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COLLEGE OF SOCIAL SCIENCES, ARTS, AND HUMANITIES

DEPARTMENT OF SOCIOLOGY AND SOCIAL ANTHROPOLOGY

ENVIRONMENTAL CHANGE AND ITS INFLUENCE ON THE CULTURAL
PRACTICES OF THE BAYSO OF GIDICHO ISLAND, SOUTHERN ETHIOPIA

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SCHOOL OF GRADUATE STUDIES

I, Eshetu Fekadu Teferi, hereby declare that this dissertation entitled ‘The nexus of environmental change and cultural change among the Bayso of Gidicho Island, southern Ethiopia’ complies with the regulations of the university and meets the accepted standard of originality.

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DECLARATION

I, the undersigned, declare that this dissertation is my original work and has not been produced and presented in any other academic institution. All sources of material used for the dissertation have been properly acknowledged.

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ESHETU FEKADU TEFERI

ABSTRACT

Gidicho Island and the coastal areas of Lake Abaya were once known for their abundant vegetation, fertile soil, and disease-free environment, which created a conducive environment for living. However, these attributes have significantly diminished due to the environmental changes the region has undergone. This study examined the adverse effects of environmental change on the culture of the Bayso community of Gidicho Island, with a particular emphasis on their indigenous belief system and marriage customs. A mixed-methods approach was utilized to understand these themes thoroughly. Qualitative data were collected through interviews, focus group discussions, and observations. Quantitative data, on the other hand, were sourced from the United States Geological Survey website and organized to analyze land use and land cover changes in the study area from 1990 to 2020. The results showed that the Bayso people viewed themselves as an essential part of their environment, a view that shows the natural environment is a foundation of their life, expressing it as '*ul hiki enijuromaya*.' Consequently, damaging the environment (*ul*) has been regarded as a form of self-damage. Guided by such beliefs and values, they established remarkable spiritual and local practices to sustain the abundance of their *ul*. Nowadays, however, they are suffering from severe environmental challenges that have damaged their resources. These challenges arise from changes in their perception and value of their environment, influenced by sociocultural, structural, and climatic factors. Ethnographic data revealed that human activities such as deforestation and overgrazing are the main causes of environmental change in the study area. These activities are fueled by the growing demand for agricultural land, construction materials, and energy. Geospatial analysis also showed a significant decline in vegetation cover over the past three decades, mainly because of extensive overgrazing and the conversion of 2,190 km² of forests and 707 km² of shrublands into cultivated land and settlements. Thus, due to severe resource scarcity, particularly of grazing land, and the spread of cattle diseases, the Bayso have lost a significant portion of their herds, which were the mainstay of their livelihoods and religious rituals. Consequently, they were forced to migrate to areas on the west coast of Lake Abaya. The decline in animal products and their exposure to dominant cultures disrupted their two cultural institutions, namely, the indigenous belief system and the extended family that played a crucial role in sustaining their cultural identity. Thus, they lacked the consecration of *Wa'a*, ancestral spirits, and ritual leaders, which were essential for establishing enduring marriages. As a result, there are changes in some elements of their marriage custom, including a decline in arranged marriage, an increase in divorce and early marriage rates, and exposure to unwanted sexual behavior. Besides, the decline of their belief system has disrupted local environmental conservation efforts and exacerbated environmental degradation. In this context, this study provides insights and mechanisms

for restoring the Lake Island environment and establishing sustainable human-nature relationships. Equally, successful intervention strategies suggested in the study could serve as a model for other communities facing similar challenges. It also contributes to the debate on the link between environmental change and cultural change.

Keywords: Bayso, Gidicho Island, Environmental change, cultural change, southern Ethiopia

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LIST OF ABBREVIATIONS

AT: Adaptation Theory.....	34
ARTs: African Traditional Religions.....	20
CE: Cultural Ecology.....	34
DP: Diffusionist Perspective.....	34
GGZCT: Gamo Gofa Zone Culture and Tourism Office.....	130
MAW-WRDO: Mirab Abaya Woreda-Woreda Rural Development Office	57
PE: Political Ecology	34
SNNPR: Southern Nations Nationalities and Peoples' Region.....	60
UNECA: United Nations Economic Commission for Africa	122
USAID: United States Agency for International Development.....	114
WZFEDO: Wolayta Zone Finance and Economic Development Office.....	150
WVE: World Vision Ethiopia.....	126
WWF: World-Wide Fund for Nature.....	24

LIST OF PUBLICATIONS

1. Eshetu Fekadu, Mamo Hebo, and Guday Emirie (2024). Impact of environmental change on the Indigenous belief system of the Bayso Community of Gidicho Island, Southern Ethiopia. *International Journal of Anthropology and Ethnology*, 8 (16). <https://doi.org/10.1186/s41257-024->
2. Eshetu Fekadu, Mamo Hebo, and Guday Emirie (2025). Trends and Triggers of Environmental Change on Gidicho Island and Its Environs, Southern Ethiopia. *Island Studies Journal*. Early access. <https://doi.org/10.24043/001c.132185>

LIST OF LOCAL TERMS

Bayso Terms

Aba, Abo, and Ababo: Father

Abbaddo: Ritual expert

Agud: A big compound of an extended family

Alenko: Fire

Babar: Son

Banti: Arranged marriage

Bayso-dunguza: Cultural cloth of Bayso

Bekeko: Water

Borbona: Ambatch tree

Burs: Bridewealth

Chaqa: Oath

Charfanna: A ritual staff of a *Wonno*

Deltitti: Daughter

Dem: Terrace

Durisa: Evil spirit

Entter: Husband

Eratano: Wedding ceremony

Franta: Ring made of iron

Gaariun'en'tano: Ancestral spirits

Gashe: An elephant tusk

Hassaa: Necklace

Kallacha: A phallus-shaped ornament that *Wonno* ties on his forehead

Kesume: Marriage

Kollo: A homemade long dress of a *Wonno*

Korfinje: A seat of a *Wonno* made from ambatch tree

Lakka: A bracelet made of iron

Landi: A dress made of goat skin

Maganencho: Ritual assistant, wife of a *Woycha*
Metabiyallo: Miscarriage
Min: Cultural house of Bayso
Obooro: A mixture of milk and (honey)water for ritual purposes
Oddobbado: Husband of abbaddo who coordinates the *elabo* process
Oriwonno: wife of a Wonno
Qango: curse
Sakil /Borde: The cultural drink of Bayso, made from a powder of maize/sorghum
Shorre: porridge
Songon: Public meeting place
Tunne: Impure
Tuqamo: Messenger of a *Wonno*
Ul: Environment
Wa 'a: Supreme being of the Bayso
Wollabo: Traditional boat
Wonno: Ritual leader
Workicha: false banana
Woyicha: Ritual assistant

Amharic Terms

Belg: Characterized by a short period of rain in parts of Ethiopia
Buluko: A big garment made of cotton
Dega: High-latitude area
Kebele: Local administration
Kolla: lowland
Kremet: Ethiopian rainy season
Zemecha: A campaign called 'Development through knowledge and cooperation'
Woynadega: Med-latitude
Woreda: District

CHAPTER ONE

INTRODUCTION

This chapter introduces the study by discussing the background, the research problem, objectives, scope, significance, limitations, ethical considerations, and organization of the study.

1.1. Background of the Study

The environment is human beings' immediate surroundings, including the physical and social systems (Kumar, 2018). According to Kumar, while the physical environment includes natural features such as water bodies, soil, vegetation, and air, the social environment consists of the settings in which people live, cultures, and institutions created by humans to monitor and regulate their living conditions. The physical environment has been a source of life for humanity around the globe, providing goods and services since time immemorial (Millennium Ecosystem Assessment [MEA], 2005). More recently, however, while the demand for natural resources has continued to increase, the potential of the environment to provide these goods and services has been reduced due to environmental change (Global Resource Outlook, 2024). According to Smil (2005), environmental change is any alteration of the environment. Although the environment is constantly changing with or without human involvement, the rate of change and its effects have recently intensified due to industrialization, urbanization, and population growth (MEA, 2005).

Studies show that environmental change is a result of multiple factors, including human actions, natural hazards, and structural factors. For instance, according to Gouide (2000) and Nyssen et al. (2004), human actions such as clearing forests for agricultural land and settlement, cutting trees for construction, firewood and charcoal production, overgrazing, and burning fossil fuels trigger environmental damage. Similarly, natural hazards such as droughts, floods, and forest fires contribute to environmental change (Mata-Lima et al., 2013; Ayenew, 2019). Also, Amechi (2009) argues that structural factors such as

population growth, poverty, and government policies aimed at socio-economic development, including villagization and investment activities, cause resource degradation.

In this study, the term “environmental change” refers to the substantial degradation of essential components of the physical environment, such as vegetation, soil, air, and water, resulting from human activities as well as structural and natural factors. These changes adversely affect the Bayso people's livelihoods and cultural practices, including their indigenous belief system (IBS) and certain marriage customs. Indeed, the change in the environment can have either a positive or a negative effect on the environment and human life. For example, according to Tadesse (2002) and Claus, Chan, and Satterfield (2010), human actions such as agroforestry, reforestation, the use of clean energy, and support for legislation that promotes environmental protection efforts contribute to environmental sustainability and socio-economic development. However, I argue that while human activities contribute to the conservation of natural resources and promote economic and sociocultural developments, these developments are not easily maintained in the absence of environmentally friendly policies and sustainable usage customs. Conversely, Gouide (2000) and Nyssen et al. (2004) posited that deforestation, overgrazing, and the burning of fossil fuels, among others, trigger a depletion of natural resources that adversely affect human ways of life.

Currently, environmental change and the resultant resource degradation have become a threat to almost all aspects of human life across the globe, causing hunger, widespread poverty, migration, and increasing mortality (MEA, 2005; Thakur, 2010; Jack, 2017). However, its effects on developing countries, especially in sub-Saharan Africa, are harmful because inhabitants' lives in this part of Africa are inextricably linked to the natural environment (Nche, 2014; Sakariyahu et al., 2024). In this regard, crop and animal products of the majority of sub-Saharan Africans have declined due to soil infertility, scarcity of grazing, the spread of cattle diseases and alien plant species, and severe droughts and floods that exacerbated poverty levels (Gebremedhin et al., 2024; John, 2024; Slayi et al., 2024). The point is that the decline of crop and animal products impoverished not only their livelihoods but also their cultural traditions. What matters is that due to increasing poverty,

rural communities in sub-Saharan Africa lack the financial and technological resources to compensate for the loss of natural resources that are vital to their socio-economic and cultural life. Besides, natural disasters, mainly floods and droughts, forced inhabitants to migrate, detaching them from their cultural bases and exposing them to new ways of life (Awojobi, 2017; Ibrahim and Mensah, 2022; International Organization for Migration [IOM], 2023). As a result, they failed to maintain cultural institutions, traditions, and practices that played a crucial role in shaping and guiding their lives and sustaining the affluence of environment (Nche, 2014). The fact is that environmental degradation in the context of sub-Saharan Africa means the annihilation of cultural institutions, traditions, values, practices, the abode of gods and goddesses, and ancestral spirits, sources of healing, and sites of revelation and transformation (Gemeda, 2019).

Thus, sacred natural sites of religious rituals, once respected and protected by all and handed down from generation to generation, have lost this grace due to environmental change (Chitando, 2017). Consequently, their belief system, which is inextricably linked to the environment and the entire way of life of sub-Saharan Africans, including their food traditions, clothing, subsistence economy, marriage customs, environmental conservation mechanisms, healing and cleansing rituals, has lost its strong foundation (Chitando, 2017; Mulugeta, 2017). Because of this, some writers (e.g., Gumo et al. 2012) perceived the current environmental shift as a threat to creation as a whole. This implies that if the problem of environmental change is not addressed timely manner, it could disrupt the very existence of humanity in this part of Africa.

The Bayso people are the inhabitants of Gidicho Island in Lake Abaya and villages on the west coast of the lake, in the South Ethiopia Region. They had their own cultural traditions and values that were linked to the environment. However, the Bayso have been experiencing changes in their local environment for generations. As a result, Gidicho Island and its surroundings have been losing their affluence (*mogossa*), and life on the island has become increasingly difficult and demanding. As a result, the Bayso people, who once led prosperous lives, were subjected to poverty and forced to engage in activities that were considered taboo (e.g., cutting down trees to burn charcoal and collecting firewood for the

market). This not only exacerbated environmental damage but also led to the decline of livestock, which seriously affected the socio-economic and cultural life of the Bayso. Accordingly, this study examined the environmental changes affecting the cultural practices of the Bayso people of Gidicho Island, with a particular focus on their IBS and marriage customs.

My motive for studying the environmental change in the study area from 1990 to 2020 is linked to the following reasons. First, 1991 was a time of political transition in Ethiopia from the *Derg*¹ regime to the Ethiopian People's Revolutionary Democratic Front, EPDRF, and this political disturbance contributed to the damage of the country's forest resources. This was because *Derg's* environmental policies had nationalized forest resources and ignored the rights of farmers to access and use forest resources (Chala, 2015). Thus, after the fall of the *Derg* regime in 1991, peasants destroyed large areas of forest in many parts of the country, including forest resources on the western shore of Lake Abaya. Second, according to Baxter (2002), the heavy rains in the southern Ethiopian region in the 2000s due to the El Nino incident caused an increase in the water level of Lake Abaya, which submerged the farmlands of the study people. Moreover, the study area and some other areas in southern Ethiopia experienced the worst drought caused by La Niña incidents in the 2010s (Tierney, 2013). Therefore, I believe that these incidents have damaged the natural resources of the study area as well as the livelihoods and cultural life of the Bayso. This is an anthropological attempt designed to study the nexus of environmental change and cultural change, and its effects on culture in a local context. Thus, I believe that the knowledge gained and the conclusions drawn from this research will help identify factors that could trigger environmental change in similar contexts, as well as how such changes

¹ *Derg* is an Amharic term to mean a committee or council, officially it was known as the Provisional Military Administrative Council (PMAC). It was the Marxists-Leninist military dictatorship that ruled Ethiopia from 1974 to 1991 under the leadership of Colonel Mengistu Hailemariam. In 1987 Mengistu dissolved the *Derg* and established the country as People's Democratic Republic of Ethiopia (PDRE) under a new constitution. Finally, it was overthrown by a rebel force the Ethiopian People's Revolutionary Democratic Front (EPRDF) in May 1991 (see Gebeyehu, 2010).

could affect the culture of communities in rural Ethiopia. This, in turn, would assist researchers and policymakers in considering grassroots ecological and sociocultural variations, along with indigenous conservation mechanisms, while formulating conservation strategies that sustain both the environment and cultural traditions.

1.2 Statement of the Problem

Gidicho Island and the Lake Abaya coast were once known for their abundant vegetation, fertile soil, and healthy environment (Braukmann, 2012). However, these attributes have significantly diminished due to the environmental changes the region has undergone. Scholarly work in the area includes sociolinguistic, ethnographic, ethnohistory, and geographical studies. Sociolinguistic studies of Fleming (1964), Hayward (1978), Corbett and Hayward (1986), Brenzinger (1999), Hirut (2004), Siebert & Höft (2001), Sava (2011), and Lemi (2019) detail the structure, typology, and endangerment of the Bayso language. Ethnographic studies by Braukmann (2012) and Epple (2016) explored Bayso's cultural life. Notably, Epple's (2016) work provides a foundational understanding, but its synchronic approach lacks a diachronic analysis of environmental pressures, a gap that this study addresses. Studies by Feseha (2008), Tadele (2014), and Mohamed and Teferi (2019) examine the socio-economic and administrative systems of the Bayso people. On the other hand, the environmental overviews by Neumann (1902), Hodson (1927), and Schut (2004) are crucial for understanding trends in environmental change in the region. Abinet's 2019 study is the only one to examine Bayso's risk perception and adaptation strategies. However, his work also neglects the link between environmental and cultural changes. In sum, existing accounts provide context but lack a comprehensive human ecology analysis of the region.

My study addresses a gap in existing research by examining how environmental changes, climate fluctuations, and resource degradation affect the culture, social structures, and daily lives of the Bayso people. Focusing on Gidicho Island and surrounding villages along the western shore of Lake Abaya, the study provides a more comprehensive understanding of Bayso culture and its environmental context. This expands on research that primarily focuses on Gidicho Island or Alge village. The study covers the period from 1990 to 2020.

During this time, the country experienced political instability, which led to significant deforestation, including in the coastal areas of Lake Abaya. Additionally, severe droughts, erratic weather, and catastrophic floods in the Abaya Lake watershed have damaged the region's natural resources. In light of these insights, this study analyzes the effects of environmental changes on the region's ecosystem and the livelihoods of the Bayso people. The study is structured on four themes: 1) the Bayso's environmental perceptions; 2) observable environmental changes and their effects on nature, wildlife, and livelihoods; 3) factors driving environmental change in the region; and 4) the effect of environmental change on Bayso culture, including cultural practices, social structures, and livelihood strategies.

This study is based on a detailed understanding of several influential studies on human-environment relationships that stem from both theoretical debates and empirical investigations. I have incorporated various explanatory perspectives and insights from these foundational accounts into my study. Particularly, the collaborative work of Vining, Merrick, and Price (2008) addresses “people's perceptions and understandings of the environment.” According to these authors, the way rural communities perceive and value their surroundings plays a crucial role in conservation efforts. They propose that most rural communities rely on their environment and view themselves as integral parts of it, and this inspires them to care for their environment. This suggests that understanding the community's perception and valuation of their environment is essential for gaining a deeper understanding of human-environment relationships in specific contexts.

‘Environmental change’ is a central theme of my research, which has been significantly influenced by Dessalegn's (1994) monograph titled “Environmental Change and State Policy in Ethiopia: Lessons from Past Experience.” Dessalegn's work examines the prevailing environmental discourse in Ethiopia, which is largely shaped by the views of foreign experts. He argues that this narrative blames farmers for the ongoing environmental crisis and overlooks the contributions of indigenous farming and conservation practices. His study suggests that to fully understand the current environmental changes at the local level, researchers must consider all potential influences rather than focusing on one aspect.

The most informative scholarly work on the theme of “factors of environmental change” is Smil's (2005) contribution titled “*Global Ecology: Environmental Change and Sociocultural Flexibility*.” In this work, Smil aims to identify the key factors driving environmental change. He specifically highlights the negative impact of human activities that have degraded the environment's potential through the exploitation of natural resources since the Industrial Revolution. While the study mainly emphasizes human activities, I found it beneficial to understand other factors related to environmental change and how some of these factors are interconnected, either directly or indirectly.

The last piece of academic work that has significantly contributed to my study of the impact of environmental change on culture is the paper by Adger et al. (2012). This paper discusses how environmental change adversely affects people’s lifestyles. The authors present evidence indicating that when individuals are displaced from valued places, their cultures are diminished and, in many cases, endangered. Furthermore, there is often no effective replacement or adequate compensation for the loss of important cultural sites.

Therefore, to achieve the stated objectives, this study is guided by the following questions:

1. How does the Bayso experience, interpret, and respond to environmental change on Gidicho Island and its environs?
2. How does environmental change manifest itself on the island and in its environs?
3. What are the factors contributing to environmental change on Gidicho Island and its environs, and what other factors aggravated the problem?
4. What are the ecological, social, and cultural implications of this change (specifically on their IBS and marriage customs)?

1.3. Objectives of the Study

1.3.1 General objective

The study argues that severe environmental change and subsequent resource scarcity in the study area risked the Bayso culture. Accordingly, this study examined the effects of

environmental change on the culture of the Bayso, with a special focus on their indigenous belief system (IBS) and marriage customs, by analyzing their conception of the environment and environmental change, identifying causal factors and the extent of the problem.

1.3.2 Specific objectives

Based on the general objective, this study attempted to achieve the following specific objectives:

1. To understand Bayso's insight into their environment and environmental changes.
2. To determine how environmental changes manifest on Gidicho Island and in its surrounding areas.
3. To identify the leading factors that trigger environmental changes in the study area.
4. To explain factors that aggravated the environmental problem in the study area
5. To analyze the effects of environmental change on the IBS and marriage customs of the Bayso.

1.4 Scope of the Study

This study has thematic and geographic scopes. Thematically, the study focused on investigating the impact of environmental change on Bayso culture, with a particular focus on their IBS and marriage customs. Geographically, the study covered Gidicho Island and Bayso villages on the west coast of Lake Abaya, Mirab Abaya woreda, the Gamo zone, and southern Ethiopia.

1.5 Significance of the Study

One of the most important areas of focus in anthropology is the study of the complex relationship between societies and the environment in which they live. Indeed, such anthropological studies shed light on how human activities change their environment and the impact of these changes on their livelihoods and cultures, either positively or negatively. This study examines the harmful effects of environmental change on the culture

of the Bayso community, emphasizing its importance in advancing knowledge and formulating effective strategies to preserve both the environment and its cultural heritage. By exploring this relationship, the study aims to provide researchers with theoretical and empirical insights that will improve the understanding of the relationship between culture and environment in rural areas. The review of existing literature reveals a lack of anthropological research that focuses on the impact of environmental change on culture, both at the local and national levels. Therefore, this study aims to fill this knowledge gap and make a meaningful contribution to the academic discourse. It also seeks to highlight the complex interaction between environmental and cultural change and contribute to a deeper understanding of their relationship. The findings may also contribute to the emerging field of island studies, which is getting international recognition recently. This research will not only advance knowledge but also provide actionable strategies to mitigate the effects of environmental change on culture. It also provides recommendations for policymakers, officials, practitioners, and non-governmental organizations (NGOs) who are working to ensure the sustainable use of natural resources. Finally, the study aims to strengthen efforts to protect and conserve the island's fragile ecosystem and ensure its cultural and environmental integrity for future generations.

1.6 Limitations of the Study

In the literature review, I found that there is a lack of detailed anthropological studies related to my research topic, both nationally and locally. As a result, I have limited myself to studies that focus on the mainland. In this context, since lake islands such as Gidicho are not that remote and share similar geographical features with the mainland, I believe that the level of their exposure to factors of environmental change is almost comparable to that of the mainland. Therefore, I believe that materials written about the mainland also provide information about the Lake Islands. The other limitation is the problem of translating the ethnographic data from the Bayso language into the Amharic language. The source of my suspicion is my field experience. For example, translators sometimes seek to summarize informants' views in their mandate, and this undermines researchers' efforts to comprehend the experiences and perspectives of a study community. As much as possible,

I have tried to overcome these problems by training research assistants to translate and take notes during interviews and FGDs. In addition, I have used Amharic as a medium with informants who speak Amharic since a significant number of Bayso are multilingual, who speak Bayso (their mother tongue), Wolayta, Afan Oromo, and Amharic (Hayward, 1978; Siebert and Hoeft, 2001). Finally, although I had originally planned to hold a one-day workshop with representatives from each segment of the study community, including local and *Woreda* officials, to communicate with them about the purpose and process of the research and the expected role of the community in the research, this did not materialize due to the outbreak of COVID-19. To address this information gap, I have communicated with informants during the interview session.

1.7 Ethical Considerations

In social science research in general and social anthropology in particular, research philosophies and approaches require the involvement of informants in research. Similarly, researchers are expected to develop close relationships with the study subjects because they are expected to remain in the study group for a long period. Accordingly, such a subject-subject relationship must be properly and ethically managed. In this regard, all the informants and the majority of the study community were informed of the purpose of the study, their role in the study, and the benefits they would expect. During the individual interview and group discussion sessions, I used an audio recorder with the consent of each study participant. All the informants were paid a small per diem allotted to them upon completion of the interview or discussion sessions. In addition, together with research assistants, I visited individuals who were in bed, expressed my condolences to mourners, and contributed some money for such individuals, for the reason that the Bayso tradition requires such support for individuals who face such social problems. Finally, in writing the research findings, I have cited the views of informants where necessary, using pseudonyms to protect their identities.

1.8 Organization of the Study

This study is organized into nine chapters. Chapter One introduces the research topic in general by providing information about what the study is about, stating the problem, objectives, significance, limitations, and ethical considerations. Chapter Two focuses on a literature review. In this regard, key terms used throughout the study, theoretical considerations, and accounts of the culture-environment relationships were consulted. Chapter Three addresses the research methodology and provides detailed information on how the study was conducted, ranging from research motives to analytical procedures. Chapter Four provides contextual information about the study area, including the population, physical features, and socioeconomic and cultural aspects of the study community. Chapter Five focuses on how the Bayso people understand and perceive their environment, as well as the current environmental changes on Gidicho Island and its surroundings. Chapter Six attempts to answer the question of how environmental change is manifested in the study area. Chapter Seven identifies factors related to environmental change in the study area. Chapter Eight discusses the effects of environmental change on the indigenous belief system (IBS) and some elements of the Bayso's marriage customs. Finally, Chapter Nine presents the major findings and recommendations.

CHAPTER TWO

LITERATURE REVIEW

This chapter focuses on a review and conceptualization of key terms, factors related to environmental and cultural change, impacts of environmental change, the link between culture and environment, and the theoretical framework of the study.

2.1 Conceptualizing Key Terms

As the terms described here are frequently used throughout this dissertation, I have found it imperative to provide their meanings from the outset.

2.1.1 Environment

Scholarly works reveal that environment is one of the broadest, most complex, and contentious concepts in social science. Some scholars relate it to the term ‘surrounding’, which refers to the bio-physical context that is the natural world in which human beings live or an area where human beings are surrounded by bio-physical factors (e.g., Barry 1999; Johnson et al. 1997; and Thin, 2002). According to these scholars, the environment incorporates biotic factors, such as human beings, plants, animals, and others, and abiotic factors, such as light, air, water, soil, and the like. In the same way, the Federal government of Ethiopia, in its Environmental Protection Proclamation No. 295/2002, Article 2/3 defines ‘environment’ as:

The totality of all materials whether in their natural state or modified or changed by humans, their external spaces and the interactions that affect the quality or quantity, and the welfare of humans or other living beings, including but not restricted to land, atmosphere, weather and climate, water, living things, sound, odor, taste, social factors, and aesthetics (FDRE, 2002, p.1940).

Gumu et al. (2012, p.524) characterize the environment from an African perspective as “the totality surrounding a substance or a person’s existence and the way they relate to the world. This covers the social, political, economic, spiritual, and natural environment that comprises living and non-living things, including water, air, land, all plants, human beings, and other animals, and the existing inter-relationships. Gumu et al.’s description of the

environment is quite similar to Bayso's understanding of the environment (*ul*). Therefore, I used the term environment throughout this dissertation in a similar fashion.

2.1.2 Environmental change

Environmental change is an alteration of the physical environment that might have either negative or positive consequences. For instance, Billiot (2017) conceptualized 'environmental change' as a change in the physical and biogeochemical environment that may be induced naturally or by human activities, such as deforestation, fossil fuel consumption, land reclamation, agricultural intensification, and dumping waste. Equally, Johnson et al. (1997) argue that 'environmental change' is an alteration in the environment or a change in precipitation or global temperature that may result naturally (e.g., wildfire caused by lightning). While some environmental changes (e.g., afforestation of bare lands) could have a positive impact on that particular environment, others often present challenges to human life. In this regard, Nwankwoala (2015) contends that damages to the natural environment adversely affect the socio-economic and cultural life of inhabitants. For instance, environmental change may cause forced migration, subject people to new social contact, and confront them with new problems². Accordingly, in this study, "environmental change" is defined as any damage to the natural environment that alters essentially the natural quality of the soil, water bodies, forests, shrublands, and air. Therefore, such changes in the status and quality of the environment in Gidicho Island and its environs, and their impact on the life of the study community, are measured by analyzing data collected through interviews, observation, and geospatial data analysis.

2.1.3 Factors for environmental change

Studies indicate that environmental change is a result of different factors, including human activity, natural hazards, and structural factors. Environmental changes on our planet have

²<http://www.yourarticlelibrary.com/culture/cultural-change-main-factors-and-causes-of-cultural-change/23392> Accessed Jan. 11, 2019.

been taking place for millions of years, but the scale, magnitude, and speed at which changes have been occurring since the Industrial Revolution, particularly over the last sixty years, is new and disturbing. Almost all accounts of human-environment research (e.g., Morales et al. 2009; Rechkemmer and Falkenhayn, 2009; Salih, 2001; Moran, 2010; Herman, 2013; Tyagi, Garg, and Paudel, 2014) accentuated that human activities are the foremost factors that bring about the change in the environment through individual or group action to satisfy their needs and wants. Some of such major human activities that place pressure on the environment are clearing forests and bushes to open land for grazing and crop farming, cutting trees for the construction of houses, corrals, and firewood, and overgrazing.

There is also a firm belief among some scholars that natural factors, too, have a devastating impact on the environment. For instance, Mata-Lima et al. (2013) and Guha-Sapir et al. (2012) associate the current environmental change and its consequential impacts with natural factors. Mata-Lima et al. (2013) categorized natural factors into three, viz. hydrological (floods, tornadoes, and hurricanes), climatology (wildfire, extreme temperatures, and drought), and geophysical (earthquake, tsunami, and volcanic eruption). They argue that these elements affect the ecosystem and have damaging consequences on the socio-economic and cultural well-being of the people living there. According to studies, Ethiopia's topographic diversity makes it vulnerable to natural disasters like landslides, droughts, and floods. For example, Daniel (2007) notes that in 2006, floods in Dire Dawa town and south Omo caused several deaths and forced many others to leave their homes. Likewise, a landslide in a small peasant village in the Gofa Zone of southern Ethiopia in July 2024 triggered over 250 deaths and the complete evacuation of the local inhabitants due to heavy rainfall (Cable News Network [CNN], 2024). On the other side, a disastrous drought that affected almost three million people in the Somali region of Ethiopia in 2022 forced 163,000 people to flee their home areas. Additionally, 372,000 residents of the Borana Zone were affected by this drought (Assessment Capacities Project [ACAPS], 2023).

Another factor that harms the environment is the structural factor. Even though there is a tendency among scholars to give much weight to human actions and, in some cases, to natural factors, there are still few (e.g., Amechi, 2009; Paul, 2021) who realize the strong impact of structural factors on the natural environment. In this regard, Amechi (2009) argues that environmental change in sub-Saharan Africa is rooted in structural factors, including poverty, lack of access to information to make decisions on resource use, lack of political will from government officials to design environmentally-friendly economic policy, and weak institutional capacity to manage the environment.

2.1.4 Impacts of environmental change

Research works on human-environment relationships (e.g., Abebe, 2014; Nche, 2014; Awojobi, 2017; and Jack, 2017) revealed that environmental change and the resultant resource degradation have affected all aspects of human lives throughout the globe. Yet, the impact of environmental change on developing countries, especially in sub-Saharan Africa, is damaging for the reason that inhabitants in this part of the globe do not have adequate finances and technology to mitigate the damage to the natural resources (Awojobi, 2017). Accordingly, the economic and sociocultural lives of the majority of inhabitants in sub-Saharan Africa are affected by the current environmental changes and the resultant resource degradation, as shown below.

In regard to the economic impact, due to soil infertility, drought, and flood incidents, the agricultural production of the majority of sub-Saharan Africans has declined. This has not only worsened the poverty level but also caused food insecurity (FAO, 2011). For example, according to Dagnaygebaw (2019), nearly 2.9 million people in central Ethiopia faced food insecurity because of environmental degradation. From 1991 to 2008, environmental degradation caused a 13% decline in agricultural production, and it is also estimated that by 2050, the production of wheat, maize, and sorghum will decline by 25.4%, 21.8%, and 25.2%, respectively (Tariku, 2020). Some reports show that environmental change is exacerbating climate change, leading to extreme weather events such as droughts, floods, and wildfires that disrupt the livelihoods of indigenous communities and force them to flee their traditional lands (Kanungo, 2023).

As indicated elsewhere in this study, environmental change and the resultant resource scarcity have eroded the values, beliefs, and norms of inhabitants in sub-Saharan Africa that had a decisive role in guiding their lives and maintaining the environment (Ochola, Muhia, and Mwarasomba, 2000). In this regard, since the life of the majority of the rural poor in this part of Africa is inseparably linked to and dependent on their environment, changes in the natural features of the environment affect their lives significantly. For instance, environmental degradation is responsible for the decline of the health system of sub-Saharan Africans (e.g., Awojobi, 2017; Nche, 2014). According to these authors, flood incidents and the rise in sea levels in coastal areas created a favorable environment for the prevalence of waterborne diseases such as malaria and cholera. Nche (2014) adds that the region experienced a large loss in biodiversity, including herbs that had medicinal value, as a result of increasing temperatures. This affected the traditional health system of Africans in the region. It is also reported that environmental degradation has caused irreversible damage to sacred sites, burial grounds, places of spiritual significance, and the close connection with nature, which risks the survival of indigenous communities (Kanungo, 2023). Similarly, Abebe (2014), in his study entitled “*Climate Change, Gender Inequality and Migration in East Africa*”, found that floods and landslides have displaced hundreds of thousands of residents from their living areas in the Horn of Africa. The problem is that such displacement separates inhabitants from their cultural base and places that they value. In this regard, what matters is that there are often no effective substitutions or adequate compensation for lost sites of significance (Adger et al., 2013).

2.1.5 Culture

Conceptualizing culture in anthropological research is essential for comprehending its complex nature, which is built on three core aspects: knowledge, behavior, and material culture (e.g., Hofstede, 2001; Jordan, 2025). By viewing culture as knowledge, we can appreciate it as a collective system of information, beliefs, and practices that groups learn and share across generations to ensure the continuity of their cultural identity (Belod, 210). This perspective highlights the cognitive dimensions of culture, revealing how individuals acquire, process, and apply cultural knowledge in their daily lives. It also discloses how

specific cultural insights shape behavior, social interactions, and worldviews (Jordan, 2025). Equally, characterizing culture as behavior allows researchers to recognize it as a collection of observable actions, practices, and interactions among group members (Spencer-Oatey, 2012). This viewpoint emphasizes the importance of individual behavior in specific contexts and reinforces the idea that culture is not static, but is learned and transmitted through these actions (Nalk, Baker, and Mohiyeddini, 2023).

The material aspects of culture play a crucial role in shaping how individuals express their cultural identity through the physical objects, resources, and spaces they interact with (Spencer-Oatey, 2012). Tools, technologies, clothing, and architecture all serve as representations of cultural values and beliefs. They not only guide social interactions but also inspire a sense of identity and continuity that connects generations (Idang, 2015). Idang adds that these material expressions provide insight into a society's technological capabilities and economic organization. Realizing culture through this lens is important for appreciating how societies adapt to their environments and construct cultural meanings over time. Accordingly, I argue that conceptualizing culture in such a multifaceted way is crucial for studying cultural change within a particular community.

2.1.6 Cultural change

Cultural change refers to the alteration or discontinuation of existing 'tried' and 'tested' procedures transmitted from the culture of the past and the introduction of new procedures (Sutton and Anderson, 2010). According to Malinowski (1945, p.1), culture change is:

The processes by which the existing order of a society that is its social, spiritual, and material civilization is transformed from one type into another, including [...] change in a terrestrial settlement, in its belief and system of knowledge, in its material tools and their use, and the consumption of goods on which its social economy is based 1945:1.

Varnum and Grossman (2017) perceive 'cultural change' as a change in ideas, norms, and behaviors of a group of people or changes in the contents of their products through time, typically on the scale of decades or centuries. According to Spencer-Oatey, the "three basic components of culture: things, ideas, and behavior patterns, can undergo additions, deletions, or modifications. [In this process], some components die out, new ones are

accepted, and existing ones can change in some observable way” (2012, p.14). Spencer-Oatey also contends that although the pace of cultural change varies from society to society, there is nothing as constant as change. Besides, there is a common understanding among scholars that societies endeavor for the viability and continuity of their culture through their adaptive capacity. However, since cultures are always refreshed and experience change, through innovations, discoveries, and contacts between two cultures, so, every generation has a new culture that is not experienced by the previous generation (Farooq, 2013). In this regard, any anthropological account of the culture of any society is a type of snapshot view of one particular time. In general, in the context of this study, the term ‘cultural change’ is operationally defined as a change in the Bayso way of life that is a change in ideas, norms, customs, shared values, symbolic expressions, how they interact, realize, and value their environment. More specifically, it refers to changes in some elements of their marriage customs and belief system, as a result of environmental change.

2.1.7 Factors of culture change

Naturally, cultures are liable to change and also resist change. If changes in culture are inhibitive, then the question will be what factors contribute to such changes, and which other factors encourage resistance to change? Knott (2008) and Danso (2020), who studied the nature of culture and its change, have identified the following factors, viz., factors at work in a society, contact between communities, and environmental change. Details of each of these factors are presented as follows. According to Knott (2008), every society has certain factors that contribute to change, including invention and discovery. Invention refers to the technological and ideological advancements within a community that alter its traditional way of life by introducing new technologies or ideas. This, in turn, leads to the adoption of new lifestyles. Sibani (2018) further noted that inventions add new cultural elements that were previously unknown, such as the radio, computer, TV, and internet. Each of these innovations significantly impacts individuals' lives. According to Sibani (2018, p.64), “When a culture feels that a way of life is better than the current way, then it is likely the culture will adapt to these better ways and incorporate that way into their lifestyle”. Discovery also contributes to culture change by providing a better understanding

of previously existing elements in the environment, usually through scientific research (Sibani, 2018).

Conversely, Danso (2020) postulated that habit and integration of cultural traits are some of the factors that encourage societies to resist cultural changes. Danso argues that usually elderly people are reluctant to change since they are not ready to replace their comfortable ways of life, which provide them with emotional security. Contact between societies results in cultural change within societies through diffusion (Alderman, 2012). This means that as two societies interact with each other, cultural elements of the stronger society move to the weaker one to tempt change in the recipient culture. This is because when cultures of different strengths interact with each other, the weaker is substantially changed as a result of its contact with the stronger culture (Danso, 2020). However, some scholars, such as Sibani (2018), argue that there are some instances in which the dominant groups also adopt cultural traits of the minority.

On the other hand, as explained in the background of this study, the environment has been playing a key role in the continuity of life on the planet Earth. However, the core elements of the natural environment, including air, water, soil, and vegetation, are liable to change because of human activities (e.g., deforestation and overgrazing), natural factors (e.g., drought and flooding), and structural factors (e.g., poverty, population growth...). Hence, such changes in the environment adversely affect the way of life of people in that particular environment. For example, lengthy droughts may require the adoption of conservation techniques to overcome a scarcity of resources. Similarly, rising sea levels may force coastal communities to flee their homelands, and this causes a loss of traditional territories and exposure to new ways of life (Kanungo, 2023). Such environmental challenges encourage societies to innovate, adapt existing practices, or adopt entirely new cultural norms to ensure their survival and well-being. Therefore, it can be argued that a change in the physical features of the environment will lead to a change in the culture of societies in that particular environment (Danso, 2020).

2.1.8 Religion

Scholars of the study of religion, such as Eller (2007), underlined that religion is one of the most challenging terms to have an agreed-upon definition. According to Eller, diversity in religions, variety of beliefs and practices, the difference in interpretation of these beliefs and practices, and integration of religion with its surrounding culture are among the factors that hinder efforts to have a common definition. As a result, presently, we have a large number of definitions that range from Marx's 1867 critical phrase 'opiate of the masses' to E. B. Taylor's definition of 1871 'the belief in spiritual beings' and from Emile Durkheim's 1965 conception of religion 'a unified system of beings and practices' to the most commonly quoted definition of Clifford Geertz of 1973, "a religion is a system of symbols which act to establish powerful, pervasive and long-lasting moods and motivations in [men] by formulating conceptions of a general order of existence and closing these conceptions with such an aura of factuality that the moods and motivations seem uniquely realistic" (Barnard and Spencer, 2010, p.608).

Defining religion becomes even more difficult in the context of Africa, for the fact that Africa is a continent of diverse ethnic and cultural groups, who practice varied IBS. It is also impossible to talk about 'African Traditional Religion' as if it exists as a single lucid body of beliefs and practices which can be identified as 'African religion'³. Consequently, a substantial number of scholars prefer to use 'African Traditional Religions' in the plural. Hence, cognizant of such variations, Awolalu (2007, p.426) defines African Traditional Religions (ATRs) as:

It is a belief system that has been handed down from generation to generation by the forebears of the present generation of Africans. It is not a fossil religion (a thing of the past) but a belief system that Africans today have made theirs by living and practicing it. This is a ritual system that has no written literature, yet it is 'written' everywhere for those who care to see and read. It is largely written in the people's myths and folktales, in their songs and dances, in their liturgies and

³ African Traditional Religion World Mark Encyclopedia of Religious Practices. Available at Encyclopedia.com. 2019 <https://www.encyclopedia.com>. Accessed April 15, 2021

shrines, and in their proverbs and pithy sayings. It is a belief system whose historical founder is neither known nor worshipped. It is a religion that has no zeal for a membership drive, yet it offers persistent fascination for Africans, young or old.

In the same vein, Anthony (2014) too, defined it as a belief system that resulted from sustaining faith held by ancestors of the present Africans and has been practiced nowadays in a variety of forms and intensities by a large number of Africans embracing indigenous practices, beliefs, and customs often handed down from generation to generation merging the idea of the past, present and the future. Hence, throughout this study, ATR/IBS is realized in line with the idea of Awolalu (2007) and Anthony (2014) deliberated in the above lines. Besides, even though the two phrases, ATRs, and IBS have similar meanings referring to a variety of belief systems indigenous to the continent of Africa, there were tendencies among Europeans to consider ‘African Traditional Religions’ as ‘primitive’ and fossil religion’ which is incapable of adapting to changes (Anthony, 2014; Awolalu, 1976; Effah, 2009). But the fact is that the term ‘traditional’ is used to accentuate that ATR is a foundational religion that has been handed down from forbearers and practiced by Africans nowadays, and to distinguish it from other religions, such as Christianity and Islam. Consequently, I have opted to use these phrases interchangeably throughout this study.

