



SCHOOL OF POSTGRADUATE STUDIES

INSTITUTE OF INDIGENOUS STUDIES

**INDIGENOUS KNOWLEDGE AND PRACTICE OF BIODIVERSITY
CONSERVATION AMONG DERASHE PEOPLE, SOUTH ETHIOPIA**

BY: -

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A THESIS SUBMITTED TO SCHOOL OF POSTGRADUATE STUDY,
DILLA UNIVERSITY, IN PARTIAL FULFILLMENT FOR THE
DEGREE MASTER OF SCIENCE IN INDIGENOUS STUDIES.

JUNE,2024

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APPROVAL SHEET

Approved by Board of Examiners:

Adviser ----- signature ----- Date -----

Internal Examiner ----- signature ----- Date -----

External Examiner ----- signature ----- Date -----

Chairman ----- signature ----- Date -----

STATEMENT OF DECLARATION

The undersigned declare that this work, which entitles indigenous knowledge and practice of biodiversity conservation among D'irashe people in south Ethiopia, is my own work and all the sources that I have been indicating and acknowledging by means of reference, and perhaps this work will not be submitted before by anyone at any institution. And also, my background is in since and sociology, and social anthropology, so it possible to study this title.

MA. Asfaw Alemu-----signature

Name of student -----

CERTIFICATION

This is certify that the thesis entitled indigenous knowledge and practice of biodiversity conservation among D'erashe people, south Ethiopia presented to Dilla university for the award of MA Degree is a genuine and speaks in confidence work done by MA. Asfaw Alemu during 2022-2024 under may supervision. Thus, I hereby recommended for acceptance by Dilla university.

Abiyot Mebrate (PhD)

(Advisor)

Date-----

Dilla, Ethiopia

ABSTRACT

Since ancient times, one of the densest indigenous populations in terms of ethnic groups in Ethiopia has been supported by the indigenous knowledge and practice of biodiversity conservation systems in D'erashe woreda. indigenous knowledge and practices of biodiversity conservation systems, such as agroforestry, crop rotation, planting native trees, and protecting land, water, sacred areas, plants, and animals, are still in use in this region. The primary goal of the research was to evaluate and investigate the local indigenous population's knowledge and practices around biodiversity conservation. Focus group dissection, interviews, field observations, and key informant data were gathered. and subjected to qualitative, anthropological, and quantitative analysis, the result revealed a striking existence of indigenous knowledge and practice of biodiversity conservation, such as planting and resource conservation. In addition, they separate the kinds of plants that are appropriate for the conditions before digging and tilling on time before planting trees. Based on plant type, the data showed that the following have steadily disappeared whereas plants have continued to exist in dega, woynadega, and qolla agroecologies. People believe that conserving indigenous biodiversity is preferable, despite the effects of industrialization, the information gap, and negative attitudes. Along with important elements like the decline in native plant life, pruning, burning, modern tree planting, and human perspectives in both agro-ecologies. Additionally, every variable was examined for substantial connection. In order to ensure the continued existence of indigenous knowledge and biodiversity conservation practices, it may be necessary to integrate these practices with current technologies, give recognition to indigenous people, and bring back their traditions.

Key words: Indigenous, Biodiversity, Conservation, Clans, preservation, and Dirashe

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List of acronyms

A.A	Addis Ababa
AFDB	African Development Bank
CBD	Convention on Biological Diversity
FGD	Focus Group Discussion
IFAD	International Fund for Agricultural Development
IUCN	International Union for Conservation of Nature and Natural Resources
MA	Millennium Ecosystem Assessment
WCU	World Conservation Union
WRI	World Resources Institute

Glossary of indigenous Terms

Albata:-Middle latitude

Arguba, ateya, shelale and holte ;_ derashe keble

Ayiga :- spring

Ayma:-Temporary house in the farming land

Dama:-king

Da'ete/K'ala:- Group work

D''erashe, K'ussume, M'asholle, M'ossiye:- Indigenous ethnic group in the zone

Dega :- high land

Gidole :- town of Gardula

Hagayta :- minor rainy season

Hormaqaalo:-The first town of De'rashe woreda or District (mountain)

Hungula:-Used for cultural storing of croup

Kashane :- the second mJOR rainy season

Kawasha :- stone cab

Kitolla: population of Gardula

Koligawhushet;- moringa

Kosoma :- compacted soil

Kuko :-Tabbo

Mona :- internal part of tarka it is imporatant for production

Paraa :- new year

Pone :- dry season

Poldha :-Head of clan

Po'lota:- Underground used for storing of croup

Potaya :-

Soyo:-Low land

Tarka :- on the farming land made from corn and sorghum

Tillilo:- part of gardula mountain

Woyna dega :- middle latitude

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Biodiversity is the variety of life on Earth at all its levels, from genes to ecosystem, and can encompass the evolutionary, ecological, and cultural processes that sustain life. In all its forms and all its interactions. Is the most complex feature of our planet and it is the most vital. "without biodiversity, there is no future for humanity",prof(1985) The quantity, diversity, and adaptability of living things (microbes, animals, and plants). When describing many facets of biological systems, biodiversity is typically observed at the levels of genes, species, ecosystems, and cultures. The emergence of new species, new ecosystems, or new genetic variety can all lead to an increase in biodiversity. It declines when an ecosystem complex disappears, a species goes extinct, or genetic variation within a species declines Yoseph 1996 fundamentals of preparatory program of Biology.

Levels of biodiversity :- Genetic diversity- this refers to the variation of genes within species. This includes genetic variation within a population. Genetic diversity is measured using of DNA- based and other techniques. Species diversity- this refers to the variety of species within a region. Such diversity can be measured in any ways like species richness, species abundance and taxonomic diversity. Species richness- is the total number of species in a defined area. Species abundance- refers to the relative number among species. Taxonomic diversity- is the variation of species from each other as seen by their taxonomic distribution in general, families, orders, classes and phyla. Ecosystem diversity- includes the broad differences between ecosystem types and the diversity of habitats and ecological processes occurring within each ecosystem. It is harder to define ecosystem diversity than species or genetic diversity because the boundaries of communities and ecosystems are not clear and stable. Cultural diversity- like genetic or species diversity, some attributes of human cultures represent solutions to the problems of survival in particular environments. Cultural diversity is manifested by diversity in language, religious beliefs, land management practices, are, music, social structure, crop selection diet and many other attributes of human society (IUCN) (2004).

Biodiversity conservation the practice of protecting and preserving the wealth and variety of species, habitats, ecosystems, and genetic diversity on the planet, is important for our health, wealth, food, fuel, and services human being depend on.is order to derive sustainable benefits

for present and future. The management of biodiversity by humans with the goal of providing the greatest possible sustainable benefit to current and future generations is known as biodiversity conservation. The range of diverse forms of life that can be found in one place includes fungi, plants, animals, and even microbes like bacteria that make up our natural world. This is known as biodiversity. Conservation is the management of the Earth's resources in a way which aims to restore and maintain the balance between human requirements and those of other species. Humanity's prudent use of the planet's resources is environmental resource conservation (IUCN (World Conservation Union), 2008)..

major activities of Conservation: Preservation- this is done for endangered habitats or species through the establishment of natural reserves such as zoos or captive breeding programmes. Captive breeding is an activity where by an endangered species is captured and bred in captivity. Preservation also involves the maintenance of genes in gene banks, botanic gardens. Management- of ecosystems. For example, a grassland ecosystem has to be managed in some way otherwise succession occurs and the grassland becomes invaded by bushes and trees. Grazing and occasional burning can help to maintain the ecosystem as grassland. Reclamation- is an active form of conservation done when damaged habitats are restored. Creation- is the most active form of conservation where by new habitats like new natural forests, new ponds etc., are set up for the purpose of conservation. Because of its significance on a social, economic, ecological, and planetary level, biodiversity conservation is essential for all living things (Millennium Ecosystem Assessment [MA], 2005).

