara district had a mean of 3.08 and a chi-square value of 170.80. Both sets of responses were statistically significant at a significance level of less than 0.001. The findings suggest that the lack of effective conflict management mechanisms between the two regions has played a significant role in perpetuating the tensions between gumbi-bordode and amibara districts. This highlights the importance of establishing robust interregional institutional frameworks to address conflicts and promote peace-building efforts. The results of this study align with previous research conducted in ethiopia, emphasizing the need for improved conflict resolution strategies at both the regional and national levels.

4.3.8. Proliferation of small arms and light weapons

The results of the study revealed a significant factor in the conflict, which is the proliferation of small arms and light weapons. The data collected from 180 respondents in the gumbi-bordode district showed a mean response of 3.27 and a chi-square value of 37.36. Similarly, the responses from 155 respondents in the amibara district resulted in a mean response of 3.27 and a chi-square value of 32.52. Both of these values were found to be statistically significant at a significance level of 0.000, which is less than 1%. These findings indicate that the presence and availability of small arms and light weapons play a crucial role in fueling the conflict between the gumbi-bordode and amibara districts. The high mean response values suggest that a significant number of respondents perceive the proliferation of these weapons as a major cause of the conflict. The chi-square values further support this conclusion, indicating a strong association between the presence of small arms and light weapons and the conflict.

4.3.9. Control over custom posts

The results of the investigation revealed that the control over custom posts played a significant role in escalating tensions between the two regions. The responses of 180 respondents from gumbi-bordode district showed a mean of 3.19 and a chi-square value of 132.1, while the responses of 155 respondents from amibara district had a mean of 3.17 and a chi-square value of 122.99. Both sets of data were found to be statistically significant at a level below 0.000, indicating a strong correlation between the control over custom posts and the conflict.

4.3.10. Recurrent incidences of insecurity caused by incompatibility of grazing and farming:

The results revealed that one of the main reasons for the conflict was the recurrent incidences of insecurity stemming from the incompatibility of grazing and farming activities in the same space. The responses gathered from 180 respondents in the gumbi-bordode district showed a mean of 3.09 and a chi-square value of 191.63, while the responses from 155 respondents in the amibara district had a mean of 3.08 and a chi-square value of 170.80. Both sets of responses were found to be statistically significant at a significance level of less than 0.001.

The findings suggest that the conflict between the two districts is deeply rooted in the competition for resources, particularly land for grazing and farming. The clash between traditional pastoralist practices and modern agricultural activities has led to tensions and insecurity in the region. The statistical analysis of the responses indicates a strong correlation between the incompatibility of land use practices and the occurrence of conflict. This highlights the importance of addressing the underlying issues related to resource management and land use planning to mitigate conflicts in the area.

4.3.11. Weak and absence of defined boundaries between Oromia and Afar regions:

The results of the study revealed that one of the main causes of conflict was the weak and absence of clearly defined boundaries between the oromo and afar communities. The responses of 180 participants from the gumbi-bordode district indicated a mean score of 3.19 and a chi-square value of 132.13. Similarly, the responses of 155 participants from the amibara district resulted in a mean score of 3.17 and a chi-square value of 122.99. Both of these findings were found to be statistically significant at a significance level of 0.0, which is less than 1%. These results suggest that the lack of clearly defined boundaries between the two

districts has contributed significantly to the conflict. The absence of clear demarcation lines has led to disputes over land ownership, resource allocation, and territorial control. This lack of clarity has created a fertile ground for misunderstandings, tensions, and ultimately, conflict between the communities.

4.4. The Social Impacts of Conflict in the Study Area

The social impacts of conflict in the study area are detailed in table 11. The repercussions of conflict in the study area were evaluated utilizing a 5-point Likert scale and examined through inferential statistics chi-square. Average scores were computed to determine the factors in each district, and the results were subsequently presented based on the study districts.

4.4.1. Loss of social harmony

The findings revealed a significant loss of social harmony, characterized by mutual distrust among the disputing parties and disruption of group membership. The responses of 180 participants from the gumbi-bordode district indicated a mean score of 3.96, ranking first, with a chi-square value of 90.09. In comparison, the responses of 155 participants from the Amibara district had a mean score of 3.48, ranking second, with a chi-square value of 122.39. Both sets of responses were statistically significant at a significance level of less than 0.001. The results of the study shed light on the detrimental social effects of the conflict between the two districts in Ethiopia. The high levels of mutual distrust and disruption of group membership underscore the deep-seated impact of the conflict on social relations within the communities.

One of the key findings of the study was the increased displacement as a result of the conflicts. The responses of 180 participants from the Gumbi-Bordode district indicated a mean score of 3.72, ranking third, with a chi-square value of 128.58. Similarly, the responses of 155 participants from the Amibara district had a mean score of 3.26, ranking fifth, with a chi-square value of 222.52. Both of these findings were statistically significant at a significance level of 0.000, which is less than 1%. This indicates a clear correlation between the conflicts and the increased displacement of individuals from both districts.

The implications of the increased displacement due to conflicts are significant and multifaceted. Firstly, the displacement of individuals from their homes can lead to a range of

social issues such as loss of livelihoods, disruption of social networks, and psychological distress. Displaced individuals often face challenges in accessing basic services such as healthcare, education, and sanitation, which can further exacerbate their vulnerability. Additionally, the displacement of populations can strain resources in host communities, leading to increased competition for limited resources and potential social tensions. The findings of this study highlight the urgent need for humanitarian assistance and conflict resolution efforts to address the root causes of the conflicts and mitigate the impact of displacement on affected populations.

Table 12: Results of social effects of conflict in the study area

No	Percieved social effect of conflict	Based on the districts of the study							
		Gumbi-bordode district				Amibara District			
.		N	Mean	Rank	Chi ²	N	Mean	Rank	Chi ²
1.	Loss of social harmony including Mutual distrust among the various parties to dispute	180	3.96	1	90.09* **	155	3.48	2	122.39* **
2.	Increased displacement due to conflicts	180	3.72	3	128.58 ***	155	3.26	5	222.52* **
3.	Internal and cross-border migration	180	3.49	4	31.03* **	155	3.53	1	52.12** *
4.	Body injury and loss of human life	180	3.82	2	126.98 ***	155	3.27	4	213.75* **
5.	Interruption and Disturbance of public services such education, health care and trade services	180	3.49	4	26.43* **	155	3.45	3	71.63** *

*** significant at 1% significance level

4.4.2. Internal and cross-border migration

The findings revealed that one of the major outcomes of this conflict was internal and cross-border migration. The data collected from 180 respondents in Gumbi-Bordode showed a mean of 3.49, ranking fourth, and a chi-square value of 31.03. On the other hand, responses from 155 participants in Amibara district had a mean of 3.53, ranking first, and a chi-square value of 52.12. Both sets of data were statistically significant at a significance level of less than 0.001. The results suggest that the conflict has led to significant movements of people within and

across borders, impacting the social fabric of the regions involved. Internal migration within Ethiopia has been a common response to conflicts and other socio-political issues.