Every cultural group in Africa has developed a complex and distinctive set of belief systems and practices throughout its history. Although they seem to vary from each other, there are common features that suggest ATRs/IBS form a cohesive belief system (Beyers, 2010; Gale, 2006). Krüger, Lubbe, and Steyn (2009, p.35) enumerated these commonalities, which can be taken as the major tenets of the belief system, including “belief in Supreme Being, belief in spirits and divinities, the cult of ancestors and the use of magic, charms and spiritual forces”. The other common point in this regard is that the ATR system is based on oral traditions. That means it has no manuscripts as that of the Holy Bible of Christians and the Quran of Islam, rather adherents believe that it is written in their hearts, minds, rituals, songs, dances, sayings, and religious functions (Okeke, Chukwuma, and Tochukwu, 2017).

The other commonality is the role of spirits in ATRs. In ATRs, there is a belief that spirits are inherently indescribable, immortal, and invisible entities (Tukari, 2000). According to Tukari, this belief stems from the understanding that spirits do not possess a physical body through which they can be perceived. However, they can incarnate in any material form to make themselves visible for a specific response or purpose. Besides, Africans believe in, recognize, and accept the fact of their existence. In ATRs, there are three main sources of spirits: (1) created by the Supreme Being as a 'special race' of their own. Here, it is believed that as a 'special race' spirits continue to reproduce their kind and increase in number, (2) remains of human beings, after humans die physically, and (3) dead animals, since in Africa, some communities believe that animals have souls and spirits which continue to live with the spirits of dead men (Mokgobi, 2014). The majority of people in Africa believe that spirits dwell in the forests, bush, rivers, mountains, hills, lakes, animals, human beings, the sky, the ground, valleys, objects, charms, rituals, amulets, around villages, and such others (Awolalu, 1976). This means the entire environment is full of spirits. Based on their impact on human beings (either positive or negative), spirits are categorized as bad ones and good ones. Consequently, human beings used to protect themselves in different ways, including magical power, sacrifices, and offerings to appease, control, and change the cause of their action (Mokgobi, 2014).

Equally, sacrifice has a key role in ATRs. In the African context, the term 'sacrifice' refers to a sacred gift made to gods or other spiritual beings to establish and perpetuate a consecrated bond between humanity and the divinities (Awolalu, 1976). Likewise, offerings denote a gift of an animal, food, water, milk, honey, money, and the like. Here, the major difference between these terms is that 'sacrifice' involves the shedding of human blood while offerings do not (Tukari, 2000). Accounts attest that there are some conditions and situations on which the practice of sacrifice and offerings is dependent, including "the occurrence of drought, epidemics, war, raids, invasion of insects and pests, and destructive floods" (Awolalu, 1976, p.59). Similarly, according to Mokgobi (2014), sacrifices and offerings are practiced in times of rites of passage, during plantation, at harvest, at ceremonies of purification of a person or a village after an epidemic, and above all when the rains fail or are delayed. For instance, adherents of ATRs slaughter and offer different

types of animals for communication between the living, the ancestors, and God, which involves chickens, goats, and cattle, depending on the orders or the favorite of the ancestors (Epple, 2016). However, such slaughters could be made at the homestead of the persons concerned, so that blood can be spilled there.

2.2 Culture-Environment Link

An anthropological approach to the culture-environment nexus examines the dynamic interactions between human societies and their environments. This approach encompasses resource management, adaptation to ecological change, and the substantial impact of environmental factors on cultural practices, beliefs, and social structures (Milton, 1996; Milfont and Schultz, 2016). Culture shapes the human-environment relationship by determining how people realize, interact with, and value their environment (Milton, 1996). According to Colage (2022), culture serves as a powerful lens that frames environmental issues and influences to check whether sustainable practices are adopted or whether untenable practices persist. Consequently, it is believed that cultural norms, beliefs, and practices dictate resource management, consumption patterns, and environmental behaviors.

Milton (1996, p. 40) also highlights three basic ways of understanding the relationship between humans and their environments: 1) humans adapt to and are influenced by their environments, 2) humans actively modify their environments to meet their needs and thereby reshape those environments, and 3) humans engage with their environments in ways that mutually influence both parties. As we explore these points, it is clear that in the first scenario, humans significantly change their environments through practices such as crop production, herding, and construction. In this perspective, unsustainable use of natural resources affects human life, especially in rural areas where communities depend on natural resources for their subsistence (Onuoha, 2008). In this regard, I argue that although the environment has a tangible impact on human life, it is not determinant because, as I will discuss in the following pages, the culture-environment interaction is not unilinear, but rather multilinear, in which two entities influence each other.

In the second scenario, human efforts to satisfy their needs lead to natural resource exploitation. These actions can have serious and often unintended consequences, including habitat destruction, pollution, and climate change. This is a perspective that sees humans as a great rival to the abuse of nature (Lapka, Vavra, and Sokolickova, 2012). Of course, reports indicate that the rate of resource consumption and anthropogenic changes in the environment have accelerated throughout human history because of population growth and technological development (National Research Council, 1999). It is also argued that humans have caused substantial environmental degradation in the past, are causing it now, and will cause it in the future (Zhou et al., 2014; World Wide Fund for Nature [WWF], 2017). In this case, too, although I consider the pressure of human activities on the environment, I argue that human action will not be the only factor for the current environmental degradation, as there are other factors, such as natural and structural factors, which directly or indirectly contribute to such damages. The other critical point that we need to keep in mind is that the influence of culture on the environment can also be positive, that is, beneficial. For example, the cultural landscapes built in different parts of the world, including the Gedeo agroforestry, the Konso cultural landscapes, and the current efforts to plant billions of trees in different parts of Ethiopia, have ecological, economic, and cultural significance. For this reason, Lapka, Vavra, and Sokolickova (2012) emphasized that human efforts in conserving the natural environment in different parts of the world are the best example of positive human influence on their environment.

In the third scenario, we see a strong connection between environment and culture in which the environment informs cultural norms, whereas cultural values shape how we interact with the environment. This link underlines not only the influence of the environment on culture but also how cultures affect ecological practices and values. The point is that the link between culture and environment is a complex relationship in which each entity influences the other. In this regard, cultural practices, values, and traditions shape how humans interact with and use natural resources. Conversely, the environment (e.g., natural resources and geographic features) shapes cultural development by influencing how communities make a settlement and subsistence mechanisms. Therefore, I argue that both environmental and cultural changes are functions of multiple factors, and the interactions

between them can also be either direct or indirect. They can be beneficial or harmful to either or both. Thus, with this general orientation to the multidirectional conversation, I have analyzed Bayso's perspectives on the culture-environment nexus and how they characterize the current environmental change in their locality.

2.3 Environmental Change: Global, Regional, and Local Contexts

2.3.1 Global environmental change

Global environmental change, driven by both natural processes and human activities, entails significant alterations to Earth's systems on a global scale (Vitousek, 1992). Such changes manifest as transformations in climate, land use, water resources, and ecosystems, with human actions being a critical influencing factor. The increased concentration of greenhouse gases, primarily resulting from the combustion of fossil fuels, is a key driver of global warming (McMichael, Nyong, and Corvalán, 2008). This phenomenon leads to altered weather patterns, characterized by more frequent and intense heat waves, which pose substantial risks to human health. Furthermore, these changes disrupt ecosystems and adversely affect both public health and agricultural productivity, thereby exacerbating vulnerabilities, particularly in regions with limited resources.

In their article titled '*Climate Change and Socio-Economic Impacts: Determinants of Vulnerability for Developing Countries*,' Afzal et al. (2024) assert that global environmental change significantly influences the socio-economic and cultural fabric of developing nations. They identified the adverse effects on economic sustainability that arise from sociocultural factors and environmental degradation. The authors emphasize the severity of socio-economic damages incurred due to climate change, particularly in regions such as South Asia (e.g., Pakistan). Furthermore, according to the Global Forest Watch⁴, deforestation and forest degradation persist at alarming rates globally. In 2022 alone, 6.6 million hectares of forest were lost worldwide, 96% of which were in the tropics. Fires and

⁴ <https://www.globalforestwatch.org/dashboards/global/>

agricultural expansion are major causes, with primary rainforest loss reaching a record high in 2024. Thus, it is believed that such destruction fuels biodiversity decline, increases carbon emissions, and harms communities that depend on forests. Therefore, it can be concluded that global environmental change undermines fundamental human needs and triggers natural disasters, extreme temperature events, depletion of natural resources, declining agricultural yields, persistent poverty, food insecurity, and migration, especially in low-latitude regions (Karfakis, Lipper, and Smulders, 2012, p. 133). Furthermore, these changes contribute to millions of deaths annually, particularly in developing countries (Thakur, 2010).

2.3.2 Regional environmental change (Africa)

In his seminal work *'Local Environmental Change and Society in Africa'* (2001), Mohamed Salih provides a comprehensive analysis of the significant effects of environmental degradation on African institutions and economies. Using compelling case studies from Ethiopia, Kenya, Uganda, and Swaziland, Salih elucidates the societal ramifications of environmental change, illustrating how it fundamentally disrupts local systems and risks the livelihoods of vulnerable populations. The book underscores the essential role of local knowledge in informing effective environmental policy and highlights the disproportionate effects experienced by marginalized social groups. By addressing critical dimensions of social justice, Salih advocates for the necessity of equitable solutions to environmental challenges. Furthermore, he examines how environmental alterations influence local perceptions, practices, and the structural integrity of communities. By transcending the conventional nature-culture divide, the author promotes a sophisticated understanding of the intricate relationships among environmental factors, human agency, and cultural interpretations, thereby enriching the wider discourse on environmental change through the perspectives of social science and the humanities. As articulated by Fonjong, Matose, and Sonnenfeld (2024), Africa confronts an urgent threat from climate change, primarily due to its dependence on climate-sensitive resources, limited adaptive capacity, and notable socio-economic vulnerabilities. Despite contributing only a small percentage to global greenhouse gas emissions, African nations remain at the

frontline of climate impacts. African landmasses are particularly susceptible to droughts, floods, and extreme weather events, which not only threaten their ecosystems but also exacerbate poverty and food insecurity. Environmental change in Africa represents a pressing challenge that endangers the welfare of millions of Africans, resulting in resource scarcity, infrastructure degradation, and forced displacement (Awojobi and Tetten, 2017). In regard to resource destruction, Nasi (2025) posited that from 2010 to 2020, Africa experienced the highest rate of forest loss worldwide, with an average of 3.9 million hectares destroyed each year. These forests are primarily located in the tropical moist regions of Central and West Africa. The effects of such damages vary, but their consequences are unequivocal. For instance, the devastating weather events of 2010 led to significant flooding and landslides across the region, displacing approximately 48,000 individuals in Uganda and 55,000 in Kenya, Namibia, Rwanda, and Zambia (Abebe, 2014). Equally, the United Nations Framework Convention on Climate Change (UNFCCC) has emphasized that “environmental changes in Africa are disrupting the economic and ecological foundations of communities, with one-third of the population already residing in drought-prone areas and an alarming 220 million people facing drought exposure annually” (UNFCCC, 2007, p. 18).

2.3.3 Local environmental change (Ethiopia)

In recent decades, Ethiopia has faced profound environmental challenges, largely driven by climate variability and change. These challenges manifest as rising temperatures, shifting precipitation patterns, and an increased frequency of extreme weather events, such as devastating droughts and floods (Alemu, 2017). The main contributors to these issues are climate change, severe deforestation, land degradation, and unsustainable agricultural practices. Regarding deforestation, the Global Forest Watch reported⁵ that Ethiopia lost 67.6 thousand hectares (kha) of natural forest in 2024 despite its recent reforestation efforts. This resulted in 27.7 million tons of CO₂ emissions and significantly contributed to soil

⁵ <https://www.globalforestwatch.org/dashboards/country/ETH/?>

erosion. Gebremarkos (2012) relates such vegetation destructions to illegal logging, shifting cultivation, investment encroachment, and resettling farmers in areas designated for human settlement after deforestation. These activities have resulted in significant losses of economically valuable indigenous forest species and wildlife. Accordingly, researchers like Gebremarkos (2012) and Wassie (2020) argue that a combination of factors, including population pressure, agricultural expansion, migration, urbanization, resettlement, climate change, and pollution, interact in Ethiopia to severely damage natural resources. According to these authors, the country's large population puts immense pressure on the sustainability of land, water, forests, rangelands, and wildlife, creating a vicious cycle of environmental degradation. This cycle is evident through soil loss, diminished vegetation cover, unsustainable farming methods, reliance on dung and crop residues for fuel, overgrazing, and disruption to wildlife. These factors collectively erode the nation's natural resources. Fikru and Gemechu (2020) further highlighted the detrimental effects of these drivers on the ecosystem and the livelihoods of local communities. These issues lead to worsening water quality, declining biodiversity, and reduced ecosystem services. These consequences exacerbate socio-economic problems, political instability, marginalization, and poverty. It also caused increasing droughts and floods, food insecurity, water scarcity, and displacement, which disrupted the lives and futures of many Ethiopians. In general, the environmental crisis in Ethiopia is characterized by deforestation, biodiversity loss, soil degradation, surface water depletion, persistent crop failures, deepening food insecurity, rural poverty, material destruction, and, tragically, loss of life (Demele, 2001; Hailab, 2004; FDRE, 2011; Aynalem, 2015).

2.4 The State of the Environment in Ethiopia

Ethiopia is blessed with abundant natural resources, including plenty of landmass, vegetation cover, fertile soil, favorable climate, water, and wildlife (Gebremarkos, 2012; Simachew, 2020). Other researchers (e.g., Aynalem, 2014; Badege, 2003; Gebremarkos, 2012) reported that the country was once covered with vast natural forests. Drawing from historical and ecological records, these authors assumed that several hundred years ago, over 63% of the total landmass was covered by forests. The affluence of the environment

in Ethiopia is also documented in the accounts of travelers and diplomatic missions of Europeans dating back to the 16th century (Mengesha et al., 2020). However, recent studies have made clear that the country has been suffering from severe natural resource degradation (e.g., soil, water, and forests), which is fundamental to the livelihood of the majority of the people in rural Ethiopia.

Many researchers, (e.g., Bekele, 2008; Gebremarkos, 2012; Ogbaharya and Tecle, 2010), attribute environmental degradation in the country to socio-economic factors such as increasing human and livestock population, expansion of state and peasant farms, resource use traditions; political issues including civil unrest and external aggression, neglect of the people at a grassroots level in planning and decision-making. These scholars also noted that government policies and decisions that disregard sociocultural and ecological variations at a local level, including the villagization and resettlement schemes, and climatic factors such as the risk of desertification and climate change (less and erratic rain) contribute to the problem. Accordingly, the livelihood of the majority of the rural poor is significantly affected because of the decline of crop and livestock products (Badege, 2001). However, the state of the environment and the level of concern given to environmental issues have had different facets along successive regimes in the country: the Imperial regimes, the military government (*Derg*), and the Ethiopian People's Revolutionary Democratic Front (EPRDF).

2.4.1 The Imperial Regimes

According to Dessalegn (2001), environmental issues have been a concern in Ethiopia since the final years of Menelik II's reign (1889-1913). Dessalegn argues that the emperor, alarmed by the increasing fuel wood crisis, established the Ministry of Agriculture in 1908, intending to safeguard the forests and other resources. Dessalegn adds that as a pioneering government institution, this ministerial office played a significant role in promoting good agricultural practices, increasing agricultural and livestock production, and monitoring and preventing disasters (Dessalegn, 2001). However, others, like Bekele (2008), disagree with this perspective and argue that prior to the Italian occupation (1936-41), there was no

formal environmental institution in Ethiopia. They suggest that even the Italians' concern in this case was primarily focused on the economic value of natural resources.

During the reign of Emperor Haile Selassie I, the tradition of resource use remained unchanged, and policymakers were primarily concerned with the economic value of the environment. For example, according to Endalkachew (2020), until the late 1960s, the environmental approach of the imperial government was based on economic interest. This indicates that the government's focus on managing natural resources like forests, water, soil, and wildlife was aimed at increasing government revenue rather than addressing environmental problems. However, this economic strategy led to extensive deforestation and degradation of natural resources due to agricultural expansion and fuelwood extraction (Environmental Protection Agency [EPA], 2012). Besides, ignorance of the value of indigenous knowledge of local communities and the top-down approach of government policies had affected environmental conservation initiatives. Because of the increasing resource degradation in the country, the imperial government decreased its frontier economics attitude and favored environmental conservation activities (Endalkachew, 2020).

The imperial regime emphasized environmental conservation activities, and policymakers directed their interest toward this goal (e.g., Chala, 2015; Endalkachew, 2020). However, as noted by Dessalegn (2001), throughout this period, the country was not free from the influence of frontier economics. This means environmental issues were not a major concern of the imperial government; rather, they were postponed (Dessalgen, 2001). Thus, the imperial government's negligence in implementing effective environmental protection measures claimed the lives of hundreds of thousands of Ethiopians as the country faced a deadly drought in the 1970s, and this forced the old monarch to lose its throne.

2.4.2 The Derg regime

At the time when the military government came to power, the environmental situation in the country was terrible. In response, the military government devised an economic policy that combined elements of the frontier economy and environmental conservation (Melaku,

1998). Additionally, the nationalization of rural lands and forests, tree-planting initiatives, and the financial and technical support received from international donors contributed to *Derg's* conservation efforts (Endalkachew, 2020). However, even though the military government had the initiative and commitment to deal with the environmental problems of the country, some of its measures, such as the nationalization of community lands, the prohibition of private ownership, failure to involve the rural masses in planning and decision-making, and policies and decisions that disregarded cultural and ecological variations at a grassroots level hindered the realization of *Derg's* efforts (e.g., Ogbaharya and Tecle 2010; Melaku, 1998; Endalkachew, 2020; Dessalegn, 2001).

2.4.3 Ethiopian People's Revolutionary Democratic Front/EPRDF

During the period of the Ethiopian People's Revolutionary Democratic Front (EPRDF), too, Ethiopia experienced substantial resource degradation due to ongoing resettlement and villagization schemes, natural disasters, the expansion of agricultural investment, and climate change. Furthermore, traditional cultivation and cattle breeding practices and the land that have been used for thousands of years have exacerbated the problem (Endalkachew, 2020). Additionally, forests have been cleared to accommodate the increasing demand for agricultural land due to a growing human and livestock population, which requires more food, fodder, and wood for fuel and construction (Endalkachew, 2020).

Therefore, intending to manage such environmental problems, the EPRDF government has established environmental institutions and policies. It also practiced extensive conservation and tree-planting initiatives by mobilizing millions of Ethiopians (Ogbaharya and Tecle, 2010). However, these government efforts were impeded by a lack of environmental awareness and weak participation of the people, a lack of commitment and political will of government officials, and the continued dependence of the rural poor on natural resources (Kefauver, 2011). In a related case, a recent study on resource degradation in the country found that “the country's deforestation rate was 0.8% in 1990-2000, the highest in the world” and “forest cover, which was 65% at the national level and 90% in the highlands,

was reduced to 2.2% and 5.6%, respectively, and this exacerbated the erosion rate to 130 tons/ha/year for croplands and 35 tons/ha/year on average for all lands in the highlands” (Aynalem, 2014, p.73). Furthermore, Temesgen (2017) argues that soil degradation in the highlands has eroded the resource base and worsened food shortages caused by drought. As a result, peasants have been forced to use marginal land on steep slopes or relatively unsuitable soils, and this aggravated the problem in the country.

In general, the highland areas of Ethiopia are the center of agricultural activities, which are the backbone of its economy and a means of subsistence for the majority of the country’s population. Therefore, the degradation of this area poses a substantial threat to the sustainability of the country’s economy and triggers an enormous impact on the social and cultural life of its population. According to Aynalem (2014), the environmental issues in the country have become increasingly complex due to the arrival of a large number of people who moved to the southwest from the drought-affected areas in the north through resettlement programs in the 1980s. Consequently, the high demand for firewood and construction timber in these new settlements has put strong pressure on forest resources. This highlights how government policies aimed at solving issues in one area can impact the country's resources in another area. Currently, southwestern Ethiopia, known as the only forest reserve in the country, has been facing strong pressure from resettlement programs and agricultural investments that are designed to expand coffee and tea plantations (Temesgen, 2017). Temesgen adds that government officials have failed to address the psychological and cultural challenges that communities encounter after being displaced from their homeland.

In lowland areas, among pastoral communities, grazing lands are invaded by alien plant species like *Parthenium hysterophorus* and *Prosopis juliflora*, posing a risk to the cattle population and the pastoral way of life (FDRE, 2011). Additionally, environmental changes have jeopardized the sustainability of water resources in the country. For example, the drying-up of Lake Cheleleka in the upper stream of Lake Hawassa, lower water levels in Lake Ziway and Abijata, and increased alkalinity in Lake Abijata are some notable instances (Demele, 2001; Mulugeta, 2013).

2.5 Environmental Policies of Ethiopia

Ethiopia's environmental policies are designed to promote sustainable development, protect natural resources, and improve the quality of life for its citizens. These policies are based on key initiatives, including the Environmental Policy of Ethiopia (EPE), as well as various proclamations that address specific environmental issues (FDRE, 1997). These policies emphasize the right to a healthy environment, advocate for sustainable resource management, and encourage citizen participation in environmental decision-making (FDRE, 1997). Academic works (e.g., Kelbessa, 2012; Mebratu, 2021) posit that these policies have significantly contributed to the country's resource conservation efforts. They incorporate environmental considerations into development planning, promote sustainable resource management, and highlight the link between environmental health and human well-being. The goal is to balance economic growth with protecting natural resources to ensure that current and future generations can benefit from them (Mebratu, 2021). However, according to Kelbessa (2012), Mebratu (2021), and Tadesse and Tirfu (2023), these policies have several limitations. These include inadequate public awareness, insufficient political and bureaucratic commitment, and weak implementation capacities of environmental institutions. Additionally, despite policy efforts, issues such as deforestation, soil erosion, and biodiversity loss continue to persist. Furthermore, the policies often lack a comprehensive approach to address the interconnectedness of economic development and environmental sustainability, particularly with regard to agriculture and farming systems (Mebratu, 2021). In the study area, key obstacles to environmental conservation include inhabitants' continued dependence on natural resources, mounting poverty, insufficient awareness of conservation policies, and a lack of commitment among local officials to implement such policies. These challenges are further exacerbated by the weak institutional capacity to effectively manage and protect natural resources, as well as the decline of local knowledge and institutions. Consequently, deforestation, soil erosion, flooding, and resource scarcity continue to threaten the area's ecological integrity and inhabitants' livelihoods and cultural traditions. Addressing these interconnected issues requires a multifaceted approach integrating sustainable livelihood

alternatives, community-based conservation initiatives, enhanced environmental education, and strengthened governance mechanisms.

2.6 Theoretical Framework of the Study

Human-environment relations are complex and adaptive. They are complex because the environment and social systems have many interrelated and interdependent parts, and adaptive because they have feedback structures that improve survival in a changing environment (Roa, 2015). Scholars have long been working hard to gain a complete scientific understanding of this complexity and adaptability, and its implications for human life. Since the latter half of the 19th century, various theoretical frameworks such as environmental determinism, environmental possibilism, ecosystem-based, and actor-based models have been utilized. Despite their significant role in human ecology, these theories have overlooked the bidirectional interactions between social systems and the environment, and the fundamental principle of human ecology that 'systems are open' (Rambo, 1980). In recent decades, other theories have emerged to fill this gap. However, there is no single theoretical perspective that fully captures the complex relationships and multiple factors that trigger environmental change. Therefore, the theoretical framework of this study is structured by integrating ideas from four theoretical orientations: Political Ecology (PE), Cultural Ecology (CE), Adaptation Theory (AT), and Diffusionist Perspective (DP).

2.6.1 Political ecology

PE is an approach to study culture-environment interaction and the resultant environmental change by integrating political-economic and ecological explanations. It encompasses various definitions, ranging from Wolf's early work (1972) to recent accounts (e.g., Robbins, 2012), reflecting differences in emphasis. For example, Blaikie and Brookfield (1987) view PE as an approach that merges ecological concerns with a broadly defined political economy, capturing the dynamic interplay between society and land-based resources. Similarly, Watts (2000) and Robbins (2012) describe PE as a method to comprehend the intricate relationships between the environment and society by analyzing

access to and control over resources, and their impact on environmental health and sustainable livelihoods. Additionally, Stott and Sullivan (2000) (cited in Robbins, 2012) define PE as economic conditions that force people into activities leading to environmental changes due to the absence of alternative options. These perspectives highlight that PE mainly focuses on examining the link between society and land-based resources, exploring access to and control over resources, and identifying economic conditions that drive activities disrupting natural environmental functions (Robbins, 2012).

Both from the notions of the definitions and the premises of political ecology discussed above, it can be assumed that the major assumption of PE is that environmental change and ecological conditions are a product of political processes (Robbins, 2012). Political ecology-oriented studies situate themselves within the larger framework of human ecology and focus on the following themes: (1) how both nature (environment) and societal structures determine each other and shape access to natural resources, (2) the connections between access to and control over resources and environmental change, and (3) the social outcomes of environmental change (Schubert, 2005, p.9).

The criticisms of PE relate to its various dimensions, specifically politics, economy, and ecology. Political ecologists, due to their selective focus and emphasis on certain aspects, have become targets of criticism from their opponents. For instance, Vayda and Walters (1999) contend that “some political ecologists only address questions related to bio-physical ecology or environmental change” (p. 611). For some scholars, PE is not a comprehensive but rather a specific framework for examining the interactions between the environment and society (Schubert, 2005, p. 9). In light of these criticisms, it is crucial to address these shortcomings to improve its significance. Therefore, I argue that researchers have to consider the political, economic, and environmental dimensions of PE to gain valuable insights.

Accordingly, I employed this theory to identify the causes of environmental change in the study area. In doing so, it gave me a better understanding of the human-environment interaction of the study community and how this interaction led to environmental

degradation. It helped me to identify how the Bayso's resource use tradition, the villagization policy, and the growing poverty in the region forced the Bayso people to exploit the natural environment.

2.6.2 Cultural ecology

In human-environment interactions, CE is the study of human adaptations to the social and physical environment (Steward, 1968). Steward, the leading American Anthropologist and proponent of this approach, and Piccardo and Canepa (2021) noted that CE intends to investigate the relationship between human beings and their environment, identifying the environment as a fundamental variable that influences culture and human adaptation. This theory assumes that human beings adapt themselves to their environment, but they can change their environment according to their needs and wants (Steward, 1968). In his extended discussion, Steward also presumed the reciprocal impact of environmental degradation on human life. As can be inferred from his deliberation, Steward made a fundamental departure from the notions of environmental determinism⁶ and possibilism⁷, which advocate that 'human beings were completely the product of their environment' and 'the presence or absence of specific environmental factors place limits on human developments either by permitting or forbidding their occurrence, respectively (Maris, 2007). It also accepts that sociocultural traditions and values of a community affect its resource use traditions (Schutkowski, 2006).

However, CE has been criticized for several reasons. First, although it rejects the environmental determinist perspective, its model often reproduces environmental determinism (Milton, 1996). In addition, despite its emphasis on a more interactive

⁶ Environmental determinism was championed by a geographer, Ellsworth Huntington, whose views were rather ethnocentric. For example, he thought that Europeans were culturally superior, and that this superiority came from the favorable climate of Europe. His views required a one-to-one mapping of environment onto culture (Marris, 2007, p.15).

⁷ In reaction to environmental determinism, the famous Berkeley anthropologist Alfred Kroeber introduced the idea of environmental possibilism (Gunn, 1980)

relationship between people and their environment, the process of linear connection remains dominant (Mairs, 2007). According to Milton (1996), cultural ecology does not provide a clear model for explaining how cultural features emerge and persist, nor does it effectively determine the extent of environmental influence on the evolution of a particular culture. Furthermore, Steward's rigid categorization of “core” and “non-core” elements of culture may overlook the dynamic and evolving nature of cultural elements and their relative importance, potentially leading to oversimplification.

I found it useful for this study because, firstly, its assumption that ‘human beings can change their physical environment in their efforts to satisfy their needs and wants’ helped me to see how the Bayso and other ethnic groups in the study area have caused damage to forest resources in their effort to secure agricultural land, building materials, and firewood. Secondly, it also allowed me to consider the impact of sociocultural traditions and values that have inspired the Bayso to have large herds without considering the damage this causes to grazing lands and their livelihoods. This theory may also help us understand how external forces, such as exposure to other cultures, can shape existing human-environmental interactions.

2.6.3 Adaptation theory

According to Nelson, Adger, and Brown (2007) and Smit and Wandel (2006), adaptation is a process of purposeful change in response to risks brought on by the combination of environmental hazards or in anticipation of or in response to external stimuli and stress. This implies that a response of some kind is required to deal with changes in the environmental conditions as they occur. Other authors (e.g., Jansson and Ostrom, 2006) associated adaptation with a process of decision-making and the actions carried out to preserve the socioecological system's ability to respond to alterations or disturbances in the future. Therefore, adaptation in human systems refers to the capacity for adaptation, which increases an individual's or a group's ability to modify their behavior in response to changing environmental conditions through both innate and learned mechanisms (Brown, 2007). In general, according to Janssen and Ostrom (2006), adaptation to environmental

change is defined as an adjustment in social and ecological systems in response to actual, perceived, or expected changes and their impacts.

The goal and process of adaptation are strongly related to the ideas of vulnerability and adaptive capacity (Smit and Wandel, 2006). Accordingly, Smit and Wandel described ‘vulnerability’ as being exposed to risks and the inability of people or communities to manage risks and other unforeseen circumstances. Some people and places are more susceptible to specific risks than others, but exposure ultimately determines vulnerability (Holling, 1973). This implies that while exposure rises, vulnerability rises as well, and vice versa. Similarly, a social system's ability to adapt is determined by the social and technological know-how as well as the tactics used by individuals and organizations to react to socio-economic and environmental changes (Lui et al., 2007). As a result, it is assumed that societies with a high capacity for adaptation adjust to changes easily (Smit and Wandel, 2006).

Kiessling (2022) argued that adaptation to environmental change builds resilience, reduces risk and vulnerability to environmental change, and improves well-being and the ability to anticipate and effectively adapt to change. Russell et al. (2010), on the other hand, suggest that adaptation threatens a person's well-being and can lead to loneliness, homesickness, loss of support networks, and perceived discrimination. For example, migration is often seen as a form of adaptation to climate change through which households and communities work to reduce risks associated with climate change (Afolayan and Adelekan, 1999). In the context of the Bayso, it caused dislocation, separation, loss of belonging, degradation of cultural heritage, and exposure to other cultures. In their study “*Migration and Culture Change*”, Rapport, Sardoschau, and Silve (2021) also emphasized this point, arguing that groups that migrate may lose their cultural identity if they are unable to adapt to environmental changes. Accordingly, in this study, I used this theory to understand why the Bayso chose to migrate rather than remain on the island and face the challenges of environmental change, focusing on their adaptive capacity and vulnerability, and their environment.

2.6.4 Diffusion perspective

Diffusion is a theory that attempts to understand the nature of culture in terms of the origin of cultural traits and their movement from one society to another (Alderman, 2012). Cognizant of this nature of diffusion, Diah et al. (2014) and Crossman (2018) have characterized it as the spread of ideas, customs, or practices from a culture of origin to another society. According to these authors, it is a social process through which innovations, ideas, values, concepts, knowledge, practices, behaviors, materials, and symbols move into diverse groups in a society. Some other authors (e.g., Alderman, 2012) argue that diffusion involves more than just the simple movement of ideas and artifacts across an area, but involves the degree to which one cultural way of thinking may impact and alter the other one. There are two types of diffusion: relocation and expansion. Relocation diffusion refers to the spread of cultural ideas through shifting residential regions, whereas expansion diffusion focuses on the transfer of ideas within a stationary, non-relocating population (Alderman, 2012).

The British, German, and American schools of thought are the three schools associated with diffusion. The British anthropologists N.J. Perry and Elliot Smith are credited with formulating the British school of thinking (Diah et al., 2014). Their central claim was that human culture began in Egypt and spread around the world over time (Kuklick, 2001). The British school of thought holds that “people are inherently uninventive and invariably prefer to borrow the inventions of others’ cultures rather than develop ideas for themselves” (Diah et al., 2014, p.156). In their endeavor to explain why certain cultures bear no traces of Egyptian culture, these academics noted that certain cultures simply decline. However, their arguments are unrealistic and ethnocentric that claiming Egypt to be the cradle of all cultures (Kuklick, 2001).

Father Wilhelm Schmidt was an advocate of the German school. The British school's belief that ‘human beings, in general, are uninventive and attempt to borrow from other cultures’ is one that Schmidt and his supporters argue for (Erick, 2001). However, the German school differed from the British school in that it never accepted the notion that ‘culture has

only one origin.’ Instead, they postulated that there were once many cultural hubs, from which civilizations spread to other regions. These centers were known as ‘*kulturkreise*’ in German (Dial et al., 2014).

The American school, developed by Clark Wissler and Alfred Kroeber, was the other one. After that, Boas and his pupils Kroeber and Robert developed a theory known as ‘moderate diffusionism,’ which is now generally acknowledged in the field of anthropology (Kuklick, 2001). Kuklick also claims that this attitude made it possible for many mechanisms of change, inventions, and acculturation to coexist. The American school of thought holds that while every civilization is influenced by others, the process of diffusion is contingent and random, and it naturally leads to changes in the receiving population (Erick, 2001). For instance, Dean (1997) noted in his article “*The Diffusion of American Culture in Western Europe since World War II*” that the United States of America was able to exert cultural influence on Western Europe following World War II, mainly through the emergence of a consumer goods culture similar to that of the United States. According to Dean, the spread of American culture throughout Western Europe produced a shared cultural environment and even caused the risk of cultural change due to acculturation. Accordingly, perhaps one can imagine the extent to which American companies (e.g., McDonald's and Coca-Cola) have influenced the rest of the world. Similarly, Bahtt (2008) supports Dean's theory with his research on the Gujarati Diaspora, highlighting how direct interaction among cultures leads to cultural change.

Diffusion, like other anthropological theories, is not free from criticism. Despite the lack of an ethnocentric viewpoint, its proponents sustained the innate inferiority of non-Western people (Kuklick, 2001). Second, researchers who support diffusion disregard to explain why many civilizations exhibit no indications of cultural origin. Finally, anthropologists discovered that some cultures exist where there is constant contact but no exchange of cultural materials, despite the belief held by diffusionists that diffusion is an inevitable process (Diah et al., 2018). I have used this theory because of its ‘relocation diffusion’ assumption, which postulates that cultural traits spread as a result of the Bayso’s migration to areas on the west coast of Abaya Lake. Thus, guided by this idea, I have come to

understand how the Bayso's way of life and thought were disrupted by the cultural practices of the Gamo and Wolayta, who are the dominant cultures in the area. More precisely, the extent to which the lifestyle of these people has adversely affected the IBS and marriage practices of the Bayso because of the interactions between the two cultures after the Bayso migration.

PE, CE, and AT likely share common ground in their analyses of environmental changes because they all focus on the interplay between human actions and environmental outcomes. PE examines the power dynamics and social inequalities that shape environmental change, as well as how these dynamics influence environmental change and cultural responses. In contrast, CE explores the relationship between human cultures and their environments but overlooks power dynamics and social inequalities. Meanwhile, AT investigates how systems adjust to environmental challenges, but it is criticized for potentially neglecting the wider social and political contexts of these changes. All three perspectives address how human societies interact with, are affected by, and attempt to manage environmental changes. They also address the causes and consequences of these changes. While interconnected, these theories study the human-environment relationship with different emphases: PE focuses on power dynamics, CE on cultural practices, AT focuses on responses to change, and DP on how relocation of communities from their homeland as a result of resource degradation affects their cultural life.

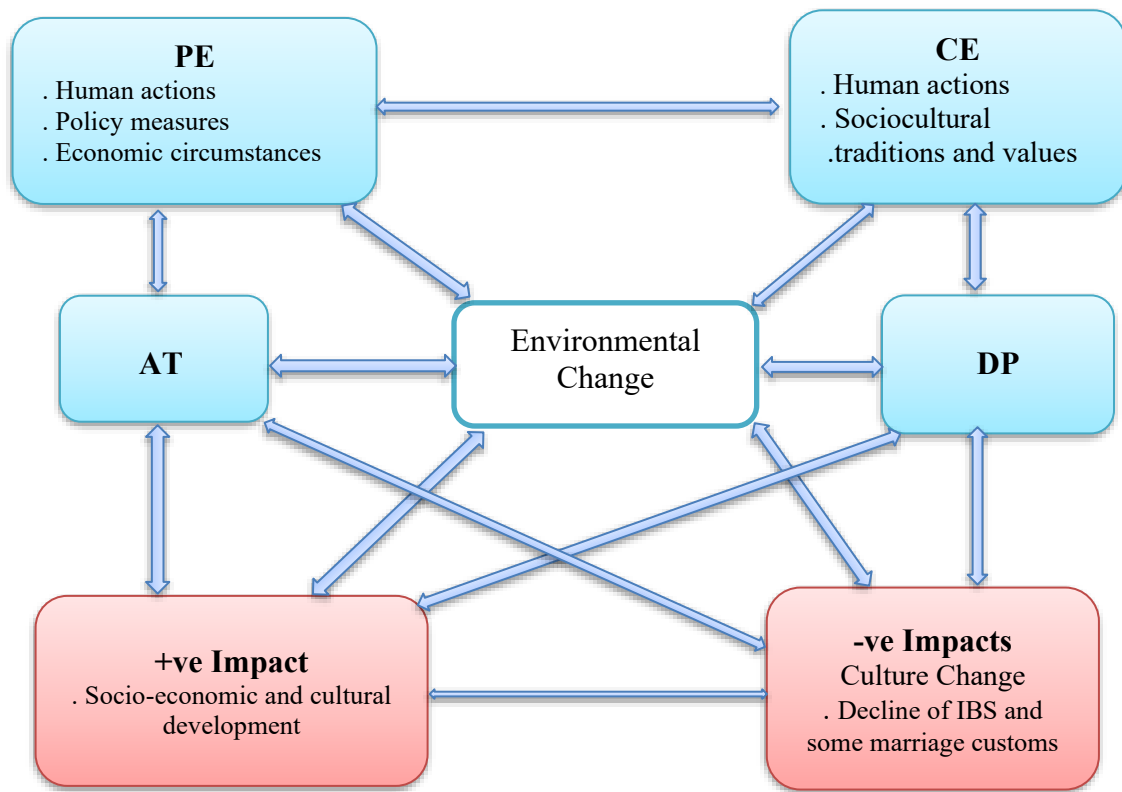


Figure 1: Theoretical framework of the study

Source: Designed by the researcher, based on accounts of human ecology and field data.

This theoretical framework is structured based on accounts of human ecology and field data to illustrate how each theory is linked and complemented with the other to trigger environmental change and subsequently change Bayso's culture.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter addresses the methodological issues of the dissertation, focusing on how I approached the study community, the research paradigms used, the sampling and data collection methods, the data analysis procedures, and my field experiences.

3.1 Research Motive and Rapport Building

3.1.1 Research motives

In my stay at Birbir High School and my subsequent three research visits to Gidicho Island and other villages on the west coast, I realized that the Bayso have been suffering from the recurrent drought that has affected their socio-economic base (grazing and agricultural lands) and forced them to flee their homeland. On each trip, I find ruins of abandoned houses that show the number of migrants each year. Thus, it can be assumed that ‘Gidicho Island’, the place of origin of the Bayso identity and home of their cultural traditions, is threatened by environmental changes. Therefore, my motive to engage in this research is my personal experience of realizing the problem in the study area.

3.1.2 Rapport building

According to Molden (2011) and May (2003), productive communication begins with trust and understanding. If researchers fail to ensure this, people might be suspicious and hesitant, and this, in turn, risks the information collected by the researcher. For example, participants may fabricate stories or withhold important information. Therefore, such cases can be assumed to compromise the research and invalidate the research work. Therefore, Molden (2011), May (2003), and other scholars, such as Guillemin and Heggen (2009), advise researchers to establish appropriate relationships with participants. In this regard, I did not face any major problems because of the outstanding relationship I established with the Bayso while working at Birbir High School for almost a decade. After my departure, I visited them recurrently for research purposes, and most importantly, my former students,

who are now in different positions at the *woreda* and local levels, have facilitated my case. In addition, I have followed all formal procedures. For instance, I have produced a letter of support from Addis Ababa University, the Gamo zone Administration, and the Mirab Abaya *woreda* Administration to facilitate fieldwork. Besides, language skills are one of the qualities of an anthropology student who plans to perform field research, as language plays a key role in building trust. In this regard, I tried my best to use the language, at least for simple communication, assisted by a small ‘Bayso-English’ dictionary prepared by Dr. Lemi Kebebew, and this helped me to deepen my relationship with the community.

After establishing myself in the study community in this way, I stayed in the field for nine months, from April 15, 2020, to February 3, 2021, which was executed in three phases. In the first phase (from April 15 to July 14, 2020), I familiarized myself with officials and the study community through a personal conversation about the study objective, how the study would be conducted, and the role expected from the study community. After establishing myself, I trained five research assistants for two days on how to organize, tape-record, translate, and transcribe interviews and FGDs. Contextual information about the study area was then collected, focusing on the physical environment and the sociocultural, economic, and political life of the community. After the end of the first phase, I had my first break from July 15 to 24, 2020. During this time, I reviewed and refined the data collected in the first phase of the study and cross-checked whether the relevant data for the first research question had been collected. Then, I started the second phase, which was conducted from July 25 to October 24, 2020. During this period, much data related to the factors of environmental change in the study area, the interactions of Bayso with the environment, and the manifestations of environmental change in Gidicho Island and areas on the west coast of Lake Abaya were collected. The second break was from October 25, 2020, to November 3, 2020, during which a similar data reviewing process was conducted. The final phase of fieldwork was carried out from November 4, 2020, to February 3, 2021. During this time, data on the effects of environmental change on the IBS and marriage customs of the Bayso were collected.