According to MA, 2005 and IUCN (World Conservation Union), 2008, it is the management of important and valuable ecosystems, including those that support fish, wood, pastureland, topsoil, minerals, forests, watershed areas, and animals. Everything on Earth, including human existence, depends on these vital ecosystems. Nonetheless, scientists report that the planet has experienced unprecedented levels of carbon emissions, detrimental environmental degradation, and biodiversity loss year after year (Cook et al., 2013). This is not new information, though, and the consequences of ignoring this problem are getting worse by the day. Significant environmental deterioration, the loss of natural resources, and the extinction of species have already resulted from such record emissions for life on Earth (MA, 2005; Oksanen et al., 2010). For example, encouraging others to recognize and take action on these environmental challenges is essential given that carbon emissions have reached a total of 402 parts per million and are still rising (Cook et al., 2013).

There are, of course, a lot of indigenous people in the world, and it is well recognized that they are where humans first originated. In other words, these indigenous people are conserving biodiversity without realizing it when they plant and care for native trees. This is because their lives on the land their ancestors left behind are closely linked to the land, plants, animals, and climate. The theft of traditional knowledge and genetic resources poses a threat to the preservation of biodiversity worldwide, but particularly in the countries of Sub-Saharan Africa (Amara, 2003).

Additionally, Africa is significantly contributing to the preservation of the world's biodiversity because it is the home of complete indigenous populations and is the ancestor of indigenous peoples. Biodiversity provides a fundamental basis for economic livelihood and societal wellbeing in Africa (Cadman et al., 2010). Because of African taboos and beliefs, people were discouraged from using environmental resources carelessly, particularly when they were associated with sacred sites, forests, and wildlife areas (Appiah-Opoku, 2007; Adu-Gyamfi, 2011; Ryser, 2011; Toledo, 2013). This contributed to the enforcement of laws and regulations for environmental preservation and conservation. Because they are sacred or have spiritual significance for the communities that care for them, trees, wildlife, and plants are protected in traditional protected areas (Dudley et al., 2009; Mascia et al., 2014). According to the African Development Bank (AfDB), 2015, a large share of the world's biodiversity and natural resources are found in Africa.

Ethiopia, is one of the African countries, and being the race (birth) place of mankind, it shows that there are more than eighty indigenous reserves. Ethiopia has acquired indigenous community knowledge in many areas, including the preservation of soil and water, the selection and storage of seeds, the development of suitable farming systems, the advancement of traditional farm implements, and the adaptation of resilient coping strategies to endure food insecurity over time (Tizita E.E. 2016). Ethiopia has great geographic diversity and climatic variability. This has created a diverse and suitable ecosystem that is home to a large number of flora, fauna, and microbial species (Wakshum, Sebsebe, and Tamrat 2010). At the moment, the federal government is making a significant contribution to biodiversity conservation. Bloom is making biodiversity conservation so that Ethiopia can be an example for Africa and the world. The Dirashe ethnic group is one of the four ethnic group found in the Gardula zone in Southern Ethiopia

This indigenous ethnic group include in the Ethiopia eighty indigenous ethnic group. Agriculture is the major means of livelihood of the people. They settled on fertile land which is suitable for agriculture (Tefera 2015). The Dirashe people has made the community beautiful by being tolerant, helping each other and have their own culture, history, heritage, and language. In the community of Dirashe, besides farming, planting and caring for plants have a high place, which means that in the days when they were governed by the king (*Dama*) system, they understood that a *Dama* and p'oldha both their own plant, land, animals and spring identification it has a sign for protection in the community.

Evolution Theory

It is now well admitted by ecologists that the conservation of biodiversity should imply preserving the evolutionary processes that will permit its adaptation to ongoing and future environmental changes. Conservation biodiversity has been criticized for adopting a fixist conception of life. For the sharpest critics hoisch and oennings, 2005; smith, ruford, and Wayne, 1996, conservation it's are freezing the evolution of life when they try to preserve existing species or communities just as they are. However, the truth is conservation scientists have been strongly infused by evolution in his seminal article published in 1985, Michael. Conservation ists care for "the long – range viability of whole systems and species, including their evolutionary potential" (soule, 1985). Both the biodiversity generating process perspective and the biodiversity- pattern perspective appear convergent at the scale of global biodiversity. However, the concept of evolutionary potential (EP) and the prescriptions derived from the commitment to conserve it remain ill-defined sowing confusion and possibly participating in the limited adoption of evolutionary principles in conservation policies (mace and Purvis, 2008).

Economic theory

As Walrasian economics is used in conservation biodiversity, assigning relative prices to, for example, ecosystem services and endangered species is essential to the decision-making process to achieve efficiency. The walrasian models is essentially a financial investment model that shows how a perfectly rational individual investor, acting with perfect information at a specific point in time, maximizes her or his discounted flow of future income by optimally choosing an investment portfolio. In economic models of sustainability (Arrow et al. 2004), the investment problem becomes how to optimally allocate the resources available a representative human valuation and public policy? The methodological requirements of the walrasian system demand that everything valuable in a good or productive input must be captured in a single price so that the "calculating machine" of the market can establish the

pecking order of priorities. This is the main way economic is used in conservation biodiversity.

Conservation theory

Conservation biodiversity has two threads: the small-population paradigm which deals with the effect of smallness on the persistence of a population, and the declining-population paradigm which deals with the cause of smallness and its cure. The processes relevant to the small-population paradigm are amenable to theoretical examination because they generalize across species and are subsumed by an inclusive higher category (Soulé 1981). The declining-population paradigm, on the other hand, is that relevant to most problems of conservation. It summons an investigation to discover the cause of the decline and to prescribe its antidote. Hence, at least at our current level of understanding, it evokes only an ecological investigation which, although utilizing the rigor of tight hypotheses and careful experimentation, is essentially a one-off study of little theoretical interest. The principal contribution of the small-population paradigm is the theoretical underpinning that it imparted to conservation biodiversity, even though most of that theory presently bears tenuous relevance to the specific problems of aiding a species in trouble (Frankel 1981). It would contribute immeasurably more if some of the theoretical momentum so generated were channeled into providing a theory of driven population declines, thereby liberating the declining-population paradigm from the inefficiency of case-by-case ecological investigations and recovery operations. The declining-population paradigm is urgently in need of more theory. The small-population paradigm needs more practice. Each has much to learn from the other. A cautious intermixing of the two might well lead to a reduction in the rate at which species are presently going extinct (Soulé 1987a).