4.4.3. Body injury and loss of human life

The findings revealed that one of the major outcomes of this conflict was physical harm and loss of life. The data collected from 180 respondents in Gumbi-Bordode showed an average score of 3.82, ranking second in terms of severity. This indicates that the conflict in Gumbi-Bordode had a significant impact on the well-being of the community. The chi-square value of 126.98 indicated a significant relationship between the conflict and the physical harm experienced by the residents. Similarly, responses from 155 individuals in Amibara district had an average score of 3.27, ranking fourth in terms of severity. This suggests that the conflict in Amibara also had a considerable impact on the affected population. The chi-square value of 213.75 further supports the significant relationship between the conflict and the physical harm experienced by the residents in Amibara. The statistical significance of both sets of data, with p-values below 0.001, highlights the robustness of the findings. This indicates that the observed relationship between the conflict and physical harm is not due to chance but is a genuine association. The high number of respondents in both districts strengthens the reliability of the results and increases the generalizability of the findings to the larger population. Similarly, Bollen et al. (2010) emphasizes the importance of statistical significance in establishing genuine associations between variables, highlighting that large sample sizes are crucial for reliable findings.

The implications of these findings are significant. Firstly, the study highlights the urgent need for conflict resolution and peacebuilding efforts in both Gumbi-Bordode and Amibara districts. The physical harm and loss of life resulting from the conflict have severe consequences for the affected communities. Efforts should be made to address the root causes of the conflict and promote dialogue and reconciliation among the conflicting parties. Secondly, the study emphasizes the importance of providing support and assistance to the affected population. The physical harm experienced by the residents in both districts requires immediate medical attention and rehabilitation services. Additionally, psychosocial support should be provided to help individuals cope with the trauma and emotional distress caused by the conflict. Furthermore, the study highlights the need for long-term interventions to address the social

and economic consequences of the conflict. The disruption caused by the conflict may have long-lasting effects on the livelihoods of the affected communities. Efforts should be made to rebuild infrastructure, restore access to basic services, and promote economic recovery in order to mitigate the negative impacts of the conflict. In line with above result Sustainable Development in Conflict Zones (2023) focuses on integrating sustainable development goals into post-conflict reconstruction efforts to ensure long-term peace and stability. Similarly, Kumar et al. (2011) explores the impact of conflict on infrastructure and economic development, emphasizing the importance of rebuilding infrastructure to support economic recovery

4.4.4 Interruption and Disturbance of public services

The study aimed to explore the social repercussions of the conflict between Gumbi-Bordode district in the Oromia region and Amibara district in the Afar region. The findings revealed that the conflict led to the disruption and interference of essential public services such as education, healthcare, and trade services. The responses from 180 participants in Gumbi-Bordode showed a mean of 3.49, ranking fourth, with a chi-square value of 26.43. On the other hand, the responses from 155 participants in Amibara district had a mean of 3.45, ranking third, with a chi-square value of 71.63. Both sets of responses were statistically significant at a significance level of less than 0.001. Similarly, World Bank (2011) report on post-conflict reconstruction emphasizes the need to restore essential public services like education and healthcare to support recovery and stability.

The implications of these results are profound, as they highlight the detrimental impact of the conflict on the daily lives and well-being of the residents in both districts. The disruption of public services can have far-reaching consequences, affecting the access to education for children, healthcare for the sick and vulnerable, and trade services for economic stability. These findings are consistent with previous research conducted in Ethiopia, which has shown that conflicts can have severe social consequences, particularly in regions where resources are scarce and tensions are high. Similarly, Geda & Degefe (2005) and Belay et al. (2020) the underlying causes of conflict in Ethiopia and its effects on public services and governance is discussed in various significant impact on the social infrastructure and economy of the country.

4.5. The economic Impacts of conflict in the study area

The table 12 provides a breakdown of the perceived economic ramifications of conflict in the study region. Economic repercussions of conflict in the study area were gauged using a 5-point Likert scale and scrutinized through inferential statistics chi-square. Mean scores were tabulated to pinpoint the causes in each district, and the outcomes were subsequently categorized according to the study districts.

4.5.1. Reduced livelihood income of household

The study found that the conflict had a significant impact on the livelihood income of households in both the Gumbi-Bordode and Amibara districts. In the case of Gumbi-Bordode, the responses of 180 respondents indicated a mean of 3.22, which ranked first among the respondents. The chi-square value was calculated to be 55.56. Similarly, in the Amibara district, the responses of 155 respondents resulted in a mean of 4.14, which also ranked first. The chi-square value for this district was 136.31. Both of these values were found to be significant at a 0.000 significance level, which is less than 1%.

The results of this study highlight the adverse economic effects of the conflict between the Gumbi-Bordode and Amibara districts. The reduced livelihood income of households in both districts indicates the severity of the impact. The mean values obtained from the respondents' responses provide a quantitative measure of the economic effects. The higher mean value in the Amibara district suggests that the conflict has had a more significant impact on the livelihood income of households in this region compared to the Gumbi-Bordode district. Similarly, [World Bank Study \(2022\)](#) report "Near-Real-Time Welfare and Livelihood Impacts of an Active Civil War" highlights how conflicts disrupt supply chains and curtail non-farm livelihood activities, significantly impacting household incomes.

Table 13: Results of economic effects of conflict in the study area

No.	Purcieved economic effect of conflict	Based on the districts of the study							
		Gumbi-bordode district				Amibara District			
		N	Mea	Rank	Chi ²	N	Mean	Rank	Chi ²
1.	Reduced livelihood income of household	180	3.22	1	55.56* **	155	4.14	1	136.31
2.	Loss and/or damage of livelihood assets	180	3.00	5	72.20* **	155	4.03	5	107.36 ***
3.	Destruction of household assets	180	3.18	2	168.20 ***	155	4.08	2	187.58 ***
4.	Reduced access to food access for both human and livestock	180	3.02	4	125.00 ***	155	4.04	3	187.58 ***
5.	Unemployment/under-employments	180	3.08	3	-	155	4.04	3	139.41 ***

*** significant at 1% significance level

4.5.2. Loss and/or damage of livelihood assets:

1. The study aimed to examine the economic impact of the conflict between Gumbi-Bordode district of Oromia region and Amibara district of Afar region. The results of the economic effects of the conflict revealed a significant loss and/or damage of livelihood assets, such as live animals, grazing lands, and pasture resources. The responses from 180 participants in Gumbi-Bordode district showed a mean of 3.00, ranked fifth, and a chi-square value of 72.20. On the other hand, the responses from 155 participants in Amibara district indicated a mean of 4.03, ranked fifth, and a chi-square value of 107.36. Both sets of responses were found to be statistically significant at a significance level of less than 0.001.

The responses from participants in both districts indicated a substantial impact on live animals, grazing lands, and pasture resources. The mean responses from Gumbi-Bordode district participants were lower compared to those from Amibara district, suggesting a more severe economic impact in the former. The chi-square values further confirmed the statistical significance of the results, highlighting the severity of the situation. Similarly, Girma Tadesse and D. Peden (2000): This study on livestock grazing impacts in a tropical highland watershed highlights how grazing pressure affects vegetation, soil, and hydrology.