3.2 Research Paradigm

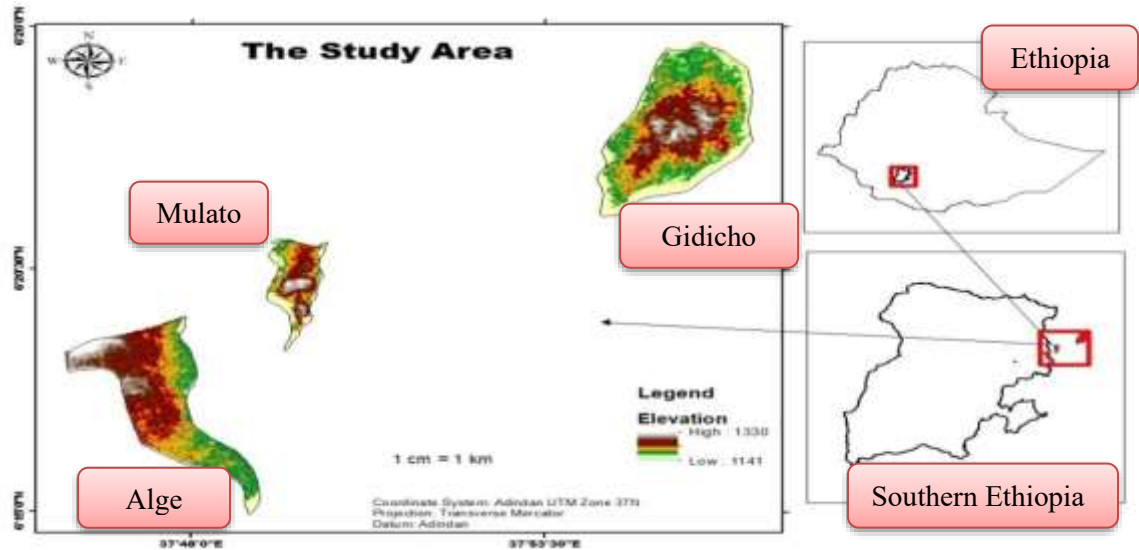
Paradigms represent contrasting worldviews that reflect and guide researchers' decisions. According to Kuhn (1970), research paradigms consist of shared agreements among researchers regarding how to understand and address problems. Paradigms encompass the responses to three fundamental philosophical questions: 1) What is the nature of reality (ontology)? 2) What is the relationship between the researcher and the researched (epistemology)? 3) How should the researcher go about acquiring knowledge (methodology)? In the social and behavioral sciences, paradigms have traditionally been categorized into two main groups: positivist/quantitative and constructivist/qualitative (Tashakkori and Teddlie, 1998). However, after intense confrontations between these two groups regarding ontological stances as well as epistemological and methodological issues, scholars introduced a mixed-methods approach (pragmatic paradigm) to address these challenges. This approach highlights the value of incorporating elements from both qualitative and quantitative methodologies.

3.3 Pragmatic Paradigm (Mixed-Method)

The study employed a pragmatic paradigm (mixed method), which involves the collection and integration of both qualitative and quantitative data. The main assumption of this method is that the combination of qualitative and quantitative methods provides a more complete understanding of a research problem than either method alone (Armitage, 2007). I found the integrated approach to be essential for analyzing the damages of environmental changes on the livelihoods and culture of the Bayso people, as it combines the strengths of quantitative and qualitative methods. This integration gave me a more comprehensive and nuanced understanding than either method could have offered on its own. Using this approach, I was able to capture the wide range of cultural effects the Bayso experienced due to resource degradation in their area.

Regarding the implementation of this approach, qualitative data were collected through individual and group interviews and observations based on the established research themes. However, owing to the distance and contextual differences between the three research sites (Gidicho, Alge, and Mulato, see Figure 2), the use of conventional ethnography was inconceivable. Hence, I used multi-sited ethnography to reduce the above limitations.

Figure 2: Map of the study area



Source: GIS data of the study are from 1990-2020

At this point, I think it is good to give a brief explanation of what multi-sited ethnography means and what distinguishes it from conventional ethnography. As Marcus (1995) noted, the essence of multi-sited ethnography is to follow people, connections, associations, and relationships across space because they are substantially continuous but spatially discontinuous. According to Falzon (2005), multi-sited ethnography is commonly used to denote two things: the practice of conducting ethnographic fieldwork in more than one place, and complex and ongoing methodological discussion. In terms of the first, the practice of doing ethnographic work at more than one site is indeed nothing new. For instance, Malinowski's seminal work, *"Argonauts of the Western Pacific"*, is written partly as a narrative of voyage and movement, following a complex economic practice from one site to the other (Erikson, 2010). In terms of methods, "multi-sited ethnography involves a spatially dispersed field through which the ethnographer moves, temporarily stays in two

or more places, or conceptually, through techniques of juxtaposition of data” (Falzon, 2005, p.2).

3.4 Sampling Techniques

Individuals with extensive and relevant knowledge of their culture and the current environmental changes, who are willing to share their experiences and opinions, were purposely selected. Equally, the three study sites (Alge, Gidicho, and Mulato, refer to Figure 1) were also purposely selected because they represent different aspects of Bayso's life. For example, Alge was chosen for two reasons: politically, it is the center of the Bayso local administration, and demographically, it is home to the largest portion of the Bayso community on the western shore of Lake Abaya. Gidicho represents what the Bayso call their ‘homeland’ and the basis of their culture and traditions. Mulato, on the other hand, represents diversity, as the Bayso share villages with other ethnic groups, especially the Gamo in Wajifo village.

3.5 Data Sources: Secondary and Primary

The data used in this study were generated from secondary and primary data sources. The secondary data were collected from books, journals, articles, dissertations, and official documents, including proclamations and policies that focused on the protection and management of the country's natural environment. The primary data sources, which were the main source of the study, were individuals who were expected to have relevant knowledge of Bayso culture and those who were interested in environmental issues. Similarly, geospatial data that focused on analyzing the extent of environmental change in the study area from 1990 to 2020 were downloaded from the USGS website.

3.6 Data Collection Methods

Data collection is a systematic approach to collecting and analyzing data from a variety of sources to get an in-depth understanding of the problem. For this study, I used different data collection methods for both quantitative and qualitative data. Accordingly, quantitative data were collected from the USGS website and organized for analysis by

experts in the field. As a result, the LULC change data of the study area from 1990 to 2020 for a total of 30 years, were analyzed. To assess the LULC changes in the study area over the last three decades (1990 to 2020), Landsat images for the periods 1990, 2000, 2010, and 2020 were taken. The images were acquired from the USGS Earth Explorer website (earthexplorer.usgs.gov) for December, as it was a dry month. All the images had a spatial resolution of 30*30 meters. In general, the types and characteristics of the Landsat images used are described in Table 1.

Table 1: Type and characteristics of the Landsat images

No.	Image	No. of scenes	Path/Row	No. of Bands	Sensor	Resolution	Date of acquisition	Source
1	Landsat-5	2	168/56 & 169/55	7	TM	30 m X 30 m	18/12/1990	GLCF
2	Landsat-7	2	168/56 & 169/55	8	ETM+	30 m X 30 m	26/12/2000	GLCF
3	Landsat-7	2	168/56 & 169/55	8	ETM+	30 m X 30 m	24/12/2010	GLCF
4	Landsat-8	2	168/56 & 169/55	11	OLI	30 m X 30 m	27/12/2020	GLCF

Source: Organized by a GIS expert, April 2022

In these processes, ground control points (GCPs) were collected for the validation of LULC change classification. The GCPs were collected specifically for assessment. Three hundred GCPs were collected for each LULC map, and a total of 1200 GCPs were collected for the validation of all the produced maps. Similarly, a shapefile of the study area was generated based on the shapefile from the Central Statistics Agency, CSA 2008. Finally, a 5 km buffer zone was created to produce the final shapefile of the study area. In general, for the analysis of LULC changes and collection of GCPs, two software programs, viz. ArcGIS 10.8 and Google Earth Pro were used. On the other hand, qualitative data were collected through interviews, FGDs, observations, and photography.

3.6.1 In-depth interview

An in-depth interview has facilitated my effort in getting a clear picture of the informants' point of view. In this regard, I conducted 28 in-depth interviews (16 men and 12 women)

with individuals who have relevant knowledge of the study themes. Accordingly, officials and inhabitants selected from three study sites participated. Equally, I have conducted nine key informant interviews (eight male and a female) with a former *balabat* (local administrator), ex-*Wonnos*, political leaders, and elderly individuals, who are assumed to have ample knowledge and experience in their socio-economic and cultural life, as well as the current environmental situation in their locality. I found it very useful to confirm and obtain further insight into the in-depth interviews. These interviews were held predominantly at informants' homes/offices, mostly after their daily execution to feel comfortable. Equally, efforts were made to create a secure environment for the interviews. A semi-structured interview guide that focused on the major themes of the study mentioned earlier in this dissertation was used. Guiding questions were sometimes modified when the interview was in progress based on the response of informants. This allowed me to further investigate how much the Bayso were influenced by their worldview in their relationship with the environment. These guiding questions also helped me to analyze the nature of the current environmental change in the study area and its adverse impact on Bayso's IBS and marriage customs.

3.6.2 Focus group discussions

Focus group discussion (FGD) is a formally organized group of individuals brought together to discuss a topic or series of topics during a specific time. It is a beneficial technique for obtaining informants' perspectives and concerns about certain issues (Kruger, 2002). According to David, Marczyk, and Dematteo (2005), FGD provides an open and unrestricted forum for individuals to discuss ideas and clarify each other's impressions and opinions. This method provided me with a comprehensive and contextual understanding of environmental change and its effects on Bayso culture. It also offered insights into how sociocultural traditions and economic factors influenced the Bayso people's resource utilization behaviors and their responses to environmental challenges, as well as the difficulties they encountered in maintaining their cultural traditions. I did not employ a social survey in this study due to its limitations in capturing the depth and complexity of cultural understanding and its inability to fully address the nuances of

individual and community experiences (Thopson, 2016). Instead, I relied on qualitative approaches, such as in-depth interviews, key informant interviews, FGDs, and geospatial data to assess the extent of environmental change in the study area and its effects on the livelihoods and cultural life of the Bayso.

Cognizant of these benefits, for my study, focus groups were organized based on sex (male or female) and age (young or adult) to minimize the domination of certain groups. Accordingly, groups of young males and adult males, and young girls and adult women were formed. This method of controlling the group composition to match carefully chosen categories of participants is known as segmentation (Morgan, 2013). “Segmented samples are closely tied to the emphasis on homogeneity in the composition of focus groups. This homogeneity not only allows for more free-flowing conversations among participants within groups but also facilitates analysis that examines differences in perspective among groups” (Morgan, 2013, p.7).

Based on the standards noted above, I conducted four FGDs, each in Alge and Mulato, but only two in Gidicho since the number of inhabitants was very small. In general, I carried out a total of 10 FGDs, and the maximum number of participants in each FGD in Alge and Mulato was eight, fearing the consequences of gathering more people in one place amid the COVID-19 pandemic. In general, a total of 78 (39 male and 39 female) discussants participated. Intending to have a successful discussion and to cope with possible messes, I have introduced ground rules for the sessions, highlighting that participants have to talk to and respond to each other but not to facilitators, to respect each other, not to disclose what they heard at FGD for third parties, and refrain from criticizing others’ views. Finally, all FGD sessions were tape-recorded by research assistants with the consent of the study participants, and I took detailed notes of each discussion.

3.6.3 Observations

I implemented a planned observation strategy to collect data on the daily activities and environmental conditions in the study area. Of the available observation methods, including participant and non-participant observation, I opted for non-participant

observation for my study. This decision is based on the need to move between different sites within a specific timeframe, which makes immersing myself in the culture of the study participants challenging. I have observed agricultural fields (e.g., banana plantations and horticultural areas), grazing lands, villages, coastal areas, and school buildings submerged by lake water. I have also taken photographs of these scenes to support my argument.

3.7 Integration of Qualitative and Quantitative Data

Ahmed, Pereira, and Jane (2024) argue that integrating qualitative and quantitative data is essential for comprehending the complex and evolving relationship between environmental and cultural change. The authors emphasize that qualitative data, gathered through methods such as in-depth interviews, focus group discussions, and observations, provides rich, nuanced insights into cultural perceptions, practices, and beliefs that shape community responses to environmental changes. This qualitative perspective reveals how individuals and groups interpret and interact with their changing surroundings. In contrast, quantitative data, including detailed geospatial information, provides precise, measurable evidence of environmental changes, such as changes in LULC and ecological patterns. Merging these two distinct yet complementary approaches allows researchers to capture the influence of environmental changes on cultural practices and how communities adapt to these changes. This results in a deeper, more holistic understanding of the issue (Ahmed, Pereira, and Jane, 2024).

In this study, I used quantitative data to supplement ethnographic insights and confirm qualitative findings, which greatly improved the research's credibility. For example, I carefully compared participants' interview responses with extensive LULC change data. This allowed me to critically evaluate the reliability and depth of the information provided by the informants. This analysis verified accuracy and illustrated broader trends in land usage. Additionally, I used the LULC data to stimulate discussions about the underlying causes of land cover changes, such as population growth, agricultural expansion, and climate change impacts. Integrating these methodologies balanced their respective limitations and provided a more robust and nuanced understanding of the research problem,

highlighting the intricate interconnectedness of cultural practices and environmental dynamics.

3.8 Data Analysis

3.8.1 Quantitative data analysis

The LULC change data of the catchments and the study area are organized in maps and tables to show the changes detected in the last thirty years, from 1990 to 2020. Accordingly, the percentages and maps of the identified LULC types, namely, cultivated land, forestland, shrubland, wetland, water bodies, and settlements, were used to supplement and complement the ethnographic data.

3.8.2 Qualitative data analysis

Since, in a qualitative paradigm, data analysis goes hand in hand with data collection, I have gone through the data carefully and repeatedly from the beginning to structure and shape the themes. In this case, in-depth and key informant interviews were carefully transcribed by research assistants, and I translated them into English after each phase of the fieldwork. The observation and interview notes and transcripts were then carefully edited to fill any gaps and to increase the readability of the text and the validity of the data. Together with documents and photos taken for illustration purposes, the entire data was then organized thematically and analyzed through thematic analysis, which is an investigation of related themes by relocating the data from unrefined to data that is quite significant (O’Leary, 2004).

However, I have employed different analytic approaches for the FGD data. As can be inferred from scholarly works, qualitative analysis techniques that can be used to analyze focus group data include grounded theory analysis, content analysis, and discourse analysis (Morgan, 1988; Glaser, 1978). However, Morgan (1988) recommends the use of content analysis in this regard. Therefore, based on his recommendation, I have employed content analysis for focus group data since it provides researchers with better insight into the perceptions of informants on their lived experiences (Nyumba et al., 2018) and to discover

patterns undetectable by merely reading the texts (Robson, 1993). In FGDs, content analysis is a method used to systematically examine and interpret the verbal and nonverbal communication of discussants. This method helped me identify patterns, themes, and meanings relevant to the research question. I deconstructed the FGD data into smaller units, such as words or phrases. These units were then categorized and analyzed to conclude the discussants' experiences and opinions regarding the effects of environmental change on the livelihoods and cultural life of the Bayso. Therefore, all the data generated from the FGDs were cleaned, organized, and classified thematically.

In general, the qualitative data were managed, processed, and analyzed as follows. First, the data obtained from interviews, FGDs, and observations were transcribed, translated, and organized to identify recurring patterns and themes. Next, these themes and patterns were applied to the research questions, considering the context of environmental change and the cultural setting. Using multiple data sources to validate the findings enhanced the study's credibility. Finally, I presented the findings clearly and concisely, using quotes and photographs to support my arguments. Then, I administered the results of the two independent analyses of qualitative and quantitative data through a 'convergent parallel design' to supplement and combine the results of each analysis. This was followed by interpreting and writing the dissertation.

3.9 Field Experience

I believe that social science researchers are inherently susceptible to biases because they are influenced by their education, social background, life experience, and political affiliations. This means that researchers' field endeavors, including the way they make conversations with informants and observe and interpret issues and events, are mirrored through their perspectives and thoughts. Therefore, it can be argued that there is no value-free research in social science. In this regard, what I believe is that as much as possible, refrain from conscious and deliberate biases.

My fieldwork among the Bayso lasted for nine months. During this time, I encountered several incidents that affected my research in various ways. One instance in this regard was

the problem of compensating research participants. Ideally, a researcher should compensate informants for the time and effort they contribute to research projects. However, in our context, this proved to be challenging. The reason is that the amount of budget that Addis Ababa University assigns for a Ph.D. candidate is too small to cover the expenses of a candidate, let alone his/her informants. In addition, the study area has been visited by foreign researchers, who paid a good amount of money for each participant. Consequently, my informants expected an equivalent payment. Moreover, because of the inflation in the country, every service charge has skyrocketed, while the PhD candidates' per diem is insufficient by any standard. Beyond the very nature of fieldwork itself, such issues complicated my fieldwork for some time. However, I managed the problem by communicating honestly with the study participants about the amount of money assigned to each informant and the weak economic base of the country that hinders the government's effort to finance research projects. Hence, such briefings and my friendly approach to everyone helped me win their support. However, I do not believe that things will continue in this way. Therefore, the Ministry of Education and the Federal Government have to make new financial arrangements to relieve graduate students from such financial constraints.

Similarly, the lack of proper documentation of reports for each year in the government offices of Mirab Abaya Woreda created an information gap in my study. For example, in the last three years (from 2018/19 to 2020/21), the majority of Bayso farmers have lost hundreds of hectares of farmland due to the expansion of lake water. However, these documents were not found either at the local administration that produced the reports or at the *Woreda* Agriculture and Rural Development Office, which is expected to compile such reports at the *woreda* level. I was subsequently forced to depend on individual notes and reports from experts' documents.

The other challenge that I encountered throughout my fieldwork was the outbreak of COVID-19. The outbreak was declared as I was preparing myself for fieldwork after defending my dissertation proposal. COVID-19 has indeed affected the lives of millions of people worldwide. In addition, it disrupted the world economy enormously and impaired

the day-to-day interaction of people, since close interaction and bodily contact between and among individuals are some of the mechanisms by which the virus is transmitted from person to person. Comparatively, those early days were scary and required everyone to limit his/her movement and interaction with other people. As a result, I was forced to be cautious in my movement and interaction with others.

My caution stemmed from my concern not only for myself but also for the lives of others in the study area. As a result, I had canceled a one-day workshop that would have included an introductory session on the research objective and its implementation with representatives from government offices and the study community. I was also forced to reduce the number of FGD participants because of the perceived risk. Some of the incidents that I have experienced concerning COVID-19 have been astonishing and funny. For instance, when I was in the fieldwork wearing masks, I found that some of the inhabitants were gazing at me, others swished each other, pointing to me, and kids shouted, saying Corona...Corona. To be honest, I was not offended by these acts; rather, I'm very much concerned about their innocence and being unaware of the fatal disease. In all these ups and downs, I managed my fieldwork following the COVID-19 protocols (e.g., keeping my distance, using sanitizers, wearing masks, and communicating with informants and their relatives to do the same thing).

Equally, the hot environment along the lakeside, incidental heavy rain, the lake waves, and the bites of mosquitoes gave me a hard time on the mainland and the island. Despite these challenges, I have managed my fieldwork, seeking solutions to each of the challenges together with my assistants and the study community.

CHAPTER FOUR

DESCRIPTION OF THE STUDY AREA

This chapter describes the study area to provide contextual information about the people, location, language, physical setting, economic activities, indigenous administrative and belief systems, family organization and marriage arrangements, and cultural heritage of the study people. The description starts with general information about the *woreda* (Mirab Abaya) and then proceeds to the study area.

4.1 Background of the *Woreda*: An Overview

The Mirab Abaya *woreda* is one of the eighteen *woredas*⁸ in the Gamo Zone (see Appendix VI) and belongs to the newly established South Ethiopian Regional State. The *woreda* is divided into 24 *kebeles*: one urban and 23 rural *kebeles*. It has a land area of approximately 1,600 km², which is divided into three major agroecological zones: *kolla* (lowland with an altitude below 1220 asl⁹), *woyna dega* (medium elevation), and *dega* (highland) (Asheanfi et al., 2017). Among the 24 *Kebeles*, 16 are in *kolla* agroecology, six are in *dega* agroecology, and the remaining two are in *woyna dega* agroecology (Asheanfi et al. 2017). The *woreda* shares a boundary with Wolyta in the North, Arbaminch Zuria in the South, Lake Abaya in the East, and the Gamo highlands in the West. The average rainfall in the *lowlands* (*kolla*) is 580 mm, whereas it is 1,000 to 1,100 mm in the highlands (*dega*) and *woyna dega* (Ashenafi et al., 2017).

Birbir is the town of Mirab Abaya *woreda*, which is located 50 km from the Zonal town, Arbaminch, 60 km away from the regional town, Wolayta, and 455 km away from Addis Ababa. According to the headperson of the Statistical Office of Gamo-Gofa Zone, the 2016 population projection of Mira-Abaya Woreda was estimated at 92,587 people, with 80,800 and 11,787 people living in rural and urban areas, respectively. In terms of religion, 52%

⁸ Arbaminch zuria, chenchu town, MirabAbaya, Chenchu zuria, Selamber town, Arbaminch town, Dita, Grada martha, Gacho baba, Daramallo, Bonke, Kamba zuria, Kogota, Kamba town, Gereze, Kucha zuria, Boreda and Kucha alpha,

⁹ Above sea level

of residents are Protestant, 41% Orthodox Christian, 5% Muslim, and 1% Catholic (Ashenafi et al., 2017), and approximately one percent of residents are adherents of IBS (Mirab Abaya Woreda-Woreda Rural Development Office [MAW-WRDO], 2007).

A mixed farming system is the dominant economic activity in Mirab Abaya *woreda*. Major crops include: maize, sorghum, wheat, barley, *workicha* (false banana), cotton, and banana. Cattle, goats, and poultry are the main forms of livestock (Eshetu, 2012). Recently, fishery, horticulture, and apiculture have become alternative economic activities of inhabitants, essentially for young people. At Birbir town, trade activities are flourishing, mainly in the service sector, including hotels, restaurants, and metal and wood workshops (Eshetu, 2012).

4.2. The Study Area

4.2.1 The people, location, and language

Gidicho is the largest island on Lake Abaya, which is inhabited by the Bayso and Haro¹⁰ communities. The Bayso live in two villages on the island: Shigma in the north and Bayso in the southern part of the island. The Haro, on the other hand, inhabited a village also called ‘Haro’, which is located midway between Shigma and Bayso villages (Epple, 2016). Currently, the majority of these communities have left the island due to drastic environmental changes and the resulting resource scarcity that forced them to settle in coastal areas of Lake Abaya.

In the population and housing census of 1984, the terms ‘Haruro’ and ‘Gidito’ were used to refer to the Haro and the Bayso people, respectively, as separate ethnic groups, but share

¹⁰ The Haro probably originated in different parts of Lake Abaya, especially its eastern shores, as well as Lake Chamo in the Gamo-Gofa Zone of southern Ethiopia and among different groups of hippopotamus hunters. Today, Haro Settlements are found in different localities in and around Lake Abaya, which are not related to their places of origin (Braukmann, 2012, pp.182-183)

one language, 'Gidichogna'. Conversely, in the 1994 census, both ethnic groups were identified by one name, 'Haruro', and their language was 'Harurogna'. In contrast, in the 2007 census, all inhabitants of the island and villages on the west coast, both Haro and Bayso, were ethnically recognized as 'Gidicho' and their language was 'Gidichogna'. Such inconsistent and arbitrary naming of people and their languages is not only academic but also fails to recognize the interests of the communities concerned. In this context, the people designate themselves as 'Bayso' and refer to their home island as 'Gidicho.' In contrast, the people residing in Haro village, located on the island and sharing a village with the Bayso on the west coast, are of the Haro ethnic group, and their language is known as Harurogna. In this context, the people designate themselves as 'Bayso' and refer to their home island as 'Gidicho.' Therefore, throughout this study, I have used the term 'Bayso' to refer to the study people and their mother tongue.

According to one of my key informants, Balamo Worba, until 1991, the inhabitants of Gidicho Island were under Gedeo Awraja (now Gedeo Zone), Wonago woreda, while those who settled on the western shore of the lake were under Gamo Awraja (now Gamo Zone), Mirab Abaya woreda administration. Accordingly, they were worried and concerned about the division of their ethnic group (Bayso) into two administrations: Gedeo and Gamo. Subsequently, after the new political arrangement in the country in May 1991, the dissatisfied and annoyed islanders decided not to continue under Gedeo. Accordingly, they officially submitted an application to the regional government indicating their interest in joining their relatives on the western coast of Lake Abaya. Therefore, "following a referendum organized by the Regional Council, the islanders were officially included in the then Semen Omo Zone" (Mohamemd and Teferi, 2019, p. 83). With this, the Bayso became one of the nine additional minorities with special constituency and thereby "represented in all administrative structures from *woreda* to regional offices and have a seat both at the Regional and Federal House of Federation since June 1995" (Brenzinger, 1995, p.5). Currently, they are one of three ethnic groups, namely, Gamo, Zayse, and Bayso, which constitute the Gamo Zone administration.

The Bayso use mainly their language called ‘Bayso’, which belongs to the lowland East Cushitic language family (Brenzinger, 1995). They are also competent in Gamotho, Gats’ame, Wolaytegnna, and Amharic. Currently, while young people mainly use Bayso, Gamotho, and Amharic, elders and some adults are fluent in Oromifa, in addition to their mother tongue, because of their long-lasting relationship with the Guji people (Hayward, 1978; Epple, 2016).

The population of the Bayso was approximately 3,260 in 1994, according to Brenzinger (1995), and it was 5,491 in 2007 (CSA, 2008). The current population is projected to be 9,800 (Joshua Project, 2023). In this regard, the head of the Gamo Gofa Zone Statistical Office informed me that his office only makes projections at the zonal and woreda levels due to financial and logistical constraints. Consequently, I had to rely on Joshua Project projections. According to this projection, the Bayso population has tripled over the last 30 years. The 2007 census revealed that the Bayso are dispersed across all regions and the Addis Ababa city administration. This move of the community to every corner of the country is related mainly to the recurrent drought that heavily affected their means of survival and the absence of other economic opportunities to sustain their life in one part and seek secondary and tertiary education in the other.

4.2.2 Physical settings of the study area

As part of the main rift valley system, Lake Abaya and its catchment areas, including the rift floor, belong to the *kolla* zone. The region is characterized by a mean annual temperature and rainfall of 23°C and 700 mm, respectively, and is largely covered by savanna forests (Tadiwos, 2011). In contrast, the western escarpment, which belongs to the *woynadega* agroecological zone, has a mean annual temperature and rainfall of 19°C and 1500 mm, respectively, and is covered by tropical mountainous rainforests (Tadiwos, 2011; Schutt, 2004). Most parts of the escarpment in the region have two modes of precipitation delivery annually in spring and summer (Thieman, 2006). According to Thieman, the first is a period of short rain, while the second is characterized by a period of long rain. An Italian geographer, Neumann (1902), who visited Lake Abaya, was impressed greatly by

the extensive grassland near the lake, which was full of game animals (e.g., elephants and lions) at the time of his journey. In a similar vein, Hodson (1927), who contributed a chapter to the book '*Seven Years in Southern Abyssinia*', was much-admired by the fertility of the soil along the lakeside.

4.2.3 Economic activities

The Bayso were initially pastoralists, who based their life on herding cattle and goats on the island and engaged in the cultivation of maize, sorghum, cotton, and apiculture (Sava, 2011; Epple, 2016; Lemi, 2019). Some scholars, such as Kul 1958, cited in Fleming (1964, p.90), stand against this view, arguing that “apparently the Bayso were highland farmers who followed an essentially pastoral route from north Borana-land around the ‘Darasa’ (currently Gedeo) highlands and occupied the same lowlands where Guji-Oromo live now”. An account of the Southern Nations Nationalities and Peoples Region [SNNPR] (2001) considers them mixed farmers. However, geographical explorers such as Smith (1897) and Neumann (1902), who visited the area almost a century ago, reported the affluent environment, which was a perfect place for animal husbandry. Correspondingly, the Bayso believed that their ancestors were herders and that for them, life without cattle was inconceivable. However, we never shove out the well-organized agricultural experience that the Bayso had, given that the remains of some elaborate traces are on the island. Although the point raised by Kul was able to attract the attention of some scholars, such as Fleming (1964), a significant number of scholars, who studied some aspects of Bayso's life, including Brenzinger (1995); Sava (2011); Epple (2016); Lemi (2019), Mohamed and Teferi (2019), and this study confirmed that the Bayso were initially pastoral.

4.2.4 Marriage and the family organization

According to informants, culturally, the foundation of a family¹¹ structure among the Bayso is a nuclear family, although this unit had no practical role in the social life of the Bayso for the fact that such nuclear families were incorporated into the extended family. Among the Bayso, the extended family comprises three or more generations within one enclosure (*agud*). The household of such an extended family was led by a male household head, *Abbo kanjin*, and his wife, the senior woman. However, each nuclear family has a separate bedroom in the enclosure, and the possession of farm tools, a traditional boat (*wollabo*), and fishing nets is freely shared (Epple, 2016).

In their marriage custom, the Bayso are exogamous, a marriage custom that compels them to marry outside of their clan, because they consider their clan members as relatives. They were also cautious not to marry outside of the Bayso clans, so as not to pollute their blood with the ‘impure’ *tunne*. They perceive that a community that fails to comply with food taboos, circumcision, and salve descendants is impure (*tunne*). Consequently, they believe that marrying such people can result in pollution. In this regard, they hate Haro, a small community that shares the island with them, since they eat hippo meat and are uncircumcised (Epple, 2014). According to informants, Bayso has two marriage types: arranged (*banti*) and levirate (*eelano*). While arranged marriage (*banti*) is further divided into two categories: *multiatano* and *siyamokesano*, based on economic status and the level of attention given to the marriage ceremony; similarly, levirate marriage (*eelano*) is also divided into two categories: levirate (*eella*) and sororate (*aba eenoote*). (For details, please refer to sub-chapter 8.5).

The Bayso people are also characterized by a patrilocal extended family in which each couple resides in the compound of the husband’s family. They also maintain personal ties and join social groups based on culturally constructed genealogical kin (Epple, 2016). All

¹¹ The African concept of the family is broader than the general Western notion of family – the nuclear system; it is broader and includes the nuclear family as well. The African extended family comprises a large number of relatives, who are connected by blood bond and trace their descent to a common ancestry (Acquah, 2011).

the genealogical relationships, i.e., father, mother, son, daughter, brother, sister, children, husband, and wife, have terminology among the Bayso. Accordingly, they call their father and father's brothers with the same term '*abo*', mother (*ayo*), son (*babar*), daughter (*deltiti*), brother (*abi*), sister (*abba*), child (*yittiti*), husband (*entter*), wife (*ori*), and aunt (*tengo*). Since they are known for a form of family organization in which the father or eldest male is the head of the family (patriarchy), descent is consequently counted through the male line (Epple, 2016).

According to Epple (2016), the Bayso people are a result of a merger of different clans, who came from different areas, essentially from Gamo and Oromo. In her brief account, Epple noted that Achele, Gondo, and Golmakka clan members were originally from a Gamo clan, Boroda malla, whereas Baala, Fago, and Dhantu were from Oromo; specifically, Fago and Baala were from Guji, whereas Dhantu was from Arsi Oromo. Neumann (1902) had a similar conception of the origin of the Bayso, positing that they were from the eastern part of the country, which was significantly affected by the intrusion of the Somali. This was because Neumann was amazed by the language and physical resemblance between the Bayso and his Somali fellows, who escorted him. Similarly, Kul 1958, cited in Fleming (1964), presumed the origin of the Bayso somewhere between the Burji-Sidama or Sidama and Gedeo highlands to the east of Lake Abaya. According to Kul (as cited in Fleming, 1964, p.90), "either the ancestral Bayso crossed the Burji-Sidama occupied highlands from the east or the Sidamo and Gedeo occupied the highlands to the east of Lake Abaya, displacing the ancestral Bayso who occupied those highlands". Equally, a document by SNNPR (2001) substantiates the views of the above authors, highlighting that those who created the new Bayso identity were initially from Gamo and parts of Oromia.

According to the myth of the origin of the Bayso, initially there were four brothers (Gidicho, Daraso, Gujo, and Boroda), whose life was based on animal herding in a place called Laluncha, that supposed to be the vast land east of Lake Abaya. Thus, 'Gidicho' moved to the area where currently, the largest island, Gidicho (inheriting his name), is currently situated, while Gujo headed to the nearby lowland on the east coast together with

his herds. Similarly, Daraso traveled to the adjacent highlands east of Lake Abaya, where agriculture became his mainstay, whereas Boroda settled on the Gamo highland west of Lake Abaya, where he mastered subsistence agriculture. Thus, according to this myth, Boroda, one of the four brothers of Gidicho, initially migrated from Laluncha. This implies that Boroda is not a stranger to Gidicho Island, as claimed by Epple (2016). Equally, the myth highlights that these four brothers dispersed from Laluncha to the Gamo highlands and Guji areas, contrary to the thesis that makes Gidicho a center for a fusion of different ethnic groups.

There are two compelling possibilities regarding the emergence of the ethnic identity known as 'Bayso'. One viewpoint asserts that the Bayso identity evolved through the integration of migrants from various ethnic backgrounds, as well as outsiders who arrived on the island for a variety of reasons over time. Another perspective suggests that the identity emerged from a fusion involving Gidicho (one of the four brothers) and his relatives who settled on the island, as well as individuals from other regions. To attain full membership in this community, individuals must gain local acceptance and receive a ritual blessing from a *Wonno*. This rite involves sprinkling a sacred mixture called *obooro*, composed of milk and honey (Epple, 2016). The development of the 'Bayso' identity appears to be shaped by geographical context, kinship connections, and shared cultural practices rather than by ancestral lineage alone. This fluidity in ethnic affiliation highlights the dynamic nature of identity formation, in which individuals actively negotiate and redefine their sense of belonging through social interactions and rituals. The significance of the *Wonno* and the *obooro* ritual emphasizes the importance of local traditions in validating membership in the 'Bayso' community. Besides, extensive socio-linguistic studies conducted by Brenzinger (1995), Sava (2011), Epple (2016), Lemi (2019), and others noted that their mother tongue, 'Bayso', is an integral part of the Cushitic family. This confirms Bayso's Cushitic ethnic affiliation. These findings corroborate the claims of early 20th-century linguists such as A. N. Tucker (1930), who classified Bayso as part of the Oromo language cluster. Tucker noted that, despite notable influences from neighboring Omotic languages, Bayso retains a fundamentally Cushitic grammatical structure and lexicon, thereby solidifying its classification.

The Bayso had a tradition of dividing land among all Bayso clans on Gidicho Island. Accordingly, each clan had its own land for settlement, burial, grazing, and agriculture. In addition, sacred getaways for religious rituals and sacrifices were also assigned to each clan. Therefore, every clan was served in this way, and settling or burying outside of one's clan territory was strictly forbidden and taboo. However, in contrast, in villages on the west coast, all the Bayso clans and even other ethnic groups live together. Hence, as the Bayso moved from their cultural base (Gidicho Island) to new areas forced by environmental change, they lost those cultural land arrangements and were exposed to new sociocultural experiences that were odd to them. This greatly affected the cultural values and traditions that they had established for centuries.

4.2.5 Customary administration (Wonno system)

The customary administrative system of the Bayso was known as a *Wonno* system, in which a *Wonno* had both administrative and religious power over his people until the inclusion of the area in the Ethiopian empire under Emperor Menelik II at the end of the 19th century (SNNPR, 2001; Epple, 2016). After the inclusion of Gidicho, local administrators (*balabats*) were assigned by the *enderase* (a provincial governor) of the emperor to bear the task of administration, while the spiritual role was left to a *Wonno*. The title '*Wonno*' of the Bayso was analogous to the title '*Kawo*' of Gamo and Wolyita, but in the case of the Bayso, a person who won this position was solely responsible for administrative and religious issues. Each Bayso village (Bayso, Shigma, and Golmmaaka¹²) had its own *Wonno*, and each *Wonno* was accountable for the well-being of the community, their herds, and the fertility of the land through prayers, periodical rituals, and sacrifices to ancestral spirits and *Wa'a* (Supreme being). Since the Bayso had and still have a strong belief in the power of individual and communal blessings and curses, *Wonnos*

¹² According to informants, Golmmaaka is the second largest island in Lake Abaya, located just off the western shore of the lake. It was inhabited by the Bayso until the 1990s. This island is still a source of forest products for the Bayso to build their houses and corals.

were expected to carry out blessings and curse wrongdoers until they gave up their IBS. However, this role is currently carried out by community elders.

The *Wonno* system had specific criteria for the selection of capable individuals to the office of *Wonno*, including male, wealthy (mainly cattle), fully healthy (no mental or physical disability), firstborn of his family, and a reputation for being generous and wise. Some authors, such as Eshetu (2012), consider migration and population numbers as factors that prevent some clans from providing nominees for the competition for the office of *Wonno*. According to Eshetu (2012), among the twelve clans of the Bayso, Mulmale had a larger population; hence, other clans were afraid of the Mulmale clan to make them *Wonno* fearing their dominance. Similarly, some clans, such as Dabote, Baala, and Dakarte, were not allowed to be *Wonno*, since it was supposed that part of their population had migrated with the position of *Wonno* to other areas. Hence, based on these criteria, elders select a *Wonno* from the nominees after a careful assessment of each case. In general, this attests that among the Bayso, the title *Wonno* was not inherited from father to child; rather, it brought capable ones to the leadership based on the established criteria.

During their reign, *Wonnos* were assisted by *Woychas*, elderly individuals, and ex-*Wonnos* in their endeavors to address the socio-economic and administrative issues of the community. They also had a messenger, *tukaamo*, who used to escort them on their periodical visit throughout their villages, communicate the decisions of *Wonnos* to the public, and call dignitaries and the community for public meetings. The selection of a *tukaamo* had different approaches in the Bayso villages. In this regard, while there was no clan restriction in Shigma, it was only from the Dhabootee clan members in Bayso village. Nonetheless, in both cases, it was an individual who received the trust of a *Wonno* that would be nominated.

Among the *Wonnos* of the Bayso people, the ‘Bayso’ *Wonno* was considered the senior and superior, because the first *Wonno* in Gidicho Island ‘Achele’ belonged to the Bayso village and later inherited his name for his clan to be called ‘Achele’. Therefore, even today, Bayso considers *Wonno* ‘Achele’ the forefather of the Achele clan. Such superiority

was expressed in public rituals, where Bayso *Wonno* always initiated speeches and blessings (Epple, 2016). The term of office of a *Wonno* was two to three years, yet a *Wonno* who failed to satisfy the socio-economic and administrative expectations of the community, and if his reign was characterized by misfortunes (e.g., drought, epidemics, war, and pests), elders had the right to ask him to resign for the good of his people. If *Wonno* died while working in the office, he would be succeeded by his son. If he had no son, his brother would inherit not only the office but also his wife. Then, anyone who won the competition would take over the position. Finally, even though some authors, such as Mohammed and Teferi (2019, p.35), consider the customary administrative system of the Bayso as ‘participatory by its nature’, I contend that this is not true because women in this community, who constitute 50.3% of the total population CSA (2008), the poor, and disabled individuals were alienated from the system.

4.2.6 Indigenous belief system

The IBS of the Bayso is intertwined with the *Wonno* system. In religious terms, a *Wonno* was considered a head priest, an intermediary between the Bayso and *Wa’a* (Supreme Being), and was considered sacred as long as he was in the position. Consequently, a *Wonno* was reserved in his communication with other persons, in his movement, eating, and wearing. For example, in his interaction with the community, no one was allowed to touch him, no one was supposed to walk in front of him, no one was allowed to stand higher than him, and no one was allowed to stand whenever *Wonno* sat down (Epple, 2016). Similarly, a *Wonno* was expected to eat meat from animals he slaughtered, drink from his cup, and eat food prepared in his own house. As a sacred person, a *Wonno* was expected not to kill any animal, even as small as a mosquito, and he never cut his hair as long as he was in office (Epple, 2016). The major responsibility of a *Wonno* was a prayer and sacrifice to *Wa’a* and spirits for the health and peace of the Bayso, the fertility of their herds, the affluence of the environment, and protection from misfortunes.

4.2.7 Cultural heritages

The myth of the origin of the Bayso and studies that focused on some aspects of the Bayso culture, such as Epple (2016), indicate that ‘Gidicho’ and his relatives and individuals from different ethnic groups found themselves at a place called Gidicho, where they converged and established a new ethnic identity called ‘Bayso’. In their long stay, the newly constructed identity has developed certain common cultural elements that the Bayso share and use to express their belongingness to the new identity, which can be categorized as spiritual and material culture. For instance, ‘Bayso’, their mother tongue, which is a symbol of their identity and a way in which they communicate their culture to outsiders, their indigenous administrative and belief system, and their calendar,¹³ can be taken as a spiritual culture of the Bayso. In contrast, cultural clothes, including *landi*, *challa*¹⁴, *kollo*, and *Bayso-dunguza*, a traditional boat (*wollabo*) and beehives (*habos*)¹⁵, and their cultural house (*min*), are part of their material culture. However, currently, because of severe environmental changes in the region, the way of life of the Bayso, which was linked with their natural environment, has experienced heavy damage. Following their migration to the west coast villages and nearby towns, the Bayso are more affiliated with town lifestyles, particularly the youth. Hence, the Bayso began to consider some of their cultural traditions, such as their IBS, marriage customs, and cultural clothes, as backward.