1.2. Statement of the Problem

In the Dirashe people both the farmers and the community pay great attention to planting trees. There are nine (9) clans in Dirashe, each clan has its own leaders the names of the leaders call as *p'oldha* and the king (*Dama*) both have plant, land, animals, and spring water symbol (totems), so they called by their name in the community. And the followers take care of them by planting, kipping them without anyone commanding them, and but even if the plant are dry, neither nor the non-members will pick them for firewood because they consider them as taboo (*kuko*) water like as purification purpose and cultural rituals in the community (Abdulfeta 2010).

The Dirashe people have inherited the knowledge of planting indigenous trees, animals, indigenous water in the farming land (Targa, Potaya), and spring water conserving from their ancestors to make the biodiversity of their fields suitable and they will be used cultural drugs, so still now there is sacred place, spring water, and animals that covered by the names of Dama, p'oldha, and individual. As aforementioned explained, Dirashe ethnic groups have been used the indigenous conservation of biodiversity of through by their knowledge and surviving their life. Agriculture (planting tree, the preparation of cultural drugs, crop farming and livestock production) is the major source of livelihood for the Dirashe Firew (2009).

However, nowadays, on the high land of Dirashe some indigenous people these kinds of conservation system are omission due to various factors. These factors are modernization, indigenous plant replaced by modern plant like Juniper Tree and Ecuolyptus comaldulens (bahire-zafe) this is against the ideal, that is, it dries up springs, prevents soil fertility and killing and destroying the native plants that are sprouting from their work, preparation of cultural drugs, just like the ancestors who planted plants and call them by their names, this kind of knowledge and wisdom is being lost, Negative attitudes towards these indigenous plant, stereotype and cultural religious. The aim of this research is to explore and documented the Dirashe people knowledge used to conserve biodiversity, local naming system of plant species, spring water, animals, and to allow this knowledge to be passed on to the next generation. So, the researcher of these studies would like to conduct on this topic by exploring the reasons and consequence of that the some people of Dirashe removing of indigenous plant and replaced it by exotic species.

1.3. Objectives of the Study

1.3.1 General Objective

The main objective of this study was to investigate the indigenous knowledge and practices of the Dirashe people in terms of conserving biodiversity resources and to assess its dynamics in Dirashe, Southern Ethiopia

1.3.2 Specific Objective

The specific objectives of the proposal are to:

- ❖ Identify and describe the method to conserve the biodiversity of the Dirashe people and naming of the plant and animals species.

- ❖ Assess the advantage of religion or indigenous cult and sacred place in conserving the biodiversity in the study area.
- ❖ Assess the factor affecting indigenous knowledge and practices of conservation
- ❖ Assess what types of plant their use to conserve biodiversity.
- ❖ Assess the Dirashe conserving water and land in relation to biodiversity conservation?

1.4. Research Questions

This proposal attempts to answer the following questions:

- ❖ How can the indigenous people of Dirashe conserve biodiversity and indigenous naming of the plant and animals species?
- ❖ What types of plant trees conserve biodiversity on the highland and lowland of the Dirashe people?
- ❖ What is the influence of the indigenous plant on the Dirashe people?
- ❖ How can religion or indigenous cult conserve biodiversity?
- ❖ How water and land management contribute to biodiversity conservation?

1.5. Significance of the Study

This research was a great contribution to document indigenous knowledge and practice toward conserving biodiversity resources. Because what I was answering is the process by which the indigenous communities of Dirashe grow to understand their views or attitudes towards indigenous plants and animals and understand what benefits they can get from them. On the protection side, it is making a significant contribution by protecting biodiversity. Those who cut, burn, and plant trees was a good attitude toward protecting them. It is a principle and a starting point to make all communities participate by paying attention to this idea.

1.6. Scope of the Study

The content research is meant to investigate the indigenous knowledge and practice of biodiversity conservation in the Dirashe. The scope is to solve the practice and challenges of indigenous knowledge and practice of biodiversity conservation in Dirashe people because there is an occurrence of challenges and obstacles to conserving biodiversity by indigenous

plants in the ethnicity of Dirashe, as well as the existence of modernity, a negative attitude, serotype, and a knowledge gap. So, it would be possible to generalize the findings in the area of the Dirashe. This study involves religion, youth, elders, and women's.

1.7 Limitation of the study

The barriers to the success of this study are different factors such as; the data for this study was collected and prepared through interviews and joint discussions with the indigenous people who are familiar with the wildlife of Dirashe district. While collecting data for the research, I have encountered elders who are very old and can tell the story clearly. But because they have a physical illness, i.e., their ears are unable to understand and answer the question correctly, I have encountered the inability to speak to answer the old people while being able to hear. In addition, they are aware of biodiversity conservation and avoid explaining it to others in a clear way. Although the climate and topography of my study area are favorable, there are some areas with topographical implications for biodiversity conservation. In addition, it can be seen that there is a willingness to taste the knowledge, practice, and care of biodiversity from the ancestors, because I have seen that all indigenous plants and trees are being replaced by modernity, i.e., eucalyptus. In addition, I have faced obstacles in order to successfully complete this research, the main and biggest of which is a lack of budget, climate and transportation.

1.8 Organization of the Study

This research consists of three chapters. The first chapter is about the introduction (background), statement of the problem, research question, objective of the study, significance of the study, scope of the study, limitations of the study, and organization of the study. The second chapter elaborates on reviews of some theoretical and empirical literature about indigenous knowledge and practice of biodiversity conservation. The third chapter presents methodology, a description of the study area, research approach, types and sources of data, methods of data collection, ethical considerations, a timetable, and references.

CHAPTER TWO REVIEW OF RELATED LITERATURE

2.1. Historical background

In the Dirashe, there are four ethnic groups: *D'irasha*, *Kusume*, *Mashole*, and *Mossiye*. This ethnic group has its own culture, history, heritage, and language. The *D'irasha* ethnic group is one of the four ethnic groups in the zone, and it occupies a higher position than other ethnic groups in the zone in terms of size and number of ethnic groups. Also, all ethnic group has made the zone beautiful by being tolerant and helping each other and their culture. As it is, their language is similar to the Oromo language, so it is classified as Cushitic. In the *Dirashe* peoples, in addition to the main houses in the villages, there are temporary houses, *ayma*, in the farming plots. These temporary houses often serve to keep cattle, provide shelter, slip at night, and stay temporarily to watch the crops (Hansamo 1993). They perform numerous labor-intensive jobs such as land preparation, weeding, harvesting, threshing, and storing. According to the economic importance, women have been benefited and get freedom to control over the petty income obtained from the *Moringa* market, even if the income is low as compared with other types of agricultural production.

It is also noted that men are often more involved in control over cash crops, while women have control over large items such as *Moringa* products and poultry, and around the house, women regulate all cultural storage of crop *polota*, *ungula*, and *money*. The major objective is to clearly indicate that the *Dirashe* people are indigenous and have knowledge and practice of biodiversity conservation. Today, in *Dirashe*, there are forty-six kibbles, one *Gidole* town administration, and autonomous four native/indigenous ethnic groups: *Dirashe*, *Kusume*, *Mashole*, and *Mossiye*, and they are one of the indigenous and ethno-linguistic groups in the Southern Nations, Nationalities, and Peoples of Ethiopia. In 1883 E.C., Emperor Menelik, after controlling the area, made it the center of his administration, making it the hindmost center of *Dama*. At the tip of *Hormaqqallo*, documentation would inform (Abdulefeta 2010).