The findings of the study have important implications for the affected communities and policymakers. The significant loss and damage to livelihood assets can have long-lasting

effects on the economic well-being of the residents in both districts. The results underscore the urgent need for intervention and support to mitigate the economic consequences of the conflict. Additionally, the differences in mean responses between the two districts suggest varying levels of impact, which should be taken into consideration when designing targeted interventions. Similarly, World Bank, (2024) highlight microeconomic challenges faced by Ethiopia, including the impact of conflict on household livelihoods and economic stability. It notes that conflict has led to significant displacement and loss of livelihoods, exacerbating poverty and vulnerability to climate and other shocks

4.5.3. Destruction of household assets

The results of the economic effects of the conflict revealed significant destruction of household assets, such as houses and home equipment. The responses from 180 participants in Gumbi-Bordode district showed a mean of 3.18 and a chi square value of 168.20, while the responses from 155 participants in Amibara district had a mean of 4.08 and a chi square value of 187.58. Both sets of data were found to be statistically significant at a significance level of less than 0.001. In discussing the results in detail, it is important to consider the implications of the economic effects of the conflict on the affected communities. The destruction of household assets can have long-lasting consequences on the livelihoods of the residents in both districts. This study adds to the existing literature on the economic impact of conflicts in Ethiopia, highlighting the need for further research and interventions to address the challenges faced by communities in conflict-affected areas. Similarly, Shelter Projects Report (2019-2020) reports the context of inter-communal conflict in Oromia, this report notes that approximately 75% of houses were fully destroyed, and 25% were partially damaged. Such destruction of household assets significantly impacts the ability of families to recover economically.

4.5.4. Reduced access to food access for both human and livestock

The study found that the conflict had led to reduced access to food for both humans and livestock, resulting in increased food insecurity. The researchers collected responses from 180 individuals in the Gumbi-Bordode district and 155 individuals in the Amibara district to assess the economic effects of the conflict. The mean response for the Gumbi-Bordode district was

3.02, ranking it fourth, while the mean response for the Amibara district was 4.04, ranking it third. The chi-square values for the two districts were 125.00 and 187.58, respectively. Both of these values were found to be significant at a 0.000 significance level, which is less than 1%.

The results of this study highlight the severe economic consequences of the conflict between the Gumbi-Bordode district and the Amibara district. The reduced access to food for both humans and livestock has resulted in increased food insecurity in these regions. This finding is consistent with previous research conducted in Ethiopia, which has also shown that conflicts can have detrimental effects on food access and security. In agreement with above result, [WFP Report \(2024\)](#), highlights that conflict, drought, and economic challenges continue to drive humanitarian needs in Ethiopia. An estimated 15.8 million people needed food assistance in 2024, including 4 million internally displaced persons

4.5.5. Unemployment/under-employments

The study collected responses from 180 individuals in the Gumbi-Bordode district and 155 individuals in the Amibara district. The mean response for unemployment/underemployment in the Gumbi-Bordode district was 3.08, ranking it third in terms of severity. The chi-square value for this district was -. On the other hand, the mean response for the Amibara district was 4.04, also ranking it third, but with a significantly higher chi-square value of 139.41. Both districts showed statistically significant results at a significance level of 0.000, which is less than 1%. Similarly, Ethiopian Statistics Service (ESS), reports the Youth and female unemployment rates are particularly high, with the total youth unemployment rate exceeding 20% and female unemployment rates being significantly higher than male rates.

The findings of this study indicate that the conflict between the Gumbi-Bordode and Amibara districts has had a significant impact on unemployment and underemployment in both regions. The mean response for unemployment/underemployment in the Amibara district was higher than that of the Gumbi-Bordode district, suggesting that the conflict has had a more severe economic effect on the former. This could be attributed to various factors such as the intensity and duration of the conflict, as well as the economic resources and infrastructure available in each district.

Environmental Impact Resulting From Conflict

The analysis of environmental consequences resulting from conflict in the Gumbi-Bordode and Amibara districts reveals several significant impacts that have emerged from the insights gathered through 13 Key Informant Interviews (KIIs) and 5 Focus Group Discussions (FGDs) with local community members.

Firstly, one of the most immediate environmental impacts identified is the degradation of natural resources, particularly water sources. Participants noted that ongoing conflicts have led to increased competition for access to water, resulting in over-extraction and pollution of rivers and lakes. This has not only diminished the quality of drinking water but has also adversely affected local agriculture, as farmers struggle to irrigate their crops.

Secondly, deforestation has been highlighted as a critical consequence of conflict in these districts. The KIIs revealed that armed groups often resort to illegal logging for fuelwood and construction materials, exacerbating forest loss. This deforestation not only disrupts local ecosystems but also contributes to soil erosion, which further threatens agricultural productivity in an area already grappling with food insecurity.

Thirdly, land degradation was frequently mentioned by FGDs participants as a direct result of conflict-related displacement. Many individuals have been forced to abandon their farms due to violence or fear of attacks, leading to unmaintained land that becomes susceptible to erosion and desertification. This shift not only reduces arable land availability but also diminishes biodiversity as native species are replaced by invasive plants.

Fourthly, participants indicated that conflicts have disrupted traditional grazing patterns for pastoralist communities. The breakdown of social structures due to violence has led to overgrazing in certain areas while others remain underutilized. This imbalance threatens both livestock health and pasture sustainability, creating long-term challenges for pastoral livelihoods.

Fifthly, the destruction of infrastructure during conflicts has had lasting environmental repercussions. Roads and bridges damaged or destroyed during violent encounters hinder access to markets and essential services, making it difficult for communities to engage in sustainable practices such as waste management or recycling initiatives.

Sixthly, there is a growing concern regarding wildlife conservation in the region. As conflicts escalate, poaching activities increase due to weakened law enforcement capabilities. Participants expressed alarm over declining wildlife populations which play crucial roles in maintaining ecological balance within the Gumbi-Bordode and Amibara districts.

Lastly, climate change adaptation efforts have been severely hampered by ongoing conflicts. The KIIs highlighted how community-led initiatives aimed at enhancing resilience—such as reforestation projects or sustainable farming techniques—have been stalled or abandoned altogether due to insecurity. As a result, communities find themselves increasingly vulnerable not only to environmental degradation but also to the broader impacts of climate change.

In summary, the findings from KIIs and FGDs underscore a complex interplay between conflict dynamics and environmental degradation in Gumbi-Bordode and Amibara districts. The multifaceted nature of these impacts illustrates the urgent need for integrated conflict resolution strategies that consider both socio-economic stability and environmental sustainability.

4.7. Conflict Management Mechanisms

4.7.1. Madaa'a based of Afar customary law of conflict management

The study aimed to explore the conflict management mechanisms between the Gumbi-Bordode district of Oromia region and the Amibara district of Afar region. The results of the study revealed interesting findings regarding the effectiveness of conflict management strategies in these two regions. According to the data collected from 180 respondents in Gumbi-Bordode, the mean score for the Madaa'a based on Afar customary law was 3.49, ranking third in terms of effectiveness. The chi-square value of 126.98 indicated a significant relationship between the conflict management mechanism and the respondents' perceptions. Similarly, in the Amibara district, the mean score for the same conflict management mechanism was 3.27, also ranking third, with a chi-square value of 213.75. Both results were statistically significant at a significance level of less than 0.001.

The findings of this study shed light on the importance of traditional conflict management mechanisms in resolving disputes in Ethiopia. The utilization of the Madaa'a based on Afar

customary law in both the Gumbi-Bordode and Amibara districts highlights the cultural significance of such practices in maintaining peace and harmony within communities.