¹³ This calendar divides days and months of the year based on the movement of moon and stars (SNNPR, 2008)

¹⁴ A leather dress made from goat skin for men (Tadele, 2014, p.56)

¹⁵ A traditional beehive of the Bayso is made of a *Habos* tree. *Habos* is a tree mainly found in hot and rocky lands. The stem and branches of this tree are thick and soft. The Bayso carve the inner part of the stem to host a bee swarm. Leaving a small passage for bees, they close the hole with a well-fitting stone (Eshetu, 2012). Every Bayso has his own *Habous* on rocky hills of Gidicho; even those who migrated to the mainland are used to visit their beehives occasionally to produce honey. *Haboos* tree with large number of beehives determines the social status of a person among the Bayso and customarily, a farmland that holds large number of *haboos* tree is given to eldest son. Customarily, cutting a *habos* tree and raping a girl had equal value among the Bayso and those committed such act were punished a heifer for a *Wonno* and for the daughter’s family.

CHAPTER FIVE

THE ENVIRONMENT AMONG THE BAYSO: ITS MEANING, TRANSFORMATION, AND COMPONENTS

This chapter explores the meaning and transformations in the environment in the study area, focusing on its essential components and Bayso's relationship with neighboring communities. From the interviews and FGD, I gained valuable insights about the unique characteristics of Gidicho Island and its surroundings, as well as the longstanding traditions of interaction and resource use that have shaped the Bayso way of life over the past thirty years.

5.1 Meaning and Transformation

The Bayso's understanding of their environment, including the current environmental change, is evident in the way they define the term 'environment' and their religious views. The meaning of the Bayso term '*ul*' approaches the English term 'environment' in that the phrase *ul kaniro kagi*, literally translates as 'things surrounding human beings.' These 'things' include, among others, crops, forests, grasslands, wildlife, domestic animals, insects, soil, rain, water, and wind. In Bayso's belief system, the life of all creatures on the earth, from tiny insects to human beings, was reliant on the provision of *ul* (environment). The indispensability of *ul* to Bayso's life is evident in the saying, *ul hiki enijorumaya*, which means '*ul* is the basis of life'. They conceived that all entities of *ul*, including living things (*nefo kaabo*) and non-living things (*nefo kaliki*), are creatures of *Wa'a*; hence, they all deserve respect, care, and protection. Therefore, it can be presumed that such environmental values and religious conceptions encouraged the Bayso to sustain the affluence of their environment, perhaps for centuries. In this regard, a ritual leader who gave me an interview in Alge village noted that:

Keeping the well-being of the environment was a task for each villager in those days. Above all, Wonnos and the elderly were responsible for communicating the value of the environment to their adherents and families, respectively. In this regard, for instance, I used to advise my villagers to construct or repair terraces (dem) in their farmlands to prevent water soil erosion and ensure fertility in slope areas, in addition to the fallow

method and crop rotation. Besides, we used to set fire to pasture land during a dry season to control pests that attacked our herds and to encourage new growth. In those days, exploitation of forest resources, including felling trees for construction purposes, required permission from a Wonno (Chumbaro Assefa, July 15, 2020).

The above excerpt highlights the deep appreciation and care the Bayso people have for their natural environment. Their practices regarding resource usage were approached cautiously. For instance, when a Bayso man aimed to build a house, corral, or fence, he was required to seek approval from his *Wonno*. Once he received permission, he would only cut down the necessary amount of material. Similarly, when gathering firewood, they would take branches from trees and utilize those that had already fallen. Furthermore, the Bayso people had a tradition of preserving a forest for honeybees and maintaining a buffer zone between their farmland and the lake (Abinet, 2019). An interview I conducted in the village of Mulato on August 16, 2020, can further illustrate the Bayso's concerns and practices regarding their natural environment:

Our life is inextricably linked to the environment that surrounds us. The lake water, the vegetation, and the soil have made unique contributions to our survival. As a result, we have developed various methods to preserve these resources. For example, in addition to taboos, sanctions, and other local mechanisms of environmental protection, we have a social norm that compels us to value trees. For example, when we plan a marriage for our sons, as in other ethnic groups, we send elders to the daughter's family. When they arrived, the elders were asked various questions by the daughter's family to obtain contextual information about the prospective son-in-law. One such question is whether the son, the daughter's future husband, has a tree (oddoro obboga) on his farmland where his wife would rest. This was because it was the norm in our community to have acacia trees (oddoro) on our farmland where we rest after hard work. The implication of this is that if you do not have an acacia (oddoro), you will not get a wife (Ganamo Ganbura¹⁶).

These concerns and values of the Bayso to their environment are very much related to the viewpoints of Boamah (2015), which argues that human beings are part of and entirely dependent on the environment. Of course, it is difficult to conclude that all human beings are entirely dependent on their environment for their survival. For instance, technologically advanced Western European and North American societies have the technology and finance to substitute significant parts of resources that they may tap from the environment.

¹⁶ Pseudonym given by the researcher

Yet even these societies are not completely independent of the environment. On the contrary, developing countries (e.g., Ethiopia) and communities who live in remote areas of the country (e.g., the Bayso) are almost entirely dependent on their natural environment for their sustenance.

Therefore, as can be seen from the above excerpts and discussions, any member of the Bayso who is familiar with such environmental values would not dare to deliberately harm his or her environment. The Bayso thought that violating these values and traditions had serious consequences. Firstly, abusing the environment, such as cutting down trees without a *Wonno's* permit, setting fire to forests, and killing wild animals, goes against the will of *Wa'a*. They believed that such actions would annoy *Wa'a* and cause him to punish the people. Secondly, the damage to the environment itself endangers the lives of the inhabitants. In this regard, based on how they realize and value their environment and the current environmental changes, I have categorized the Bayso into the following three categories: (1) The majority of Bayso people recognize the importance of the environment in their lives, and that damaging the environment is a form of self-destruction. At the same time, they unknowingly abuse their environment because of sociocultural traditions and values that encourage them to keep large herds. (2) Some of them have a comparable understanding of the importance of the environment to their existence, but because of their deviant nature, they abuse it carelessly. (3) Few others understand the value of the environment but are forced to abuse it due to a lack of alternatives to sustain their lives.

The Bayso people have realized the threats to their environment from traditional resource use and unpredictable weather patterns (extreme heat and heavy rains). They describe the environmental changes in their area as a decline in environmental quality. This decline is reflected in the reduced capacity of their environment to provide essential resources for their livelihoods, building materials for shelter, herbs for human and animal health, and sites for rituals and sacrifices. To confront these challenges, they have developed essential social norms such as sanctions/taboos and religious rituals that encourage sustainable practices. In addition, they have implemented adaptive methods (e.g., terracing (*dem*),

periodic movement of herds (*gondossa*), fallow method, fire, flood, and crop rotation). Consider the following brief discussions on these adaptive mechanisms.

According to an elder in the village of Mulato, *dem* (terracing) is a cultural structure used to prevent water-soil erosion in hilly areas. This structure is built with small logs, stones, grass, and soil. They place the structure at a distance of four to five meters. At the time of plowing, they unload the soil held in the plow on the *dem* and plant a running grass called *sordi* to strengthen it. In this way, they used to control soil erosion and moisture on their farmland. Elders used to advise their relatives not to destroy a *dem*, warning that if they did, they would lose the soil. I saw some old traces of *dem* in the middle of the two Bayso villages on the island (see Figure 3). However, I was told that the Bayso had already abandoned this tradition following their migration.



Figure 3: Dem, a traditional terrace of the Bayso

Source: Photo by the researcher, Gidicho Island, May 15, 2020.

According to one of the ritual leaders in Alge village, the Bayso had a tradition of leaving land fallow for a year or two to give the soil time to recover. In addition, they set fire to grazing land to encourage the growth of new grass and to control pests that affected the health of their herds. Furthermore, the Bayso, noticing the intrusion of earth salt (*gora*) into

grazing and agricultural lands, used flooding to neutralize the acidity of the soil, see Figure 4.



Figure 4: Impact of earth salt (*gora*) at coastal farmlands in Alge village

Source: Photo by the researcher, May 10, 2020

Accordingly, they would direct floods to areas of earth salt (*gora*) to mitigate the salinity of the soil and thereby use the land either for agriculture or to enhance its grazing capacity. They also had a tradition of crop rotation, believing that it avoided the scarcity of soil minerals. The Bayso usually rotated crops year after year, planting legumes (beans). The practice of planting leguminous crops nutritionally enriches the soil with nitrogen, which is incorporated into the soil with the help of a plow¹⁷. Furthermore, they fostered a spirit of solidarity by sharing resources with those who were in need, in an attempt to reduce the impact of resource degradation on their lives. This suggests that, in addition to religious rituals, the Bayso used various ways, including taboos, sanctions, and local mechanisms, to maintain the quality of grazing and agricultural lands. This is almost congruent with the

¹⁷ <https://www.vedantu.com/evs/leguminous-plants>

notion of adaptation theory, which posits that humans practice both innate and acquired mechanisms to cope with environmental change (Jansson and Ostrom, 2006).

In human ecology, the dynamic interplay between human and environmental systems is evident, as highlighted in Chapter Two of this study. Take, for example, the Bayso community, who see itself as an integral part of its environment. It is crucial to understand that their cultural practices are related to this context. The actions of the Bayso have a significant impact on their environment, both positively and negatively, while at the same time, their way of life is shaped by it. Consequently, it can be argued that the identity of the Bayso, their socio-economic practices, and their material and spiritual culture are a direct reflection of the environment. This includes the Gidicho Island and its environs, the lacustrine environment, and the cattle wealth. Therefore, the following sections will explore the insights of informants, who shed light on these components, illustrating the culture and environment link of the study area.

5.2 Components of *UI*

5.2.1. The Gidicho Island

Studies indicate that there are more than 21 islands¹⁸ in Lake Abaya. Of these, the largest one is Gidicho¹⁹, followed by Golmakka²⁰ (Hirut, 2004; Tadele, 2014). In my stay on the island, I realized that the landscape of Gidicho is rectangular-shaped, which is a relatively

¹⁸ Of the 21 islands, next to Gidicho and Golmaaka, Hirut (2004) identified some of them by name including, Megala, Agise, Shayitatwi, Langama, Ugayye, Get'eme, Ganjulle, Wolege, Adela, Daboye and Paragossa. In similar attempt, Tadele (2014) mentioned the other small islands which are near Golmaaka, such as Oddola, Oadophata, Oibire and Tabekor. According to Tadele, when people move on and off by their traditional boats, they use these dry lands to take rest particularly to eat their lunch or to renew their energy to continue the remaining distance without fatigue.

¹⁹ According to Wedekind (p.c.) in (Brenzinger, 1999) the term Gidicho derives from a Gedeo term meaning "small thing inside [the water]". Brenzinger estimated size of the island (extends about 8 km NS; and 3-4 km).

²⁰ *Golmakka* is located closer to the main land at the west coast in comparison to other islands. As I have personally witnessed, it is covered by thick forest of different species, but dominantly with that of acacia. Still this island provides the Bayso those who live in Alge with logs for construction of house, granaries and corrals and the soake tree for building their traditional boat. According to Tadele (2014), until 2010 it was inhabited by a Golmakka clan, but currently, they all left out to Alge and other villages at the west coast. Then it was given to foreign investor who intended to build a lodge to host tourist but not materialized.

longer distance from north to south and a short width from east to west. Also, I have perceived that the northern, southern, and eastern parts of the island are relatively flat lands, and the western and central parts are hilly. Mohamed and Teferi (2019) citing the account of *Keres Tenatena Tebeka Baleseltan* in the 1987 Ethiopian calendar indicated that the total area of the island is about 40 *gasha* or 1600 hectares, of this 116 hectares of land was reported to be cultivable land, while the remaining 1084 hectares of land was identified as uncultivable land covered by trees and shrubs of different kinds and almost 400 hectares as grazing land. But recently, because of the increasing lake water level, the entire cultivable and grazing land was submerged by the lake water.

Inhabitants of the island, particularly the elderly, highlighted that decades ago the hills of the western and central part of the island were covered by thick acacia, cactus, and hibiscus forests, whereas areas adjacent to the lake with vast grassland. The absence of human and animal disease and wild beasts, and rich grazing and agricultural land in the past, made it a perfect area for herding and practicing small-scale agriculture. In this regard, Mohammed and Teferi (2019) identified that Lalo, Rid, Elangé, Odola, Bato, Aka, Ĥakaré, Beleka, and Ćewto were some of the agricultural fields on the island. They also stated that Lalo and Rid were relatively extensive and fertile. Equally, the island was known for its animal population. Regarding the conduciveness of the island for herding, Professor Brenzinger witnessed that “donkeys from the Guji are brought to Gidicho to recover from diseases” (1995, p.5).

5.2.2. Lake Abaya

Lake Abaya is one of the natural resources of the study area that the Bayso are very concerned about. This is because its origin, existence, and resources in the lake are closely linked to the socio-economic and cultural life of the Bayso. Therefore, I believe that considering these features of the lake will contribute to our understanding of how the Bayso perceive the current environmental changes.

According to Bayso mythology, the vast area now covered by the lake was once flat land where the Bayso and Borana herded their cattle. They lived in temporary shelters scattered

throughout the vast area. One of the former ritual leaders, *Wonno* Chumbaro of Alge village, narrated the myth of the formation of the lake as follows:

The formation of the lake was related to a small water well from which inhabitants fetched water. Accordingly, on one occasion, a lactating woman went to a nearby water well to fetch water, but a woman whose attention was on her infant left the water well, which had to be closed after fetching water. Then, the water flowed out to cover the whole vast land, leaving hilly areas that formed the current islands in the lake (Aug.13, 2020).

On the contrary, accounts in geology and hydrology attribute the formation of the lake to volcanism and tectonic processes that played critical roles in the development of lakes and drainage systems in the East African Rift System. For instance, Ababu (2005) and Tadiwos (2011) reported that the main cause of the formation of lakes in the Main Ethiopian Rift was the faulting process associated with rift formation. Specifically, Tadiwos (2011, p. 22), in his article titled ‘*Geology and Geothermal Resources of the Northern Lake Abaya Area (Ethiopia)*’, posited that “the formation of Lake Abaya was accompanied by late Pliocene rift shoulder volcanic activity, such as Damota, which consisted mainly of trachytic lava and rift margin rhyolitic volcanic complexes, producing extensive ignimbrite successions that are now exposed along the rift escarpment.” The key point here is that while the myth emphasizes sociocultural insights and defines issues within the context of the Bayso, the scientific perspective is primarily concerned with the systematic understanding of phenomena based on observable facts. Accordingly, I argue that both perspectives contain valuable insights that must be interpreted within their specific contexts. However, as a student of the social sciences, I am more inclined to the emic perspective because it reflects Bayso's understanding of natural phenomena.

In old manuscripts and maps, Lake Abaya was referred to as Lake Margherita. This name was given by the Italian explorer Vittorio Bottego, the first European to visit the lake, who named it Margherita in honor of Queen Margherita, the wife of King Umberto I of Italy (Epple, 2016). The name Margherita appeared in earlier journals and books, such as Neumann (1902) and Hodson (1927), but it is no longer in use today. Lake Abaya is the largest of the Ethiopian Rift Valley lakes, situated at 6°5'14"N, 37°41'20"E (Fassil et al., 2017). It is approximately 60 kilometers long and 20 kilometers wide, covering a surface

area of 1,160 km². However, due to significant silt deposits transported from the surrounding highlands by flooding, the lake's water has been pushed out to the adjacent vast lands on the western shore. As a result, the width of the lake has been increasing (Schutt and Thiemann, 2006; Ababu, 2005). The lake has an average depth of 7.1 meters and a maximum depth of 13 meters, situated at an elevation of 1,268 meters, making it the largest rift valley lake²¹.

Geographical explorers who visited Lake Abaya, such as Hodson (1927), were astonished by its clear and fresh water, crowded with fish and hippos. In contrast, those who visited Lake Abaya nearly a century after Hodson's exploration observed that the water had turned reddish-brown due to a high concentration of suspended sediments transported into the lake by its tributaries (Schutt and Forch, 2002). The primary cause of these destructive floods is the loss of vegetation cover in the surrounding highlands. Lake Abaya is fed by three big rivers, including Bilate, Gidabo, and Galena, along with their tributaries, such as Hamessa, Baso, and Hare (Baxter, 2002; Schutt and Forch, 2002; Ababu, 2005).

Schutt and Forch (2002), who analyzed the lake level data, confirmed that there was an overflow from Lake Abaya to Lake Chamo until the 1970s. According to these authors, although the lake level consistently decreased from the 1970s until 1988, it was refilled again by 1996, albeit with some fluctuations. However, since 1996, the lake has shown a significant increase due to heavy precipitation in Southern Ethiopia, perhaps related to El Niño. In 2021, following heavy rainfall in the region, Lake Abaya experienced an outflow once again after forty years.

Lake Abaya is rich in natural resources, including minerals, various species of fish, hippopotamus, birds, a multitude of crocodiles, and other aquatic life (Hodson, 1927; Tadele, 2014). For example, Hodson (1927) wrote about nitrate soda (*meqado*), which the local community used to sweeten the test of their tobacco by crushing and mixing the *meqado* with tobacco. According to informants, still, this mineral is still used together with

²¹ www.rippleethiopia.org

tobacco by the communities around the lake, including the Guji and Borana. Regarding the fish resources of the lake, Samson (2015) reported that the lake contains 20 species of fish and has the potential to produce 600 tons per year. Among these species, he ranked the Nile tilapia, African catfish, Nile perch, and silver catfish based on their annual yield.

Remarkably, field data and various accounts reported that the Bayso people were not traditionally accustomed to fishing or consuming fish until recently. They believed that eating fish could be harmful and might lead to tooth decay (Epple, 2016). However, with the assistance of Christian missionaries, the Ethiopian Orthodox Church, and the *Derg* regime, they were trained in fishing techniques and provided with fishing equipment. As a result, fishing improved over time and became the main source of food and income for Bayso youth, as I observed. Currently, however, fish yields have decreased because the breeding grounds for fish, particularly the grass along the lake shore and the *borbona* trees, which created a favorable environment for mother fish to lay eggs, have either been cleared for traditional boat (*wollabo*) construction or eroded by strong waves. Furthermore, the underdeveloped fishing culture (e.g., overfishing) has exacerbated the problem (Tadele, 2014).

FGDs in Shigma and Bayso villages²² revealed that Lake Abaya is closely related to the socio-economic and cultural life of the Bayso in different ways. For instance, it provided a safe area where they had lived peacefully on the island for such a long period, using the lake as a shield from enemies in the past. In this regard, it was the Bayso who had the know-how to build a *wollabo* and a sailing, to transport people, animals, and goods throughout the lake region in the early days. In a related case, according to Braukmann (2012), islanders' cultural way of life persisted relatively untouched due to their geographical peripheral position till they were forced to the west coast by environmental degradation. Lake Abaya has been a source of water for its inhabitants for drinking, food preparation, personal hygiene, and for their herds. What is more, recently, it has played a

²² May 27, 2020

crucial role by providing water for agricultural investments on the west coast of the Lake. They also consider that washing a wound with lake water helps to cure it. Perhaps this is because of the saltiness of the lake water, since salty water kills bacteria (Khan, 2023). It also created an alternative means of income for the community, attracting the majority of the Bayso youth to fishing and horticulture (see Figure 5).



Figure 5: Onion farms on the west coast of Lake Abaya

Source: Photo by the researcher Alge, May 13, 2020

In addition, Lake Abaya was one of the ritual sites where *Wonnos* and ritual experts offered sacrifices and performed ritual activities. But still, they fear the lake, since they believe that there are demons or evil spirits such as *durisa* that risk human life and their herds. For example, travelers to or from Gidicho would stop for lunch in the middle of the lake, where an elder in the boat would throw a small amount of food in all directions to appease the spirits. Similarly, if someone died on the lake, they slaughter a goat so that its blood is sprinkled on the lake water, and part of the meat is thrown into the lake water by elders as a sacrifice (Epple, 2016).

The Bayso people understand that life at Lake Abaya can be full of challenges, including the threat of evil spirits, turbulent waves, crocodiles, and poisonous snakes. It is important for anyone approaching the lake to be aware of these dangers and to proceed with caution.

A fisherman in Gidicho Island informed me that they prepare their children in traditional boat building, sailing, and swimming to prepare them for such challenges. In a related case, sailing a traditional boat on a straight line, which demands physical strength and skill in sailing a boat, has been considered a criterion to witness a rite of passage from childhood to adulthood. As indicated by the Bayso, one of the challenges to sailing straight on the lake was the waves. There are quite a large number of waves in Lake Abaya, namely, *logodo*, *golando*, *ergado*, *hanagado*, *borodawo*, *hagasto*, and *shafa*, which arise from different directions of the lake and have different intensities. Of these, *hanagado*, *hagasto*, *logodo*, and *shafa* are the most powerful waves that induce significant damage to travelers and their goods. Details of these waves were explained by one of the sailors named Ankarso Anjulo²³, in Shigma village on Sep. 21, 2021.

The first wave is called Hanagado. This wave comes from the northern part of the lake and blows south, especially in the early morning, for four consecutive hours. Hanagado makes sailing quite challenging, especially during the winter season. The second wave is known as Hagasto, which comes from the northwestern part of the lake and blows from around noon until 10 o'clock local time. The third wave is called Logodo. This wave arises mainly from Lake Chamo, located south of Lake Abaya, and blows north. It usually occurs during the summer season and is the strongest wave on the lake, regularly starting after 10 o'clock local time. Finally, Shafa is a wave that comes from the east, starts at six in the morning, and lasts for two hours. This wave is relatively the weakest compared to the others mentioned above.

Furthermore, the lake water flooded grazing and agricultural lands and destroyed ritual, sacrifice, and burial sites on the island and the west coast. For instance, the rising lake water submerged hundreds of hectares of banana farms on the west coast (see Figure 6 and Appendix 5) and in doing so it dragged hundreds of the Bayso to poverty, from earning tens of thousands of Birrs per year to nil. However, despite all these challenges, the Bayso never complained about the lake, the fact that they consider it a source of their life.

²³ Pseudonym given by the researcher



Figure 6: Banana plantation overridden by the lake water

Source: Photo by the researcher, June 2020

They believe that such natural challenges are managed by the physical strength and skill of the Bayso men in building and sailing a traditional boat, as highlighted in the preceding paragraph. Above all, they consider that such challenges are the results of their transgressions. Accordingly, in such cases, they organized religious rituals (prayers and sacrifices) to *Wa'a* and spirits seeking their mercy. For instance, even today, when Bayso starts their journey on the lake, they pray to *Wa'a* to make their ride peaceful. In former days, when the waves were so strong and difficult to sail, they used to invite a ritual leader, seeking his blessing. On such occasions, a *Wonno* berates a lake wave not to harm his people, saying *beke logodo korowasi battatta hudiri, hudirina woga ayka*, to mean, the lake be cool...respect your people, keep the tradition.

Furthermore, the Bayso believed that a community that lives on an island and crosses a lake has to be friendly and respectful to all human beings and hate theft, deception, and other sinful acts to avoid any form of disaster from the Lake. In addition, as a community, they were guided by a life principle, 'being good for others is to be good for oneself', and also consider everyone as brother and sister, saying *napati kaayo kaodo yele*. Given the virtues mentioned, the Bayso throughout their history, until their forced migration to the

west coast following resource degradation on the island, theft, rape, early marriage, disrespecting elders, and ritual leaders. Likewise, the incident of elopement (*buta*) and early marriage were taboo and rare. This implies that the contact that they made with other ethnic groups on the west coast villages adversely affected the current life of the Basyo because of the diffusion of ideas and experiences of the dominant ethnic groups in the region, mainly the Gamo and Wolayta.

5.3 Cattle Wealth

It was difficult to consider life among the Bayso without cattle since herding was the major economic base of the community, perhaps for centuries, and their IBS was reliant on animal products. As a result, the majority of the Bayso had a large number of herds. Of course, in the Bayso tradition, counting herds was considered taboo, which triggered misfortune to their animals. So, they used to count the number of corrals that an individual owns. Concerning their cattle wealth and animal products, Gulla Zeleke, an elderly person from Alge village, stated the following:

As a herder community, we valued owning a large number of herds. Consequently, a rich man was estimated to own up to 15 corrals (a corral was estimated to hold 60-70 head of cattle), and a poor one was supposed to have at least one corral. An individual who owns 15 corrals is expected to have more than 1000 head of cattle, and we used to call such individuals by the honor name 'kumma kute', to mean a man who owns 1000 cattle. In those days, because of the large cattle size, we had excessive milk, which was beyond the consumption of family members and calves, so we used to feed our cattle by pouring it into a long trough (Jan. 11, 2021).

This informant's view coincides with the findings of Epple (2016), who noted that on Gidicho Island, individuals had hundreds of cattle, and the area was known for its milk and milk products. Goats and donkeys were merely sent to the surrounding hills, and no one looked after them. They fed on and bred in fields until the time they were to be slaughtered or sold, respectively.

In those days, individuals who owned such large herds used to prepare a feast (honey, bear, and meat) to celebrate their success with the community. But, according to Balamo Worba, an elderly man from Alge village, the purpose of this feast was to thank *Wa'a* for His provision of such a large herd and also to plead with Him to protect their cattle wealth from

disease and bad eyes. There was also a supposition among some of the elderly that it was intended to show the amount of animal wealth that one owns. On the occasion, dignitaries (ritual leaders, *balabats*, and ex-*Wonnos*) and the laymen were invited to enjoy the feast for about a week. Following this feast, the person ties a bell to the neck of a cow selected from his large herd. Hence, as his herd moves from one place to the other, the bell is heard from distant areas, and the local people understand that the herd of the popular man is around. The two events, the feast and tying a bell, were instrumental in declaring his new social status '*kuma kute*' to the community officially. In fact, '*kuma kute*' is an Oromo term that means owning 1000 head of cattle. According to Misginaw and Ayalneh (2012), this term is also used by the Soro clan of the Hadiya people, who are popular for their pastoral life. Though it needs further investigation into how the three Cushitic people (Bayso, Oromo, and Hadiya) shared this term, perhaps it gives a hint that there was/is a close relationship among them.

The study revealed that the Bayso value is large for the following reasons. Firstly, cattle, goats, and sheep had a crucial role in the Bayso religious rituals for the reason that religious rituals were not practiced without animal products such as meat, milk, butter, blood, and the contents of animal stomachs. Secondly, the leather of a cow or an ox was used to prepare women's cultural cloth (*landi*), and the urine of a goat was used to treat an individual infected with malaria and to wash clothes. Likewise, the Bayso had a belief that having good quality food (animal products) is like a vaccine to protect against infectious diseases. Consequently, they used to consume large amounts of meat, milk, and honey in those days. Above all, cattle wealth was a source of status '*kuma kute*', and a criterion for the candidacy of the office of *Wonno* and other ritual positions. In general, what we infer from the above explications is that the Bayso kept large herds essentially to meet their sociocultural traditions and values, without considering their environmental impact. Correspondingly, Hurni (1988) emphasized how much number is valued over qualities, because social status is traditionally associated with the number 'how many cattle one owns'.

Cognizant of such values, the Bayso were much concerned about their cattle. Accordingly, they never allow strangers to stare at their herds at a time when they are coming in at night. Therefore, if there is a stranger at the time when cattle come in, they advise their guest to be somewhere else, till the cattle come into the corrals. This was because they feared it might cause an unanticipated sickness and death of their cattle. In a similar vein, for the close attachment that they had to herds, if they planned to sell some of them, first, they communicated with their relatives. The reason was that, firstly, if they got the money, they had the chance to get it back easily. Secondly, they did not want to lose their productive cattle species forever. The Bayso also had a belief that a person might be economically poor, but should not be poor for what they eat. Because the social norm forced wealthy individuals in the community to support the poor by providing milking cows and goats, which was almost equivalent to present-day corporate responsibility.

Recently, because of the recurrent drought, the prevalence of some disease types such as *palmolisis* (diarrhea) and *gandi* (Abinet, 2019), and the intensification of agriculture on the west coast of the lake, they lost a significant part of their animal wealth. The Bayso effort to lessen the impact of cattle disease in traditional ways was not effective for the reason that medicinal plants deteriorated due to the harsh drought and environmental degradation. In general, the Bayso cultural life, which encompasses their daily food, clothing, Thanksgiving ceremonies, rituals of bereavement, marriage, and religious practices, heavily relies on animal products. As a result, it can be concluded that the loss of herds due to resource degradation and the spread of animal diseases risked their livelihoods and cultural traditions.

5.4 Bayso's Relation with the Coastal People

Since the Bayso have predominantly lived in a lacustrine environment, it is understandable that their efforts to communicate with neighboring communities involve crossing the lake water. This requires them to have some sort of device to sail across the lake. This challenge required them to be alert to their surroundings. In one such watchful move, they got a floating log on the lake, which is light and soft, locally known as a *borbono* tree. In such

an effort, the attentive Bayso built their traditional boat called *wollabo* from a *borbono* tree and trained themselves to sail through trial and error.

This invention paved the way for the Bayso to access coastlands (Corbett and Hayward, 1986). Presently, the Bayso are pleased about their *wollabo* and speak proudly that it was they who introduced such an invention to their neighbors. There is, however, an antithesis concerning the ownership of the raft, which argues that the Bayso adopted the raft technology from the inhabitants of Getsemé Island (Brenzinger, 1995). However, recent studies (e.g., Eshetu, 2012, Tadele, 2014; Epple, 2016) and this study ascertained that it is the Bayso who introduced the raft technology to other ethnic groups in the catchment area, including the Haro. Now the raft has become one of the cultural heritages that the Bayso pride themselves upon. In my field stay among the Bayso, I witnessed that every family in Gidicho has its *wollabo*. The Bayso built *wollabos* of different sizes for different purposes. In this regard, while smaller ones are used for personal use, such as fishing, the bigger one is used to transport people, goods, and animals up to a total weight of 500 kg (Eshetu, 2012).

In general, the Bayso have sailed to the east coast to the Guji people, whom they consider to be their relatives. In this effort, they used to visit Malka, a small market center on the east coast of the lake, every week. Even in times of drought, the Bayso would move their cattle to the Guji areas in search of pasture, and the Guji would do the same. They also maintained a wonderful relationship with the Gedeo, which was mainly based on trade relations. As part of their trade interactions, the Bayso provided the Gedeo with *buluko* (large handmade blankets), which they purchased from the Ochollo, a subgroup of the Gamo ethnic group, and bought *kocho*, a product made from *workicha* (*enset ventricosum*), from the Gedeo. The Ochollo were skilled weavers, and over time, the Bayso learned the art of weaving from them and incorporated it into their own culture (Eshetu, 2012).

The Bayso also established friendly relations with the Gamo highlanders (the Boreda and Done), especially at a weekly market in the town of Birbir, where the Bayso provided

buluko and earth salt²⁴ and the Gamo provided them with cereal crops such as barley and wheat, and sheep. According to some accounts, the relationship between the Bayso and other coastal communities, such as the Gamo, Gedeo, and Guji, is established by an oath (*amato*). For example, Eshetu (2012) and Mohammed and Teferi (2019) reported that the bond between the Bayso and the Gamo was formalized through *amato*. The *amato* ceremony involved a ritual in which the Bayso, who were herders of cattle and goats, offered a goat, while the Boreda (highland dwellers who were engaged in farming and herding cattle and sheep) offered a sheep. After slaughtering these animals, they crossed the blood, symbolically sealing the promise of alliance, friendship, and the avoidance of conflicts that could spill blood.

In addition to the relationship they established with the surrounding communities crossing the lake, the Bayso were curious about the vast grasslands along the western shore of Lake Abaya on their way to and from Gidicho. Thus, attracted by the affluent environment, they encouraged some of their relatives to move their cattle to that area. As a result, some courageous people, especially the youth and adults, took the first initiative to move with their cattle to the western shore of Lake Abaya. Thus, the first migration to the western shore of Lake Abaya may have started a long time ago, before the large-scale forced migration following the devastating drought of 1984-85. As estimated by Prof. Brenzinger, the Bayso had started their migration to the west coast of Lake Abaya five or four generations ago.

At the time when the first migrants arrived on the western shore of the lake (probably in the early 20th century), the vast area that stretches from Qorga (near the Hamessa River) to Arbaminch (then Abullo) from north to south, which is about 65 km, and from the foothills

²⁴ Earth salt is a salty soil chiefly found along the shores of lakes, including Lake Abaya and Lake Chamo. According to Wondu and Mahider (2020), the formation of earth salt is related to parental material, climatic conditions, irrigation water quality, irrigation frequency, and drainage issues. Among the Bayso, it is referred to as *goro* and the Gamo call it *bolle* or *addo*. In all communities, it has been added to cattle diet. Informants indicate that those living near the lake lead their cattle to the lakeside, while highlanders transport earth salt using mules to feed their livestock. The Bayso have designated the collection and sale of *goro* to widows as a means of providing them with economic support. Consequently, it is prohibited for other groups to engage in the sale of *goro* (Mohammed and Teferi, 2020).

of the Gamo highlands to the adjacent areas of Lake Abaya from west to east, which is about 15 km, was uninhabited, except for the periodic migration of some Guji-Ormo herders. This was because the area was known for its dense forest, malaria infestation, and people's belief that it was full of evil spirits. As a result, the surrounding ethnic groups, such as the Gamo, who settled in the western highlands, and others, such as the Wolayta, did not have the courage or the means to come to the region. Therefore, until the 1980s, when the Bayso were forced by the *Derg* regime to establish a formal village on the western shore of the lake, about 10 kilometers from the *woreda* town of Birbir, they lived scattered along the western shore, practicing pastoralism and small-scale agriculture.

Accordingly, the alliance that the Bayso forged with the Gamo allowed them to peacefully herd their cattle in a vast area along the western shore of Lake Abaya, stretching from the Hamassa River to Arba Minch. They also practiced small-scale agriculture, including the production of maize, beans, and cotton to support their economy. During this time, the Bayso were not able to establish a strong sociocultural link with the Gamo for the reason that they moved with their herds periodically in search of better pastures, lived scattered over a large area, and the thick forest hindered communication with others. On the contrary, they maintained a tradition of occasionally visiting their relatives on the island and providing them with cattle and crop yields. Attending religious and marriage ceremonies and funerals was considered a social norm. They even transported the bodies of their relatives to Gidicho Island to bury them in their clan's designated burial grounds. The following excerpt illustrates the strong bond between the Bayso and their relatives at home, as well as their connection to their cultural land.

Inhabitants who stayed in Gidicho until very recently and those who migrated to the west coast and other parts of the country considered Gidicho a center of our cultural tradition and identity. This is because of the umbilical attachment that we have to it since it is an area where we were brought up, a place where we tested life, a burial site where our deceased relatives rest in peace, and a ritual and sacrifice site where religious and social festivities were held. In general, it represents all walks of our life and identity (Manaye Malamo²⁵, Gidicho, May 21, 2020)

²⁵ Pseudonym given by the researcher

The above discussions and excerpt suggest that the Bayso people have a strong sense of affection for and belonging to their homeland, whether they live in Gidicho or have migrated to the west coast of the lake. However, climate change, sociocultural traditions, and economic pressures have eroded these relationships in recent decades, resulting in severe resource scarcity and forced migration. Resource degradation in the area has strained the community's values, concerns, social fabric, and sense of belonging to their homeland. As a result, traditional coping mechanisms that were once effective in navigating environmental challenges are now insufficient, thereby exacerbating the region's environmental problems.

CHAPTER SIX

MANIFESTATIONS OF ENVIRONMENTAL CHANGE IN THE GIDICHO ISLAND AND ITS SURROUNDING

The accounts of Smith (1897) '*Throughout Unknown African Countries*', Neumann (1902) '*From the Somali Coast through Southern Ethiopia to Sudan*', and Hodson (1927) '*Seven Years in Southern Abyssinian*' detailed the extent how much these authors were astonished by the scenery of Lake Abaya and areas around it. According to these accounts, the affluence and fertility of the land, the vegetation and enormous wildlife, and the majestic view of the lake were beyond human conception. Now, almost a century after their exploration, the region has lost that distinctive attribute, and the environment has changed drastically since then. Elderly Bayso, who participated in this research, also witnessed this change, comparing the abundant environment of their fathers and grandfathers with that of today. The Gidicho Island and its environs, once a perfect environment for its inhabitants and herds, have lost that grace and affluence (*mogassa*) and are currently characterized by drought and famine. Consequently, such changes in the study area have been manifested in different ways, including deforestation, lake sedimentation, the spread of alien plant species, land degradation, and decline of production. Details of each will be presented in this chapter.

6.1 Deforestation

The study revealed that environmental change in the study area is manifested in several ways. First, it is manifested in the decline of the vegetation cover. In this regard, a respected Bayso elder, Balamo Worba, clarified: "Gidicho Island and its environs were covered by dense forests and grass species decades ago, including *bedincha* (*acacia abyssinica*), *ododoro* (*acacia nilotica*), *wadesa* (*cordia africana*), *bebe* (*euphorbia tirucalli*), *selando* (*euphorbia abyssinica*), *sordi* (*cynodon dactylon*)²⁶, and *borbona* (*aescynomene*

²⁶ <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:397065-1>

elaphroxylon)²⁷ among others, which had socio-economic and ecological values”. For this reason, the elderly repeatedly used the term *mogossa* (affluence) in their interviews to describe the dense forests, vast grasslands, fertile soils, sufficient periodic rainfall, and a favorable environment for living, herding, and crop production, where there were no diseases and alien plant species.

These informants' viewpoints are consistent with the accounts of Asebir et al. (2018), who identified the area around Lake Abaya as one of Ethiopia's biodiversity hotspots. However, the expansion of agricultural activities, mainly driven by investment projects, smallholder farms, and the villagization program of the 1980s, has resulted in a significant loss of vegetation in the study area. As a result, numerous native plant species mentioned above are now threatened with extinction due to extensive deforestation. These include *Acacia nilotica* (*odoro*), which is harvested for construction and charcoal production; *Cordia africana* (*wadesa*), much valued for timber; *Aeschynomene elaphroxylon* (*borbona*), which is used to make household items such as stools, shelves, benches, and traditional boats (*wollabo*), and to feed cattle by chopping its stems during droughts; and *Cynodon dactylon* (*sordi*), which suffers from overgrazing in addition to drought. Equally, wildlife such as elephants (*daano*), lions (*lubaan*), tigers (*kefeel*), and antelopes (*gadanssa*) once inhabited the lake's coastal areas and were described in Newmann's account of 1902. Today, however, these remarkable species face imminent extinction. The destruction of their natural habitats and increased poaching have severely diminished their numbers as to FGDs in Mulato village.

The alarming rate of deforestation in this area has triggered disastrous flooding, risking the socio-economic foundation of the Bayso community. This also caused heavy sedimentation in the lake. The accumulation of silt is largely caused by extensive deforestation in the surrounding highlands that left the topsoil vulnerable to erosion. As highlighted by Sheer (2020), forests are guardians of soil. They reduce soil erosion by intercepting rainfall, maintaining soil moisture through transpiration, and securing the soil

²⁷ Refer <https://www.dictionary.com/browse/ambatch>

with their root systems. When deforestation occurs, we lose these protective services, exposing the topsoil to the dual threats of wind and water erosion. According to informants, during heavy rains, floods from the bare Gamo highlands carry away topsoil and deposit silt into the lake. This has led to a dramatic transformation of Lake Abaya, turning its once-clear waters, a condition witnessed by Hodson in 1927, into a muddy, reddish-brown state, depicting the alarming level of silt accumulation. The rising silt levels push the lake to encroach upon essential areas, drowning farmlands, pastures, burial sites, and vital community infrastructure, especially in Alge village. A concerning report from the *woreda* EPA office reveals that during the 2019-2020 period alone, the lake submerged 110.5 hectares of farmland (see Appendix V). This crisis not only jeopardizes agriculture and livelihoods but also threatens the cultural heritage and stability of the community.

6.2 Spread of Invasive Alien Plant Species

Invasive alien plant species are defined as plant species that spread beyond their normal area of distribution (Richardson et al., 2003). Presently, invasive alien plant species have been spreading easily and swiftly all over the world, given the modernization of the transport system that has interconnected the globe. Accounts reveal that there are about 35 invasive alien plant species in Ethiopia (Gedyon, 2017). According to Gedyon, the foremost of these are *Parthenium hysterophorus*, *Eichhornia crassipes*, *Prosopis juliflora*, *Lantana camara*, and *Xanthium strumarium*. These species are essentially found in areas such as grasslands, open woodlands, flood plains, wildlife parks, open fields of settlement, bare areas along roadsides, crop fields, and water points (Wakshum, Sebsebe, and Tamiru, 2018; Gedyon, 2017). These species have become a major threat to the country's water bodies, wetlands, agroecosystems, and grazing lands (Taye, 2003).

In the study area, roadsides, farmlands, public areas, and coastal areas of the lake were invaded by two of these alien plant species, namely, *Parthenium hysterophorus* and *Eichhornia crassipes*. So, in the following part of this chapter, I will explicate details of these species, focusing on their distribution and impact on the socio-economic life of the Bayso and the ecology.