Italy overran the first town, *Hormaqqallo* Mountain. At that time, some indigenous people and their cultural heritage were all damaged by aircraft (bombs), and the remaining people were settled by digging forts and settling them. We still know that a fort is found on the *Horma-Qalo* mountain and also on the *kitole* administration of Italy house, water tank, and indigenous people of *kitole* digging the forts. The *Dama* on the second-place *kitole* is the body of *Hormaqaalo* Mountain (Hansamo 2001). *Tililo* and *Kitole* were both found in the

Horma-Qalo mountains. According to the foundations of *Entoto* Mountain and Addis Ababa Town, there is a similar history with *Hormaqqallo* Mountain and *Kitole*. First, the foundation of Addis Ababa is on the *Entoto* mountain; similarly, the foundation of *Kitole* is on the *Horma-Qalo* mountain. After going to Addis Ababa, come down to *Fillewuha* and now the emperor Menelik capitol and say Addis Ababa, and also *Kitole*, come down from *Horma-Qalo* mountain and say *Kitole*.

The establishment of Addis Ababa by the King of Menelik is similar to the establishment of *Kitole* by *Dama Sama*. The establishment of Addis Ababa history started in the era of *Intoto* Mountain. And also, the establishment of *Kitole* started in the era of *Tililo* Mountain. In general, if we studied *Dirashe* just to know about it, whose age may be around 600 and above (Abdulefeta), 2010. The present political and economic headquarter of *Dirashe* district is *Gidole (Kitole)* town. It was established by Italians during their brief occupation of Ethiopia from 1936 to 1941 and remained the oldest town in the region. Geographically, *Gidole* is located at 37.30' East and 5.30' North, latitude and longitude, respectively. Also, it is the capital town of *Dirashe*; it is located 550 km from the Federal Capital Addis Ababa and 321km from the south west of Awassa. Agriculture (crop farming and livestock production) is the major source of livelihood for the *Dirashe* because they are very attached to the farming land, but also not only for the economy for the *Dirashe* people, but because their land is like an identity. In general, they are found in the Great East African Rift Valley. So to conserve biodiversity, they use different knowledge systems.

Indigenous people around the world play a major role in maintaining biodiversity, or life as it exists on land, which includes both living and non-living objects that are invisible to the unaided sight as well as plants and animals. Put another way, although indigenous people have lived alongside the soil, plants, climate, and both domestic and wild animals their entire lives, they do not know these things; still, they use what they do know to preserve and honor this existence. Because of their innate knowledge and comprehension of ecological processes and regional biodiversity, indigenous peoples play a significant role in sustainable small-holder farming all over the world (Heywood, 2011). The way that biological systems and indigenous peoples interact on a sociocultural level has been crucial to the long-term conservation of biodiversity. The preservation of biodiversity is crucial for all living things due to its importance on a social, economic, ecological, and global scale (Millennium

Ecosystem Assessment [MA], 2005). Environmental conservation is the result of humanity's wise use of the planet's resources (IUCN (World Conservation Union), 2008).

Indigenous peoples have spiritualities that are primarily composed of a set of values, beliefs, and respects that are closely related to the local ecosystems and biodiversity (Mallarach, 2006; Verschuuren et al., 2008; Verschuuren and Brwon, 2018). By designating specific locations as SNS, such as forests, water sites, mountains, and particular animals as totemic species, one can express their spiritual connection to the natural world. Because of their regard and holiness, these areas have been preserved for cultural reasons and should not be misused or recklessly destroyed (Pungetti et al., 2012). For instance, the main motivation behind the preservation of holy woods worldwide is spiritual (Frascaroli, 2013).

2.2 Climate

2.2.1 Indigenous climatic zones of Ethiopia

The indigenous Ethiopia classification of climatic zones is based on altitude and temperature. This system divides the nation into the following five major climatic zones: Bereha, Kola, Woyna Dega, Dega and Wurch. **Bereha:** Is the hot arid climate and also the climate of the desert lowlands that are found below 500 m above mean sea level where the average annual rainfall is less than 400 mm, and average annual temperature is over 30⁰c. Bereha is usually characterized by strong wind, high temperature, low relative humidity, and little cloud cover. Evaporation is always in excess of rainfall in some places. **Kola:** Is a (warm-to hot semi- arid climate) and also the climate of the hot lowlands with an altitudinal range of 500 to 1500 m a.s.l. average annual temperature are between 20⁰c and 30⁰c. although mean annual rainfall ranges between 410 mm and 820 mm, it can be as high as 1600 mm. rainfall is highly variable from year to year. This region is intermediate between the hot arid climate and the humid climates. **Woyna Dega:** this is subtropical warm-to-cool semi- humid zone which corresponds to roughly with what is commonly known as the warm temperature climate. Woyna Dega has distinct dry and wet months in winter and summer respectively. The average annual temperature is between 15⁰c and 20⁰c, and annual rainfall is generally around 1200mm. Woyna Dega covers the temperature highlands that fall with altitudes between 1500m and 2300 m amsl. In the southwest, rainfall reaches 2400 mm (Firew 2009).

Dega: corresponds roughly with the temperate climate. Dega is the climate of the cool temperature highlands. It covers a region with an altitude range of 2300 m to 3300 m amsl. he coldest month is less than 10⁰c. The area experiences adequate rainfall. Rainfall ranges from

about 1000 mm, in most areas, to 2000 mm in higher altitudes. Wurch: is a type of Alpine climate. The annual average temperature is less than 10⁰c. Annual rainfall is between 800 and 2000 mm. the zone exists at altitudes equal to or more than 3300 m amsl. This zone exists as afro- alpine areas on the highest areas of Ethiopia's plateaus. It is found in small isolated high areas such as the senate plateaus (Abdulefeta), 2010.

2.2.2 Rainfall

The area has bimodal climate the mean annual rainfall in the area is ranged from 600-1600 mm and according to traditional agro climatic condition the Dirashe is categorized as three agro-ecological zones: *Dega* (high land), they produce highland crops like barley, peas, and beans, vegetables like potatoes, tomatoes, carrots, and cabbage. The highland of *Dirashe* is also among the *enset*-growing areas in southern Ethiopia. Besides agricultural land, their homeland consists of an area covered with natural and manmade forests and grazing land. *Woyna Dega* (middle latitude) area where approximately around half of the *D'erashe* people reside. This area is more suited for the cultivation of cash crops like coffee and chat, and *Qolla* (low land) with 17.24%, 34.17 % & 48.61percent respectively is widely used for cereal production, such as sorghum, maize, and *teff* (Firew 2009).

The area has bimodal climate, the major rainy season is the belg season from March to May, and the minor, meher season is from September to November both in the lowland and highland areas and also have four agricultural seasons. The first major farming land preparation season is the period from February to April, and it is called the “*Para*” new year. The first harvesting season are between May and July; they call this season “*Kashane*.”, the second major rainy season is the belg season from March to May, and the minor, meher season is from September to November both in the lowland and highland areas and *Hagayta*, is called minor rainy season from August to October. The third harvesting and the dry season, which is from November to January, are said to be *Pone* (Hansamo 2001)

2.2.3 Neighbors:

The Dirashe nation is bordered by pagade (chamo) lake and kore nation in the east, Kusume and konso nations in the south, Ale nation in the west, Mashole in the southwest, and zaise and Gamo nations in the north.