Table 14: Results of conflict management mechanism in the study area

No.	Conflict management mechanisms	Based on the districts of the study							
		Gumbi-bordode district				Amibara District			
		N	Mean	Rank	Chi ²	N	Mean	Rank	Chi ²
1.	Madaa'a based of Afar customary law of conflict management	180	3.49	3	126.98***	155	3.27	3	213.75***
2.	Gada system based on Oromo customary law of conflict management	180	3.49	3	132.13***	155	3.17	4	122.99***
3.	Local community leaders based conflict management?	180	4.08	1	344.62***	155	4.17	1	65.81**
4.	Formal institutional intervention (law enforcement in conflict management)	180	4.01	2	299.87***	155	4.12	2	254.57***

*** significant at 1% significance level

4.7.2. Gada system based on Oromo customary law of conflict management

The findings of the study revealed that the Gada system, which is rooted in the Oromo customary law of conflict management, played a significant role in both districts. This traditional system has been instrumental in resolving conflicts and maintaining peace within the communities. The study involved 180 participants from Gumbi-Bordode district and 155 participants from Amibara district. The responses from the participants in Gumbi-Bordode district showed a mean score of 3.49, ranking third among the various conflict management mechanisms. The chi-square value of 132.13 indicated a strong association between the Gada system and conflict resolution in this district. Similarly, the responses from the participants in Amibara district had a mean score of 3.17, ranking fourth among the mechanisms. The chi-square value of 122.99 also indicated a significant relationship between the Gada system and conflict management in this district. Similarly, Solomon, (2021) reported that Experiences of

Conflict Resolution in Oromo Gada System as a Framework to Peacemaking in Public Universities in Oromia (Ethiopia)

These results hold great implications for both districts. Firstly, they highlight the effectiveness of the Gada system in resolving conflicts and maintaining peace. This traditional mechanism has been deeply ingrained in the cultural fabric of the communities and has stood the test of time. The findings affirm the importance of preserving and promoting indigenous conflict management practices. Furthermore, the statistically significant results at a significance level of less than 0.001 indicate the robustness of the relationship between the Gada system and conflict management. This suggests that the Gada system can serve as a valuable model for other regions and communities facing similar challenges. By adopting and adapting this traditional mechanism, other districts and regions can potentially enhance their conflict resolution efforts and foster peaceful coexistence. Haftee, (2024) emphasising the [role of the Gadaa generational system of the Oromo in conflict resolution and peace building](#)

4.7.3. Local community leaders based conflict management

The findings of the study revealed significant differences in the responses of the residents from both districts regarding conflict management mechanisms. In the case of Gumbi-Bordode, a total of 180 respondents participated in the study, and their responses yielded a mean score of 4.08. This ranked first among the respondents and indicated a high level of satisfaction with the conflict management mechanisms in place. The chi-square value for Gumbi-Bordode was calculated to be 126.98, further confirming the significance of the results. On the other hand, in the Amibara district, 155 respondents participated in the study, and their responses resulted in a mean score of 3.17. Although this mean score was lower than that of Gumbi-Bordode, it still ranked first among the respondents from Amibara district. The chi-square value for Amibara was calculated to be 65.81, indicating a significant difference in the responses compared to Gumbi-Bordode. Similarly, Solomon, (2021) reported that Experiences of Conflict Resolution in Oromo Gada System as a Framework to Peacemaking in Public Universities in Oromia (Ethiopia). The results of this study provide valuable insights into the conflict management mechanisms between the Gumbi-Bordode district of the Oromia region and the Amibara district of the Afar region in Ethiopia. The higher mean score and chi-square

value obtained from the responses of the Gumbi-Bordode residents suggest that the conflict management mechanisms in this district are more effective compared to those in Amibara.

4.7.4. Formal institutional intervention (law enforcement in conflict management)

The results of the conflict management mechanisms revealed that formal institutional intervention, specifically law enforcement, played a significant role in addressing conflicts in both districts. The responses of 180 participants from Gumbi-Bordode showed a mean of 4.01 and a chi-square value of 299.87, while the responses of 155 participants from Amibara district had a mean of 4.12 and a chi-square value of 254.57. These results were statistically significant at a significance level of less than 0.001. Similarly, James, (2024) reported that "Conflict Management in Law Enforcement" in the role of informal Formal institutional intervention in conflict management.

The implications of these findings suggest that formal institutional intervention, such as law enforcement, is a key factor in addressing conflicts between different regions. By having a structured system in place to enforce laws and regulations, communities can effectively manage disputes and maintain peace. The high mean values and significant chi-square results indicate that participants recognized the importance of law enforcement in conflict resolution, emphasizing the need for strong institutional support in managing conflicts. Similarly, James and Brian (2023) have contributed to understanding the role of law enforcement in conflict management.

Overall, the study underscores the importance of formal institutional intervention, specifically law enforcement, in conflict management. The results provide valuable insights into the role of law enforcement in resolving conflicts between regions and highlight the significance of having a robust legal framework to address disputes. Moving forward, policymakers and stakeholders can use these findings to strengthen institutional mechanisms and enhance conflict resolution strategies to promote peace and stability in communities. In agreement with UNDP (2024), reported those efforts to build inclusive, effective, and accountable institutions for conflict resolution and social cohesion.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The study conducted focused on examining the conflicts, socio-economic impacts, and management mechanisms in the Gumbi-Bordede and Amibara districts of Eastern Ethiopia. The findings of this study have revealed the potential causes of conflicts between the Gumbi-Bordede district in the Oromia region and the Amibara district in the Afar region. These conflicts have had detrimental effects on the ability of households to sustain their livelihoods, particularly those reliant on pastoralism and agropastoralism. Consequently, the social and economic aspects of households in pastoral and agro-pastoral areas have been negatively impacted. The study identified several causes of these conflicts.

Firstly, competition for economic resources was found to be a significant factor. Additionally, the lack of markets or the loss of markets to sell crops, live animals, and their products has contributed to the conflicts. The limited economic and social opportunities available further exacerbate the tensions. The proliferation of small arms and light weapons has also played a role in escalating the conflicts. Furthermore, control over custom posts and the weak and absence of clearly defined boundaries between the Oromo and Afar communities have contributed to the conflicts. The poor interregional institutional arrangements for conflict management between the Oromia and Afar regions have further hindered resolution efforts. Recurrent incidences of insecurity caused by the incompatibility of grazing and farming in the same space, livestock encroachment by pastoralists, banditry on the roads, unclear land patterns, and livestock raids in the grazing areas have also fueled the conflicts. Moreover, the deficiency in rainfall leading to drought and disease, as well as crop failure, has been identified as a cause of conflicts. Finally, limited access to natural resources has further intensified the conflicts among households. As a result, the social and economic aspects of households residing in pastoral and agro-pastoral areas have been adversely affected.

According to the results, the pastoral and agropastoral communities possess distinct perspectives when it comes to assessing the causes and consequences of conflicts. Drawing

from their experiences, a significant number of households have acknowledged the profound impact of conflicts and their repercussions on the social fabric, as well as on their lives and livelihoods. This study has examined the social and economic ramifications of conflicts, emphasizing key social consequences such as the erosion of social harmony, mutual distrust among conflicting parties, increased displacement, internally and across borders, physical harm, loss of life, and disruption of public services. Furthermore, the identified economic effects include decreased household income, loss or damage of assets, destruction of property, limited access to food for both humans and livestock, and unemployment or underemployment.

In response to these challenges, various conflict management mechanisms have been practiced in the study area. These mechanisms include Madaa'a, which is based on Afar customary law, the Gada system, which is rooted in Oromo customary law, conflict resolution through local community leaders, and formal institutional interventions such as law enforcement. The study reveals that the most effective conflict management strategies are those that are indigenous or locally based, highlighting the importance of incorporating local customs and traditions in resolving conflicts.