6.2.1 *Parthenium*

Recently, parthenium has become one of the aggressively spreading and destructive alien plant species. Accounts disclosed that parthenium is originally from Mexico, and then it dispersed all over the world through different mechanisms, but essentially through humanitarian food aid (Wakshum, Sebsebe, and Tamiru, 2018). Regarding its introduction to Ethiopia, there are two suppositions. The first one assumes that it was introduced through humanitarian aid in the 1980s following the devastating drought in the country (Hedberg et al., 2004). The second supposition relates it to the aggression of the Somali forces (McNeely et al., 2001) that the weed came to Ethiopia via military vehicles during the Ethio-Somalia war of 1976-77. Regardless of the way through which this weed entered Ethiopia, Parthenium is easily dispersed throughout the country because of its unique features, including high seed production capacity, adaptation to wide climatic and soil conditions, and spread by animal movement (Wakshum, Sebsebe, and Tamiru, 2018). In the context of the study area, informants noted that parthenium was introduced to their locality via food aid following drought incidents in the region since the 1980s. Among the Bayso, parthenium is known as *faramsiisa*. The connotation of the term is essentially associated with its aggressive spread and impact on the socio-economic life of the Bayso and the ecology. Danboye Ekka²⁸, an elderly person from Alge village, shared his opinion as follows:

Currently, if farmland is invaded by faramsiisa, there is no way to reclaim it. This is because it drains the fertility from the land and dominates all the other plant species around it. We have not been able to control it, and there is no effective way to eradicate it. So, the only option for desperate farmers is to abandon the land for good. This means giving up the land once and for all because of this weed. That is why we use the term faramsiisa to describe the extent to which the weed has forced us to evacuate our farmland. (December 13, 2021).

At the moment, on Gidicho Island and in areas on the west coast *faramsiisa* is well-suited in farmlands, grasslands, roadsides, and open spaces (consider Figure 13).

²⁸ Pseudo name given by the researcher



Figure 7: The spread of parthenium in farmland in Alge village

Source: Photo by the researcher, Alge, Dec.11, 2021

As highlighted in the excerpt above *farmssiisa* caused the decline in agricultural products, exhausting the fertility of the soil and damaging crops on farmlands. In doing so, it ruined the economic base of the Bayso, which was already endangered by periodic drought and rising lake water levels. Similarly, its prevalence in open spaces caused discomfort while walking through and enjoying public spaces. What is more, recently, because of the scarcity of pasture, cattle fed on this weed, and this changed the taste of milk and meat. Congruently, Nazrawit, Abraham, and Gedyon (2020); Wakshum, Sebsebe, and Tamiru (2018) reported that parthenium deteriorated the meat and milk quality of cattle and sheep due to the consumption of this weed. Likewise, the accounts of Bajwa et al. (2018), Mekonnen (2017), and Kilewa and Rashid (2013) established that parthenium causes serious allergic reactions, respiratory problems, and other health complications, including eye irritation, itching, inflammation of the skin, diarrhea, mouth ulcers with excessive salivation, and death in livestock.

In sum, as can be inferred from the above explications, the impact of *faramsiisa* on the life of the Bayso has two main aspects: economic and ecological. The economic impact is

mainly related to the decline in agricultural products. The fact is that the weed sucks the fertility of the land and prevents the growth and development of other plants, including crops. According to Neguse and Kifle (2016) *Parthenium* competes and suppresses the growth of crops due to its allelopathic²⁹ nature, and its seeds change the normal flavor of crops when mixed with them. Thus, together with the recurrent drought, the Bayso faced a chronic food shortage that exposed them to famine and extreme poverty. Similarly, it also affected the livestock of the Bayso by invading available grasslands and requiring them to feed desperately on this weed. Consequently, cattle experienced health problems and, in some cases, it caused death. The ecological impact of *faransiisa* was related to the decline in soil fertility and native plant species. For instance, it impaired the development of native grasses such as turf, *sordi*³⁰, which had a paramount role in maintaining soil fertility and erosion. Above all, *sordi* is a major grass species for fodder and for building the traditional terrace called *dem*. Therefore, the loss of *sordi* means soil erosion, infertility, and shortage of forage, which in turn causes a decline in crop and animal products. In this way, *faransiisa*, contributed to the decline of the ecology, which is a base for the socio-economic and cultural life of the Bayso. Consider Figure 14 to realize how much cattle were suffering from a decline in grazing.

²⁹ Refers to the ability of a plant to inhibit the growth of other plant by releasing chemicals (Lopes et al.2022).

³⁰ *Cynodon dactylon*



Figure 8: Cattle foraging on Gidicho Island

Source: Photo by the researcher, Gidicho, June 2020

6.2.2 *Eichhornia crassipes*,

Accounts (e.g., Wakshum, Sebsebe, and Tamiru, 2018) indicate that *eichhornia crassipes* (commonly known as water hyacinth) is native to the Amazon basin. It is a perennial plant type, which is characterized by a broad, thick, shiny, and floating on a water surface, and may rise above the water up to one meter. There was an assumption that it was introduced to Ethiopia long ago, and for the first time, it was seen around Koka dam along Awash River, in Gambella along Baro, Gilo, Pibor, and Sobate rivers (Midgley, Hill, and Villet, 2006). Studies revealed that nowadays, water hyacinth is prevalent in Ethiopia in higher latitudes as a temperature rise (Rahel and Olden, 2008) and in tropical and sub-tropical water bodies where nutrient concentrations are often high due to agricultural runoff, deforestation, and insufficient wastewater management (Wondimu, 2016). Currently, it infests major rivers and lakes of the country. The study revealed that Lake Abaya and its surroundings, which are identified by high temperature, loss of a significant part of its vegetation cover, flooding, and silt accumulation in the lake, have created fertile grounds for the expansion of this weed. Among the Bayso water hyacinth is known as *hauri*.

The EPA officer of the Gamo zone has estimated that nowadays (at the time of this study), the coastal areas of Lake Abaya from Arbaminch to Qorga are covered by water hyacinth. In the same way, the Mirab Abaya *woreda* EPA officer expressed that almost 680 hectares of Lake Abaya are covered by this weed. According to this officer, efforts were made to remove this weed from the lake, mobilizing the community around the lake for a one-day labor per week. However, I was not able to witness any such efforts during my stay in the study area. Perhaps, there might be some attempts in this regard; however, since Lake Abaya is the home of the killer Nile crocodile, therefore, it is not as easy as it is in Lake Tana to use human labor to clear *hauri* from the lake. As a result, no one in the region has taken effective action to halt the rapid spread of this weed. Based on my field observations, I can argue that the weed is spreading rapidly in the coastal parts of the lake and the marshes (see Fig. 15).



Figure 9: The spread of *Eichhornia crassipes* at Gidicho Island

Source: Photo by the researcher, Gidicho, June 2020

The Bayso believed that *hauri* impaired their life in different ways, but principally in areas of fishing and boat transport. In this regard, during my stay on the island, I interviewed one of the fishermen in Shigma village. Here is an excerpt from his interview.

If you had visited this area (pointing to the lakeside) perhaps decades ago, it was covered by different native grasses and tree species, including bulrush and borbono, respectively.

These species were well adapted to the lacustrine environment and protected coastal areas from the impact of heavy waves. This created a convenient environment for mother fish to lay eggs. However, recently, because of the destruction of the borbono tree and bulrush, coastal areas were exposed to lake waves, and hauri infested the area. Therefore, because of the destruction of breeding sites and heavy mats of hauri, mother fish were forced to flee to distant areas. Consequently, there is a substantial decline in fish products, and fishing has become tiresome (Sagoya Alando³¹, Dec. 11, 2021).

As indicated in the above excerpt, the lives of the Bayso youth, who engaged in the fish sector, were affected tremendously because of the damage to the lacustrine environment. In fact, in the early days, due to cultural reasons, the Bayso were neither eating fish nor fishing. However, following the severe drought in the region that damaged the socio-economic bases of the community in the 1980s and the ensuing poverty in the region, the government, religious institutions, and NGOs introduced fishing as a way out of the problem. With this, nowadays, fishing has become the only means of survival for those who lost their farmlands due to the increasing lake water, as there was no extra land to compensate for such losses. However, as indicated in the excerpt, because of the damage to native plant species in coastal areas and the invasion of *hauri*, the fish resource has declined, and this has deteriorated the life of the Bayso. Equally, Kateregga and Sterner (2009) found that the dense mat cover, together with the root system of hyacinth, damaged the breeding and nursery grounds of commercially important fishes in Lake Victoria. Besides, sailors who gave me an interview in Shigma village on Gidicho Island also noted that the heavy mat of *hauri* has created a hindrance to their sailing, both with traditional and motor boats. One of these sailors expressed the following.

Recently, the lake coast was fully covered by hauri, and it became tedious to navigate over the heavy mat of this weed. Therefore, it required additional labor to push boats to the center of the lake, and on some occasions, this exposed us to the threat of crocodiles and hippos (Markos Manaye, May 15, 2020).

³¹ Pseudonym given by the researcher

Congruently, De Groote et al. (2003), Enyew et al. (2020), Wakshum, Sebsebe, and Tamiru (2018) underlined that the heavy mat of water hyacinth considerably affected navigation in water bodies of Ethiopia.

6.3 Land Degradation

Land degradation is a complex term that has no single unique feature, but rather describes how one or more of the land resources (e.g., soil, water, vegetation, air) have changed for the worse (Johnson et al., 1997). According to the UN (2012), land degradation is the reduction of biological or economic productivity of rain-fed croplands, irrigated croplands, pasture, and forests because of human and natural factors. Human causes of land degradation are related to land clearance, including deforestation, depletion of soil nutrients, overgrazing, and inappropriate irrigation (Scheer, 1999). In Ethiopia, land degradation is a common environmental problem and one of the major causes of low and declining agricultural productivity, causing severe food insecurity and rural poverty (Demel, 2001). The heavy deforestation that the country experiences every year has triggered huge soil erosion, which is perhaps the first in the world (Paulos, 2001).

As indicated in Chapter Five of this dissertation, which focused on the perception and understanding of the Bayso on their environment and the account of explorers in the introductory part of this chapter, the Gidicho Island and areas of the west coast of Lake Abaya were rich in vegetation cover and fertile soil. In addition, much was said about the conduciveness of the island environment for herding, because of the rich pasture, and the absence of disease and wild beasts. In this regard, an elderly³² informant from Alge village lacked words to describe the splendid life that the Bayso enjoyed in those days. However, recently, the island environment was completely changed to shrublands and thorny plants (see Figure 16), and a large part of the grazing and agricultural fields were changed either to dusty lands or submerged by the lake water (see Figure 17). Equally, Berry (2003) noted

³² Machuqe Gallo, Alge, Oct. 14, 2021.

that land degradation was manifested by the expansion of thorny weeds in areas once rich pastures, soils becoming thin and stony, and a decline of vegetation cover.



Figure 10: Thorny plants on hilly areas of Gidicho Island

Source: Photo by the researcher, Gidicho, May 2020



Figure 11: Degraded grazing lands on Gidicho Island

Source: Photo by the researcher, Gidicho, June 2020

This suggests that clearing forests and woodlands to satisfy inhabitants' needs and wants exposed the topsoil of the study area to water soil erosion. Thus, the topsoil is washed away by heavy rain, essentially during the rainy season of the Bayso (*badessa*), and this has deteriorated the life of the Bayso.

6.4 Decline of productivity

Declining agricultural productivity refers to a persistent decline in the efficiency of converting agricultural inputs (e.g., land, labor, and capital) into agricultural outputs such as crops and livestock (Dharmasiri, 2009). This problem can be observed through a variety of indicators, such as a decline in the average yield per harvest (Fuglie, 2018). Researchers (e.g., Epple, 2016) and community leaders have expressed concern about crop and livestock productivity on Gidicho Island and its environs in the wake of the severe 1984-85 drought in the region that caused severe resource scarcity. Similarly, local officials and former *Wonnos* have also explicated how resource degradation in the area has significantly affected their livelihoods, relating it to the decline in milk production and the decreasing banana and maize yields from their farms over the past three decades.

One of my key informants from the village of Mulato detailed the following points about the decline in milk production, which he linked to the lack of pasture, the spread of disease, and the introduction of alien plant species. Consider the following excerpt:

In those days, before the 1980s, we were the top milk producers in the region. For instance, my family owned more than ten milking cows. We milked our cows early in the morning and at night, collecting over one liter of milk from each cow each day. This meant we had more than 10 liters of milk daily. As a result, we churned milk every two days to make butter. As a result, we had enough dairy products in our diet. We also supplied large quantities of milk and milk products to the weekly markets in Malka and Bibir on Tuesdays and Saturdays, respectively. Sometimes, we were forced to feed our cows the surplus milk. However, these days, we have lost a significant portion of our cattle due to a shortage of pasture, the spread of cattle diseases caused by erratic weather, and the invasion of alien plant species like faramsiisa. Consequently, we are currently unable to get even a cup of milk for our children. Today, I have two cows, but I am unable to get even a liter of milk from them. Additionally, caring for them and covering their medical expenses costs me a substantial amount of money (Karbore Kumato³³, May 13, 2020).

³³ Pseudonym given by the researcher

Some informants added how the presence of alien plant species affects cattle health and contributes to a decline in milk production. According to these informants, the spread of *faramsiisa* has significantly damaged pastures, affecting cattle health and altering the taste of milk. Parallel to this, Abera (2023) and the Policy Study Institute [PSI] (2023) related the decline of milk production to a shortage of feed, disease, lack of supportive policy, and invasive alien plant species. According to the CSA (2017), the national average of milk products is 1.37 liters per cow per day. This is far more than the amount of milk that the Bayso collected from a cow per day recently, as highlighted in the excerpt above.

Crop productivity in Ethiopia is an area of ongoing research. Despite the increase in yields of crops such as maize and wheat, the agricultural sector in Ethiopia faces various challenges, including population growth, climate change, natural resource depletion, and political instability, that have been affecting agricultural productivity (Ibsa and Feysal, 2021). In terms of crop production in the study area, I focused specifically on maize productivity, as maize is the main staple food for the Bayso. In this context, the Bayso compared their current maize production with that of thirty years ago. Below is an excerpt from my interview with one of my key informants that explicates the case.

In the past, although we were pastoral, we cultivated cereals such as maize and sorghum mainly for our own consumption. Our farms were no larger than a quarter of an acre, yet we managed to produce three to four quintals of maize each year, which is approximately 12 to 16 quintals per hectare. We achieved this without much difficulty, as the soil was fertile and we received a sufficient amount of rainfall throughout the year. However, currently, we are required to use agricultural inputs such as improved seed varieties, fertilizers, and pesticides to enhance productivity. Despite these efforts, we have not been able to harvest the expected yields, and at times, we have lost entire crops due to invasive alien plant species, severe drought, and a lack of financial resources to purchase the necessary agricultural inputs. Consequently, we are unable to produce the required amount of maize. Imagine how much we are suffering from food insecurity today due to the growing population (Lageru Landabo³⁴, Bayso, Nov. 13, 2021).

The above excerpt shows that, let alone today, where the study area has experienced drastic resource degradation, in the early days when Gidicho Island and its environs were known for their rich natural resources, the maize production of the Bayso was estimated to be 12

³⁴ Pseudonym given by the researcher

to 15 quintals per hectare. That means it is much lower than the national average of 25 to 26 quintals per hectare reported by Amanuel and Worku (2024).

The other important finding highlighted in this study is the banana productivity of the area and the challenges it faces. Informants noted that over the past two decades, the banana farm has emerged as one of the leading cash crops and income sources for the inhabitants of the lowland Gamo zone. This zone covers 70% of the country's total banana market supply (Common Fund for Commodities [CFC], 2004). Focus group participants in the village of Alge revealed that the Bayso, who own land in the coastal areas of the lake and along the floodplains, have highly productive banana farms. The fertile soil and easy access to irrigation have contributed to their success. Participants reported that these farmers harvest between 700 and 800 kgs of bananas per month from half a hectare, which generates about seven to eight thousand Birr per month. This income has enabled them to build new houses, pay for their children's education, purchase water pumps for irrigation, and meet their basic needs. However, the rising water levels in the lake have submerged large banana plantations. Consequently, the production of bananas has diminished considerably. As a result, farmers who once earned a substantial monthly income are now left with no means of support.

The findings demonstrate that resource degradation is a crucial indicator of environmental change in the study area. Driven by either natural forces or human activities, these changes often lead to severe issues, including deforestation, flooding, the spread of invasive plant species, and a decline in essential resources, as discussed in this chapter. These effects underscore the urgent need to address the effects of environmental shifts on the availability, quality, and sustainability of natural resources in Gidicho Island and its environs.

CHAPTER SEVEN

FACTORS FOR ENVIRONMENTAL CHANGE IN GIDICHO ISLAND AND ITS ENVIRON

Environmental change has been caused by a variety of factors, including human activities, natural hazards, and structural factors, although there is no consensus as to which of these factors play the main role or which others are supportive. While this is a theoretical consideration, the purpose of this chapter is to identify which of these factors have triggered environmental change in the study area through an analysis of informants' views and geospatial data. In this regard, the results show that the factors responsible for the current environmental change in the study area are 'human activities', including the actions of the Bayso and other communities in the catchment area of Lake Abaya, and strangers who have come from different parts of the country. Equally, 'natural hazards', essentially droughts and floods, and 'structural factors', such as poverty, population growth, villagization, and investment projects along the shores of the lake, contributed to the problem. Details of each of these are discussed below.

6.1 Human Activities

Since the appearance of human beings on the planet Earth, humankind has exploited natural resources to satisfy its needs and wants. In the process, humans have altered and damaged their environment (Moran, 2010). However, as indicated earlier in this dissertation, it is a fallacy to conclude that all human activities trigger damage to the environment since such a conclusion risks overlooking positive contributions. Nevertheless, several authors (e.g., Rechkemmer and Falkenhayn, 2009; Shibru and Kifle, 1998) blame human actions for the current environmental change.

In light of this general view, this study attempted to explain the experiences of the Bayso of Gidicho Island and its environs. As explained in Chapter Five above, the Bayso were very much concerned about their environment and had local knowledge and experiences that helped them to maintain the affluence of environment. The Bayso's commitment to

environmental conservation is evident in the remains of structures like ‘*dem*’ (terraces) throughout the island and in their traditional expressions. For instance, the phrase ‘*dem arotyde...dem barowa*,’ which translates to ‘do not destroy *dem*; if you do, you will lose the soil,’ highlights the need to preserve these terraces for sustainable farming. This raises an important question: if the Bayso people value their environment that much, what has caused the present environmental degradation on Gidicho Island and in areas along the western shore of Lake Abaya? In this regard, the study revealed two pressing issues. Firstly, for the majority of the Bayso, since they were formerly a pastoral community, their impact on the environment, particularly on the forest resources of the region, was insignificant. However, they recognized the impact of overgrazing due to the large herds that they kept in the past. The following excerpt is from an interview with one of the ritual readers in Shigma village on May 15, 2020, which illustrates this case.

As a herder community, we value herds greatly; we never thought of life without them. Since they were sociocultural and economic assets of our life, every one of us needed to maximize the number of our herds to achieve the sociocultural merit that the community set [candidacy for a Wonno and Woycha] for important positions. People never considered the environmental damage [large herds] induced as a result of overgrazing. You see, we realize things lately after the recurrent droughts devastated our lives, famine ruined us, and above all, after we lost our cattle (Gamado Ganbura³⁵).

In addition to overgrazing, I contend that as a rural community, the Bayso had also induced some pressure on the environment in their endeavor to satisfy their basic needs. For instance, they need small plots of land for agricultural activities and housing, which entails clearing forests and shrublands. To build their traditional house (*min*), they required the best quality and a large amount of forest resources. In general, like other rural communities in Ethiopia, the Bayso have been using forest products to build their shelters, fences, and corrals (Figure 12).

³⁵ Pseudo name given by the researcher



Figure 12: Forest products used for construction

Source: Photo by the researcher, Gidicho, 2015 Source: Photo by the researcher, Alge, Nov. 2021

These constructions result in large withdrawals from the forest over time. This is evident in the fact that about 74% of housing units in rural areas depended on forest products (see Mekete, 1996). Secondly, some Bayso informants accuse other communities who have been living in the catchment areas (e.g., the Gamo and Wolayta) of environmental degradation in the area. The coming of the Gamo to the lowland areas was related to the socio-economic and political dynamics in the region. According to Freeman (1999), due to the socio-economic and political change in the Gamo highlands in the late 19th and early 20th century, the Gamo highlanders experienced a drastic decrease in the average size of land holdings. Freeman noted that the Gamo who suffered from such resource shortages were forced to encroach on pasture and marginal lands, and this caused serious ecological damage. Therefore, it is believed that this caused a decline in the amount of agricultural surplus that people could produce. Thus, it is understandable that the Gamo who suffered from resource scarcity in their home areas were forced to descend to the west coast of the

lake. Likewise, the Wolayta³⁶ (one of the densely populated areas in the country), who suffered from similar socio-economic problems in their home areas, flooded the area, hoping to benefit from the rich resources of the region. According to one of the local officials in Alge village, on their arrival, the Gamo and Wolyta migrants engaged in clearing forests for agricultural land and cutting trees for construction. At the same time, since they had no other means to sustain their life, perhaps until they had their first harvest, they engaged in selling logs that helped build houses, fences, and corrals in the region, and collecting firewood and burning charcoal for market and home use (see Figure 13).



Figure 13: Charcoal production in Alge village

Source: Photo by the researcher, Dec. 2021

The Bayso accused the Gamo and Wolayta of introducing the production of charcoal for home use and market, and selling of firewood, which was odd to the Bayso. The aggressive exploitation drastically changed the scenery of the region. In this way, for the first time in

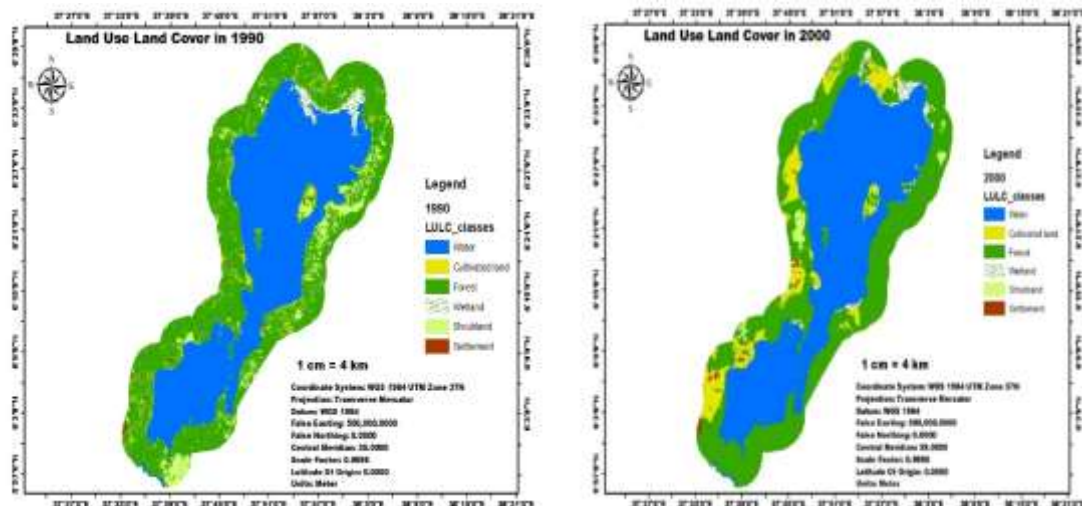
³⁶ According to the Socio-Economic Profile of Wolayta Zone, “the zone represents one of the most densely populated parts of the country. Average population density (crude) for the Zone was about 342 persons per square kilometer, though it may rise well over 500 persons/km² for some of the districts” (Wolayta Zone Finance and Economic Main Department [WZFEDO], 2003, 3).

its history, the rich natural resource of the west coast of Lake Abaya was exposed to destructive human actions.

FGDs conducted in Alge village (Aug.23, 2020) and in Mulato village (Oct.18, 2021) have emphasized both internal and external human factors for forest and land degradation in the area as follows:

The forest resource on the west coast of the lake was cleared for agricultural land, construction, firewood, and charcoal production, dominantly by the Gamo and Wolayta, who came to the area in the last four/five decades. But, the damage to the island environment is associated with overgrazing, since the majority of our people had large herds.

These discussants' viewpoints about the impact of human activities on the natural environment of Gidicho Island and areas on the west coast of Lake Abaya were analogous to the analysis of LULC change of the catchment area within the 5 km² buffer in general and the study site in particular for four consecutive decades from 1990 to 2020. As indicated in Figure 14 and Figure 15, and Table 2 and Table 3, respectively, cultivated land and settlement classes exhibited a significant increment, while forest and shrublands diminished gradually in the same period.



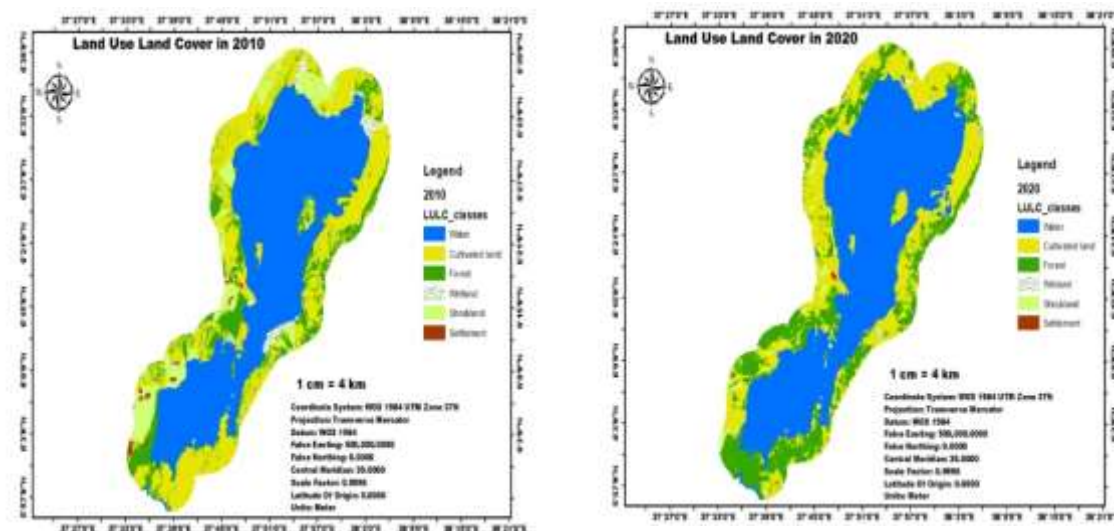


Figure 14: LULC change maps of the catchment (1990-2020)

Source: GIS data of the study area

Table 2: Area and percentage of LULC changes in the catchments from 1990-2020

No	LULC The whole area (buffered 5km)	1990	(%)	2000	(%)	2010	(%)	2020	(%)
1	Cultivated land	9,374	4.1	19,919	9	66,604	30	79,641	35.92
2	Forest	92299	42	85647	39	24870	11.2	21038	9.49
3	Shrubland	13,371	6	2415	1	16274	7.3	1623	.73
4	Wetland	3987	1.8	3581	1.5	3969	1.8	42	0.02
5	Water bodies	102357	46	109189	49	108919	49.2	116886	52.71
6	Settlement	343	0.1	980	0.5	1095	0.5	2501	1.13
Total		221731	100	221731	100	221731	100	221731	100

Source: GIS data of the catchment

As depicted in Table 2, cultivated land has made a significant increment in catchment areas of Lake Abaya within a 5 km² buffer from 9374 km² (4%) in 1990 to 79641 km² (35.92%), and settlement from 343 km² (0.1%) to 2501 km² (1.13%) in the same period. But it should be clear that the increment of cultivated land was a result of human action, including clearing forests and shrublands for construction and farming. Though not comparable with that of cultivated land, settlements established in the region in the last 30 years had an

impact on both the forests and shrublands of the region. As can be inferred from the Table, the catchment areas of Lake Abaya within a 5 km² buffer had lost 71,261 km² (32.5%) of forest in the last 30 years. Equally, the shrubland of the region has declined from 13,371 km², which was 6%, in 1990 to 1623 km² (0.73%) in 2020. Therefore, it can be concluded that the loss of such large forests and shrubs was a result of human activity, which is manifested in terms of the expansion of cultivated lands (peasant farms and agricultural investments) and the expansion of villages and small towns in the region. In addition, it is understandable that the growing number of inhabitants and livestock population in the region has worsened the devastation of the natural resources in the region.

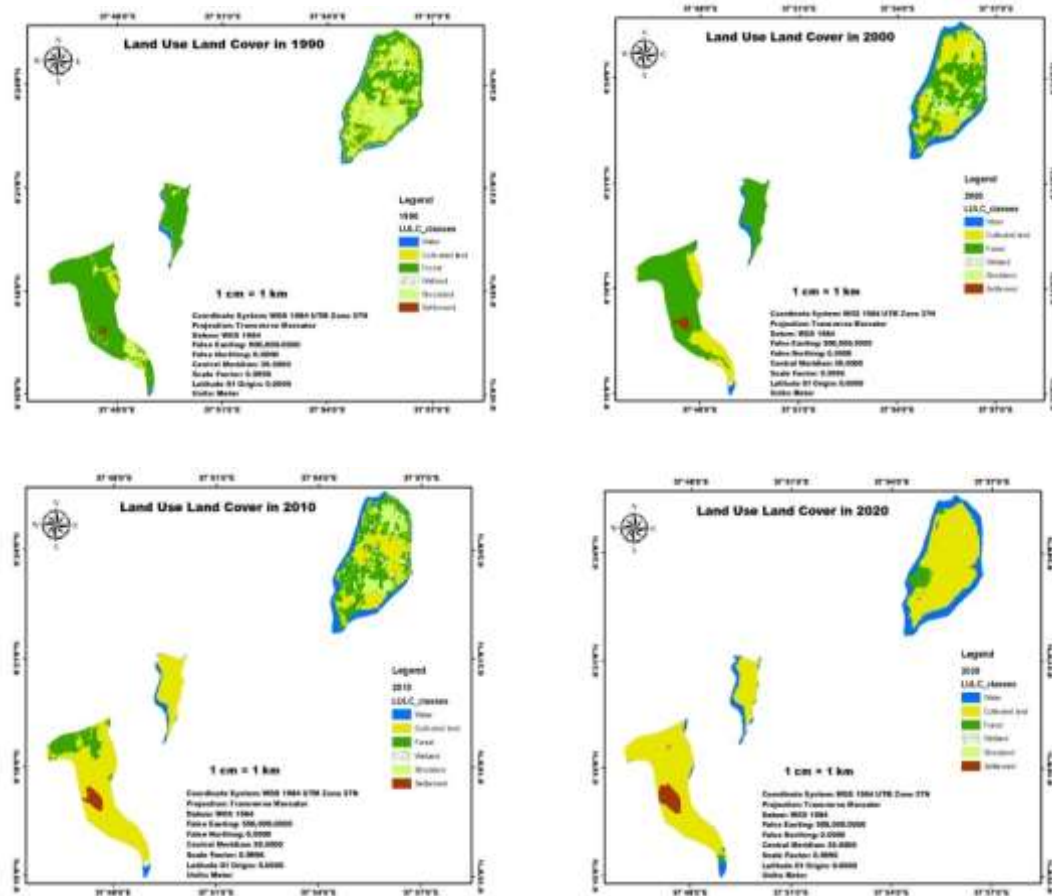


Figure 15: LULC change maps of the study area (1990-2020)

Source: GIS data of the study area

Table 3: Area and percentages of LULC changes in the study area from 1990-2020

No	LULC classes	1990		2000		2010		2020	
		Area (km ²)	%	Area (km ²)	%	Area (km ²)	%	Area (km ²)	%
1	Cultivated land	616	16	1006	25.9	2086	53.6	2886	74.2
2	Forest	2335	60	2151	55	942	24.2	145	3.7
3	Shrub land	719	18.5	263	7	372	9.6	12	0.3
4	Wetland	52	1.3	4	0.1	11	0.3	10	0.3
5	Water bodies	153	3.9	424	11	403	10.4	692	17.8
6	Settlement	14	0.3	41	1	75	1.9	144	3.7
Total		3889	100	3889	100	3889	100	3889	100

Source: GIS data of the study

With regard to the LULC change analysis of the study area, cultivated land has increased from 616 km² (16%) in 1990 to 2886 km² (74.2%) in 2020. Similarly, settlement increased from 14 km² (0.3%) in 1990 to 144 km² (3.7%) in 2020. However, this change was a result of the expansion of peasants' farmlands, investment projects, and the villagization scheme, essentially at the expense of forests and shrublands. As can be seen in Figure 10 and Table 3, forestland has shrunk from 2335 km² (60%) in 1990 to 145 (3.7%) in 2020, whereas shrublands decreased from 719 km² (18.5%) in 1990 to 12 km² (0.3%). During the same period, settlement schemes consumed 130 km² of land in the study area, which is about 3.7% of the study area in 2020.

Comparatively, the net increase of cultivated land in the last 30 years in the study area, which amounts to 58.2% is by far greater than that of the LULC change patterns of the catchment areas within the 5 km² buffer, which was only 31.82%. This is related to the congestion of a large number of people in areas of forests and shrublands of the study area, mainly in Alge village and other small villages, as a result of the villagization program in 1986-87 and the investment projects. But the point is that the expansion of cultivated land

was fundamentally driven by human action. This means the Bayso, the Haro, the Wolayta, the Gamo, and other ethnic groups, who came from different parts of the region, and investment activities have damaged the forests and shrublands of the study area, intending to secure and expand agricultural lands. This confirms that human activity in the study area had a greater contribution to the exhaustion of forests and shrublands. The other significant change in the LULC change in the study area was water bodies, including Lake Abaya and tributary rivers, which increased from 3.9% in 1990 to 17.8% in 2020. Perhaps, this change can be related to the huge flood incidents due to the decline of forests and shrublands, and the swelling of rivers due to high precipitation in recent years in the study area.

6.2 Natural Hazards, *Daano*

The other important factor mentioned is natural hazards (*daano*), which are a result of natural and sociocultural factors. According to some of my key informants³⁷, natural hazards such as drought and flood cause environmental destruction. But they also noted that such natural hazards were driven by human activities, such as clearing forests and shrublands seeking agricultural land and construction material, and the use of marginal lands. In terms of sociocultural factors, the Bayso associated some of the misfortunes (e.g., famine, epidemics, flooding, drought) they experienced in their lives with the wrath of *Wa'a*, evil spirits, and the curse of ritual leaders for their transgressions. Correspondingly, a study by Shehu and Molyneux-Hodgson (2014) in northern Nigeria found that the study community attributed environmental changes and degradation to God's punishment for their misdeeds, in addition to human activities. Some informants emphasized that natural hazards have had far-reaching impacts on the natural resources and also on the community's life. Some of these natural hazards (e.g., drought and flood) and their impact on the environment and the Bayso way of life are discussed below.

³⁷ Ballamo Worba and Machuqe Gello (Alge, Jan.13, 2021)

6.2.1 Drought (*banqe*)

Drought is defined as a prolonged deficit of rainfall, soil moisture, and surface and groundwater in a given area (Tavares da Costa and Krausmann, 2021). However, such characterization of drought may not be the same throughout the globe, given the contextual differences. For instance, the Bayso realize the onset of drought as ‘too hot temperature’, ‘dry weather condition’, or ‘dried up pastures and bushes’, a popular plant among the Bayso, *mayala* gets green amid a hot and dry temperature, and as the sky becomes foggy, *eyotte saare*. Therefore, as the Bayso realized such signs, they took adaptive measures, such as migration (*gondossa*) with their herds to areas of better pasture. The factors that brought drought to the Bayso were almost similar to other natural disasters mentioned above. But in some cases, the Bayso associated drought with *Wonno*’s luck. In this regard, they assumed that if a *Wonno* was ill-fated, his era was characterized by misfortunes. Consider the following excerpt.

In our tradition, unfortunately, if a period of a Wonno was characterized by bad fortunes, such as drought, epidemics, flood, and war, then elders never allow him to stay in the position. Consequently, elders used to discuss the issue with the community and decided to bring another capable person to the position. For instance, during the period of Wonno Eliyas³⁸ and his relatives, we encountered destructive drought, and as a result significant part of our people were forced to migrate to different areas together with their herds. Accordingly, throughout our history, the reign of Eliyas was considered a period of disaster. Customarily, we believed that if a Wonno was a man of good luck, then his period was characterized by timely rain, rich pasture, and an increase in the productivity of cattle. Consequently, a large number of Bayso youth are circumcised and engage in marriage (Handabo Alagna³⁹, Mulato, Dec. 20, 2021).

However, scholarly accounts relate drought to natural factors. For instance, Caminade and Tierney (2010) indicated that the drought in the Sahel region was caused naturally. In this regard, other authors (e.g., Dutra et al., 2013; Tierney, 2013) found La Nina as a head factor for the drought that ravaged Ethiopia and Somalia between 2010 and 2011. In this case, they characterized La Nina as a lack of rainfall in both the October-December (short rainfall) and March-May (long rainfall) seasons. On the contrary, Dai (2011) held human

³⁸ Pseudonym given by the researcher

³⁹ Pseudonym given by the researcher

beings responsible for their destructive actions, such as the emission of greenhouse gases and resource use practices that contributed to the current drought in Africa.

In general, droughts are recurrent features that can occur either as a result of human action or natural or sociocultural factors, or all, but the point is that the extent of vulnerability to droughts is high due to poverty and heavy reliance on rain-fed agriculture (Masih et al., 2014). At the moment, drought held second place next to floods in terms of people affected, and it continued to impose heavy damage on people's lives, animals, and the environment (Tavares da Costa and Krausmann, 2021). In light of the above exposition, I have made an effort to comprehend the nature, extent, and impact of drought in the study area. The ethnographic data revealed that the Gidicho Island and the catchment areas were affected by several drought incidents, specifically in 1984-85, 1991-92, and 1994-95. Details of these droughts are as follows.

The drought incidents were recognized by a lack of rain, both in the *belg* (short rain) and *badeessa* (long rain) seasons, which continued for more than a year and exhibited extremely hot and dry temperatures that turned all grazing and agricultural lands into dusty grounds. In the former days, when they faced such devastating droughts, they used to migrate either to the west coast or to the Guji land on the east coast to sustain the life of their cattle. At the time of the 1984-85 drought, however, all the regions were affected and had nowhere to go. The only means they were left with was to chop the *borbona* tree to feed their cattle. There was a time when everyone on the island would cry out to *Wa'a* and confess their transgressions. For their part, the *Wonnos* and the elders encouraged the people to turn their faces to *Wa'a* and to respect all cultural norms. Parallel to their efforts to sustain their herds, they also worked hard to compensate for food shortages through indigenous risk management methods, including the consumption of plants such as reed (*aala*). This waterside plant has a yellow powder (pollen) at the tip of its long, slim stem, so they collect it for food. They also used to eat the seeds of *Eichhornia crassipes*, usually known as water hyacinth (*hauri*). After grinding the seeds of this plant, they made porridge. The Bayso also sold earth salt (*gora*) to support their lives.

The drought had a tremendous effect on the life of Bayso. Firstly, they lost a large number of their cattle, which played a crucial role in their life. In addition, hunger prevailed in the region following the dry-up of crops and the decline of animal products. Consequently, they were forced to look for aid and failed to comply with the sanctions and taboos that aimed to maintain the cultural norms of the community. Besides, chopping the *borbono* tree to feed their herds had posed serious impact on the Bayso. This was because the Bayso's effort to maintain the life of their herds at the expense of this tree endangered its species.

In the years 1991-92 and 1994-95, the island and the catchment areas of the lake also experienced other incidents of drought. These droughts had devastating consequences on the life of the Bayso, which did not fully recover from the previous drought impacts. As the droughts got harsher, they lost their remaining cattle. As a result, some of the Bayso fled their homelands to search for daily labor in the nearby towns, including Birbir, Arbaminch, and Sodo. As life became precarious, selling firewood and burning charcoal for the market became a routine activity. Thus, it can be concluded that drought, as one of the natural factors, has greatly affected the life of the Bayso in different ways. First, it caused the loss of a significant part of their herds because of the decline of pasture and the spread of cattle disease. Second, the decline of agricultural products and the worsening of living conditions on the island forced the Bayso to migrate to the west coast seeking a better life, which by itself left them prone to the cultural influence of the dominant ethnic groups, the Gamo and Wolayta. Third, it caused the degradation of the natural vegetation of the island as a result of natural processes on the one hand, and due to increasing human actions (e.g., charcoal burning and firewood selling) on the other hand.

6.2.2 Flood (*daad*)

A flood is an overflow of a large amount of water over dry land and is categorized into three types: coastal, river, and rainfall (Traverse and Krausmann, 2021). According to these authors, coastal floods are prompted by the combination and interaction between high tides, storm surge, sea level rise, river flow in estuaries, and coastal subsidence. River floods

occur when water levels overflow onto adjacent lands. Conversely, flash floods are caused by heavy rainfall that exceeds the infiltration capacity of the soil, and when rainwater is not retained due to the removal of vegetation cover (Adugnaw, 2014). In the context of the Bayso, the flash flood that descends from the Gamo highlands to villages at the foothills, including Ankober, Mole, Dalbo, Birbir, and Alge, affected the lives of these communities. The second is a rise in the Lake water level. In this regard, because of the heavy sediment in the lake, the lake water has been increasing recently and submerging villages and fertile agricultural lands.

As is in other flood-prone areas of the country, flooding usually takes place at the peak of *kiremt* season (*badeessa*) in July and August in the study area. However, there was an unseasonal flood that caused substantial damage in Alge village. Some accounts indicate that unseasonal rains occur due to weather disruptions as a result of El Nino⁴⁰ incidents in areas where rainfall is not normally expected at a particular time (United States Agency for International Development [USAID], 2016). For instance, since 2000, Ethiopia has experienced unseasonal rains, which affected crop harvest in parts of Oromia, Amhara, and the former SNNPR. The best instances, in this case, were Bonke and Mirab Abaya *woreda* of Gamo Zone, where a large number of people suffered as their economic foundation and social fabric were ruined by huge floods and substantial landslides.