2.3 Capital city of study area:

The local name of the town and the capital of the district is known as "*Kitole*". Later, it was known as "*Gidole*" by its inhabitants who could not speak the local language. Hansemo July 1993, however, the rural residents of the surrounding community still call it "*Kitole*". We like to go with her old name "*Kitole*" which is used by the people. This is because local native first names have their own meaning and are more suitable for the area. The name of kitole city has its own meaning in the local language. In the language of the nation, kitole means wine and indicates the character of Dega air. It means *Komole* (upland), kitole (or plateau), soyo (kola). Beru simallo 2008, therefore, we would like to state in advance that wherever it is necessary to mention the name of the city in this work, we use "*kitole*".

The establishment of the city has an ancient history. The nation's *Dama* (King) center was from ancient times at the peak of "*Horma-Kalo*" mountain. The place is known as "*Tililo*". Beru 2008 Later, the center of *Dama* moved down to the foot of the mountain and was located in the village known as "*Koregora*" in the present day city of kitole. Although the *Dama* residence was completely destroyed during the Derg era, the place of worship and judicial house that was next to it is still there. After Emperor Mnelik's army conquered the area, he made his administrative center at the ancient center of *Dama* at the peak of "*Horma-Kalo*" mountain. Data indicate that the time was 1883. Later, when Italy invaded our country, he bombed the first city and made his center at *Kitole*. This means that the *Dama* therefore, the information about the establishment of the city is that some say "it was during the reign of Emperor Menelik" and others say "it was in the period of the Italian invasion". But in our opinion, both are wrong. We find that the city was founded in ancient times. Especially if we consider the time when the city was founded on mount *Horma-Kalo*, it further confirms the antiquity of its foundation. Because it is known that the city on the top of *Horma-Kalo* mountain was not founded by Emperor Mnelik's army, but the local *Dama*. Emperor Menelik's army did not establish the city but expanded it. If this is the case, we should count the age of the city not from 1883 (when Emperor Mnelik's army took control of the area), but from the time when *Dama* settled on the site (*Tililo*) (Firew 2009) .

Because *Kitole* is a part of *Horoma-Kalo* mountain and area. *Dama* of the nation is at the back. If it is said that *Tililo* and *Kitole* have nothing to do with each other, the founder of *kitole* is not Italy, but it is still the *Dama* of the nation. Because it was not Italy that brought the city down to the foot of the mountain. Before the Italian invasion, the center of the *dama*

was moved from the top of the mountain to *Kitole*. Proof of this is that the *Dama* center, which was founded before Italy took control of the area and established its main center in the city, is still a historical witness in the city. Although the *Dama's* main residence was destroyed during the Derg regime, the place is still well known. We know and have seen that the house and the place where the worship and judicial ceremonies were held next to the house are still there. Therefore, if we say that the beginning of the city's foundation is when it came down from the top of the mountain to where it is now, then it should be the time when *Dama* moved the center from the top of the mountain to *Kitole*, not 1929 (when Italy took control of the area and established its center in *Kitole*). When did *Dama* move his center from *Tililo* (the top of the mountain) to *Kitole*? Although we cannot find the exact time, information indicates that it was after Emperor Mnelik's army took control of the area and before he entered Italy and settled in *Kitole*. Therefore, it is important to understand that the age of the city is more than the estimated and mentioned seventy-one hundred years (Hansamo 200).

But we believe in the first idea. *Kitole* is part of the *Horma-Kalo* mountain area. *Tililo* and *Kitole* are settlements located in the *Horma-Kalo* mountain area. Like the capital of Ethiopia, *mount Entoto* and *Addis Ababa* city. *Kitole* and *Addis Ababa* formations are similar. *Addis Ababa* was originally founded on *mount Entoto*. *Kitole* was founded on *mount Horma-Kalo*. *Addis Ababa* later came down from the mountain to the area where Emperor Mnelik's palace is now, and it was called *Addis Ababa*. *Kitole* came down from *mount Horma-Kalo* and was called *Kitole*. *Addis Ababa* was founded by king Menelik. *Kitole* was founded by *Dama Sama*. The history of *Addis Ababa's* foundation begins from the time when it was on *mount Entoto*. The story of *Kitole's* creation must begin with the story of *Tililo*. It is expected from the city administration to study this thoroughly and prepare and heritage for the development of history and tourism. *Kitole* city is 58 kilometers from *Arbaminch*, 550 kilometers from *Addis Ababa*. To go from the center of the country (*Addis Ababa*) to *Kitole*, you can first go to *Arbaminch* by car or by air. Next is a ride from *Arbaminch* city station to *Kitole*. Minibuses and different car run daily (Abdulefeeta), 2010.

2.4 Soil

Soil in the *Dirashe* are majorly characterized by 48% clay, 30% red and 22% black soil with water holding capacity, it cracks during dry season of the year and hence it is fertile soil in its

origin. In the rugged mid-highland areas of D'erashe remnants of volcanic ashes predominantly.

2.5 Culture:

The Dirashe ethnic group has its own cultural values that it shares with its neighbors. Especially in music, agriculture and other social, economic and political aspects of life, we find it to be a nation with wonderful cultural arts that are worthy of the country and the world. D'irashé's musical instruments have attracted the attention of many researchers. It is believed that they will add a value to our country's music in the future. If promotion and further development activities are carried out, they are more likely to become widely known in a short period of time.

The way of preserving soil fertility and moisture associated with the traditional art of agriculture can be said to be wonderful. The traditional and scientific arts and knowledge called *Tarka*, *Kosoma*, *Potaya*, *Kawasha* are indeed seen to be able to protect the fertility and moisture of the land. What is surprising is that we are not doing the work of spreading the national wisdom and knowledge in an age where our country's land fertility is decreasing from time to time. It can be assumed that we are seen as a country and people who do not know what we will not fail to use the knowledge for the development of the country. Because the viability of the traditional knowledge is well known, loved and trusted by the nation and it is still a living art that is widely practiced Beru 2008.

2.6 The importance of biodiversity

Biodiversity is a fundamental value to humans because we are dependent on it for our nutritional, cultural, and economic needs, and the mismanagement of biodiversity leads to resource decline and biodiversity crises. Moreover, indigenous knowledge develops in local contexts to solve local problems, and it is just another form of knowledge that does not set itself in opposition to the sciences. The biodiversity found in any one area or country varies in complex ways, depending on the physical size, local climatic conditions, topography, vegetation, and soil type (UNECA, 2001). Biodiversity provides the basis for the livelihoods of many people and for growth at both local and national levels. The direct benefits of biodiversity include the provision of food, medicine, fodder, energy, and timber. Indirect benefits include the provision of essential life support services, such as the recycling of carbon, oxygen, and nitrogen; mitigation of pollution; protection of watersheds; and

combating soil erosion. Biodiversity is essential for ensuring food security, and its economic value is easily recognized.