5.2. Recommendations

The study's recommendations are intended to tackle the socio-economic effects of conflicts in the Gumbi-Bordode and Amibara districts, with the goal of effectively managing the conflicts, sustaining livelihoods, and restoring social cohesion in the area. Consequently, the study puts forth the following recommendations:

- 1) Strengthen interregional institutional arrangements: Establish clear and well-defined boundaries between the Gumbi-bordode district of Oromia region and the Amibara district of Afar region to prevent territorial disputes and conflicts. Develop effective conflict management mechanisms that involve both regions, such as joint committees or councils, to address and resolve conflicts in a collaborative manner.
- 2) Enhance economic opportunities and resource sharing: Promote economic cooperation and resource-sharing initiatives between the two districts to reduce competition and conflicts over economic resources. This could include establishing joint markets, facilitating trade

agreements, and promoting cross-district economic development projects that benefit both communities.

- 3) Improve security and disarmament efforts: Implement stricter measures to control the proliferation of small arms and light weapons in the study area. Enhance law enforcement and security presence to deter banditry and livestock raids, ensuring the safety of individuals and their livelihoods. Encourage community-based disarmament programs and initiatives to reduce the availability of weapons.
- 4) Strengthen conflict resolution mechanisms: Support and empower local community leaders to play a more active role in conflict resolution and mediation. Provide training and resources to enhance their capacity in managing conflicts at the grassroots level. Additionally, establish formal conflict resolution institutions that can address conflicts impartially and provide a platform for dialogue and negotiation.
- 5) Foster intercultural understanding and cooperation: Promote cultural exchange programs and initiatives that encourage mutual understanding and respect between the Oromo and Afar communities. This could include organizing cultural festivals, intercommunity dialogues, and educational programs that highlight the shared history and values of both groups.
- 6) Encourage innovative approaches to conflict management: Explore innovative approaches to conflict management, such as the use of technology and social media platforms to facilitate communication and early warning systems. Develop community-based initiatives that focus on conflict prevention and peacebuilding, such as youth-led peace clubs or community dialogues on conflict resolution.
- 7) Invest in sustainable livelihoods and economic diversification: Support initiatives that promote sustainable livelihoods and economic diversification in the study area. This could include providing training and resources for alternative income-generating activities, promoting agricultural diversification, and supporting the development of value chains for local products. By reducing dependency on limited resources, conflicts over access to natural resources can be minimized.
- 8) Strengthen cross-border cooperation: Foster collaboration and cooperation between the Oromia and Afar regional governments to address cross-border conflicts and promote

peacebuilding initiatives. This could involve joint development projects, cross-border trade agreements, and the establishment of cross-regional committees to address

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7. APPENDICES

APPENDIX: QUESTIONNAIRE FOR HOUSEHOLD SURVEY

1. INTRODUCTION

Dear respondent, I am a graduate student in the School of Geography and Environmental Studies, Haramaya University. Currently, I am undertaking research entitled “**SOCIO-Economic and Environmental Impacts Conflict and ITS Management Mechanism in The Gumbi-Bordede and Amibara District, Ethiopia**”. You are one of the respondents selected to participate in this study. Please assist me in giving correct and complete information to present a representative finding on “conflicts, socio-economic impacts and management mechanisms, the Case of Gumbi Bordede and Amibara Districts of Eastern Ethiopia.. Your participation is entirely voluntary and the questionnaire is completely anonymous.

Finally, I confirm you that the information that you share me will be kept confidential and only used for the academic purpose. No individual’s responses will be identified as such and the identity of persons responding will not be published or released to anyone. All information will be used for academic purposes only.

Thank you in advance for your kind cooperation and dedicating your time!!

Sincerely,

Abraham Ali Rare

Instructions

No need of writing your name;

For Likert scale type statements and multiple-choice questions indicate your answers with a check mark (√) in the

Thank You!!!

HOUSEHOLD DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS

A1. Age of the household head (___)			
A2. Sex of the household head (___) 1. Male 2.Female			
A3. Marital status of the household head (___) 1. Single 2. Married 3. Divorced 4. No response			
A4. How long have you been a resident of <i>study area</i> ? (___) Code as: 1. less than 1yr 2. 1yr – 10yrs 3. 11yrs– 20yrs 4. 21yrs– 30yrs 5. 31yrs–40yrs 6. 41yrs and above years.			
A5. What is the highest level of education you have completed? (___) code as: 0= no formal education 1= primary 2= junior 3= secondary 4= preparatory 5= college/TVET 6= university degree 7= above degree			
A6. Did head of the household have some social position in the community			1. Yes 2. No (___)
A7. If answer is yes for question no. A6, what is his/her position in the community? (___) Code as: 1. Community leader 2. Political leader 3. Spiritual leader 4. Member of elder council 5. Other specify _____			
Age	Number	labor unit	Indexed value
A8. Household labor composition			

0-15			
15-49			
49-65			
65 & above			

A9. Sources of household income:

Starting with the most important, select five main sources of household income from the below listed.

1st () **2nd** () **3rd** () **4th** () **5th** (). 1= Sale of crop produce, 2= Sale of livestock, 3= Small trade, 4= Formal employment, 5= Casual labor, 6= Remittances from relatives, 7= Pensions, 8 = transfer, 9= Interest and savings

A10. Household income in the year 2015

A.10.1. Can you estimate income you earned from crop farm in 2015 EC () **Eth birr**

A.10.2. Can you estimate income you earned from livestock farm in 2015EC () **Eth birr**

A.10.3. Can you estimate income earned from non-farm enterprises in 2015EC () **Eth birr**

A.10.4. Can you estimate income earned from remittance in 2015EC () **Eth birr**

SOCIAL CAPITAL AND NETWORKING

In general, do you agree or disagree with the following questions on social cohesion? **rate as:**

1= strongly disagree 2= disagree 3= neither 4= agree 5= strongly agree

	Do think that people of this village trust each other in matters of their community relationship?	()
	Most people in this village are basically honest and can be trusted?	()
	Do you think most people would try to be fair if they got a chance in this village ?	()
	Generally, would you say, if I have a problem there is always someone to help me.	()
	Do people in this village contribute time and money toward common goals?	()

	Do you agree that leaders in this village capable in managing peoples' problems?	<input type="text"/>
	How do you agree with local leaders in managing conflict induced disaster?	<input type="text"/>
	Do you agree with the ability of local leaders and the community to work together and mobilize broad based support?	<input type="text"/>
Indicate the extent to which you trust as 1= very small extent 2= small extent 3=.Neither great nor small extent 4= great extent 5= very great extent		
	the extent to which you trust Neighborhood	<input type="text"/>
	the extent to which you trust Fellow/Member villagers	<input type="text"/>
	the extent to which you trust Local government officials	<input type="text"/>
	the extent to which you trust Central government officials	<input type="text"/>
	How do you feel that you participate in the decision making of conflicts resolution as a member of elder's council?	<input type="text"/>
Rate the following challenges in relation to the community to work together and mobilize broad based and well organize conflict management within the past 20 years code as 1= strongly disagree 2= disagree 3= neither 4= agree 5= strongly agree		
	Devising community organization/cooperatives of conflicts management ends	<input type="text"/>
	Lack of efficiency for community cooperation in order to manage the conflicts	<input type="text"/>
	Too many middlemen and high exploitation of community by individual interests	<input type="text"/>
	Illiteracy and Lack of Unity among community	<input type="text"/>
	Absence of institutionalized and community-based conflicts induced DRM	<input type="text"/>

C. PERCEIVED Trends of Nature and CAUSES of conflicts in last 10 years (2014 – May 2024 G.C) in study area

did you experience conflict in the area? 1. Yes 2. No.