In former days, the highlands and all the catchment areas of Lake Abaya were covered by forests, shrubs, and grasslands. As a result, let alone a small intensity of rain, torrential rain did not cause devastating floods in the region. Much of the rainwater was maintained by the vegetation cover, while the remaining water flowed down through natural watercourses. At the time, the rainwater that streams down to the lake was described as ‘pure’, indicating limited sedimentation it carried into the lake. However, following the decline of the

⁴⁰ El niño is a warming of the central Pacific leading to high-pressure weather systems. In Ethiopia there was general agreement that an El Niño episode has a high probability to cause: 1. Above-normal rainfall from October to March in the south and south east areas; typically associated with supporting pastoralist areas due to good pasture but can also cause flooding and outbreaks of human and livestock diseases. 2. Above-normal *belg* rains with an early onset as early as January or February. At the same time, harvesting the main season cereal crops between October and November may be disrupted due to off-season rains (USAID, 2016, p.5).

vegetation cover, even water from smaller rains descends carrying the topsoil of the highland areas to be deposited in the lake. In times of torrential rains, a huge flood that arises from the surrounding highlands floods down the lowland and causes huge damage to inhabitants at the lakeside, including the Bayso and other ethnic groups in the region (see Figure 16).



Figure 16: Flash floods in Alge village

Source: Photo adopted from Abinet, June 2018

The Bayso have been affected overwhelmingly by such floods for a long time. For instance, they lost their villages, farmlands, school buildings (see Figure 17), and a clinic built with foreign aid due to these floods.



Figure 17: School building damaged by flood

Source: Photo by the researcher, Alge, June 2020

Beyond such economic destruction, floods caused a huge blow to the social fabric of the community. The Bayso were forced to change their villages and settle in other areas twice. Besides, burial sites both on the west coast and on the island were either submerged by the rising lake water level or destroyed by heavy floods. I have witnessed human remains scattered here and there on the island as a result of the damage caused to burial sites by floods.

The Bayso exhibit two contradictory conceptions of floods in their locality: floods as a blessing on one hand and as a curse on the other. It is a blessing for hundreds of the Bayso, who have agricultural land along the flood routes. Farmlands in such areas are supplied with alluvial soil transported from the surrounding highlands, and this created a favorable condition for banana plantations. As a result, peasants in such areas were able to earn from 70 to 80 thousand Birr per half a hectare per year. Thus, individuals who earned such a large sum of money were able to build modern houses in Alge village and Birbir town. On the other hand, floods are seen as a curse by those farmers who hold farmlands along the

shore of the Lake. In this case, the increasing lake water submerged hundreds of hectares of banana plantations (see Figure 6) and other crop farms. It is due to such varying consequences of the floods to people holding land at different locations that the Bayso perceived floods as both a source of wealth and a cause of poverty and starvation.

6.3 Structural Factors

A significant number of the informants I interviewed and those who participated in the FGDs perceived environmental change in terms of human activities and natural hazards. However, a few others and the majority of agricultural and environmental protection experts mentioned the impact of structural factors. In this regard, they identified the impact of poverty, population growth, investment projects, and villagization programs on the west coast of the lake.

6.3.1 Poverty

In the African context, definitions of poverty are mainly based on material concepts. For instance, according to Spicker (2020), poverty is related to circumstances in which people lack income, wealth, or resources to acquire or consume the things they need. This means that people are poor because they do not have something they need, or because they lack the resources to get the things they need. In this regard, the Bayso characterize poverty in terms of the two modes of subsistence that they have been practicing for a long viz, pastoralism and agriculture. In their pastoral life, the measure of wealth was the number of herds an individual owned. According to Gula Zeleke, an elderly person from Alge village, in the 1970s, people who possessed a few cows and perhaps a herd of goats were considered poor. It was assumed that such individuals had no extra milk and butter to sell and subsidized their meager economy. But after the Bayso changed their main livelihood to crop cultivation in recent decades, the measure of wealth has become the amount of fertile agricultural land a person owns, mainly banana plantations. In this case, a poor person is defined as someone who has no fertile land, someone who has fertile land but no oxen to plow it, or even someone who has both fertile land and oxen to plow it but is inattentive concerning production and productivity. Nowadays, the majority of the Bayso have lost

their farmland due to the rising lake water levels, and their economy has deteriorated from time to time.

According to informants⁴¹, poverty is one of the drivers that forced them to make damaging decisions in their use of natural resources. In this regard, they asserted that in the early days, their environment was rich and generous in its provision. This enabled them to practice all the necessary offerings and sacrifices to *Wa'a* and ancestral spirits. But later, as they lost their herds due to the recurrent droughts that ruined grazing lands, they had nothing on their hands to satisfy the demands of their IBS. In addition, those who changed their mainstay to agriculture were also affected by heavy floods and the rising Lake water level to the extent of total submergence of cultivated lands. Hence, the aggregate effect of the problems mentioned above had thrown the Bayso to the floor of poverty.

In recent years, the link between poverty and resource degradation has attracted the attention of scholars in the field. The main discourse on this topic includes two key aspects (Kirui, 2016). The first aspect considers poverty as a contributing factor to resource degradation. Kirui argues that the poor are highly reliant on natural resources for their survival and lack the financial means to invest in the conservation and enhancement of these resources. Similarly, Masron and Subramaniam (2018) asserted that poverty is a major cause of environmental degradation in developing countries and that alleviating poverty can significantly improve environmental quality.

The second aspect, on the other hand, seeks to examine the impact of resource degradation on the lives of the impoverished. It asserts that natural resource degradation significantly undermines the well-being of those who depend on these resources for their survival. For example, studies show that resource degradation increases the probability of household poverty by 35 percent in Malawi and 48 percent in Tanzania (Kirui, 2016). In this context, Kousar and Shabbir (2021) argue that environmental degradation is a major contributor to poverty; therefore, efforts should focus on improving environmental quality, which can

⁴¹ Magage Kora, Alge, April 27, 2020.

lead to poverty reduction. Conversely, some others (e.g., Barbier and Hochard, 2018a) also consider structural factors such as inequality, inadequate access to education, limited economic opportunities, and poor governance that are linked with ineffective policies and governance, exacerbate poverty, and contribute to environmental degradation.

The Bayso community's perspective on poverty is closely aligned with these arguments. As I have noted elsewhere in this dissertation, many Bayso people attribute their poverty to the need to exploit the region's natural resources, often disregarding their own cultural taboos and sanctions. Informants claim that resource degradation has severely affected all aspects of their lives. Economically, this degradation has impoverished the community to the point where they must seek aid to survive. Culturally, the degradation of grazing lands has led to the loss of their herds, which were central to their ritual practices. In addition, they have been forced to migrate, and this has exposed them to new cultures and experiences in the region. As a result, many Bayso youth have begun to view certain cultural traditions, including their language, as 'backward' (Sava, 2011).

In general, as can be seen from the above discussions, the relationship between the two entities, poverty and environmental degradation, is not operating in one direction, that is, a one-way flow from poverty to environmental degradation or vice versa. Instead, both factors influence each other bidirectionally, placing the problems of poverty and resource degradation in a vicious circle. According to Barbier and Hochard (2018a) and Baloch, Ud-Din Khan, and Ulucak (2020), the poverty-environment degradation nexus, especially in developing countries, follows a vicious cycle in which poverty is both a significant cause and effect of environmental degradation. Therefore, any effort to resolve this deadlock must focus on breaking the vicious cycle.

However, I have reservations about the common belief that poverty is inherently a cause of resource degradation. I believe that if individuals living in poverty had alternative means of survival or if government officials took responsibility for creating opportunities for the impoverished, the poor might not resort to harmful environmental practices. Impoverished rural communities are often very aware of how the environment is vital to their survival.

Additionally, the notion that a lack of financial resources or poverty is a barrier to resource conservation may not be true. This is demonstrated by several indigenous communities, such as the Gedeo and Konso of southern Ethiopia, which have significantly contributed to resource conservation through their traditional knowledge.

6.3.2 Population growth

The interplay between population growth and the degradation of natural resources is a central topic in the study of human-environment interactions. In this context, the key question is: Does population growth truly cause resource degradation? Experts in the field present the Neo-Malthusians' and the Cornucopians' perspectives that oppose each other.

The Neo-Malthusians warn that unchecked population growth poses a significant threat that possibly exceeds the Earth's carrying capacity and results in disastrous costs (Serrat, 2004). Thomas Malthus, the leading advocate of this theory, argued in his 1798 work, "*An Essay on the Principles of Population*", that unrestrained population growth will inevitably overtake available resources, leading to severe crises. Paul Ehrlich reinforced this sentiment in his influential 1968 book, "*The Population Bomb*", where he predicted alarming resource shortages that could result in widespread famine during the 1970s and 1980s. Accordingly, he urged immediate action to control population growth. Also, Paul and Anne Ehrlich's 1990 book, "*Population Explosion*", emphasized how rapid population growth generates intense environmental and societal pressures. These scholars noted that such environmental pressures manifest in increased deforestation, loss of biodiversity, rising pollution levels, and scarcity of resources. All of these factors can hinder economic development and exacerbate poverty.

In contrast, the Cornucopians' perspective challenges the need for institutional mechanisms to protect or limit the exploitation of the natural environment (Serrat, 2004). Adopting an anthropocentric worldview, Cornucopians assert that humans are distinct from and superior to all other forms of life, and value other entities solely based on their utility to human interests (Chenoweth and Feitelson, 2004; Nasong'o, 2017). A prominent proponent of this perspective, Julian Simon, argued in 1981 against the idea that population growth is a crisis

or that the earth's resources are finite, suggesting instead that human innovation can overcome these challenges. Cornucopians believe that human creativity and technological advances will continue to address resource challenges and pave the way for sustainable progress and prosperity.

Ester Boserup's innovative theory offers a compelling alternative to the polarized debates above on population growth, natural resource degradation, and their impact on agricultural productivity. It provides a more coherent framework for both researchers and policymakers. Boserup (1981) contends that population growth is not simply a function of food supply but rather acts as a catalyst for transformative changes in agricultural practices. She emphasizes how population growth influences agricultural systems and drives technological innovation, with changes in population density leading to significant adjustments in land use. Her analysis of the evolution of agricultural techniques illustrates how communities proactively adapt to increasing population pressures, shifting the focus from mere population levels to the dynamic responses of societies. Both Cornucopians and Boserup challenge the Malthusian perspective that population growth will outpace resource availability, but they approach the issue differently. Cornucopians believe that population growth drives technological innovation and resource substitution, ultimately leading to an increase in food production. Boserup, on the other hand, contends that population growth increases the demand for food production, implying that necessity drives innovation in agriculture.

Therefore, in this sub-chapter, I have examined the relationship between population growth and the degradation of natural resources in the study area, in light of the above discussions. The analysis of ethnographic data suggests that the increasing population in the catchment area, including the Bayso community, has significantly degraded the natural resources of both the catchment area and the study area in particular. One of the former *balabats* from Mulato village explained that the migration of the Gamo and Wolayta people from their homelands to the lakeshore, the birth rate in the study area, and the 1986-87 villagization program that brought a large number of people to the lake's shores, has increased population pressure on the western shore of the lake. Several informants reported that, in

the absence of alternative means of survival, these people have continued to exploit natural resources, and this exacerbated the degradation of the region. Environmental degradation on Gidicho Island is even more severe than in the coastal areas, due to its relatively small size and vulnerability to factors such as drought and soil erosion that are exacerbated by population growth.

Documents show that the population of the Bayso was about 3260 in 1994 (Brenzinger, 1999), 5491 in 2007 (CSA, 2008), and 9800 according to the recent projection (Joshua, 2023). This denotes that in the last three decades, the population of the Bayso has tripled, while the provision of the island environment has diminished greatly. Above all, the sociocultural tradition and value of having a large herd had intensified the scarcity of pasture on the island. Correspondingly, according to the Food and Agriculture Organization, FAO (1983), the damage caused by excessive livestock population on the vegetation cover can be a crucial problem, especially in developing countries where range lands are usually much more crowded. According to this study, overgrazing has caused half of the damage assessed in Africa, particularly the damage caused by goats in the Mediterranean area. Similarly, large herds of goats were used to feed in the bushes of Gidicho a few decades ago, that have caused damage to this small island. This implies that due to population growth (humans and livestock), the vegetation cover of both the island and the coastal areas of the lake was degraded, and the region experienced severe resource scarcity.

As a result, the study community is facing severe poverty and is being forced to flee their homes due to resource degradation, caused by deforestation and overgrazing. The United Nations Economic Commission for Africa [UNECA] (1993) reported that much of the natural resource base in sub-Saharan Africa is deteriorating, mainly due to the decline of vegetation cover resulting from deforestation and the conversion of savannahs to cropland driven by population growth. Likewise, for instance, Bielli et al. (2001) revealed that the population is rapidly growing at about three percent per year, leading to an alarming rate of forest clearing to meet increasing demands for food, fiber, and energy. Aynalem (2014), Schutt and Thiemann (2006), and Gessesse and Christianson (2008) support this claim,

stressing the damage imposed on Ethiopia's vegetation and the livelihoods of its citizens. Moreover, specific studies conducted by Aboneh et al. (2014) in Afar, Abera et al. (2017) in Borena, Yikunoamlak et al. (2019) in Tigray, and Galgalo et al. (2022) in the Somali region have documented the damaging effects of overgrazing on grazing lands in these areas.

In this respect, while I do not deny the pressure of population growth on the environment and the life of rural communities, I would not dare to say that it is a curse. I believe that population growth contributes to the conservation of natural resources and socio-economic development if managed by an appropriate policy. Similarly, empirical studies have reported how population growth has contributed to environmental and economic development. For example, a study by Tiffen, Mortimore, and Gichuki (1994) in Machakos County, Kenya, found that although the population of Machakos is five times larger than it was in the 1930s, the county has recently improved its environment and agricultural production, contrary to the view that population growth has led to forest degradation and declining production. Also, in Ethiopia, some studies support this argument. In this regard, a study by Barana, Senbete, and Aklilu (2018) among the Wolayta, Kambata, and Sidama, who live on *ensent* agriculture, claimed that the number of trees and vegetation cover has generally increased or at least been maintained despite the huge population in the area.

6.3.3 Villagization

Environmental change has become a serious challenge to developing countries, particularly sub-Saharan countries (Lorgen, 1999). People of this region have been experiencing the effects of environmental change, including drought, floods, soil erosion, reduction of yield, and famine that ruins the lives of millions (Gavin, 2023). Villagization has been taken as a way out to save the lives of the inhabitants of this region, who were at risk. According to Lorgen (1999), villagization is a grouping of people in centralized planned settlements. Mulatu (1991) also articulated villagization as the clustering of agropastoral and/or shifting cultivator populations into more permanent, sedentary settlements. In Ethiopia, villagization and resettlement have been important issues from the late twentieth century

to the present, serving as methods to systematize and regulate village life and rural agriculture (Canno-Lorgen, 1999). According to Keller (1992), these initiatives were implemented chiefly in response to recurrent droughts that devastated the country's resource potential, particularly in the northern highlands.

In response to the challenges of environmental change, mainly resource degradation, the Ethiopian government has been forced to relocate affected citizens to more resource-rich areas of the country (Mulatu, 1991). A prominent initiative in this regard was the villagization scheme introduced by the *Derg* government in 1984-85 (Mulatu, 1991; Sivini, 1986). Against this background, I examined the impact of villagization on the environment and culture of the Bayso people, focusing on the following questions: How was the villagization program implemented in the study area? What was the Bayso view on the program, and what were its impacts on the environment and way of life of the community?

The study revealed that the Bayso on the island, who suffered from the effects of environmental change, were forced to sustain their life on relief. But those who migrated to the west coast of the lake were living dispersedly along the coast of the lake, herding cattle and engaging in small-scale agriculture. In this context, government officials cognizant of the danger of environmental change on the island were prompted to design a settlement scheme. They planned to settle the inhabitants of the island at a place called Lado among the Guji-Oromo on the eastern shore of Lake Abaya. It was believed that the outstanding relationship that the Bayso built with the Guji-Oromo and the rich pasture of the area could attract the Bayso. However, the Bayso were not interested in this scheme, since they preferred to settle on the west coast together with their kin. Therefore, the first attempt failed due to Bayso's unwillingness. Again, after a few years, similar efforts were made to settle inhabitants of the Gidicho Island in a place called Gibichu Laluncha, still among the Guji-Oromo, but the Bayso rejected it. In this regard, the excerpt from the interview with one of my key informants provides us with more details.

At that time, our people lived in three areas: Gidicho, Wajifo (Mulato), and Alge. Of these, it was the people of Gidicho who were asked to settle in Laluncha and Lado, villages on the eastern shore of Lake Abaya, among the Guji-Oromo. This was because, until the

1990s, Gidicho Island was under the administration of Wonago Woreda, Gedeo Awraja, while those on the west coast (in Wajifo, Alge, and other Bayso villages) were under the then Semen Omo Zone (now Gamo Zone). At that time, the officials of the Wonago Woreda Administration, alarmed by the recurrent and shocking droughts on the island, proposed a villagization scheme for the island's inhabitants. Accordingly, we discussed the issue with our representatives not to accept the proposal and emphasized our interest in settling on the west coast of the lake with our relatives. When the officials who designed the villagization program finally realized that we were not willing to accept the program, they settled people from Wolayta who were suffering from land shortages (Balamo Worba, Alge village, Jan. 11, 2021, Gidicho).

On the contrary, some authors argue that the refusal of the Bayso not to settle among the Guji-Oromo was because of the conflict between the Gedeo and Guji (Asebe, 2012). Asebe detailed that because of territorial claims and counterclaims over administrative boundaries following the ethnic-based territorial adjustment, these two ethnic groups developed enmity. Consequently, the Bayso, who have an outstanding relationship with the two of them, did not want to side with any of them and took this opportunity to settle with their relatives on the west coast. At the same time, on the west coast, government officials began the process of villagization among the Gamo who lived in Dalbo village, near the town of Birbir. Again, some of the Bayso refused to settle with the Gamo and returned to the lakeshore. This suggests that either the Bayso were not interested in the villagization program as a whole, or that they were not particularly interested in sharing a village with other ethnic groups.

After years of reluctance, in 1987-88 the Bayso were forced to establish their first settlement at a place called Tema, on the west coast of the lake. In this case, male-headed families, widows, and even individuals who had two families (two wives) were equally given a plot of land for building a house. It was estimated that 200 huts were built in the first village. To have effective labor use small building teams were organized, and to encourage them, 500 kg of maize was assigned per hut. In a related case, one of my informants, Balamo Worba, shared the following points.

At that time, each team worked hard, day and night, to build more houses to acquire additional kilograms of maize. However, one consequence of this provision was our reluctance to build traditional Bayso houses for two reasons. First, the construction of these houses requires a significant amount of building materials, labor, and financial resources. In addition, some of these materials, such as straw, were particularly difficult

to obtain due to resource depletion. Second, the time required to build our traditional houses was not feasible for us because it took a significant amount of time. This means it curbs our efforts to secure additional kilograms of maize by building more huts (Alge, October 13, 2021).

At the same time, some reluctant Bayso left for Gidicho, since it was odd for them to live with other ethnic groups in one village. For that matter, those who decided to stay in the new village were also challenged by the devastating floods. In general, the situation in the new village was not attractive the fact that periodical and sudden floods made villagers restless. It caused huge destruction, including newly built houses, farmlands, a clinic, and school building, and burial sites as mentioned before. If not for the government aid in food for work and direct food aid by World Vision Ethiopia (WVE), there would be a complete collapse. Then, officials who realized the risky situation of the Bayso settled them in an area near Biribir town. Accordingly, the second village was established in 1997-98 at Alge. As usual, the government continued in its provision of 500 kg of maize per hut to facilitate the villagization process. However, the threat of the devastating flood continued to deteriorate the life of the Bayso as a result of the ever-increasing flood. Therefore, realizing the mounting environmental problem in their new village, the Bayso again started looking for other places at least to save their family. Then, they left the second village one by one and established the third one at a place called Qoqale. They established the third village for personal motives; consequently, officials made no grain aid. Since then, the Bayso have been living on this site. The third village is very close to the *woreda* town, Birbir. Therefore, through time, the Bayso, particularly the youth, experienced a town lifestyle and began to ignore some of their cultural traditions. For instance, customarily, the Bayso people appreciate hard work in all aspects of life, including farming, fishing, weaving, and others, and perceive visiting a town now and then and valuing town life as a sign of laziness. In the early days, such persons were cursed by the elderly and alienated from the community for their violation of social norms. But recently, their exposure to town lifestyle has eroded such cultural values.

The point is that though it is logical to move citizens from degraded areas to resourceful areas to save the lives of affected ones and to create favorable conditions for the restoration of degraded areas, I argue that it was not successful in the context of the Bayso. The reason

is that firstly, it was not well thought out and lacks a detailed study on the conduciveness of settlement sites for living. In this regard, for instance, the Bayso who settled without having such assessments suffered from heavy floods that ruined their life, even until today. As a result, they were forced to settle in three villages, one after the other. This brought heavy devastation to the forest resources of the region, as they required a plot of land and construction materials for housing. Also, since local officials used available grazing lands for the villagization scheme, the Bayso faced a critical shortage of grazing lands, and this considerably affected the already weakened cattle wealth. Parallel to this, Taddesse (1995) noted that among the Guji Oromo, villagization has caused the worst blow to the environment, that induced devastating poverty and diseases among the Guji peasants. According to Taddesse, the concentration of people and animals in a new village also affects inhabitants' health. What is more, villagization often changes the traditional ways of life to a certain extent, as most of the settlers have not been used to living in larger communities and often come from pastoral lifestyles.

Secondly, the fact that the villagization program brought together the Bayso, Gamo, Wolayta, Haro, and others in one village therefore, the sociocultural life of these people was affected in some aspects. A showcase in this regard was that the Bayso, who used to live in an extended family in an enclosure, *agud*, were forced to be in a nuclear family. This means the way they socialize and raise their children to keep the cultural norms of the community, and manage economic issues (e.g., mobilizing labor) was greatly affected by the program. Likewise, the villagization program has disrupted the Bayso's tradition of periodic move with their herds (*gondossa*) seeking better pasture.

6.3.4 Investment

While it is true that investment projects have played an important role in Ethiopia's socio-economic development, they have been criticized for the eviction of inhabitants, land grabbing, and environmental degradation in recent decades (Mahlet, 2018). As in other parts of the country, in Mirab Abaya *woreda*, there have been investment activities for a long time. According to the *woreda* EPA, the first investment project in Mirab Abaya was registered in 1976-77 during the *Derg* era. Unfortunately, it is difficult to get detailed

information on such projects, as there is no proper documentation and file management in the *woreda* EPA or Agriculture offices. However, the EPA officer indicated that there are currently nine investment projects in the agricultural sector along the west coast of the lake, producing tomatoes, onions, papayas, and bananas. The officer also revealed that the regional investment office has transferred about 2,000 hectares of forest land for these projects.

Local officials in the village of Alge are critical of investment projects because investors in their area have been unwilling to communicate with inhabitants about their projects, their benefits to local people, and mechanisms to mitigate potential environmental damages. The other problem mentioned by the *woreda* EPA was the reluctance of investors to carry out environmental impact assessments of their projects. These officials link the problem to structural issues, as the EPA did not have an office at a *woreda* level to regularly monitor such projects until 2015-16. They also highlighted the coordination gap among the institutions in the region responsible for facilitating investment activities. For example, there was a lack of cooperation between the Regional Investment Bureau, which issues investment licenses; the former Trade and Industry Bureau that certifies trade licenses; and the EPA, which supervises the implementation of investment projects.

In principle, investors have a corporate responsibility to the people in their project area and to the ecology. But what I found in the study area is that investors do their best to maximize their profit at the expense of the lives of the people at the investment sites and the environment. For example, investors have encroached on nearby forests and buffer zones, causing huge damage to the region's natural resources in their rush to expand their farms. Accordingly, the decline of forests in the area exposed the topsoil to erosion, and this contributed to the increasing sedimentation in the lake. Increased sedimentation, in turn, pushed the lake's water onto the nearby farmland of the peasants and to investors' farms, too. This is witnessed from the LULC change analysis of the catchment areas in Table II. As enumerated in the Table, water bodies have increased from 102,357 km² (46%) in 1990 to 116,886 km² (53%) in 2020. This means, one of the dominant water bodies in the catchment area, Lake Abaya, is pushed out to invade adjacent lands as a result of silty

accumulation. Furthermore, according to the *woreda* agricultural officer, chemicals used to control herbs and pests in horticulture farms infiltrated the lake water and threatened the fish resources of the lake. This implies that investors in the study area are acting against the very spirit of the investment policy Article 54.2 which argues that “All investors shall give due regard to social and environmental sustainability values including environmental protection standards and social inclusion objectives in carrying out their investment projects” (FDRE, 2020, p.12423). In fact, the investment policy has devised a mechanism to make accountable investors who violate the investment policy. For instance, Article 13.1/f states that “the investment permit of an investor shall be suspended if the investor violates the provisions of this proclamation, or regulations and directives issued to implement this proclamation or other pertinent laws” (FDRE, 2020, p.12398). However, informants accused government officials of their failure to discharge their responsibility of protecting the interests of the masses and the natural environment, conceivably due to a lack of commitment or corruption.

The above findings identified three key factors contributing to environmental change in the area. The first is human activity, specifically the inhabitants' efforts to meet their needs and wants by clearing forests and shrublands. The second factor is overgrazing, which is driven by sociocultural traditions that value having large herds of livestock. Lastly, structural factors, such as government policies that fail to consider local contexts, have worsened environmental exploitation. Notable examples include the villagization program of the 1980s, growing populations, poverty, and investment projects. Additionally, natural hazards, such as recurrent droughts and floods, have damaged the environment in the study area. These findings align with political ecology's core principles, which identify deforestation, unsustainable agriculture, and resource overexploitation as major drivers of environmental degradation. Often fueled by socio-economic factors like poverty, inequality, and economic growth imperatives, these actions excessively burden rural communities and worsen environmental vulnerabilities.

CHAPTER EIGHT

EFFECTS OF ENVIRONMENTAL CHANGE ON THE IBS AND MARRIAGE CUSTOMS OF THE BAYSO

Among indigenous communities of Africa, such as the Bayso, let alone their belief system and marriage customs, their entire life is inextricably linked to their environment. In this regard, the Bayso maxim *ul hiki enijorumaya*, which means ‘*ul* is the base of life’, confirms that among such communities it is difficult to assume life without natural resources. However, currently, because of the severe environmental change that caused drastic resource scarcity, they are forced to migrate to areas on the west coast of the Lake, and this move exposed them to a town lifestyle and experiences that contradict their cultural traditions and values. Hence, they were forced to give up their belief system and some elements of their marriage customs. Accordingly, this chapter examined how environmental change has adversely affected the culture of the Bayso, giving special focus to their IBS and marriage customs. However, before we proceed to these points, perhaps it is essential to consider the defining features of their IBS and marriage customs, respectively.

8.1 The IBS of the Bayso

The study revealed that the IBS of the Bayso stemmed from a *Wonno* system, which was a politico-religious system. It was ruled by a king called ‘*Wonno*’ by the Bayso. *Wonno* means ‘elected ruler’ as it was in other Gamo areas (Gamo Gofa Zone Culture and Tourism Office [GGZCT], 2004). According to Epple (2016), *Wonnos* had both political and religious powers until the region was incorporated into the Christian highland state during the reign of Emperor Menelik II at the end of the 19th century. In those days, politically, a *Wonno* was expected to administer his people, give justice, and keep the peace among his people. As stated by Bahru (1996) and Freeman (1999), areas that peacefully submitted to the forces of Menelik II were entitled to autonomous rights, while those that resisted were governed by an administrator assigned by the emperor or his representative. Accordingly,

the Bayso were given autonomous rights, and so *balabats*⁴² (local rulers) were assigned from the Bayso men by a provincial governor of the emperor, while the religious position was left for *Wonnos*.

The IBS of the Bayso was known as a ‘*Wonno* system’. It shares virtually all the major tenets of ATRs. Of these, the first one was a belief in one higher Supreme Being called *Wa’a*⁴³, the creator of living things (*nefo kaabo*) and nonliving things (*nefo kaliki*). The Bayso also believed that *Wa’a* resides in the land (*ul*) and the sky (*darur*), hence, they usually heard saying *Wa’a ka ul*, *Wa’a ka darur*, to mean God of the Earth (land) and God of the sky, respectively. The third was a belief in ancestral spirits, *gaariun en’tano*, which are assumed to reside at burial sites. Among the Bayso, ancestral spirits had a role in every aspect of the Bayso's life. Equally, they believed in a spirit called *durisa*, which is an invisible kind of force supposed to dwell in the outskirts of villages, graveyards, riversides, and in Lake Abaya. This implies that supernatural forces, essentially *Wa’a* and spirits of different types, were sources of well-being to the Bayso, to their environment, and herds as far as they maintained harmonious relations with these forces.

That means if they fail to keep the will of these forces, such as practicing periodical sacrifices and offerings, disregarding taboos, and disrespecting ritual leaders and the elderly, among others, it would be considered a transgression. Thus, it is believed that irritated by such immoral acts, these forces punish the Bayso by drought, heavy rain, famine, and epidemics. However, to get their mercy and prevent these calamities, the necessary condition was practicing conciliatory sacrifices and offerings to these forces. What is more, there was an understanding and firm belief among adherents of this religion in the power of individuals, including communal cures (*kango*) and blessings⁴⁴. This confirms that the way the Bayso realized their world, guided their socio-economic and

⁴² Leaders of a subdued people who collected their tributes (Mohammed and Teferi, 2019, p.vii)

⁴³ In fact, according to Epple (2016), *Wa’a* was addressed by different names among different Bayso clans; for instance, in Worji clan they called it Hondio, in Mulmale clan Afantira and in Achegele as Isilo.

⁴⁴ Interview with Ballamo Worba Alge, Aug. 9, 2020

cultural life, and their relation with their environment was shaped, directed, and interpreted through these religious principles.

8.2 Religious Specialists of the Bayso

In the African religious system, there were/are specialists who execute different roles in their spiritual system, including ritual leaders, healers, herbalists, diviners, sorcerers, and witches (Turaki 2000). In the same way, the Bayso had different specialists in their ritual system, comprising ritual leaders (*Wonno* and his wife, *Oriwonno*), ritual assistants (*Woycha* and his wife, *Maganencho*), ritual experts (*Oddobaddo* and his wife, *Abaddo*), and a messenger, *Tukamo*. Details are as follows.

8.2.1 Ritual leaders: *Wonnos* and *Oriwonnos*

A *Wonno* was a leading ritual leader, who was at the top of the religious hierarchy together with his wife, *Oriwonno*. The appointment of a *Wonno* was through election, as it was deliberated in sub-chapter 4.2.5 of this study. At their coronation feast and throughout their term of office, *Wonnos* used to adorn themselves with insignias including a long-woven dress (*kollo*); a big blanket made of cotton (*gashe*); a ritual staff (*charfana*); a phallus-shaped ornament for their forehead (*kallacha*), which is almost identical to that of the *Abba Gada* of the Oromo and the Gedeo; necklets made of spotty beads (*haassaa*), and bracelets and rings, both made of iron. At this ceremony, the former *Wonno* handed over objects that had a pivotal role in the ritual system, including a honey and milk container, and an elephant tusk enwrapped with *gashe*,⁴⁵ to the new *Wonno* (Epple, 2016). Customarily, *Wonnos* were not allowed to shave their hair while in office, but as soon as their term of office was over, they shaved their long hair and put it into a small pot, then delivered it to the new *Wonno*. The shaving of the long hair symbolically designates the expiration of *Wonno*'s spiritual power and the removal of him from the position. On the occasion, the

⁴⁵ Locally made cloth, known as *Gabi* in Amharic

new *Wonno* used to bless the people by spraying *obooro*, and then dwellers carried him and all his items to his house, where he slaughtered a cow for them (Epple, 2016).

An informant from Mulato village mentioned that if a period of a *Wonno* was characterized by bad fortunes, then elders never allowed him to stay in the position. In this regard, dignitaries used to discuss the issue with the community and decided to bring another capable person to the position. For instance, during the period of *Wonno* Eliyas⁴⁶ and his brothers, the Bayso experienced destructive drought, and as a result, they were forced to migrate to different areas together with their herds. So, in the history of the Bayso, the reign of *Wonno* Eliyas was recognized as the worst and most miserable life of the Bayso. Customarily, if a *Wonno* was a man of ‘good shoulder’, then his period was characterized by timely rain, rich pasture, and an increase in the productivity of animals. Consequently, a significant number of Bayso youth are circumcised and engage in marriage. Likewise, the Gamo highlanders believed that if a *Kawo* has ‘good shoulder’ crops will grow, cows will calve, women will give birth, and the *dere* (the community) will live in peace and prosperity (Freeman, 1999). In addition, Epple (2016) noted that when a *Wonno* died, his deceased body would not pass a night without another contest being started, because it was believed that the people should not be left without a king for even a few hours. Likewise, the queen, or *Oriwono*, was also expected to pass over her title to the new queen. As a ritual leader, a *Wonno* was responsible for prayers, initiating public rituals and funerals, and blessings and cursing transgressors. In religious terms, a *Wonno* was considered a head priest who served as an intermediary between the Bayso and *Wa’a*. Therefore, in their religious life, the Bayso consider a *Wonno* as a person who is *Wa’a*’s representative among them, and during his office, they regarded him as sacred.

Prayers and curses of *Wonnos*

The Bayso believed that their religious system had a way out of all sorts of problems that they encountered in their life, through prayers, sacrifices, and offerings. In this case, for

⁴⁶ Pseudonym given by the researcher

instance, prayers were habitual actions of the Bayso both at a family and public level to maintain their well-being and their herds, and the productivity of the environment. In this regard, as a leading person of the ritual system (a *Wonno*) was responsible for organizing public rituals to plead to their God either for peace and well-being or to avoid misfortunes that they might encounter in their life. Such prayers of a *Wonno* were as follows:

Wa'a ka ul, Wa'a ka darur... God of the Earth, God of the sky
Ulin alina, nogodasiasina.... let you bless our land and give us peace
Ulin bararsisina Let the land become fertile and productive
Dukuba kako hawasisina, kamelan hawasina... please protect us from diseases (Chumbaro Assefsa Alge, Dec.13, 2021)

Similarly, at a time of famine, *Wonnos* prayed to *Wa'a* seeking His protection of the community from such calamities. Since the Bayso were dependent on the supplies of *worke* (a product of *enset*) and other food items from the surrounding people, such as the Gedeo, it was usual for *Wonnos* and other ritual experts to pray for the affluence of Malka (a weekly market on the east coast of the lake). Therefore, it was common to hear the word 'Darassa' in the prayers of *Wonnos*, saying *Wa'a, Wa'a, darassaton wodin, gagalon wodin, chaletton rabisina...* Oh God, oh God, please, let the 'Derassa' (currently Gedeo) bring *kocho* for us. Make the market affluent (Malka) and bring us food items from all directions. *Wonnos* also used to pray to their God whenever they experienced environmental hazards such as droughts, saying *Wa'a, Wa'a, edamun kenina...* Oh God, oh God, please give us rain. *Barar kenina...* please give us richness.

In the early days, herding was the leading economic activity of the Bayso, and cattle had a paramount role in the ritual system of the Bayso and were a major criterion for the nomination of *Wonnos*. For this reason, the Bayso were very much concerned about the pasture, health, and fertility of their cattle. As a result, it was a norm among them to pray and perform different rituals for their herds within their respective family and even at a village level led by a *Wonno*. Some of such prayers were: *Wa'a Wa'a, ebata gedi gogo aloray, gedi ha alato, yaydewa molto, dabalo araro atato, hamogatto hame batar wonno*. This means: Oh God, let cows and heifers give birth, let them multiply, let the earth become abundant, keep away disease and misfortunes from our herds. Customarily, as a *Wonno*

took his office, it was usual for him to select a cow for his ritual purpose. In this case, after selecting a cow that grabbed his attention, a *Wonno* pleads to *Wa'a* to bless that particular cow for His ritual purpose, rubbing her back with his hands. So, throughout his term in the office, the *Wonno* only used the milk of this cow for his rituals, and the cow was given a special name called '*bude*'. If the cow becomes ill, has a lapse in milk production, or dies, he immediately selects another cow from among several of his milking cows.

In former days, in addition to herding, the Bayso used to produce sorghum and maize for their consumption. According to informants, one of the major challenges in producing these crops was the threat of birds. So, the Bayso used to appeal such cases to a *Wonno* seeking his solution. In this case, it was said that a *Wonno* orders the individual who encountered such problems to bring him one of these birds, and he spits in its mouth, and then he lets the bird go. According to informants, after such rituals, birds would not attack their crops. A *Wonno* also had the authority to pass admonitory decisions and punish individuals who violated cultural norms and those unwilling to execute the orders of *Wonnos* and elders. In this case, he summoned all villagers to his compound or public meeting area/*songon*. On the occasion, *Wonnos* and all other participants used to curse a wrongdoer saying *Wa'a, Wa'a, abisinn, bahsinn...* Oh God, oh God, may you break it, and may you destroy it. If such individuals continue in their disregard for the *Wonno's* authority, the *Wonno* will exclude them from the community with the following curse. *Woraar laena, woraar laena*, which means you are excluded from the community. The exclusion or *kango* was declared, saying: *Alenko, bekheko, beesa*. Meaning 'do not get fire and water from your neighbors'. These were some of the common elements of the rural community that facilitate interactions and social fabrics. Following the communal curse, nobody dared to share fire and water either with the wrongdoer or with his family, and even s/he was not allowed to use a boat with others, which was the only means of transport on Lake Abaya. The exclusion continues until a wrongdoer settles the problem and gets the mercy of the *Wonno*.

Although the Bayso have repeatedly stated that their lives have always been closely linked to and dependent on the lake, the rising lake level has had a major impact on the socio-

economic and cultural life of the Bayso, as described elsewhere in this study. Hence, intending to lessen such challenges, *Wonnos* and inhabitants pleaded to *Wa'a* saying:

Wa'a, Wa'a, bekke logodo korwasi batay huduri...oh God, please make it calm, and do not let the lake water wash away the soil.
Banne taay alina... stay in your place (order the lake water).
Hudurina wogayika...keep the tradition and respect your people (order the lake water).
Dadi, dadi...cool down, cool down.
Wa'a, ababina, ababina, endahekom emetera, nul ababeto semko alo san banela wonno, settattani manko alosa, olin manko olis banelawati, which means 'please Wa'a let you stop this wave that invades our grazing lands, please Wa'a we are almost losing our herds (Chumbaro Assefa, Alge, Dec.13, 2021).

Sometimes, *Wonnos* were disappointed by their people, and it was believed that this triggered misfortunes in the community. In this case, *Wonnos* forwarded their complaint to the elders in the following way.

Elako dene...they (inhabitants) forgot me
Elabo lakiso...they never provided me with milk (to note that they never provided him with milking cows for the various rituals that the Wonno practices)
Malab lakiso...they never provided me with honey
Misgerata mishata gelakosete...they never greeted me (which means they never asked the Wonno what he eats, what he drinks, and how his life was in general.
Wonno kokohata... Wonno koko wogati misi gegesako lakose... they never asked me how I led the ritual system (Balamo Worba, Alge, Jan.13, 2021).

Thus, following such complaints, elders used to communicate with inhabitants and solve the problem through the contribution of each dweller (*marancha*) either in cash or in kind. Then, things became normal as usual.

Accounts on ATRs elucidate that prayers are spiritual practices towards God and spiritual powers that operate within one's immediate environment (The Gleaner, 2016). As to this account, prayers are usually short, extemporaneous, concise, and on some occasions accompanied by sacrifices and offerings. In regards to the Bayso, prayers are conversations between them and supernatural forces (*Wa'a* and spirits of different types), and were focused mainly on three key issues: blessing, asking, and thanksgiving. This implies that they express gratitude to *Wa'a* and spiritual forces for their kindness in giving them life

and provisions. Equally, they require these forces to seek solutions to the problems and challenges that they face as a result of misfortunes and/or transgressions, and thank them for their provisions and for keeping their well-being, their herds, and their environment. Therefore, it can be concluded that prayer is a way in which the Bayso communicate with and create a harmonious relationship with *Wa'a* and spiritual powers and a way in which they seek mercy, protection, and safety.

8.2.2 Ritual assistants: *Woychas* and *Maganenchos*

The leading ritual assistants, who were next to a *Wonno* on the religious echelon, were *Woychas*. The election of a new *Woycha* was mainly from individuals who had better cattle wealth, similar to the election of a *Wonno*. This was because a *Woycha* was expected to organize numerous rituals and periodical offerings to the spirits of his clan and *Wa'a* as long as he was in the position. Though it was rare, in some instances, economically well-to-do individuals were directly assigned by elders. In such cases, nominated individuals were informed by elders about their nomination to the position of *Woycha*. It was said that on some occasions, the spirit itself selects individuals for its service. In this case, too, elders were expected to notify the case to the nominee that he was wanted by the spirit. Therefore, no one would refuse the position for fear of the consequences of refusing such invitations (e.g., serious health problems). On the contrary, sometimes individuals who seek the position forward their interest directly to elders. In such cases, as soon as the nominees got confirmation from elders went to the house of the incumbent *Woycha*⁴⁷ holding turf (*sordi*), which is a sign of his appeal to the position. After this, the nominee commences his preparation for the coronation feast, which requires a large amount of butter, animals to slaughter, and food items. But, usually, each *Woycha* was supported in kind and cash by members of his clan.