Economic importance: World economic security is tied to the natural resources (water, minerals and forests Ecological importance: Food control, water purification, climate modification and pollination etc. Socio cultural: Timber (raw material), medicine and food, religion and aesthetics, fuel, and wood (energy) However, the values of biodiversity and the manifold roles of indigenous knowledge, including biodiversity conservation, are overlooked and are at risk of going extinct in general and in Ethiopia. It is impossible to explain briefly the importance of biodiversity, which is of great importance if we keep it by planting trees. So in the meantime, we can temper the climate and balance the atmosphere by decreasing the amount of carbon dioxide in the atmosphere. According to the national biodiversity strategy and action plan (A.A. 2005), biodiversity is defined by the Convention on Biological Diversity (CBD) as "the variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems." Biodiversity, to put it simply, is the diversity of life on Earth. The foundation needed to adjust to future changes in environmental conditions is provided by this variety.

2.7 The role of indigenous people to conserve biodiversity

Indigenous peoples who have historically used resources consistently tend to have a deep understanding of how complex ecological systems behave in their particular areas. Through a protracted series of observations passed down from generation to generation, this information has been amassed. The "synchronic" observations that form the foundation of western science can be greatly enhanced by such "diachronic" observations. Eighty percent of the planet's biodiversity is found in traditional indigenous lands, which make up up to twenty-two percent of the planet's land area (WRI 2005). Indigenous peoples have a stake in maintaining and, in some cases, improving local environments because they have long relied on them for a variety of resources. They understand that biodiversity plays a critical role in producing the ecological services and natural resources that they depend on. The principles that underpin biodiversity conservation techniques were developed over an extended historical period and appear to have been the result of a process. This suggests that their body of knowledge is infinite and that their execution necessitates a close bond with the beliefsystem. It is challenging for western science to comprehend such knowledge. However, if ecosystems

and biodiversity are to be maintained sustainably, it is imperative that the significance of the knowledge-practice-belief complex of indigenous peoples linked to the conservation of biodiversity be adequately recognized United Nations Environmental program (2009).

Because of their knowledge and strong ties to the land, water, wildlife, plants, weather, and climate, indigenous people are crucial to the preservation of biodiversity. The sustainable protection of biodiversity has benefited greatly from the interactions between indigenous peoples and the sociocultural systems that support biodiversity. Every continuation of resource use practice frequently has foreign information. foundation for complex ecological systems' localized behavior. This information has been passed down from generation to generation via a protracted series of observations (AMRLO, May 1993).

Why biodiversity is important to indigenous people

Indigenous people rely on a variety of natural resources from their ecosystems and biodiversity for food, fuel, and many other necessities. These resources are essential to their way of life. A range of genetic resources, ecological processes, clean water, and healthy soil are all necessary for productive and sustainable agricultural systems. Enhancing the ability of impoverished farmers and indigenous peoples to withstand dangers such as illnesses, pests, and climate change is another benefit of biodiversity. Many species are necessary for agricultural ecosystem production, including pollinators, soil microbes, microorganisms, and genetically varied crops. Numerous wild plant and animal species find homes in agricultural settings. Although buffer zones and protected areas support biodiversity, many are also vital to the local population's ability to support themselves. Reconciling conservation efforts with human needs is a major challenge that demands innovation and solutions tailored to local circumstances. Yet many indigenous people with whom IFAD works are already reporting impacts on their ecosystems and biodiversity that sustain agricultural production and rural livelihoods (IFAD, 2010, 2011).

2.8 The role of religion to conserve biodiversity

For instance, the Ethiopian Orthodox Tewahido Church, one of the oldest Christian denominations in Africa, has a long history of safeguarding and conserving native forests as places of worship and interment in the framework of biodiversity protection. The woodlands that encircle churches are generally revered, with the trees serving as a metaphor for angels watching over the building. There are other cultural and holy landscapes designated for ritual or religious purposes, in addition to church woodlands (Doffana, 2017). These spiritually dedicated forests are an integral component of the church as they provide sites for religious ceremonies, social gatherings, and burial grounds. These church forests are, therefore, regional biodiversity hotspots and showcases for remnant vegetation and wildlife (Bongers et al., 2006). The Dirashe people, one of the oldest sacred forests, still know that conservation of biodiversity is done by religion, cultural, religious, and individual persons. This is one of the most important pieces of knowledge of the Dirashe people that practice and conserve of biodiversity.

CHAPTER THREE

Research methodology

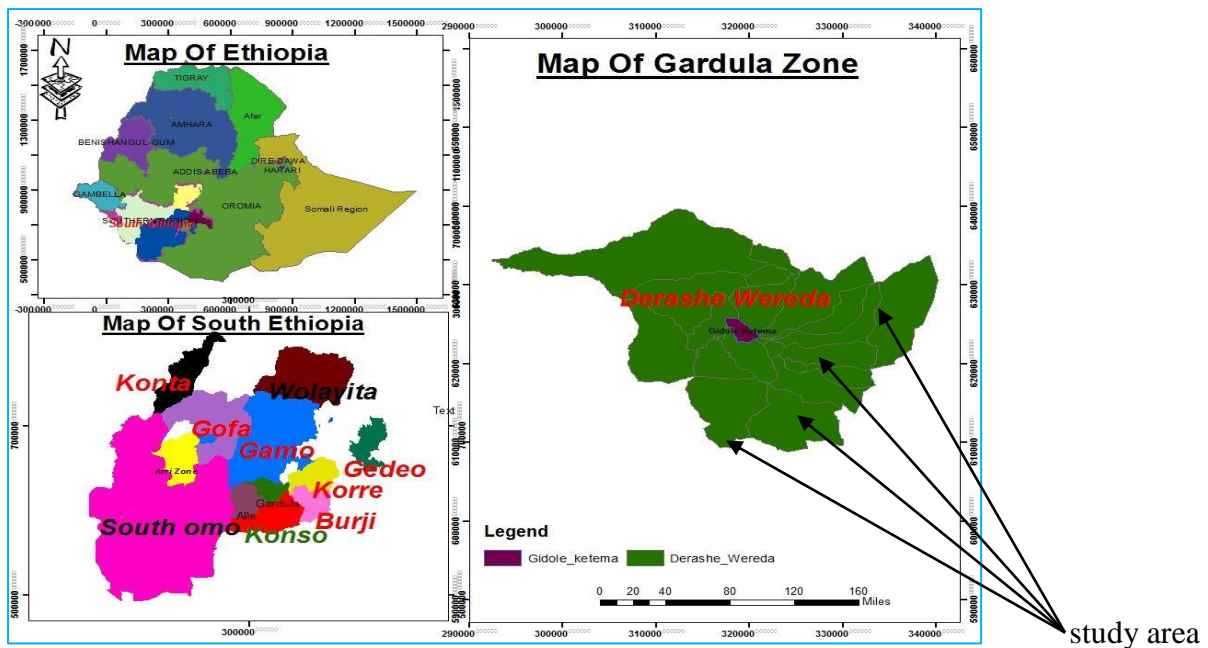
3.1 Description of the Study Area

This chapter focuses on the description of the Study Area, importance of conservation of biodiversity, challenges, methods of indigenous knowledge and practice to conserve biodiversity among Dirashe people, and the role of culture, religion, and people to conserve biodiversity.