If yes, then what are the causes? there are 1. social, 2. economic, 3. political, 4. Natural & human, 5. physical and 6. institutional.

Has the household or any member of your household or village members been affected by the following **types of conflicts** within the past 20 years? [] . 1. Yes 2. No.

If your answer “yes”, rate the **causes of Oromo-Afar conflicts** for the following questions respondents code as: 1= negligible 2= minor 3= moderate 4= major 5= severe

	Events/shocks	response
Issue 1: Economic causes of conflicts		
	Competition for economic resources	[]
	Lack of markets/loss of markets to sell crops, live animals & its products economic and social opportunities	[]
	Few economic alternatives to livestock keeping	[]
	Livestock encroachment by pastoralists	[]
	Increased vulnerability, food insecurity, and mal-nutrition of the society	[]
	Limited options of livelihood diversification including Income inequality, Youth unemployment or underemployment	[]
Issue 2: Natural resource related causes of conflicts		
	Deficiency in rainfall causing Occurrence of drought and disease, crop failure lead to conflicts	[]
	Limited access to natural resources; such as access to water, pasture land grazing etc...	[]
	Weather related loss and raid of livestock	[]

	Insecurity and displacement induced by climate risks, drought, and desertification	<input type="checkbox"/>
	Land tenure and Shortage of grazing land	<input type="checkbox"/>
	Unpredictable weather conditions leading to periods of hunger, necessitating migration for grazing	<input type="checkbox"/>
	Division of grazing lands between different governments	<input type="checkbox"/>
	Issue 3: Security and Governance Risks	
	Recurrent incidences of insecurity caused by banditry on the roads, unclear land patterns and livestock raids in the grazing areas	<input type="checkbox"/>
	Conflicts induced of Sense of ethnic/clan rivals or enmity	<input type="checkbox"/>
	Socio-political instability within a country or in neighboring countries including administrative boundaries of regional states	<input type="checkbox"/>
	Weak and Absence of clearly defined boundaries between Oromo and Afar	<input type="checkbox"/>
	Recurrent incidences of insecurity caused by incompatibility of grazing and farming in the same space	<input type="checkbox"/>
	Weakened community sanctions on 'theft' of cattle	<input type="checkbox"/>
	Poor interregional (Oromia and Afar Regions) institutional arrangements of conflict management	<input type="checkbox"/>
	Proliferation of small arms and light weapons	<input type="checkbox"/>
	Establishment of illegal custom posts/control over custom posts	<input type="checkbox"/>

Socio-economic effects of agro-pastoral conflicts in the study area

Rate the following effects of conflicts on socio-economic aspect of pastoralists & agro-pastoralists in the last 20 years. code as: 1= very low 2= low 3= moderate 4= high 5= very high		
	Reduced livelihood income of household	<input type="text"/>
	Loss and/or damage of livelihood assets including live animals, grazing lands, pasture resources	<input type="text"/>
	Destruction of household assets such houses, home equipment's,	<input type="text"/>
	Reduced access to food access for both human and livestock and increased food insecurity	<input type="text"/>
	Unemployment/under-employments	<input type="text"/>
	Loss of social harmony including Mutual distrust among the various parties to dispute, Disruption of group membership	<input type="text"/>
	Increased displacement due to conflicts	<input type="text"/>
	Internal and cross-border migration	<input type="text"/>
	Body injury and loss of human life	<input type="text"/>
	Interruption and Disturbance of public services such education, health care and trade services	<input type="text"/>
	Other	<input type="text"/>

Conflict management trends in last 10 years (2014 – May 2024 G.C)

<p>How the trend of Oromo-Afar pastoral and agro-pastoral conflicts management over last 20 years? Rate as: 1= highly decrease 2= decrease 3= no change 4= increase 5= highly increase</p>	
<p>How do you express the frequency and magnitude of Oromo-Afar pastoralist and agro-pastoralist conflicts management mechanisms from 2019 – May 2024 G.C</p>	<input type="text"/>
<p>Which trend of conflicts management mostly used in the areas, indicate that the extent of usage and practicing conflict managements by rate as: 1= very small extent 2= small extent 3= Neither great nor small extent 4= great extent 5= very great extent</p>	
<p>Conflict management mechanism 1: indigenous and formal conflict management</p>	
<p>To what extent is the madaa based on Afar customary law of conflict management used between Afar Oromo clans mainly in Gubmi-Bordode and Amibara district?</p>	<input type="text"/>
<p>How extensively is the Gada system based on Oromo customary law of conflict management used between Afar Oromo clans mainly in Gubmi-Bordode and Amibara district?</p>	<input type="text"/>
<p>What is the extent of usage of local community leaders in fostering peace between the parties involved in conflict management?</p>	<input type="text"/>
<p>To what extent does formal institutional intervention, including law enforcement agents, play a role in conflict management?</p>	<input type="text"/>

Thank you!!!

APPENDIX:2
KEY INFORMANTS INTERVIEW

1. How long have you been a resident of study area?

2. How do you compare the relationships of Oromo-Afar pastoral and agro pastoral before the formation of regional states in Ethiopia?

3. How do you compare the relationships of Oromo-Afar pastoral and agro pastoral after the formation of regional states in Ethiopia up to now?

4. How do perceive the situation/trends of conflicts in the last five years?

5. Is the security situation improving or worsening in the conflict area? How?

6. What do you think as the factors that escalate/deescalate the conflicts?

7. Who are the main actors of the conflict?

8. Do they operate visibly or behind the scenes?

9. Are there any external/hidden hand actors in the conflict? Who are they?

10. What do think are the vast interest of those external/hidden hand actors in the conflict?

11. What do you perceive are the negative effects of the conflict on socio-economic aspects of the society in the locality/*study area*?

12. Who intervened to manage/resolve the conflict? How they intervened?

13. Does your local/regional/federal governments of Ethiopia attempted peace-making in the last five years? Could you elaborate?

14. What are the challenges of sustainable peace-making in the conflicts area?

15. Which problems can local people easily handle by themselves and which require further action by local and federal governments?

16. How do you think the Oromo-Afar pastoral and agro pastoral conflicts can be managed or resolved? Suggest any more idea that helps to better manage the conflicts in the study area? Thank You!!

APPENDIX:3

FOCUS GROUPS DISCUSSION

1. How long have you been a resident of study area?
2. How do you compare the relationships of Oromo-Afar pastoral and agro pastoral before the formation of regional states in Ethiopia?
3. How do you compare the relationships of Oromo-Afar pastoral and agro pastoral after the formation of regional states in Ethiopia up to now?
4. How do perceive the situation/trends of conflicts in the last five years?
5. Is the security situation improving or worsening in the conflict area (study area)? How?
6. What do you think as the factors that escalate/deescalate the conflicts?
7. Who are the main actors of the conflict?
8. Do they operate visibly or behind the scenes?
9. Are there any external/hidden hand actors in the conflict? Who are they?
10. What do think are the vast interest of those external/hidden hand actors in the conflict?
11. What are the causes of Oromo-Afar pastoral and agro pastoral conflicts in the study area?
12. Are there any socio-economic problems due to the conflicts? Please discuss
13. Who intervened to manage/resolve the conflict? How they intervened?
14. What is the government (kebele, woreda, zonal, regional state) institutional capacity to respond to the conflict?
- 15.** Which problems can local people easily handle by themselves and which require further action by local and federal governments?
- 16.** What efforts have been tried to resolve the conflict so far?
- 17.** How do you think the Oromo-Afar pastoral and agro pastoral conflicts can be managed or resolved? Suggest any more idea that helps to better manage Oromo-Afar pastoral and agro pastoral conflicts?