The coronation ceremony, *jinasano*, of both *Woycha* and *Maganencho* lasted for two days and was attended by former *Woychas*, *Maganenchos*, *Wonnos*, and the local people. A big

⁴⁷ Customarily it was believed that a Worji clan had a legitimate power to provide *Woychas* (Epple, 2016).

feast was prepared for transferring power from the incumbent *Woycha* to the new one. On the occasion, the former *Maganencho* cut off her *haraffa* (a bracelet made up of animal leather) knotted on her left arm, which is a symbol of her disposal from the position. Next to this, objects that the former *Maganecho* used to execute rituals, such as a big pot used to keep butter (*yala 'e kajin*), a small-sized pot (*yala 'e kecher*), and the two staffs of *Woycha* (*wadessa*), which were different in length, were transferred to the house of the new *Maganencho*. The *wadassa* were immersed in the blood of animals slaughtered at the coronation ceremony and were located at a unique place in her house called the *girdi*. The *Maganencho* holds the *wadassa* always when she performs rituals and blessings.

This ritual object transferring ceremony was known as *fanchote*, and the ceremony was concluded by the blessing of the former *maganencho* to the newly appointed ones, wishing success in their stay in the position. In this ritual, the newly appointed *maganecho* was expected to slaughter an ox/cow to bless *Wa'a*, saying '*abo beresina...abo beresina...odone beresina, kefina*', which is to mean, please *Wa'a* guide us (herself and her husband) to the right path and let the spirit bless them to be successful in their effort to serve the community. Then, she put a piece of blood in her house, essentially at a part of the house called *gridi*, where she made her prayers, to show her allegiance to the spirit of her ancestors.

In the Bayso religious tradition, a *Woycha* was expected to assist his *Wonno* in organizing public rituals and sacrifices, largely at a time of calamities, initiating funerals, and collecting contributions in kind and cash (*marancha*) from villagers together with elders. He also had a receptionist and a spokesperson role, communicating prescriptions to individuals who visited them seeking solutions to their health problems. Even more, before the incorporation of the Bayso into the reign of Menilik II, *Woychas* assisted their *Wonno* on administrative matters too. Conversely, a *maganencho* performed rituals that focused on health-related issues of inhabitants, either in her special room (*girdi*) or in public spaces together with other ritual participants. A former *maganencho* in Alge village has elaborated on the case:

Any one of our villagers who experienced a health problem used to visit our home and communicate their problem to my husband (Woycha). Then, as soon as I had the information, I went to my special room, girdi to appeal the case to Wa'a through prayers, rubbing my bracelets made from animal leather (haraffa) with my hand. While I was praying, I would hear a humming voice of my spirit. As I heard that particular voice, I informed the problem with my guest to the spirit. Then, the spirit communicates the problem to Wa'a. After a while, the spirit recounts the measures that have to be taken for me. Forthwith, I recount what I was dictated by my spirit to the Woycha. Finally, it was the Woycha who notified the guest about the source of the problem and possible solutions to fix it. During this ritual, we used to slaughter animals provided by individuals who came seeking our help (Ayelech Toma⁴⁸, July 15, 2020).

Regarding the type of animal slaughtered in the ritual, Epple (2016) stated that spirits dislike sacrifice in the form of the meat of goats. Even individuals who touched a goat or consumed goat milk were obliged to cleanse their bodies with animal urine to be able to visit the house of a *Woycha*

8.2.3 Ritual experts: Oddobaddos and Abaddos

Customarily, the Bayso considered females' bodily fluids as impure and polluting. Satane Habale, a former ritual expert, explains:

We believed that women's and girls' bodily fluids, such as menstruation, the blood a woman loses after birth and miscarriage, and breast milk, could pollute that particular family and their homestead. Essentially, a drop of blood as a result of miscarriage (metebiaano) was believed to pollute the woman, her family, and even the whole land. Hence, such a woman was considered unclean (tunne); and she was alienated until she underwent a cleansing ritual (elabo) performed by Abaddo. Then, when I was in the position, a family who experienced a metebiaano, reported the case to my husband (Oddobaddo). On the occasion, the husband of a woman who had metebiaano was expected to offer a sheep to my husband for the ritual. Then, I, together with my husband and elders, report the case to a Wonno to get his consecration for the cleansing processes. Following this, together with senior Bayso women, I went to the house of a woman who had a miscarriage. There, we all bless her, putting a handful of butter on her head, while she holds the sheep, saying "The spirit of Wa'a shall be with you..." "The spirit of Wa'a's mother⁴⁹ shall be with you...." "Let her treat you, let her give you strength". After that, I slaughtered the sheep and sprinkled its stomach content inside the house, mainly on the spot where the blood or other fluid had dropped (Alge, June 23, 2020).

⁴⁸ Pseudonym given by the researcher

⁴⁹ The Bayso believed that St. Mary, the mother of Jesus, was also the mother of *Wa'a*.

Satane, in her continued explication of the roles of *Abaddo*, stated that *Abaddo* was blessed and endowed with the spirit of *Wa'a* to carry out her spiritual duties. Thus, realizing her sacredness and cleansing power, the Bayso conceived her as St. Mary, the mother of Jesus. The cleansing ritual of the Bayso corresponds with the Bachema and Rim⁵⁰ of the Amhara Region. According to Guday, in Bachema and Rim:

“...after the delivery of a child, the mother and her house are considered unclean. To make it clean, the house has to be sprinkled with holy water (täbäl) by the local priest or the spouse’s confessor-father. All those who enter this house before it has been cleaned are also considered unclean to go to church. Especially, the mother and those who assisted her during childbirth are not allowed to go to the local church until the child is baptized (Guday, 2005, p.95).”

The discussions so far and the above excerpt show that religious rituals have a supreme role in maintaining the well-being of the community through spiritual healing and cleansing, and animal products are crucial to practicing religious rituals. Correspondingly, Léo Neto et al. (2009) posited that, in different parts of Africa, religious rituals are crucial in Africans’ lives, and animal products are used for liturgical purposes.

8.3 Rituals and Sacrifices in the IBS of the Bayso

The Bayso had diverse rituals and associated sacrifices, viz., *shashafano*, *gaa-wogo*, *gabasano*, *hulluuqaa*, and *obooro*. Of these, *shashafano*, *gaa-wogo*, and *gabasano* were practiced for protection, *hulluuqaa* for prevention, and *Obooro* was used both for protection and to heal illnesses.

8.3.1 *Shashafano*

Usually, the Bayso believed that each family had a guardian spirit that kept the well-being of each family member. Therefore, to thank their guardian spirit, each family practiced a *shashafano* ritual. An elderly woman from Alge village recalled:

⁵⁰ Bachema and Rim peasants’ association is found in Mecha *woreda* in west Gojjam of Amhara Region (Guday, 2005).

We believed that each family had its guardian spirit, which escorted each member as s/he moved from place to place. Because of this, each Bayso family used to practice a shashafano ritual to thank their guardian spirit for its protection. Failure to perform this ritual would result in an unanticipated risk to our family. It was not that much of an elaborate feast; rather, it was practiced at a traditional coffee ceremony and mealtime. Therefore, at a coffee ceremony or mealtime, an elder person of his/her family throws a small amount of the food they are going to consume in all directions of the house, saying, heike amine (let you eat this), nugoda kankentata (thank you for your protection) (Korate Darge⁵¹, Sep.27, 2021).

8.3.2 Gaa-wogo

The term ‘gaa-wogo’ is a compound of two Bayso words, *gaa* (forest) and *wogo* (ritual), to mean a forest where a ritual takes place. Each village on the island had its *gaa-wogo*. An elderly man, who participated in the FGD in Mulato village, elaborated on this point in the following way:

Gaa-wogo was the most important role of Wonnos. It was held three times a year: during a rainy season (badhessa), a dry season (gillaal), and between badhessa and gillaal. It was practiced to protect us and communities around the lake, our herds, and the environment from calamities. On the ritual, a Wonno threw parts of the slaughtered animal, including a heart, tongue, and the right front leg, to the gaa-wogo as a sacrifice, and the rest was consumed at the spot, and some of it was taken to be distributed for those at home. Finally, the ritual was concluded with the blessing of a Wonno (Gambura Ganta, July 7, 2020).

In the religious life of the Bayso, the ‘right side of animals’ and organs such as the tongue and heart symbolize sanctity and purity. Because of this, at the *gaa-wogo* ritual, they used to sacrifice these organs and the right front leg of an animal.

8.3.3 Gabasano

Gabasano was a memorial feast organized by the eldest son of the deceased for the spirit of their deceased relatives/ancestors (father and mother). The Bayso believed that if family members of the deceased failed to perform the *gabasano* ritual, the soul of the dead would not get to its final destination in the sky, *darur*. It would rather hang about on the outskirts of the village, and would repeatedly appear in dreams to the relatives of the dead,

⁵¹ Pseudonym given by the researcher

complaining: ‘You left me alone ...you have forgotten me’. So, it was believed that this would cause unanticipated danger to the deceased’s family. The experience of Game Akame, an elderly Bayso woman, illustrates this case:

In the 1960s, we experienced a cholera outbreak. Then, because of the communication ban among the Island villages and the surrounding communities, it was difficult to visit infected relatives or to attend funerals at Haro. Given that, individuals who came from other villages to the island before the outbreak were forced to stay at Haro. Unfortunately, one of such individuals, named Ragase Bettalo, died of the disease and was buried on the outskirts of Haro, against the custom of the Bayso. Because of this, her family was horrified by the spirit of Ragase. The spirit appealed to her family, saying, ‘You left me alone in a forest; you detached me from my relatives’. This was to designate that the deceased body of Ragase was buried away from her relatives’ burial site. As their response to the appeal was too late, the spirit killed two out of three sons of Ragase. Consequently, Ragase’s family, who were scared by the incident, brought back the deceased body of Ragase to place it in their clan’s burial ground and practiced the gabasano ritual. It was after this ritual that things became normal for their family (Alge, Aug.22, 2020).

As to the preparation and practice of this ritual, an informant from Shigma village explained:

The Gabasano ritual was a big feast, which required the preparation of food and beverages to be served in the ceremony. Villagers contributed homemade bread (babbo), while relatives of the deceased slaughtered an ox/a goat and prepared a beverage from honey or cereal. On the occasion, the eldest son, or if not, other relatives, place some amount of the food and pour of the drink on the grave, saying “Let you eat this and drink this”. Then, calling the spirit of their dead relative, they used to say “Please bless us, until we come to you, give us health and peace” (Tube Chall⁵²e, Sep.25, 2021).

8.3.4 Hulluuqaa

The Bayso used to practice a *hulluuqaa* ritual to prevent themselves from misfortunes. It was practiced in each village under the support of elders and *Wonnos*. A former *Wonno* in Alge village explains:

At a time of drought, epidemics, and other mishaps, I used to tie a creeper on two trees on the right and left sides, then all inhabitants and animals of my village, except goats, passed through it. As they came out through the creeper, I splattered the blood of an animal slaughtered for this ritual onto inhabitants and herds, and if that was not enough, I used to splat muck. This was a symbolic process that shows how Wa’a would pass us through misfortunes. It was believed that anyone who committed a wrong act would not dare to

⁵² Pseudonym given by the researcher

participate in a hulluuqaa ritual, as it would cause unexpected danger to such individuals or their relatives. Equally, failure to practice this ritual results in mishaps (Chumabaro Assefa, June 26, 2020).

As it is explicated elsewhere in this dissertation, the Bayso believed that cattle and sheep, and their products such as meat, milk, blood, and muck, are pure. Therefore, they used these products in their religious rituals and sacrifices for protection, prevention, and healing of infections and misfortunes, and cleansing rituals. As I have learned from the account of Gemeda (2022), *hulluuqaa* is an Oromo term that refers to passing through the framed route for some cultural purpose. According to Gemeda, the passage through framed routes symbolizes a breakout from unfavorable omens or threats, which is almost comparable to that of the Bayso. Gemeda (2022) in his recent study of the Guji society revealed that the Guji employed the *hulluuqaa* ritual to avert the prevalence of COVID-19. As the Bayso had strong sociocultural and economic relations with the Guji-Oromo, mainly when they were herders, therefore, it was believed that they might have adopted this ritual from them.

8.3.5 *Obooro*

Obooro is a mixture of honey and milk, which a *Wonno* used to spit on every person and animal on their arrival to the island from nearby villages and markets to protect against a possible entrance of disease. Besides, *Wonnos* were expected to bless periodically their respective villages, inhabitants, and the herd around their territories, spattering the *obooro*. If there was a shortage of milk, *Wonnos* used to spit honey mixed with water, or if they lacked honey, they used to spit milk mixed with water. It was common for *Wonnos* to hold a small container made of calabash to contain *obooro* as they moved from place to place in their villages on the island. The Bayso, who were well aware of the protective nature of *obooro*, considered it their vaccine. For some others, it was the finest remedy given by *Wonnos* to cure sick persons and animals from their illness⁵³.

⁵³ Interview with *Wonno* Chumabaro Assefa and *Wonno* Dabalko Amano Alge, June 26, 2020

8.3.6 Rituals and sacrifices practiced to sustain the richness of the environment

Informants stated that in addition to taboos, sanctions, and local mechanisms used to sustain the richness of *ul*, *Wonnos* were expected to organize rituals and sacrifices in their respective villages and public areas. One of the former *Wonnos*, Chumbaro Assefa, explained the case as:

You see this soil, that tree, the lake water (...), these are all entities of ul contribute to our life in one or another way. Thus, we believe that any damage to these entities of ul means damage to our community as ul is the base of our life. So, as a ritual leader, our main concern was to maintain the richness (mogossa) of ul with the spiritual power and knowledge that Wa'a anointed us. In this regard, we had individuals who could decipher some environmental features and forecast the onset of natural hazards such as drought. Thus, with the advice of such individuals, we used to take essentially two measures: gondossa (periodical move with our herds) and plea Wa'a for rain, since we believed that rain is a blessing of Wa'a that gives fertility, abundance, and life to ul. For instance, at times of drought and pests, I used to call my villagers to perform a hulluuqaa ritual, to plead Wa'a and ancestral spirits for their forgiveness, since we supposed that such rituals smooth our relationships with these forces, who might be outraged by our wrongdoings. We also practiced a gaa-wogo ritual periodically, expecting the blessings of Wa'a, saying, oh Wa'a, oh Wa'a edamun kenina (oh Wa'a, oh Wa'a, please give us rain) and bararsina, kefina (please bless the land and let the earth become abundant). On both occasions, we used to slaughter animals for these forces. In this way, we sustained the richness of our ul for generations, and reciprocally, it provided us with fertile grazing and arable land, and an environment that was conducive to herding, farming, fishing, and living (Alge, Oct. 12, 2021).

In line with the above excerpt, Appiah-Opoku (2007) and Afolayan (2009) posited that indigenous practices were effective in a way that matched the modern notions of conservation and sustainable use of environmental resources. However, the death of custodians of the knowledge, migration, and the introduction of Western culture have ruined these practices.

In general, the religious rituals of the Bayso, such as prayers, sacrifices, and offerings, were practiced mainly to protect and prevent diseases, cure infected individuals and animals, and also to cleanse impurities. They also used to practice these rituals at times of drought, seeking rain and affluence of markets; during plantation seeking the blessing of *Wa'a* and ancestral spirits, and at times of harvest to thank *Wa'a* and spirits for their kindness in giving them such yields, and to create amicable relationships with them. Correspondingly,

according to Awolalu (1976, p.59), the practice of sacrifices and offerings among the adherents of ATRs is dependent on “the occurrence of drought, epidemics, war, invasion of insects and pests, and destructive floods”.

Likewise, Mokgobi (2014) posited that sacrifices and offerings are practiced in times of rites of passage, during plantation, at harvest, at ceremonies of purification of a person or a village after an epidemic, and above all when the rains fail or are delayed. So here, as can be deduced from the expositions of the ritual systems, the Bayso used to sacrifice meat, blood, milk, and the contents of an animal's stomach. This required them to slaughter animals, including cattle, sheep, and goats, depending on the orders or favorites of their ancestors and other spirits. The corollary of this is that the religious rituals of the Bayso were not expected without animal products. Therefore, it can be presumed that the decline of animal wealth has considerably affected the religious rituals of the Bayso. This finding validates the notion of cultural ecology that cultural practices and religious rituals are essential to the maintenance of natural resources in traditional societies. Rooted in cultural beliefs, these rituals encourage sustainable resource use and biodiversity conservation by shaping individuals' behavior, perceptions of nature, and social norms.

8.4 Effects of Environmental Change on the IBS of the Bayso

The Bayso experienced significant losses of livestock due to overgrazing, severe drought, and cattle diseases. These losses led to impoverishment and scarcity of animal products for sustenance and religious practices. Deforestation for cultivation land, construction materials, firewood, and charcoal further disrupted crop production by causing soil erosion, infertility, and flooding. This reduced their contributions (*marancha*) to ritual leaders and hindered their religious rituals. The depletion of natural resources has extended beyond the Bayso heartland, affecting neighboring communities that rely on the same ecosystems. This has also exacerbated the region's environmental problems, thereby affecting the livelihoods and cultural lives of its inhabitants. The Bayso's traditional coping mechanisms, such as seasonal migration (*gondossa*) and local resource management mechanisms, are inadequate for these unprecedented challenges. This threatens the fabric of their society

and spiritual life. Elders lament the disruption of ancestral wisdom and the erosion of cultural practices that once ensured harmony between them and their environment.

In my analysis, I contend that the cultural life of the Bayso people, especially their religious rituals, has been profoundly influenced by the degradation and misuse of natural resources. The connection between their environment and cultural practices is essential, as the natural environment plays a vital role in shaping their beliefs, customs, and spiritual expressions. As natural resources have been exploited or depleted, the Bayso have faced challenges in maintaining these integral aspects of their culture, leading to shifts in their rituals and a potential loss of traditional practices. This transformation poses significant implications for their identity and the continuity of their cultural heritage. According to Pearson, Jackson, and McNamara (2023), the degradation of natural resources leads to a decline in the animal and plant products that pastoralists use from the land, endangering their sociocultural life. In this regard, the Bayso, who recognize the crucial role of the natural environment in sustaining their livelihoods and their IBS, have articulated the adverse effects of environmental change on their IBS in terms of the decline in animal wealth, migration, and its consequences.

8.4.1 Decline of animal wealth

According to Gesa (2023), cattle play a crucial role in pastoral societies around the globe, providing food security, income, and religious roles. Thus, their loss erodes these livelihood assets and jeopardizes pastoral livelihoods. From the context of the Bayso, a decline in animal wealth means disruption of the sociocultural, religious, and economic life of the community. Consider the following excerpt:

In those days, herding was our survival, so in one way or another, our lives were closely tied to livestock. For example, ritual leaders and other ritual personnel used animal products to bless us, our herds, and the environment, to curse wrongdoers, and to avert diseases, evil spirits, and misfortune. Even animal excrement was used for washing clothes and treating diseases. At present, however, due to resource degradation and the spread of cattle disease, we have lost our herds, and this has disrupted our ritual system, which was the basis of all aspects of our lives (Gulla Zeleke, Alge, June 25, 2020).

The above findings clearly show that drastic environmental changes in Gidicho Island have severely affected the Bayso people's cattle wealth and crop production, affecting their livelihoods and spiritual practices. Faced with these hardships, the Bayso have been forced to migrate to villages along the west coast of Lake Abaya to save their life. This migration presented significant challenges as they attempted to adapt to unfamiliar environments and integrate into established communities. Furthermore, this move has disrupted the Bayso's cultural heritage, endangering the transmission of traditional knowledge and practices to future generations. Correspondingly, Gashu and Muchie (2028) argue that the degradation of resources has a drastic impact on the cultural life of rural Ethiopian communities, affecting their livelihoods, traditions, and social structures. They emphasize that reduced agricultural productivity due to land degradation leads to food insecurity and poverty, often prompting shifts in traditional farming methods and migration from ancestral lands. These changes threaten to erode cultural traditions and weaken social cohesion as communities struggle to adapt to their new circumstances.

8.4.2 Forced migration and its consequences

According to Black et al. (2011), migration provides both benefits and challenges for migrants. In this regard, informants believed that their migration brought them some socio-economic benefits (e.g., access to social services and agricultural land). At the same time, they faced severe challenges in maintaining their cultural traditions in general and religious rituals in particular due to their exposure to dominant cultures in their destination areas. As noted elsewhere in this study, culturally, the Bayso used to move periodically with their herds to nearby and distant areas searching for better pastures, in times of drought. However, since the 1980s, due to the harsh environmental change and the resultant resource scarcity, the Bayso lost a significant part of their herds, which were the mainstay of their livelihood. Consequently, the desperate Bayso were forced to migrate to the west coast areas of Lake Abaya, leaving their homeland once and for all. Given that, some of the elderly believed that the turning point for their mass migration was the drought incident of 1984-85, which triggered considerable damage throughout the country. One of my key informants from Mulato village articulates their migration as follows:

We consider our migration as a fish that comes out of the water. You see, as a fish dies out of the water, our migration has already detached us from our cultural base and caused a decline in our cultural values and customs. In our tradition, the elderly were considered a storehouse of our culture. Because of this, they were expected to socialize the youth with our sociocultural norms and traditions and prepare them to shoulder the continuity of our culture. However, due to the incessant migration of the youth, they were not able to fulfill their responsibility. Because of this, currently, the majority of our children, who grew up in villages on the immediate coast of the lake, are not competent in Bayso culture, and some of them do not even speak their mother tongue (Markos Makagno⁵⁴, Dec.7, 2021, Gidicho village).

The study revealed that their migration had significantly affected their IBS for the following reasons. Firstly, it impaired some of the cultural institutions of the Bayso, including the extended family (*agud*) and the *marancha* system. As can be inferred from the informant's views, in Bayso's cultural tradition *agud* comprises three or more generations within an enclosure, where each married son built a house (separate bedroom) rounding the house of *abbo kanjin*, head of the enclosure, and his wife, the senior woman. Grandparents, parents, children, and other relatives (e.g., uncles and aunts) lived together in the enclosures. Customarily, it was a must for every member of the enclosure to be at the house of *abbo kanjin* at meal times and coffee ceremonies, and usually, spent time after dinner discussing socio-economic and cultural issues. This helped them to sustain emotional attachment, acquire economic support, and communicate cultural traditions and values to their children. However, their migration to the areas on the west coast of Lake Abaya has damaged this institution and its role in ensuring the continuity of cultural traditions and values.

Equally, the usual contribution to ritual leaders in cash and kind (*marancha*) to support *Wonnos'* efforts to sustain their ritual system was interrupted as the majority of adherents left the island, and culturally, it was taboo for *Wonnos* to cross a water body. Secondly, some informants contend that their move exposed them to some government policy measures, such as the villagization scheme of the *Derg* regime. In this regard, they noted that until the recent mass migration that made them in contact with other cultural groups in

⁵⁴ Pseudonym given by the researcher

the region, they maintained their cultural traditions perhaps for generations because of the remoteness of their island from the mainland (Mirab Abaya) and they were the only people who had the skill to build and navigate traditional boats on the Lake. But later in the 1980s, because of the severe drought in the region that forced the Bayso to flee their island, the military government designed a villagization scheme along the west coast areas of Lake Abaya. Though it is logical to move citizens from degraded areas to resourceful areas to save the lives of affected ones and to create favorable conditions for the revival of degraded areas, it was not successful in the context of the Bayso for the following reasons: First, the way pastoral communities value and interact with their environment is quite different from peasants. In this regard, an individual from Alge village explains:

When we were on the island, we had a land tenure system in which each clan had its own plot of land for housing, grazing, farming, and burial. Since this was the cultural set that guided us in using land, therefore, we were not ready to accept a concentration of people within a given area and share a village with other ethnic groups. This was because of our fear that other ethnic groups might spoil our values and traditions. We also believed that herding cattle, essentially milking cows in crowded areas, would expose them to strangers' eyes, which would induce illness and unexpected death. Therefore, following our migration and inclusion in the villagization program, we sold out our few cows, which were suffering from a shortage of pasture and exposed to the consequences of strangers' eyes (Machuge Galea, Sep. 21, 2021).

Second, local officials who executed the villagization program recklessly used grazing lands for settlement, considering them as vacant land, and such actions exacerbated the shortage of pasture and affected the already exhausted cattle wealth. Third, the fact that the villagization program brought together the Bayso, Gamo, Wolayta, Haro, and others in one village, therefore, the sociocultural life of these people was affected in some aspects. For instance, the Bayso had lost their sociocultural traditions and institutions such as *gondossa*, *marancha*, and *agud*, as elucidated elsewhere in this study following their migration and contact with other cultures. These informants' views are congruent with the premises of PE, which contends that environmental change and ecological conditions are a product of political processes. In this regard, the villagization scheme of the *Derg* regime, which was designed to improve the socio-economic life of rural communities and revitalize environmental conservation efforts, was not successful, since it failed to consider sociocultural and ecological contexts at a grassroots level. Accordingly, I argue that this is

an indication of how government policies meant to solve one problem could cause other problems in Ethiopia. Fourth, their migration led to interactions with various ethnic groups along the west coast of the Lake, immersing them in new cultures that challenged their core values and traditions. For instance, daily engagements with diverse individuals in local settings such as schools, markets, and social gatherings introduced them to unfamiliar ideas and experiences that included concerning issues like alcoholism, dishonesty, idleness, and pre-marital sexual relationships. Furthermore, the influence of Christianity significantly altered the cultural life of the Bayso people, deeply affecting their traditional beliefs and practices in profound ways.

Regarding the introduction of Protestant Christianity, there are two contending views. In this regard, one of the former *balabats* and some informants related it to the opening of the first and only primary school on the island. After the school opened, the Sudan Interior Mission (SIM), then based in Gedeo, sent teachers to Gidicho at the request of the Bayso people, but used the opportunity to preach Christianity alongside secular education, and it is said that Protestant Christianity attracted the majority of the youth and adults in the island. For instance, Machuqe Gelea (an old man from Alge village) and FGDs⁵⁵ in Gidicho Island posited that using education as a gateway to the island, Christian missionaries established themselves through time and attained crucial support from the youth and the poor, who were already tired of the obligations of their IBS. Congruently, Epple (2016), who shared the above view, also stated that there was an allegation among the Bayso that the poor stood against their IBS since they conceived that their belief system favored the wealthy.

Conversely, the majority of the Bayso associated their exposure to Protestant Christianity with their migration and the contact that they made with the dominant cultural groups (Gamo and Wolayta), in areas on the west coast of Lake Abaya. In this regard, Freeman (1999) and Wolayta Zone Finance and Economic Development Office, WZFEDO (2003),

⁵⁵ Dec. 11, 2021

respectively, indicated that the Gamo and the Wolayta (then a hub of Protestant Christianity) have established themselves on the west coast of Lake Abaya, migrating from their home areas due to resource scarcity. According to Freeman (1999), the opening of a road that connected Arbaminch with Wolayta in the 1960s eased the close link between the Wolayta and the Gamo.

Therefore, it is believed that this link facilitated the easy movement of missionaries and others in the region. One best instance in this case was the introduction of protestant Christianity to Gamo areas by Wolayta believers (*amagnoch*) (Ables, 1980; Freeman, 1999). In this regard, as the first trainee in Wolayta church school, a respected Ocholo man, *Halaqa* (local chief) Gembo, played a decisive role in spreading the religion in other Gamo parts in the 1960s. In the same way, the introduction of protestant Christianity to the lowland areas of Mirab Abaya was mainly related to the close link that the Bayso established with the Wolayta and the Gamo on the west coast of the lake and the coming of Non-Governmental Organizations (NGOs) such as WVE following the drought of 1984-85. The following excerpt from the interview that I conducted with a former WVE staff member in Birbir town best illustrates the case:

The introduction of protestant Christianity in the lowland areas of Mirab Abaya, from Qorga to Omolante, is related to the flow of missionaries from Wolayta and the opening of a church school in Ocholo⁵⁶. Besides, the coming of WVE to the region has contributed meaningfully to its expansion. Following the 1984-85 drought in the region, the government and NGOs were running to save the lives of drought-affected inhabitants in our localities. In this regard, World Vision has played a paramount role by providing food aid. However, as a staff, we were oriented to influence inhabitants to prefer Protestant Christianity. In addition, efforts made to fulfill infrastructures, including schools, health centers and clinics, and food security programs attracted the majority of the Bayso and others in the region (Kebede Gambura⁵⁷, June 16, 2020).

Of course, some informants opposed the claim that food aid was used as a means to attract the Bayso and others to Protestant Christianity, but the majority of the Bayso corroborated it. Congruently, the findings of Eshetu (2021) revealed that missionaries in Gedeo used

⁵⁶ Ethnically Gamo, settled 30km south of Mirab Abaya (Biribir)

⁵⁷ Pseudonym given by the researcher

donations as a means to attract adherents of IBS to Protestant Christianity. Similarly, Fantahun (2017) stressed that aid is one of the ways that Christian missionaries used to win converts and subsequently increase the number of adherents.

In general, even if I am not refuting the introduction of Protestant Christianity to the island, I am not content with the argument that protestant missionaries had strong support from the youth and adults on the island or even from the majority of the Bayso. My complaint in this regard is, as highlighted in this study and the accounts of Brenzinger (1999), Epple (2016), and Sava (2011), the Bayso have been migrating to the west coast of the lake for a long ago. In their migration tradition, it was the youth and adults who migrated with their herds, leaving the elderly on the island. Therefore, rather, what I believe is that because of their close link with the Wolayta, Gamo, and other ethnic groups in villages on the west coast of the lake, who have been dominantly adherents of Protestant Christianity, the Bayso youth became sympathetic to the Protestant church. Parallel to my argument, Gumo et al. (2012) posited that the migration of rural Africans from their home areas exposed most of them to a mode of change that hindered the development of their spirituality.

Likewise, according to Rapport, Sardoschau, and Silve (2021), due to migration caused by climate change, inhabitants lose part or all of their cultural beliefs and values through contact. If we see the case from the relocation diffusionist perspective of Alderman (2012), the Bayso were relocated from their homeland to areas of Gamo and Wolayta; hence, the dominant cultural elements of these communities, including the ideas of Protestant Christianity, are diffused to the Bayso and replace their IBS. Indeed, according to some informants⁵⁸, initially, protestant missionaries were faced with fierce resistance from the majority of adherents of the IBS in areas on the west coast of the lake, essentially, those who feared that such a move would result in an unexpected curse on the community. While the two groups fought each other for supremacy, unfortunately, ex-*Wonno* Amano, one of the ritual leaders who fled to the west coast villages with his people and the leading figures

⁵⁸ Chmabaro Assefa and Balamo Worba, Alge, April 25, 2020.

in the opposition, died in June 1989. Then, missionaries and new converts, who were committed to placing the final heavy blow on the IBS of the Bayso, used this opportunity to mobilize the youth against ritual leaders and the elderly. Because of this, a strong effort made to coronate a new *Wonno* was unsuccessful, and this created a power vacuum for almost six months (Mohammed and Teferi, 2019).

Finally, ex-ritual leaders and adherents of the belief system, who united themselves under the motto '*sera watananeko kaumulane watano*', which means it is better to lose one's child than lose a culture, made their last effort to restore their belief system. Accordingly, they reinstated their IBS and installed a new ritual leader, named *Wonno* Dabalko, in November 1989 after a tiresome struggle. Then, *Wonno* Dabalko made some adjustments to their ritual system (e.g., slaughtering sheep rather than an ox/a cow, mixing honey with water rather than milk, and reducing the number of ritual meals), realizing the burden of resource scarcity on adherents. However, attracted by the teachings of Christianity that highlight 'God has sacrificed His only son to save the world', they disregarded their tradition of sacrifices to deities and spirits, and gave up their ritual system in 1991/2. This implies that, believing that the cultural traits of Christianity (teachings of protestant Christianity) are beneficial to their life, they replaced their ritual system with the teachings of Protestant Christianity. The account of Eneji et al. (2012) substantiates this finding, arguing that the introduction of Western religion (Christianity) eroded the rich cultural values and religious diversities of Africans, and also changed their worship system through missionary efforts.

Following their conversion to Christianity/decline of their IBS, they: (1) rejected principles, values, and customs of their belief system and disregarded the role of ancestral and other spirits in their life. (2) Gave up prayers, offerings, and sacrifices associated with protection, prevention, healing, cleansing, and well-being. (3) They also ignored and rejected the power of ritual leaders, experts, and assistants, who had once held inimitable roles in all aspects of their lives. Accordingly, they were unwilling to observe the sanctions, taboos, and orders of these religious specialists. In general, currently, their ritual system has been replaced by protestant Christianity dominantly. However, from the conversation that I had with informants, I realized that there are two contradictory feelings about the

decline of their IBS. In this regard, some informants perceived the decline of their belief system as a new era of their lives, in which they moved from darkness to light. An old lady from Alge village explains:

My family and I are pleased about the decline of our belief system because it was the dark part of our lives that led us into the trap of the devil. But today, we are enlightened by the spirits of Jesus and have conquered the darkness of the evil spirits (Alemitu yada⁵⁹, May 13, 2020).

On the contrary, some others (chiefly former ritual leaders and elders) felt remorse for the decline of their IBS. They argued that they not only lost their IBS but also their cultural system, which defined them. A former ritual leader from Alge village highlighted that:

This mess (socio-economic problems) has ensued since we have forgotten Wa'a...we dishonored His principles and values. I presume that the main reason for the current environmental crisis and socio-economic mishaps is the decline of our ritual system. What I mean is that, in the early days, our ritual system had solutions for the problems that we were suffering from (Chumbaro Assesfa, Aug. 18, 2020).

Even though the IBS of the Bayso has gone forever, some elements of it persist in Bayso's present life. The best examples of this are the *Shashafano* ritual and their belief in the power of individuals (old men and women) to bless and curse. This confirms that the influence of their IBS is still strong in their Christian lives.

In general, as explicated in the above paragraphs, the severe environmental degradation on the island that caused drastic resource scarcity and its consequences, including the loss of a significant part of the herds and forced migration, has caused the decline of their IBS. Then, if we see the case from the adaptation theory perspective, it has the following implication. Firstly, it can be argued that the Bayso were not able to adapt to the changing environment on the island. That means either they were not able to change how they behave in the environment, or the rate and magnitude of the environmental change in the study area exceeded the limits of adaptation. Accordingly, the Bayso, who realized that their adaptation effort was not successful in reducing the risks of change, were forced to migrate.

⁵⁹ Pseudonym given by the researcher

Indeed, migration itself can also be taken as an adaptation mechanism that involves fleeing to resource-rich areas. The point is that, even though their migration saved their life, they lost one of their cultural institutions (their IBS) for the reasons detailed elsewhere in this dissertation. This is congruent with the findings of Rapport, Sardoschau, and Silve (2021), who argue that if communities fail to adapt to environmental changes in their localities, they migrate and may end up losing their culture. Likewise, Adelekan (1999) posited that opting for migration as a way out of environmental change results in dislocation, detachment, loss of belongingness, and a decline in cultural traditions.

8.5 Marriage Customs of the Bayso

In many societies of the world, marriage is conceived as the basic cultural element of a society for the fact that there could be no family without it (Okon, Ekpe, and Ansa, 2014). According to these scholars, marriage and the subsequent formation of a family rest on the biological complementarities of male and female in reproduction, but both marriage and family are cultural patterns. Therefore, they differ in form and function both among and within human societies and change over time with changing sociocultural and economic conditions, and climate and environmental changes (Campos, 2020; Mahder, 2003).

Among the Bayso, marriage (*keesume*) is a union of two opposite sexes, with the agreement of both marrying families and clans as per their cultural traditions. A former ritual leader, *Wonno* Chumbaro Assefa, explains:

Keesume is the smallest but strongest cultural institution that has been playing an inimitable role in the maintenance of cultural traditions by establishing a family. It is a transition from childhood to adulthood that boosts the psychological and physical readiness of couples to shoulder socio-economic and cultural responsibilities. It is also a source of prestige to couples, marrying families, and clans, and the only customary institution that ensures continuity of generation (Alge village, Oct. 13, 2021).

Studies on marriage customs in Ethiopia (e.g., Dawit et al., 2005) reveal that marriage types vary from culture to culture. For instance, marriage by personal choice is a tradition in some ethnic groups of the south, such as the Tsemako and Karo, and conversely, among the highlanders like the Amhara, Tigray, and Oromo, marriage is usually arranged by parents. In this regard, while Bayso men choose spouses, women have no say in the

selection of their spouses. It depends on the wishes of their brothers and fathers. FGDs in Mulato⁶⁰ village specified that there are two marriage types among the Bayso: arranged (*banti*) and levirate (*eelano*). In an arranged (*banti*) marriage parents of the bride and groom organize the marriage based on specific criteria stated in this study. It also demands the agreement of marrying families and clans. Consider the following excerpt:

Banti⁶¹ is a dominant type of marriage in our community and is based on agreements between both families and the marrying clans. In this case, the boy's family first decides which clan he will marry into, and once they have chosen a clan, they look for a girl who will attract their attention. When they find the best, they nominate elders to plead for marriage (Balamo Worba, Alge village, Sep. 29, 2021).

This informant's view is congruent with the notion of Zerihun (2005), who noted that in a traditional, simple society, marriage is often more of a relationship between groups than one between individuals. It can be presumed that through such marriages, the Bayso created a strong social bond and alliance between the marrying clans. Conversely, levirate marriage (*eelano*) is the custom of the Bayso people, in which a man marries his brother's widow or, on the death of one's sister, her minor is given as a wife replacing her deceased sister. However, this marriage is mainly concerned with caring for children and maintaining the property of the family, not controlled by a person outside the kinship. This means it never gives a chance to those who were forced to inherit either their deceased brother or sister, to marry their loved ones. Nowadays, levirate marriage seems to be less common, but it is still practiced among some rural communities in sub-Saharan Africa, including the Yoruba in Nigeria and parts of Senegal, essentially for economic reasons, as reported by Odumusu and Opebiyi (2021) and the World Bank, WB (2018), respectively. Similarly, a study by Agafari (2020) found that the Doko community of southern Ethiopia still practices this marriage to some extent.

⁶⁰ A group discussion held on Feb.2, 2021

⁶¹ But in some other communities, such as the Amhara, marriage agreements were made as early as before birth, for the reason that the community perceive that girls are eligible for marriage before the age of 14 and at this age girls are no longer socially considered as children. On the other hand, boys are eligible for marriage usually at the age of 18 or above (Guday, 2005).

The elderly who participated in this study from all the study sites emphasized that their marriage system has not only contributed to the formation of lasting marriages and the continuity of generations through procreation but has also fostered a strong bond between marrying clans, families, and the living dead. They also mentioned its contribution to the prevalence of peace in the region. Thus, after saying this much about the two dominant marriage types of the Bayso, the next will be a deliberation on the mate selection conditions. In this regard, the following points are a representation of the views of many of our informants regarding the major conditions and procedures involved in Bayso's marriage arrangement. First, as indicated earlier, the Bayso practice clan exogamy. Therefore, the marriage arrangement ensures that the bride's parents don't belong to the groom's clan. Second, those who arrange the marriage make sure that the girl is '*falintee*', that is, she is permissible for marriage on the ground that there is no known blood relationship between the bride's and groom's families. Third, the girl should be '*geetetta*', that is, mature enough for marriage. This is said to be largely established through observation of the girl's physique. Fourth, the girl is also 'spied' upon for her honesty, humility, hardworking behaviour, and chastity. Once the appropriate girl is established, the boy's parents, together with selected elders, begin to look for an omen (*kaya*). Manache Galea, an elderly woman, explained this as follows:

In our culture, kaya is a sign of good or bad luck. If the elders dispatched to look for a kaya on their way to the chosen girl's home encounter a girl carrying water on her back, a singing bird like a woodpecker on the left side of their path, or see the girl's family cooking, or milking cows when they arrive is a sign of good luck. If they come across a fox, a hyena, a woman carrying an empty pot, or a mourning person in black cloth, these are signs of bad kaya. In this case, elders would return home to look for the kaya on other days. If they encounter bad kaya for the second time, elders must abandon the process, believing that kaya has not allowed the boy to marry this particular girl. If the boy insists on marrying the girl in disregard of the kaya, it is believed that the marriage wouldn't succeed and that the couple could fall ill or become barren (Mulato village, August 12, 2020).

This act of 'looking for an omen' is full of beliefs and symbolism. Some include sociocultural symbols, such as the act of 'cooking' and 'milking', life and livelihood, provisions, and prosperity; 'full' symbolizes good luck, plenty, and abundance, while 'empty' stands for bad luck, scarcity, and barrenness. Others are elements of the natural environment including the sighting of different wild animals placed on either side of the

omen signs they either allow the process to proceed, thereby predicting the success of the marriage, or signal for the process to halt thereby preventing the disaster that could otherwise occur, including marriage failure or negative social or health implications the would-be husband and wife could face. Once a good *kaya* granted the elders permission to proceed, the boy's father and other elders used to visit the girl's parents' home. This was customarily done on Sundays. Upon their arrival, the elders would stand at a gate and call for the daughter's father, saying 'abo,' 'father,' until they received an answer.

Once they are invited inside, elders present their request to the girl's parents, saying: *era ata eresisin*, literally, 'take our son and give us your daughter.' The girl's parents would respond by saying that *lakko geeteto tic'artitta*, meaning, 'we do not have a girl who is ready for marriage'. The elders representing the boy's side would show their patience and persistence, saying *oorayi jinaaray ataro*, that 'they will wait until she gets mature.' In their effort to further test the patience of the elders, and also to show how important their daughter is, the girl's parents respond *danbbe hesetta ibaaddo t'agero*, that is, 'We have already promised her to another person.' The boy's side would respectfully respond *tamanno erato kooya k'ataro*, meaning: 'It is true that many men may propose to marry her, but the fact is that only one man can marry her'. They then respectfully suggest that the girl's parents do *makkara* or 'consult' with their relatives to make the final decision. This concludes the elders' first visit. This process continues until the final decision is made. In the meantime, the girl's parents use such a 'waiting time' to assess the son's behaviour and kinship. If they are satisfied with the would-be son-in-law and his background, including his relatives and clan, they give their consent to the proposal. Once both families and their respective clans agreed to the proposal, they proceeded to the preparation of wedding rituals and feasts.