3.1.1 Geographical location

The *Dirashe* community is one of the indigenous and ethnic communities residing in Ethiopia. *Dirashe* has neighboring people; they are Amaro in the east, Gamo in the north, Konso in the south, and Alli on the west border total land 148732 k.m², and have different temperate zones: the Highland temperate zone and lowland agro-ecological zones. The area is located at the southern part of the country within GPS coordinate location of 5°-6° N and 37°- 37° 30'E. The area endowed with 47% plain lowlands, 43% hilly and 10% of mountainous highland topography *Horma Qalo* or Gardula mountain is the highest mountain an elevation of 2600m (Firew 2009). and the altitude ranged 1140-2614. The study which will be conducted in SNNPR. The study area are fare from the capital town Gidole lignaw Arguba 2K.m, layignaw holte 4 k.m, onota 3K.m and Ateya 12k.m, Shelale 13km and tachignaw holte 20 K.m.

Dirashe woreda strategic plan 2015-2025 EC



Source: - from Gardula zone 2024

3.1.2 Population

Demographically, based on the statistical progression of the 2013 plan commotions census result, the total population of the *Dirashe* is estimated at around 329,978 out of which 119.3% are women. Out of the total population, only 23.4% live in urban areas (culture tourism 2013).

3.1.3 Language:

The national language is called “Dritat”. One of the problems we encountered in this study is that different people refer to the same issue by different names. *Horma-Kalo (Horma-Kalo)*, *Dritat (Dirashtat)*, *Tarka (Targa)*, *potaita (potait)*, *Titiba (Titipa)*, *Elaita (Elaita)*, *kansit (Kansita)* and also on can be mentioned as examples. The area does not seem to create such wide and stylistic differences as if we were to say that it is a matter of word style. We couldn't figure out what caused it. Language people and native speakers may be familiar with it. The language category is related to the neighboring ethnic groups and is described as Cushitic variety Hansemo July/ 1993. And the relationship with the languages of the neighboring nations is high. The level of closeness with the Kusume, Mashole, Mosiye and Konso ethnic groups is high. Although the nation does not directly border with the Oromo, we find the Oromo language being used at different levels. The reason for this is that Dritat and Oromo are the language of the Kush tribe, when Emperor Menelik controlled the area, it was mainly Oromo military leaders and soldiers, and there was a large number of Oromo

natives who settled in the area. Amharic is also widely used as the local language of education and work Beru 2008.

3.2. Research, Design and Approach

3.2.1 Research Design

In this study, the researcher employed both qualitative and quantitative research method. The qualitative research method were used to identify the characteristics and significance of human experiences as described by participants and interpreted by the researcher at various levels of abstraction. And it also includes the procedure for selecting participants for the study, tools for data gathering, ethical considerations, and a validation plan. The study was designed qualitatively as a cultural study, and ethnographic research techniques were largely employed and quantitative approach more used for field absorption. A design in order to analyze the primary data collected as it is done in historical, sociological, and anthropological studies. Both Qualitative, ethnographic and quantitative research methods are effective in understanding more the culture in the field, numbers of species or life on the land during conservation of biodiversity. The intent of qualitative research is to understand a particular social situation, role, group, or interaction (Creswell, 1994).

3.2.2 Types and Sources of Data

To answer the basic research question, data was collect from both primary and secondary sources. The Primary data was collected from key informants, field observation, interview and focus group discussion. The Secondary data gather through by inspect published and unpublished documents, like dissertations, thesis, slick, newsletter, journals and book

3.3. Sampling method

In this research researcher used multi sampling techniques to sample the respondent of the study. Primarily, the 4 keels were selected purposively with the aim of proximity to the main road and its broad practices of indigenous way of life. Then, the snow boll sampling method was used to select knowledgeable person on the indigenous biodiversity conservation for key informant interview. Accordingly, 3 key informants from each sampled Keble totally 12 were selected. The key informants were chosen on the basis of their knowledge of the culture and their experiences with biodiversity conservation. Following, we use simple random sampling to select 32 participants of the survey. In this regard, the researcher has recruited key informants by using the following inclusion criteria: participants who have experience with

the history, knowledge about *Dirashe*, knowledge about plant species, land, water, and animals, and knowledge of biodiversity. As an elder in the community, their age range as study participants, their willingness to participate in the interview, and their ability to give consent were considered. Finally, 4 focus group discussions with 8-12 participants were conducted in three keels. The group encompasses elders of the community, religious leaders, Keble elders, farmers, Keble leaders, youth, and culture tourism officers.

3.4 Instrument of data collection

To achieve the research objectives the following method of data collection tools were used:

3.4.1 Interview

An interview is a repeated face-to-face encounter between the researcher and informants directed towards understanding the informants' perspectives on their experiences or situations as expressed in their own words (Kumar, 2005). Hence, using semi structured questioner the researcher were collected primary data from sampled household head.

3.4.2 Key informant interview

Four people from each of the four ethnic groups who were chosen for the key informant interview were long-time experts on the history of the *Dirashe* indigenous people and the preservation of biodiversity conservation. Key informant interviews enable researchers to share people's experiences with biodiversity conservation and obtain adequate information about the topic of study. The key informants were chosen on the basis of their knowledge of the culture and their experiences with biodiversity conservation. Thus, elders of the community, religious leaders, Keble elders, farmers, Keble leaders, youth, and culture tourism officers are sources of information. In this regard, the researcher has recruited key informants by using the following inclusion criteria: participants who have experience with the history, knowledge about *Dirashe*, knowledge about plant species, land, water, and animals, and knowledge of biodiversity conservation. Key informant interviews are conducted with the aim of understanding people's perspectives on the biodiversity conservation, as well as their terminology, opinions, and experiences (Kikwawila Study Group, 1994).

3.4.3 Focus group discussion

The researcher conducted with four sample farmers to gain knowledge about biodiversity conservation from four FGD in each sampled kebeles with selected ethnic group. The major aim of FGD is to verify, build on, and add on the results from other sources of data (Aschalew 2008). The researcher has gathered the information using unstructured questioner on the major discussion issues like social attitudes towards biodiversity conservation, indigenous conservation of plant and animal species, key factors that affect indigenous biodiversity, and the attitudes of people towards plant species. The researcher took on the role of a facilitator during the discussion

3.4.4 Observation

Another additional method the researcher use is observation. The combinations with other methods enables the researcher to facilitate and develop positive relationship among key informants and stakeholders whose contribution is vital for the study. Data gather through observation is also valuable in determining whom to recruit as an informant for the study and how best to recruit them (Mack et al 2005).

Therefore, to get reliable data for the successful accomplishment of the study, observation will be another major method of data gathering system to get valuable information and the researcher is collect data from direct observation of the study area; checklist is prepared and Photo graphs have taken by using digital camera. Because what peoples say, collecting plant species and do may sometimes contradict each other. Thus, direct observation will be the best solution. By using this method, the researcher is observing the place where biodiversity practice and conservation were take place.