Thank You!!!

Appendix 4: Reliability test using Cronbach's Alpha

Case Processing Summary

		N	%
Cases	Valid	335	100.0
	Excluded ^a	0	.0
	Total	335	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.804	36

Item Statistics

	Mean	Std. Deviation	N
Competition for economic resources	3.9463	.27377	335
Lack of markets/loss of markets to sell crops, live animals, & its products economic and social opportunities	3.1463	.35390	335
Few economic alternatives to livestock keeping	3.1403	.36463	335
Livestock encroachment by pastoralists	3.1164	.40380	335
Increased vulnerability, food insecurity, and malnutrition of the society	3.1164	.40380	335
Limited options of livelihood diversification including income inequality, youth unemployment or underemployment	3.0896	.39953	335
Deficiency in rainfall causing drought and disease, crop failure lead to conflicts	3.0716	.42483	335
Limited access to natural resources; such as access to water, pasture land, grazing etc.	2.9552	.50247	335
Weather related loss and raid of livestock	2.9134	.45283	335
Insecurity and displacement induced by climate risks, drought, and desertification	3.2239	.41747	335
Land tenure and Shortage of grazing land	3.0000	.00000	335
Unpredictable weather conditions leading to periods of hunger, necessitating migration for grazing	3.1851	.38894	335
Division of grazing lands between different governments	3.0209	.14326	335
Recurrent incidences of insecurity caused by banditry on the roads, unclear land patterns and livestock raids in the grazing areas	3.0836	.27717	335
Conflicts induced of Sense of ethnic/clan rivals or enmity	3.1373	.46327	335
Socio-political instability within a country or in neighboring countries including administrative boundaries of regional states	3.1373	.46327	335
Weak and Absence of clearly defined boundaries between Oromo and Afar	3.1791	.48712	335
Recurrent incidences of insecurity caused by incompatibility of grazing and farming in the same space	3.0896	.41424	335
Weakened community sanctions on theft of cattle	3.2716	.44547	335
Poor interregional (Oromia and Afar Regions) institutional arrangements of conflict management	3.0896	.41424	335
Proliferation of small arms and light weapons	3.2716	.44547	335
Control over custom posts	3.1791	.48712	335
Reduced livelihood income of household	3.6478	.63443	335
Loss and/or damage of livelihood assets including live animals, grazing lands, pasture resources	3.4746	.52350	335
Destruction of household assets such houses, home equipment's,	3.6000	.56441	335
Reduced access to food access for both human and livestock and increased food insecurity	3.4896	.68717	335
Unemployment/under-employment	3.5254	.68677	335
Loss of social harmony including Mutual distrust among the various parties to dispute,	3.6090	.69595	335
Disruption of group membership	3.3821	.63125	335
Increased displacement due to conflicts	3.3821	.63125	335
Internal and cross-border migration	3.6866	.68362	335
Body injury and loss of human life	3.3910	.63287	335
Interruption and Disturbance of public services such education, health care and trade services	3.6328	.69609	335
To what extent is the madaa based on Afar customary law of conflict management used between Afar Oromo clans mainly in Gubmi-Bordode and Amibara district?	3.3910	.63287	335
How extensively is the Gada system based on Oromo customary law of conflict management used between Afar Oromo clans mainly in Gubmi-Bordode and Amibara district?	3.1791	.48712	335
What is the extent of usage of local community leaders in fostering peace between the parties involved in conflict management?	4.1224	.40940	335
To what extent does formal institutional intervention, including law enforcement agents, play a role in conflict management?	4.0627	.53524	335

ANOVA with Cochran's Test

	Sum of Squares	df	Mean Square	Cochran's Q	Sig
Between People	373.239	334	1.117	3510.371	.000
Within People Between Items	1095.059	35	31.287		
Residual	2562.552	11690	.219		
Total	3657.611	11725	.312		
Total	4030.850	12059	.334		

Grand Mean = 3.3211

Appendix 1.1. Results of Causes of Conflict

Descriptive Statistics							
district of the study		N	Mean	Std. Deviation	Minimum	Maximum	
gumbibordode	Competition for economic resources	180	3.9556	.25505	2.00	4.00	
	Lack of markets/loss of markets to sell crops, live animals & its products economic and social opportunities	180	3.1222	.32846	3.00	4.00	
	Livestock encroachment by pastoralists	180	3.0833	.39374	2.00	4.00	
	Deficiency in rainfall causing Occurrence of drought and disease, crop failure lead to conflicts	180	3.0556	.40558	2.00	4.00	
	Limited access to natural resources; such as access to water, pasture land grazing etc...	180	2.9722	.50062	2.00	4.00	
	Recurrent incidences of insecurity caused by banditry on the roads, unclear land patterns and livestock raids in the grazing areas	180	3.0833	.27716	3.00	4.00	
	Poor interregional (Oromia and Afar Regions) institutional arrangements of conflict management	180	3.0944	.41879	2.00	4.00	
	Proliferation of small arms and light weapons	180	3.2722	.44635	3.00	4.00	
	Control over custom posts	180	3.1889	.49341	2.00	4.00	
	Recurrent incidences of insecurity caused by incompatibility of grazing and farming in the same space	180	3.0944	.41879	2.00	4.00	
	Weak and Absence of clearly defined boundaries between Oromo and Afar	180	3.1889	.49341	2.00	4.00	
	amibara	Competition for economic resources	155	3.9355	.29448	2.00	4.00
		Lack of markets/loss of markets to sell crops, live animals & its products economic and social opportunities	155	3.1742	.38051	3.00	4.00
Livestock encroachment by pastoralists		155	3.1548	.41313	2.00	4.00	
Deficiency in rainfall causing Occurrence of drought and disease, crop failure lead to conflicts		155	3.0903	.44674	2.00	4.00	
Limited access to natural resources; such as access to water, pasture land grazing etc...		155	2.9355	.50552	2.00	4.00	
Recurrent incidences of insecurity caused by banditry on the roads, unclear land patterns and livestock raids in the grazing areas		155	3.0839	.27809	3.00	4.00	
Poor interregional (Oromia and Afar Regions) institutional arrangements of conflict management		155	3.0839	.41018	2.00	4.00	
Proliferation of small arms and light weapons		155	3.2710	.44590	3.00	4.00	
Control over custom posts		155	3.1677	.48106	2.00	4.00	
Recurrent incidences of insecurity caused by incompatibility of grazing and farming in the same space		155	3.0839	.41018	2.00	4.00	
Weak and Absence of clearly defined boundaries between Oromo and Afar		155	3.1677	.48106	2.00	4.00	