Among the Bayso, the wedding day is the culmination of the process of marriage arrangement. On this day, the groom prepares for the wedding wearing neat clothes, putting butter on his head, and holding a long stick (*charfana*) in his right hand. He, accompanied by relatives and friends, arrives at the bride's house dancing and singing. Upon arrival, the

bride and groom are blessed by an elder as explained by Machuqe Galea, an elder from Alge village:

In our marriage custom, when a groom arrives at the bride's house, an elderly person slaughters a goat provided by the bride's family. He dips his finger in the blood from a slaughtered goat and smears it on the groom's forehead and the bride's neck. This symbolizes that the relationship between the two families is sealed by blood. We believed that a marriage established in this way would last for life (August 17, 2020).

This symbolism of union by 'blood' creates a sacred bond between the groom and the bride, and their respective families. However, nowadays, the majority of the Bayso people are influenced by Christianity and town lifestyles; as a result, some of these traditions are considered backward. This is followed by a bride-wealth (*burs*) transfer ceremony, which includes a gift of a heifer (*dabulo*), a goat, or a small amount of money. However, the Bayso are not strict about the amount and timing of the bride-wealth transfer. It can be given after the marriage, based on the agreement of both families. On the other hand, the girl also receives various gifts, including household items, clothes, money, and calves from her family, relatives, and friends. Then the guests and relatives enjoy the wedding feast. Finally, the ceremony is concluded by the blessings of the elders:

*Ta setena ha mogatto... let her give birth.
Ta emetana ha mogatto... may she multiply.
Egi esi ha tabiso... be a perfect union.
Wata hayiso wata habariso... may you (couples) live a longer life (Hankalcho Handabo⁶², Alge, August 12, 2020).*

As can be inferred from the above excerpt, the blessings are focused on fertility and marital stability, highlighting the central values of marriage among the Bayso. In their marriage tradition, they were not willing to conclude a marriage if the girl was not a virgin. The reason is that marrying a virgin girl was a source of honour and prestige for both marrying families and their clans. If the girl is found not to be a virgin, she is returned to her parents. In this case, her parents would give her to a Haro man as an expression of their shame and embarrassment at their behaviour. The Bayso see the Haro as 'unclean' because they eat

⁶² Pseudonym given by the researcher

hippo meat and are not circumcised (Epple, 2016). This emphasis on virginity is in line with Bayso values and norms, which strictly prohibit premarital sex, extramarital sexual affairs, abduction, and rape.

8.6 Changes in Bayso Marriage: Links to Environmental Change and Migration

8.6.1 Changes directly related to environmental change.

The theoretical discussion in this study shows that changes in environmental components lead to resource scarcity, and this forces people to change their way of life. On Gidicho Island, environmental changes such as soil infertility, pasture scarcity, increased pests and diseases, and rising lake levels have affected the Bayso community. These disruptions have endangered their livelihoods and cultural traditions. It has also damaged their material culture. Consequently, they can no longer build their traditional houses (*min*) or produce the cultural clothing (*kollo* and *landi*) that expresses their identity because of resource degradation (cotton and leather). The decline of herding as a livelihood has contributed to the decline of the religious rituals that used to play an important role in maintaining cultural traditions (e.g., establishing long-lasting marriages, religious rituals, practices related to customary marriage).

Above all, the decline in animal wealth has affected the Bayso community in all aspects of their lives. Animal wealth is not only a foundation of their livelihood and social status but also intertwined with their sociocultural practices. Rituals, ceremonies, and social interactions, including marriage, depend on this resource. So, it can be argued that changes in Bayso's cultural practices, such as some changes in their marriage customs (e.g., the decline of the *agud* system), are directly related to the environmental changes on the island. Parallel to this, Popoola (2016) posited that environmental change is one of the factors that leads to the decline of human culture. Finally, critical resource scarcity on the island forced the desperate Bayso to migrate to the western shore of Lake Abaya in search of new means to sustain their lives.

8.6.2 Changes indirectly related to environmental change but influenced by migration

The study reveals that some changes in the Bayso's cultural life are indirectly related to environmental changes on the island. However, they are directly influenced by migration and cultural interaction, which themselves are the results of environmental changes. The Bayso's migration resulted in contact with dominant cultures (e.g., Gamo and Wolayta) and exposure to town lifestyles and new ideas (e.g., Christianity) that led to the decline of their IBS. The introduction of Christianity, which contradicts the principles of their IBS, further challenged their religious values, creating a cultural change that risked their social norms and marriage customs (e.g., mate-selecting mechanisms, the notion of omen/*kaya*, and cultural ways of solving disputes among spouses). This implies that migration not only resulted in sociocultural and livelihood changes, but also exposed the Bayso to, and resulted in a more sustained and intense contact with the neighboring cultures. Such cultural interactions could be viewed as a direct cause for Bayso's cultural change, including their marriage custom. Conversely, environmental change that caused forced migration and exposed the Bayso to new cultures and ideas could be seen as an indirect force of cultural change.

According to informants, migration has separated adherents from their ritual leaders, who were not allowed to cross water bodies. As a result, adherents who have settled in the villages along the western shore of the lake have been left without the continued observance and blessings of their ritual leaders. Together with the pressure from Christian missionaries, this contributed to the decline of Bayso's ritual system. The very important point here is that since no step in Bayso's marriage customs, from the proposal of a girl to the final wedding ceremony, takes place without religious rituals, the disconnection with the ritual leaders eroded the values of their marriage customs. Moreover, the Bayso believe that long-lasting and healthy marriage is a result of the blessings and continuous observation of ancestral spirits and *Wa'a*. However, migration has disrupted their marriage tradition by introducing marriage practices that are odd to Bayso's customs, such as choosing a marriage partner without consulting families and relatives. There are also changing attitudes to the age of marriage, premarital relationships, and conflict resolution

mechanisms. This suggests that currently, the Bayso, particularly the younger generation, are increasingly distancing themselves from the traditional marriage practices that have sustained for centuries. Furthermore, their migration has disrupted their extended family mode (*agud*) that played a supreme role in the socio-economic and cultural life of the Bayso as discussed in sub-chapter 8.4.2 of this dissertation. According to one of my key informants, Balamo Worba, the decline of this institution has substantially damaged the viability of their marriage customs. See the excerpt below:

...Within the agud, tasks like building traditional boats, repairing old houses, and organizing agricultural labor were not only common but essential to help each other. Furthermore, the youth and adults of the agud played a vital role in caring for the elderly, children, and the sick, with a deep sense of responsibility and interconnectedness. At the heart of the agud was its commitment to introducing cultural traditions and values in children through the efforts of Abbo Kanjin and his wife. They used fairy tales to impart lessons on honesty, hard work, and the importance of establishing a family. For example, a strict marriage system with clear criteria for choosing a spouse ensures that children learn from a young age about whom to marry and the values and honor associated with marriage. Our migration to the coastal areas of the lake damaged this cultural institution. (Alge, Dec. 14, 2021).

Therefore, it can be concluded that the decline of these institutions, together with their exposure to dominant cultures, has disrupted the Bayso's efforts to uphold their cultural values and traditions, including their marriage customs. As a result, the Bayso have been experiencing changes in their marriage customs, including an increase in marriage outside of Bayso clans, a decline in arranged marriages, rising rates of early marriage and divorce, and increased vulnerability to unwanted sexual behavior. Let us look at each of these in detail.

As to the elderly from Alge village, one such change is the practice of marrying outside of the Bayso clans. Customarily, it was taboo for the Bayso to marry outside their clans due to concerns that it might weaken their cultural identity. They feared that, since there was no way to determine which ancestry was considered 'pure' and which was 'impure' (e.g., descendants of slaves), such marriages were risky. While there have been some instances of intermarriage between the Bayso and other communities, such as the Guji-Oromo, it was not until their forced migration in the 1980s that intermarriage began to occur on a larger

scale. Intermarriage between the Bayso and other ethnic groups can be viewed in two ways: First, there are Bayso individuals who have married members of other ethnic groups while residing in different parts of the country. Young Bayso who have lived in urban areas have influenced their peers in their choice of partners. Second, some Bayso men have married women from other ethnic groups while living in their home areas. For instance, one of my research assistants shared that his father married a Wolayta woman, whom he described as his best Bayso wife. Additionally, those who have converted to Christianity often marry outside their ethnic group, disregarding previous sanctions and taboos. As a result, these experiences have possibly encouraged both youth and, to some extent, adults, to consider marriage outside of Bayso clans. This study has found that intermarriage between the Bayso and other ethnic groups in the region has played a significant role in sustaining peace, unity, and social connections among these communities. However, sometimes intermarriage can also present challenges, such as cultural differences and language barriers, which can lead to misunderstandings and conflict⁶³.

Second, it is believed that their contact and exposure to new cultures have weakened Bayso's custom of arranged marriage. Nowadays, there is a tendency among the Bayso youth to replace arranged marriage with 'love marriage' (individuals choose their mate based on love), while the elders do their best to maintain the traditional arranged marriage (*banti*). Accordingly, choosing a potential wife themselves has become a fashion among the Bayso youth. In fact, at present, no one argues against 'love marriage', because it is an individual's right to decide whom to marry, since such decisions have far-reaching consequences for his or her future life, both positive and negative. In this regard, it is important to note that as Bayso youth become more involved in love marriage, they tend to disregard cultural values and norms that have been preserved for centuries. For example, in recent times, young adults have been unwilling to consult their families on marriage matters, and this has weakened the relationship between parents and children. As a result, most of the Bayso youth who married in this way did not receive the socio-economic and

⁶³ <https://scientificorigin.com/what-are-the-challenges-of-intercultural-marriages>

psychological support they badly needed in their struggle to build a new family. This means that a disregard for family advice can lead to a lack of insight and blessing, which are crucial in managing the challenges of marriage.

The third change is the high incidence of early marriage. Early marriage, abduction, and rape were once taboos among the Bayso due to the strong customary laws that prevented such violations through sanctions and punishments. The customary rules required the physical maturity of both sexes, which had to be proven by the observation of elders. Those who disregarded these norms faced serious consequences in the form of compensation both to the girl's family and the *Wonno* of her village. Unfortunately, recent trends indicate an alarming rise in early marriage. For instance, the registrar of vital events in Alge village informed me that more than 60% of the marriages appealed for registration in 2019-20 were early marriages. Therefore, these marriages were not registered since the newly revised family code does not recognize such marriages. This change is mainly related to the decline of the two Bayso cultural institutions (the *agud* and IBS) that had a vital role in socializing children and their exposure to the dominant cultures mentioned in this study. Equally, it can be argued that the customary laws designed to prevent early marriage and abduction now lack enforcement.

The unusual incident of early marriage among the Bayso mentioned above has forced me to question why this was occurring. To gain insight into the issue, I conducted interviews and facilitated group discussions, and the responses related to the erosion of these cultural institutions and the community's exposure to new lifestyles and ideas following their migration. Numerous studies reported a concerning trend highlighting that resource scarcity stemming from environmental crises is driving early marriages in various regions of the world. Notably, research by Ahmed et al. (2019) in Bangladesh, Nielson (2009) in Burkina Faso, Camey et al. (2020) in Uganda, and Yilma and Holvoet (2023) in northern Ethiopia accentuates this alarming phenomenon. In the Bayso context, early marriage has led to health problems associated with early pregnancy and damages that exacerbate existing resource constraints.

Divorce has become another challenge in the study area. The study indicates that Bayso's marriage tradition involves a detailed assessment of the partner's clan affiliation, socio-economic background, the consent of both families and clans, the blessings of *Wa'a*, and ancestral spirits. This process is believed to ensure that marriages contracted in this manner would last for life, without fears of divorce or misfortune. This attests that among the Bayso, marriage was not an individual affair; rather, it required the consent of different groups, and thus, it was difficult to assume divorce easily. Correspondingly, Kottack (2008) underlined that in societies where marriage represents an alliance between families and communities, divorce is more difficult. This is not to say that spouses did not have complaints about their marital lives. The point is that if couples experienced such challenges, both the marrying families and the clans would find solutions to the problem. If one or both couples insist on divorce, both the marrying families and the clans examine the problem, and if they find that the problem is unsolvable, they give their consent for divorce.

Since the 1980s, however, the Bayso people have faced significant challenges to their marriage customs due to exposure to new cultures and ideas, one of which is the increasing prevalence of divorce. The main reasons for divorce among the Bayso include extramarital affairs as a result of exposure to new cultures. The decline of the two dominant cultural institutions (IBS and *agud*), which once upheld their moral standards, has also contributed to the problem. In line with this, Burger (2023) argued that environmental crises and resulting resource scarcity disrupt livelihoods and strain family finances, exacerbating existing marital tensions and ultimately increasing the likelihood of divorce. A health extension worker in Alge village pointed out that nowadays, marriage has changed into a personal matter, diverging from their tradition. In some instances, young adults also enter marriage without being physically and financially prepared, and this undermines their ability to assume the responsibilities that come with it. Besides, some young women who have health issues such as fistulas are forced to choose divorce after only a few months of marriage, as stated by a nurse in Birbir Health Center. Therefore, it can be argued that these changes contribute to the rising incidence of divorce among the Bayso.

Likewise, exposure to town lifestyles has also weakened Bayso's marriage customs, such as exposure to unwanted sexual behaviors. According to the Healthdor Editorial (2024), unwanted sexual behavior includes a wide range of actions and manners that are harmful, non-consensual, and violate the rights of individuals. These include, but are not limited to, sexual harassment, sexual assault, sexual comments, rape, coercion, and any form of unwanted sexual contact. In this regard, the study revealed that exposure to town lifestyles, which severely contrast with their culture, risked the cultural traditions of the Bayso people, particularly the youth. Today, their cultural dress is often regarded as outdated and hence, many young Bayso disregard their traditional clothing. This shift towards modern fashion is caused by a strong desire among youth to adopt trends from their town experience. Consequently, it has become increasingly common for Bayso youth, especially girls, to wear tight clothing that exposes parts of their bodies. Unfortunately, this has heightened their vulnerability to unwanted sexual behaviors (e.g., harassment, sexual assault, rape). Lennon et al. (2017) in their study on the impacts of town lifestyle on the life of a youth reported that such clothing choices further expose young women to sexual coercion and assault. Equally, Sykinner (2015) adds that many young girls walk the streets, and attend schools and churches in a revealing dress that can be described as half-naked. This unwise pursuit of fashion not only weakens their cultural identity but also puts them at a greater risk of violence and exploitation.

In general, the results indicate that certain changes in the marriage customs of the Bayso people are indirectly related to environmental changes on the island that have weakened cultural values, traditions, and institutions. On the other hand, migration has a direct impact on Bayso culture, exposing them to dominant cultures and ideas, and encouraging the adoption of new life experiences that contradict their marriage customs. This change has introduced new perspectives on relationships and family structures, and slowly eroded longstanding marriage customs. This finding aligns with the principles of CE and DP, which assert that environmental changes such as resource depletion can prompt migration. This type of migration can disrupt traditional social structures, institutions, and cultural practices, including religious beliefs and marriage customs. Such disruption occurs as

migrants are exposed to and interact with new ways of life and experiences that contradict their cultural traditions and norms.

Furthermore, I also believe that the socio-economic and political dynamics in Ethiopia over the past three decades have adversely affected the cultural traditions and values of rural communities. For example, the Bayso in Alge village have benefited from the infrastructural development that gave them access to electricity, television, radio, telecommunication services, and potable water since the 1990s. This change has meaningfully improved their lives, but it has also endangered their cultural traditions by promoting urban lifestyles through mass media such as radio and television. As highlighted by Sava (2011), the socio-economic advancements in the country, including the rise of small towns and urban cultures, have changed rural life across Ethiopia, as is also the case with the Bayso.

Similarly, one of my key informants from Mulato village emphasized the profound impact of Protestant Christianity's arrival from Wolayta in the 1960s. This new faith presented a serious challenge to Bayso traditions by labeling their cultural and religious rituals as demonic. Additionally, a former *Wonno* from Alge village mentioned how the *Derg* regime that ruled Ethiopia from 1974 to 1991, disregarded cultural practices and smashed ritual objects. Equally, informants strongly opposed the *Derg's* villagization program, which was enforced during the devastating nationwide drought of 1984-85. According to informants, this program forcibly settled diverse cultural groups, such as the Bayso, Wolayta, Gamo, and Haro, in a single settlement. However, such measures not only undermined important cultural institutions, including the *agud*, but also exposed the Bayso to the dominance of influential cultural groups in the area. This implies that the socio-economic and political dynamics in the region in the last three decades have also contributed to the weakening of Bayso's cultural traditions, including their marriage customs.

This highlights that the severe resource scarcity and the socio-economic and political dynamics in the country in the last four decades have profoundly disrupted Bayso's livelihoods and cultural institutions, including traditional resource management systems,

IBS, and marriage customs. The decline of these institutions has further exacerbated environmental problems in the area. Therefore, it is crucial to address these interrelated challenges for preserving Bayso's cultural heritage and ensuring a sustainable future.

CHAPTER NINE

CONCLUSION AND RECOMMENDATIONS

This chapter concludes the study by summarizing essential research findings that address the study objectives and research questions. It highlights the significance and contributions of these findings, emphasizing their impact on the field. As well, the chapter examines the limitations of the study and suggests valuable areas for future research.

9.1 Conclusion

The purpose of this study was to examine the effects of environmental change on the culture of the Bayso community on Gidicho Island and its environs, with a particular focus on their IBS and marriage customs. The research questions addressed in this study were: How do the Bayso perceive and understand their environment and the changes occurring within their environment? How does environmental change manifest in this region? What factors contributed to environmental changes on Gidicho Island and its environs? Finally, how did the environmental change in the study area adversely affect Bayso's culture, particularly their IBS and marriage customs? The study argues that having an in-depth understanding of these dynamics is essential for realizing the resilience of the Bayso in the face of the current environmental changes and the effects of such changes on Bayso's cultural life.

The findings revealed that the Bayso people perceived their environment (*ul*) as 'the things that surround human beings'. They recognized that all components within *ul*, including living things (*nefo kaabo*) and non-living things (*nefo kaliki*), are creations of *Wa'a*, the Supreme Being. Therefore, these components deserve respect, care, and protection. The Bayso people accentuated the importance of their environment, stating that *ul* is the foundation of their life (*ul hiki enijorumaya*). They believed they were both physically and spiritually connected to their environment and that abusing the environment would harm themselves. This perspective led the Bayso to care for their environment, probably for

centuries, through both spiritual practices (e.g., prayers and sacrifices) and local methods of environmental conservation (e.g., *dem* construction, *gondossa* (periodical move with herds), setting fire to grazing lands). This confirms the fundamental idea of CE, which posits that cultural institutions are essential to shaping the interactions between humans and the environment, thereby influencing environmental conservation. CE highlights how the cultural norms, values, and practices embedded within these institutions govern the use of resources, adaptation to environmental changes, and the overall relationship between humans and their environment. However, this understanding of the environment has changed due to various internal and external factors. Internal factors such as population growth and cultural traditions are associated with maintaining large herds. External factors (e.g., droughts and floods) have also affected their resource use patterns. As a result, the mutually beneficial relationship that existed between the Bayso and their environment for a long time has been disrupted.

The Gidicho Island and its environs, once known for their abundant resources (e.g., dense forests, vast grasslands, fertile soils, regular rainfall, and absence of disease), have lost these qualities. The Bayso referred to this abundance as '*mogossa*.' Today, however, the region faces severe challenges, including drought and famine. Environmental degradation in the area is manifest through deforestation, sedimentation of the lake, land degradation, the spread of invasive plant species (mainly *faramsiissa* and *hauri*), and a drastic decline in agricultural production.

The analysis of the ethnographic and LULC change data for the study area from 1990 to 2020 revealed that human activities, such as overgrazing and deforestation for agricultural land, construction materials, and the production of firewood and charcoal, are the leading factors of environmental change in the region. However, the resource-use behavior of the Bayso people is influenced by sociocultural traditions that necessitate the upkeep of large herds to meet the demand for animal products (e.g., meat, milk, blood, and animal stomach contents), which were vital for their numerous religious rituals and to their subsistence needs. Equally, the study takes into account the effects of natural hazards, such as droughts and floods, and structural factors (e.g., population growth, poverty, villagization, and

investment activities). This indicates that environmental change in the study area is the result of a combination of factors, but the leading one is human activities. It is also important to note that environmental degradation has led to severe resource scarcity, including grazing land and fertile soil, which disrupted the livelihoods and cultural life of the Bayso people, including their local mechanisms of environmental conservation. This implies that resource degradation has significant damage to communities dependent on natural resources for cultural practices and livelihoods, causing displacement and loss of traditions. Thus, integrating PE, CE, and AT, this study demonstrates that environmental degradation in the study area results from a combination of factors, including human actions, natural hazards, and policy issues (PE), sociocultural values (CE), and resilience issues (AT) rather than from any single factor. The study emphasizes the importance of taking a holistic approach to address environmental challenges and moving beyond simplistic cause-and-effect relationships. Effective conservation requires considering the complex interplay of these factors. Understanding these complex relationships is essential for developing sustainable solutions that align with local contexts and effectively mitigate environmental degradation.

Migration of the Bayso from their cultural base on Gidicho Island had two implications. First, it endangered their vital cultural institutions, the IBS and the extended family, which were crucial for maintaining their cultural identity. The decline of their ritual system has had a profound impact on their cultural life and ruined their concern for and value of the environment. This is because all aspects of Bayso's life and their relationship with the natural environment were guided by their religious thoughts. Besides, customarily, the *Wonnos* were not permitted to cross water bodies. Thus, they stayed on the island, separated from their adherents, and this disrupted the usual support *Wonnos* obtained from adherents both in kind and cash (*marancha*). The decline of their IBS has also weakened local environmental protection mechanisms. Similarly, with the decline of their IBS, they lost the consecration of *Wa'a* and ancestral spirits, and the blessings from ritual leaders that were crucial in the formation of lasting marriages. Second, their migration exposed them to the dominant cultures of the region, particularly the Gamo and Wolayta, and introduced them to new ideas, such as Christianity. The arrival of Christianity, which contradicts the

principles of their IBS, has further risked their religious values and triggered a cultural change that risks their marriage customs. This change is manifested in various aspects of the Bayso marriage customs, including mate selection mechanisms, increasing incidents of divorce and early marriage, and exposure to unwanted sexual behaviors. Correspondingly, this study demonstrates how PE, CE, AT, and DP theories offer different yet interconnected explanations for the factors contributing to resource degradation and the resultant decline of cultural traditions. These theories argue that such degradation disrupts rural communities' livelihoods and cultural practices by creating resource scarcity, damaging cultural institutions, and forcing migration to new areas, where communities are exposed to new ways of life and experiences. Together, these theories highlight the importance of understanding the complex relationship between environmental factors, social structures, and cultural practices in shaping resource management and cultural resilience.

I hope that this study will provide researchers with both theoretical and empirical insights and support their efforts in examining the nexus between cultural and environmental change in a rural context. As highlighted in the literature review of this study, there is a significant lack of anthropological studies that focus on the 'impact of environmental change on culture', both locally and nationally. In this regard, I believe that the articles published in different journals from this dissertation will help to fill this knowledge gap. It is also believed that this study will contribute to the ongoing debate on the link between environmental change and cultural change. Furthermore, this research may contribute new ideas and experiences to the emerging field of island studies. This study will also contribute suitable strategies to help address the impact of environmental change on people's culture and provide suggestions to policymakers, officials, practitioners, and nongovernmental organizations (NGOs) who endeavor to ensure the sustainable use of natural resources and tackle problems related to environmental change.

The study has some limitations that have an impact on the quality and reliability of the data. This includes a lack of detailed anthropological research related to my topic, both nationally and locally. Consequently, I have limited my focus to studies conducted on the mainland. Therefore, I believe that this has affected, to some extent, my effort to

substantiate my arguments with relevant research findings. However, since lake islands, such as Gidicho, are not entirely remote and share similar geographical features with the mainland, their exposure to factors of environmental change is almost comparable to that of the mainland. Therefore, I believe that research conducted about the mainland also provides valuable insights into the lake islands. The second limitation includes the challenge of translating ethnographic data from the Bayso language into Amharic. This concern stems from my experiences in the field. For instance, translators sometimes attempt to summarize informants' views, and I believe this undermines researchers' efforts to fully capture the experiences and perspectives of a study community. To overcome this problem, I have trained research assistants on 'how to translate and take notes during interviews and FGD'. In addition, I used Amharic as the medium of communication with informants who speak it.

9.2 Recommendations

To address the problem of environmental degradation in the study area and its effects on the livelihoods and cultural life of the Bayso, I suggest that local authorities prioritize awareness raising and training of the Bayso people, particularly the youth who are indifferent to environmental and cultural issues, and in sustainable resource management. This would help the Bayso people to develop a sense of responsibility and adapt to environmental changes while preserving their cultural heritage. Besides, involving the Bayso community in participatory conservation programs such as reforestation, afforestation, and terracing could empower them to play an active role in protecting their environment. Establishing a committee from the community to supervise natural resource management and incorporating local conservation strategies in environmental conservation schemes will contribute to environmental rehabilitation efforts in the study area. Moreover, the federal and regional governments of southern Ethiopia need to enforce environmental protection policies and laws, and also address the economic challenges of the study community. Finally, the *woreda* and local officials, in collaboration with Arba Minch University, should take responsibility for documenting Bayso cultural values, traditions,

and artifacts, and initiate cultural awareness programs to revitalize and sustain Bayso cultural traditions.

9.3 Future research plans

Finally, I propose the following research areas for those who aspire to plan a research project on Gidicho Island and its environs:

1. The nexuses between poverty and environmental degradation in Gidicho Island and its environs: Analysis of current trends
2. How to create a sustainable environment in lacustrine areas? Analysis of local mechanisms and traditions of the Bayso of Gidicho Island
3. The nexuses of environmental change, resource scarcity, and food insecurity among communities on the west coast of Lake Abaya

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APPENDICES

Appendix I: Research Questions

A. Leading research questions

1. How do the Bayso perceive and understand the environment and environmental change?
2. What are the factors that triggered environmental change in Gidicho Island and its environs?
3. What are the manifestations of environmental change in the study area?
4. What are the impacts of environmental change on the culture of the Bayso community, chiefly on their IBS and marriage customs?

B. Background Information

1. Full name _____
2. Age _____
3. Sex _____
4. Marital status _____ 1st marriage (endogamy or exogamy)
5. Religion _____
6. Place of birth _____
7. Mother tongue _____
8. Language used in everyday communication at home _____
9. Family size: M _____ F _____ T _____
10. Level of education _____
11. Economic base _____
12. Additional economic activities _____s _____
13. Number of livestock: Cattle _____ Goat _____
14. Place of interview/FGD _____
15. Date of interview/FGD _____
16. Duration of interview/FGD: Started at _____ ended at _____

C. Guiding questions for an in-depth interview.

Theme: Historical background of the study area and the people

1. Where is the original home of the Bayso, and where is their ancestral origin?

2. When were these people settled on the Gidicho island? How do they come to this area?
3. How was the environmental situation of the island in those days?
4. Do you have any mechanisms to maintain the natural environment?
5. How do you perceive the relation that the Bayso had with their environment?
6. What was the economic base of the Bayso on the island in those days?
7. How was the family organization of the Bayso?
8. Have you experienced any natural disasters in your life?
9. Why did the majority of the Bayso migrate to the west coast of Lake Abaya?
10. How was your relationship with the surrounding communities?
11. Do you still maintain and practice your IBS and marriage customs? If not, why?

D. Guiding questions for an in-depth interview.

Theme: Environmental change and its impact

1. What is 'environment' for you? How do you perceive it?
2. Are you conscious of the socio-economic and cultural provisions of the natural environment?
3. Why do you think that the Bayso have been migrating to the west coast of Lake Abaya?
4. What are the factors that contributed to environmental change in the region?
5. What are the manifestations of such changes in your locality?
6. Do you think that environmental change is a serious problem in your locality? If so, what is the impact of such a change on your culture? Specifically, on your IBS and marriage customs?
7. Do you think that your contact with town life affected your culture? If so, how? If not, why?
8. What do you think is a way out of this problem?

E: Guiding questions for FGD. Theme: Environmental change and its impact

1. Do you think that Gidicho Island and its environs are under pressure from environmental change? If so, how and if not, why?
2. What is the reason for the Bayso migration to the west coast of Lake Abaya?
3. What are the causes of environmental change in your locality?

4. What are the factors that cause fluctuation of the Lake water level?
5. Do you imagine that some of the cultural elements of the Bayso are under threat as a result of environmental change? If yes, which cultural elements and how?
6. Is there any way to overcome this problem?
7. How do you perceive a town lifestyle in comparison to your cultural traditions?

F. Focus areas of field observation

1. The physical environment of the Gidicho Island and its environs
2. The availability of infrastructure (road, electricity, clinics, water supply, school...)
3. The day-to-day interaction of the Bayso with the natural environment.
4. Attend religious rituals and marriage ceremonies

G. Focus areas in case studies: Factors of environmental change, Bayso migration, and provisions of rituals.

1. What are the factors that contribute to environmental change in Gidicho Island and its environs?
2. Is there any relation between your migration to the west coast areas and resource degradation on the Island?
3. What are the provisions needed to practice the religious rituals of the Bayso?
4. Have you noticed any change in marriage customs?

H. Guiding questions for quantitative study

Theme: Extent of environmental change in the study area and the catchment areas of Lake Abaya?

1. How is the LULC change of the study area and the catchment areas?
2. What are the factors responsible for the damage to vegetation cover in the study area?

Appendix II: Informants' Profile

No	Name	Sex	Age	Marital Status	Religion	Place of birth	Mother tongue	Family size	Level of education	Economic base
1		M	90	Married	Protes.	Gidicho	Bayso	5	Uneducated	Agriculture
2		F	35	Married	Orth.	Alge	Bayso	4	Uneducated	Housewife
3		M	50	Married	Orth.	Gidicho	Bayso	4	Uneducated	Agriculture
4		F	38	Married	Protes.	Shinkiko	Bayso	2	Uneducated	Agriculture
5		M	45	Married	Protes.	Gidicho	Bayso	4	Uneducated	Agriculture
6		M	60	Married	Protes.	Gidicho	Bayso	2	uneducated	Agriculture
7		M	29	Married	Protes.	Gidicho	Bayso	9	3 rd	Agriculture
8		M	30	Married	Protes.	Shigma	Bayso	8	2 nd	Agriculture
9		M	30	Married	Protes.	Shigma	Bayso	7	3 rd	Agriculture
10		F	40	Married	Protes.	Shigma	Bayso	7	uneducated	Agriculture
11		M	30	Married	Protes.	Alge	Bayso	4	10+3	Employee
12		M	19	Married	Protes.	Gidicho	Bayso	4	5 th	Fishery
13		M	29	Married	Orth.	Alge	Bayso	3	10+3	Employee
14		M	28	Married	Protes.	Alge	Bayso	4	10+3	Employee
15		M	34	Married	Protes.	Alge	Bayso	8	4 th	Fishery
16		M	27	Married	Protes.	Alge	Bayso	5	10+3	Employee
17		M	66	Married	Protes.	Gidicho	Bayso	4	3 rd	Agriculture
18		F	40	Married	Protes.	Gidicho	Bayso	7	6 th	Fishery
19		F	65	Married	Protes.	Gidicho	Bayso	6	uneducated	Housewife
20		M	72	Married	Protes.	Alge	Bayso	7	uneducated	Agriculture
21		F	60	Married	Ortho.	Gidicho	Bayso	7	uneducated	Agriculture
22		F	40	Married	Orth.	Gidicho	Bayso	9	10 th	Agriculture
23		M	50	Married	Orth.	Gidicho	Bayso	11	4 th	Agriculture
24		F	37	Married	Orth.	Gidicho	Bayso	6	10 th	Agriculture
25		M	40	Married	Protes.	Alge	Bayso	9	7 th	Agriculture
26		F	54	Married	Protes.	Gidicho	Bayso	6	7 th	Agriculture
27		F	60	Married	Protes.	Molle	Bayso	8	uneducated	Housewife
28		M	50	Married	Ortho.	Alge	Bayso	9	uneducated	Agriculture
29		F	50	Married	Protes.	Gidicho	Bayso	6	uneducated	Agriculture
30		M	50	Married	Ortho.	Bayso	Bayso	6	uneducated	Agriculture
31		M	33	Married	Orth.	Alge	Bayso	2	1 st degree	Employee

32		M	63	Married	Protes.	Gidicho	Bayso	4	3 rd	Agriculture
33		F	42	Married	Protes.	Gidicho	Bayso	7	10+3	Agriculture
34		M	50	Married	Protes.	Gidicho	Bayso	7	5 th	Agriculture
35		F	50	Married	Ortho.	Gidicho	Bayso	8	3 rd	Housewife
36		M	30	Married	Protes.	Alge	Bayso	5	6 th	Agriculture
37		M	33	Married	Protes.	Alge	Bayso	5	10 th	Agriculture
38		M	42	Married	Protes.	Gidicho	Bayso	8	uneducated	Agriculture
39		F	60	Married	Protes.	Gidicho	Bayso	7	2 nd	Housewife
40		M	58	Married	Orth.	Gidicho	Bayso.	14	4 th	Agriculture
41		M	31	Married	Protes.	Gidicho	Bayso	8	5 th	Agriculture
42		F	36	Married	Protes.	Alge	Bayso	8	8 th	Agriculture
43		M	31	Married	Protes.	Gidicho	Bayso	7	10 th	Agriculture
44		M	45	Married	Protes.	Gidicho	Bayso	8	5 th	Agriculture
45		M	32	Married	Protes.	Alge	Bayso	5	10+3	Employee
46		F	40	Married	Protes.	Alge	Bayso	6	uneducated	Agriculture
47		F	34	Married	Ortho.	Kucha	Gamoto	4	10+3	Employee
48		M	47	Married	Otho.	Gidicho	Bayso	5	uneducated	Agriculture
49		M	44	Married	Protes.	Gidicho	Bayso	8	1 st degree	Employee
50		M	45	Married	Protes.	Alge	Bayso	7	1st degree	Employee
51		F	42	Married	Orth.	Gidicho	Bayso	7	4 th	Agri.
52		F	24	Married	Protes.	Gidicho	Bayso	2	1st degree	Employee
53		M	41	Married	Protes.	Alge	Bayso	10	8 th	Agriculture
54		M	48	Married	Orth.	Gidicho	Bayso	8	4 th	Agriculture
55		F	36	Married	Protest.	Alge	Bayso	3	3 rd	Agriculture
56		M	31	Married	Protes.	Alge	Bayso	6	5 th	Agriculture
57		M	63	Married	Protes.	Alge	Bayso	9	4 th	Agriculture
58		F	80	Widow	Protes.	Bayso	Bayso	6	uneducated	Agriculture
59		M	42	Married	Protes.	Bayso	Bayso	7	2 nd	Agriculture
60		M	63	Married	Protes.	Gidicho	Bayso	9	4 th	Agriculture
61		M	32	Married	Protes.	Alge	Bayso	6	5 th	Agriculture
62		M	36	Married	Protes.	Alge	Bayso	3	4 th	Agriculture
63		M	18	Single	Protes.	Alge	Bayso	-	7 th	Agriculture
64		M	17	Single	Ortho.	Alge	Bayso	-	8 th	Agriculture
65		F	40	Married	Protes.	Gidicho	Bayso	10	4 th	Agriculture
66		F	30	Married	Protes.	Gidicho	Bayso	7	4 th	Agriculture

67		F	34	Married	Proest	Alge	Bayso	3	3 rd	Agriculture
68		F	30	Married	Orth.	Alge	Bayso	4	2 nd	Agriculture
69		F	34	Married	Orth,	Alge	Bayso	6	3 rd	Agriculture
70		F	30	Married	Protes	Alge	Bayso	7	uneducated	Agriculture
71		F	31	Married	Ortho.	Alge.	Bayso	7	2 nd	Agriculture
73		F	50	Married	Orth	Gidicho	Bayso	9	uneducated	Agriculture
74		F	16	Married	Orth.	Alge	Bayso	2	6 th	Agriculture
75		F	15	Married	Protes.	Alge	Bayso	2	10 th	dependent
76		F	15	Married	Protes	Alge	Bayso	2	7 th	dependent
77		F	17	Married	Protes.	Alge	Bayso	2	9 th	dependent
78		F	13	Married	Protes.	Alge	Bayso	2	7 th	dependent
79		F	16	Married	Ortho.	Alge	Bayso	2	7 th	dependent
80		F	16	Married	Protes.	Alge	Bayso	2	7 th	dependent
81		F	25	Married	Protes	Gidcho	Bayso	2	uneducated	dependent
82		F	30	Married	Protes	Mulato	Bayso	3	10+3	Employee
83		F	28	Married	Protes	Alge	Bayso	3	uneducated	Agriculture
84		M	45	Married	Ortho.	Golmaka	Bayso	4	uneducated	Agriculture
85		F	70	Married	Orth	Gidicho	Bayso	1	uneducated	Agriculture
86		F	65	Widow	Protes.	Gidicho	Bayso	1	uneducated	Agriculture
87		F	48	Married	Protes.	Gidicho	Bayso	2	uneducated	Agriculture
88		M	70	Married	Protes.	Gidicho	Bayso	4	uneducated	Agriculture
89		F	76	Married	Protes.	Gidicho	Bayso	4	uneducated	Agriculture
90		M	58	Married	Orth.	Alge	Bayso	6	uneducated	Agriculture
91		F	42	Married	Protes	Gidicho	Bayso	5	10+3	Agriculture
92		F	31	Married	Ortho.	Gidicho	Bayso	3	uneducated	Agriculture
93		M	57	Married	Protes.	Gidicho	Bayso	6	uneducated	Agriculture
94		F	55	Married	Orth.	Gidicho	Bayso	5	uneducated	Agriculture
95		M	70	Married	Protes.	Gidicho	Bayso	5	uneducated	Agriculture
96		F	40	Married	Orth.	Gidicho	Bayso	6	uneducated	Agriculture
97		M	92	Married	Orth.	Alge	Bayso	6	uneducated	Agriculture
98		M	57	Married	Orth.	Alge	Bayso	4	5 th	Agriculture
99		M	50	Married	Protes	Gidicho	Bayso	4	uneducated	Agriculture
100		M	70	Married	Protes	Gidicho	Bayso	4	uneducated	Agriculture
101		M	70	Married	Protes	Gidicho	Bayso	3	uneducated	Agriculture
102		F	45	Married	Orth	Gidicho	Bayso	4	uneducated	Agriculture

103		F	65	Married	Orth	Gidicho	Bayso	4	uneducated	Agriculture
104		M	31	Married	Protes	Gidicho	Bayso	3	uneducated	Agriculture
105		M	85	Married	Protes	Gidicho	Bayso	2	uneducated	Agriculture
106		M	66	Married	Ppro	Gidicho	Bayso	5	uneducated	Agriculture
106		M	66	Married	Ppro	Gidicho	Bayso	5	uneducated	Agriculture
107		M	45	Married	Pro	Gidicho	Bayso	5	uneducated	Agriculture
108		M	53	Married	Ortho	Gidicho	Bayso	7	uneducated	Agriculture
109		F	65	Married	Ortho	Gidicho	Bayso	4	uneducated	Agriculture
110		M	60	Married	Orth	Gidicho	Bayso	8	uneducated	Agriculture
111		F	45	Married	Pro	Gidicho	Bayso	3	uneducated	Agriculture
112		M	43	Married	Pro	Gidicho	Bayso	6	uneducated	Agriculture
113		M	73	Married	Pro	Gidicho	Bayso	5	uneducated	Agriculture
114		M	49	Married	Pro	Gidicho	Bayso	7	uneducated	Agriculture
115		F	42	Married	Orhto	Gidicho	Bayso	9	uneducated	Agriculture

Appendix III: Summary of Informants' Profile

Total number of informants

Research site	Male	Female	Total	Remark
Mulato	21	19	40	
Gidicho	11	11	22	
Alge	30	23	53	
	62	53	115	

FGDs participants

Research site	Male	Female	Total	Remark
Mulato	16	16	32	
Gidicho	7	7	14	
Alge	16	16	32	
Total	39	9	78	

Interview participants

Research site	Male	Female	Total	Remark
Mulato	6	3	9	
Gidicho	4	3	7	
Alge	14	7	21	
Total	24	13	37	

Appendix IV: Decision of a committee established to prevent early marriage



Appendix V: A report on the number of farmlands submerged by the lake water

2013/12 ዓ/ም በአባይ ዕድቅ መመላት ምክንያት የተወሰዱ መሬት መረጃ የያዘ ቅጽ

ተኩረት የተባለው ቦታ	የተወሰነው ዓይነት							የሚገኝበት አካባቢ				ግብይት
	በቀረፅ	በሰራፊ	መሬት	አገልግሎት	ተገቢነት	የሚገኝበት	በርገገ	በሰራፊ	በተሰጠ	በሰራፊ	በሰራፊ	
1	0	0	45.5	0	0	0	0	45.5	418	359	777	
2	0	0	14.875	13.25	0	0	0	28.375	321	289	610	
3	0	0	109.05	1	0	0	0	110.05	509	426	935	
4	10.25	0	32.125	2.5	2	0.25	0	48.745	314	438	752	
5	0	0	34.125	0	0	0	0	34.125	248	236	484	
6	1.5	0	105	0	0	0	0	106.5	477	1023	1500	
7	32.5	0	102.1	8	0	0	0	134.68	610	553	1163	
8	1	0	141.5	2	0	0	0	144.5	142	142	284	
ጠቅላላ ድምር	45.25	0	584.275	26.75	2	0.25	0	650.475	3039	3466	6505	

Appendix VI: Gamo Zone administrative map