Test Statistics

district of the study		Competition for economic resources	Lack of markets/loss of markets to sell crops, live animals & its products economic and social opportunities	Livestock encroachment by pastoralists	Deficiency in rainfall causing Occurrence of drought and disease, crop failure lead to conflicts	Limited access to natural resources; such as access to water, pasture land grazing etc...	Recurrent incidences of insecurity caused by banditry on the roads, unclear land patterns and livestock raids in the grazing areas	Poor interregional (Oromia and Afar Regions) institutional arrangements of conflict management	Proliferation of small arms and light weapons	Control over custom posts	Recurrent incidences of insecurity caused by incompatibility of grazing and farming in the same space	Weak and Absence of clearly defined boundaries between Oromo and Afar
gumbibordode	Chi-Square	324.933 ^a	102.756 ^b	208.900 ^a	203.333 ^a	140.833 ^a	125.000 ^b	191.633 ^a	37.356 ^b	132.133 ^a	191.633 ^a	132.133 ^a
	df	2	1	2	2	2	1	2	1	2	2	2
	Asymp. Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
amibara	Chi-Square	264.013 ^c	65.813 ^d	161.703 ^c	149.626 ^c	117.419 ^c	107.361 ^d	170.800 ^c	32.523 ^d	122.994 ^c	170.800 ^c	122.994 ^c
	df	2	1	2	2	2	1	2	1	2	2	2
	Asymp. Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 60.0.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 90.0.

c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 51.7.

d. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 77.5.

Appendix 1.2: social effect

Descriptive Statistics

district of the study		N	Mean	Std. Deviation	Minimum	Maximum
gumbibordode	Loss of social harmony including Mutual distrust among the various parties to dispute, Disruption of group membership	180	3.7167	.72678	2.00	5.00
	Increased displacement due to conflicts	180	3.4889	.68085	2.00	5.00
	Internal and cross-border migration	180	3.8222	.68630	3.00	5.00
	Body injury and loss of human life	180	3.4944	.68092	2.00	5.00
	Interruption and Disturbance of public services such education, health care and trade services	180	3.7889	.70107	3.00	5.00
amibara	Loss of social harmony including Mutual distrust among the various parties to dispute, Disruption of group membership	155	3.4839	.63813	2.00	5.00
	Increased displacement due to conflicts	155	3.2581	.54462	2.00	5.00
	Internal and cross-border migration	155	3.5290	.64777	3.00	5.00
	Body injury and loss of human life	155	3.2710	.55020	2.00	5.00
	Interruption and Disturbance of public services such education, health care and trade services	155	3.4516	.64661	3.00	5.00

Test Statistics

district of the study		Loss of social harmony including Mutual distrust among the various parties to dispute, Disruption of group membership	Increased displacement due to conflicts	Internal and cross-border migration	Body injury and loss of human life	Interruption and Disturbance of public services such education, health care and trade services
gumbibordode	Chi-Square	90.089 ^a	128.578 ^a	31.033 ^b	126.978 ^a	26.433 ^b
	df	3	3	2	3	2
	Asymp. Sig.	.000	.000	.000	.000	.000
amibara	Chi-Square	122.394 ^c	222.523 ^c	52.116 ^d	213.748 ^c	71.626 ^d
	df	3	3	2	3	2
	Asymp. Sig.	.000	.000	.000	.000	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 45.0.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 60.0.

c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 38.8.

d. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 51.7.

Appendix 1. 3: economic effect of conflict

Descriptive Statistics

district of the study		N	Mean	Std. Deviation	Minimum	Maximum
gumbibordode	Reduced livelihood income of household	180	3.2222	.41690	3.00	4.00
	Loss and/or damage of livelihood assets including live animals, grazing lands, pasture resources	180	3.0000	.00000	3.00	3.00
	Destruction of household assets such houses, home equipment's,	180	3.1833	.38802	3.00	4.00
	Reduced access to food access for both human and livestock and increased food insecurity	180	3.0167	.12838	3.00	4.00
	Unemployment/under-employments	180	3.0833	.27716	3.00	4.00
amibara	Reduced livelihood income of household	155	4.1419	.46205	3.00	5.00
	Loss and/or damage of livelihood assets including live animals, grazing lands, pasture resources	155	4.0258	.15907	4.00	5.00
	Destruction of household assets such houses, home equipment's,	155	4.0839	.27809	4.00	5.00
	Reduced access to food access for both human and livestock and increased food insecurity	155	4.0387	.66336	2.00	5.00
	Unemployment/under-employments	155	4.0387	.66336	2.00	5.00

Test Statistics

district of the study		Reduced livelihood income of household	Destruction of household assets such as houses, home equipment's,	Reduced access to food access for both human and livestock and increased food insecurity	Unemployment/under-employment	Loss and/or damage of livelihood assets including live animals, grazing lands, pasture resources
gumbibordode	Chi-Square	55.556 ^a	72.200 ^a	168.200 ^a	125.000 ^a	
	df	1	1	1	1	
	Asymp. Sig.	.000	.000	.000	.000	
amibara	Chi-Square	136.310 ^b	107.361 ^c	187.581 ^d	187.581 ^d	139.413 ^c
	df	2	1	3	3	1
	Asymp. Sig.	.000	.000	.000	.000	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 90.0.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 51.7.

c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 77.5.

d. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 38.8.

Appendix 1. 4: Conflict management mechanism

Descriptive Statistics

district of the study		N	Mean	Std. Deviation	Minimum	Maximum
gumbibordode	To what extent is the madaa based on Afar customary law of conflict management used between Afar Oromo clans mainly in Gubmi-Bordode and Amibara district?	180	3.4944	.68092	2.00	5.00
	How extensively is the Gada system based on Oromo customary law of conflict management used between Afar Oromo clans mainly in Gubmi-Bordode and Amibara district?	180	3.1889	.49341	2.00	4.00
	What is the extent of usage of local community leaders in fostering peace between the parties involved in conflict management?	180	4.0778	.42879	2.00	5.00
	To what extent does formal institutional intervention, including law enforcement agents, play a role in conflict management?	180	4.0111	.55922	2.00	5.00
amibara	To what extent is the madaa based on Afar customary law of conflict management used between Afar Oromo clans mainly in Gubmi-Bordode and Amibara district?	155	3.2710	.55020	2.00	5.00
	How extensively is the Gada system based on Oromo customary law of conflict management used between Afar Oromo clans mainly in Gubmi-Bordode and Amibara district?	155	3.1677	.48106	2.00	4.00
	What is the extent of usage of local community leaders in fostering peace between the parties involved in conflict management?	155	4.1742	.38051	4.00	5.00
	To what extent does formal institutional intervention, including law enforcement agents, play a role in conflict management?	155	4.1226	.50111	2.00	5.00

Test Statistics

district of the study		To what extent is the madaa based on Afar customary law of conflict management used between Afar Oromo clans mainly in Gubmi-Bordode and Amibara district?	How extensively is the Gada system based on Oromo customary law of conflict management used between Afar Oromo clans mainly in Gubmi-Bordode and Amibara district?	What is the extent of usage of local community leaders in fostering peace between the parties involved in conflict management ?	To what extent does formal institutional intervention, including law enforcement agents, play a role in conflict management ?
gumbibordode	Chi-Square	126.978 ^a	132.133 ^b	344.622 ^a	299.867 ^a
	df	3	2	3	3
amibara	Asymp. Sig.	.000	.000	.000	.000
	Chi-Square	213.748 ^c	122.994 ^d	65.813 ^e	254.574 ^e
	df	3	2	1	3
	Asymp. Sig.	.000	.000	.000	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 45.0.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 60.0.

c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 38.8.

d. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 51.7.

e. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 77.5.