3.5 Method of data analysis

The sources of the data were qualitative in nature. Therefore, data collect from the refrains (book, brusher) use to analyze by ground root and dip studying were use suitable to analyze, to process the collect data. During collecting the appropriate of data effort was made to organize, analyze and interpret according to scientific procedures. While to do this the following important steps were followed Step 1: Data Reduction, Step 2: Data Display, Step 3: Data Analysis and Interpretation and Step 4: Major Findings, Conclusions and Recommendations.

Therefore, the data collected though questionnaires and in-depth interview had been analyzed using statistical and thematic analysis respectively. Quantitative data obtained from

questionnaire were analyzed using descriptive statistics like percentage, frequency. On the other hand, qualitative data obtained from in-depth interview and focus group discussion had been transcribed and sorted out into theme categories and then analyzed using thematically.

3.6 Ethical consideration

Research ethics is the “moral’ principle guide research from its inception through the completion and publication of results and beyond. Ethical issues are became a crucial element in social science research.

All concern bodies at all levels include the research a participant is informing about the purpose and relevance of the study for ethical acceptance. Oral and writ consent have obtain from the respondents before data collection. If the respondents are fear the researcher was protect participants from any harm result from provide information the data keeps anonymous and confidential.

Anonymity refers to removing the participants name as a first step measure to protect respondent from any harm that might result because of the information they provide whereas confidentiality refers to the protection of the data was collected (Chih Hoong Sin, 2005)

A social science researcher have an obligation to respect the rights, needs and desires of the informant(s) (Creswell, 1994).

Thus, the researcher follow ethical guidelines from the beginning to completion of this research.

The researcher obtain the interviewees, telephone interviewees and FGD participants’ inform consent and inform the purpose and type of data want from them.

The anonymity and privacy of the research participants is respect and the collect data is carefully kept (Bantayehu 2008. In addition, an effort is made to avoid bias and to become objective as possible.

CHAPTER FOUR

Indigenous knowledge and practices of biodiversity conservation among the Dirashe people

4.1. Introduction

This chapter presents the data and its analysis of realities. It has different major parts such as background information of the respondents, the existing physical environment of the study area, indigenous knowledge, attitudes and practices of indigenous people on biodiversity conservation, role of indigenous beliefs and community values in conserving biodiversity, determinate of indigenous knowledge in the study area and other. In short the chapter, thus, provides a synthesis of the available facts obtained through different methods applied during the data collection.

There are two primary sections to this chapter. The respondents' socio demographic details are covered in the first section. The knowledge and methods of biodiversity conservation included in this study are covered in the second section. Thirdly what the respondents said. A frequency table has been created by applying descriptive analysis to the data collected and the respondent's responses using various data gathering methods.

4.2. Characteristics of the Studied Households

This background information of the respondents in the study area has been collected through a survey questionnaire - pointed earlier as one of the tools of data collection in this study. One of the purposes using this tool was to provide updated demographic and socioeconomic data of the respondents. Accordingly, the following is a brief presentation of major demographic and socioeconomic characteristics.

4.2. 1. Socio demographic profile of the Respondents

The topic under investigation mostly draws men because of the division of labor between men and women, sons and daughters, in the rural community. This is another factor contributing to the weighing of the number of men. Men tend to the garden, preserve the environment, and supply the family with food most of the time. While women participate in social and cultural amenities as well as the management of natural resources in and around their home gardens, their primary activities are related to housekeeping, childcare, and food preparation. This study chose roughly the same number of homes from each Keble, taking into account the proportionality of the population number of selected respondents. About 75% of people are men and just 25% are women (Table 1). The number of men and women

varies significantly, even though it did not peak. The reason for the distinction is that men often lead the households in the community, meaning that they speak for the household in any communications with the outside world.

The Table 1 also illustrates that of the households, 40.62% had an age range of 40 to 55, and 28.12% had an age range of 56 to 70. The primary focus of the study was on individuals with extensive experience in indigenous techniques for biodiversity conservation. This was achieved through key informant interviews and focus group discussions. This has made it possible to gather adequate and comparable data for the investigation. People in the age range of 71 to 85 are social groupings that have a deep relationship with the community's natural resources as well as indigenous conservation experiences and practices. Just 9.37% of the investigated households belonged to the last group, which consisted of individuals over 86. Despite their current lack of strength to address the environmental crisis, they took part in sharing their prior knowledge and experiences, as well as socio-cultural and religious activities related to biodiversity protection.

The educational attainment mostly determines community's acquisition and dissemination of indigenous knowledge. The inheritance of indigenous knowledge and the sustainable conservation and exploitation of biodiversity are taken into consideration. Of the informants, about 43.75% were had never attended any kind of formal schooling, while 28.15% had just completed elementary school. Informants state that the lack of schools in their communities or the lack of roads to schools farther out from their villages when they were teenagers is the primary cause of their nonattendance. The other explanation is that they were unable to attend due to a number of social and financial issues. Nonetheless, these illiterate individuals manage their livelihood through a variety of lifestyle choices. Some of them are successful farmers who use their coping skills to deal with the challenges they confront, while others are traditional healers who gather therapeutic herbs from the wild. They learned from a variety of people, including their parents, their neighbors, the community, and their personal experiences. As can be seen Table1, the majority of participants had married status. Of the 32 respondents, this represents the highest percentage at. The lowest percentage of participants was widowed, making up percent of the total respondents.

Table 1 Socio-demographic characteristics of respondents

Variables	Description	Number of respondents	Percentage
Sex	Male	24	75
	Female	8	25
	Total	32	100
Age group	40-55	13	41
	56-70	9	28
	71- 85	7	22
	Above 86 years	3	9
	Total	32	100
Level of education	Having never attended school	14	44
	Elementary School (grade 1-4)	9	28
	Secondary School (grade 5-8)	6	19
	High School > Grade 9	3	9
	Total	32	100
Marital status,	Single	0	0
	Married	31	97
	Divorced	0	0
	Widowed	1	3
	Total	32	100

Source:- own survey questionnaires 2024

4.2.2. Socio-cultural and Economic Profile

Ethnic composition, places of origin and religious background

Ethnic composition, places of origin and religious backgrounds of the respondents in the study is shown in Table 2.

Table 2: The respondents' socio-cultural background

Attribute	Category	Number of respondents	Percentage
Religion	Orthodox	8	25%
	Protestant	17	53.125%
	Traditional	7	21.875%
	Total	32	100%
Ethnicity	Dirashe	32	100%
	Other	0	0
	Total	32	100%

Source:- own survey questionnaires 2024

When it comes to religion, the majority of respondents identify as protestant. The proportion of orthodox households is about 25%. Even though every household in the data collection belonged to the same ethnic group (the Dirashe), religion had a significant impact on focus group discussion (FGD) participants' opinions toward the conservation of biodiversity. People who practice traditional religions or indigenous beliefs hold others accountable for the devastation of biodiversity, particularly forests. They contend that the effects of converting to non-traditional religions included the eradication of native forests and cultural heritage in a number of the research area's communities.

4.3. The Current Status of biodiversity conservation in the Study Area

In the study, the distribution and current state of the region's natural resources have been cross-checked. The research area's focus group discussion revealed that the region's natural resource abundance has been sporadically declining. Table 3 summarizes the opinions of the households who took part in the focus group discussion regarding the state of biodiversity in the region.

Table 3: The responses of FGD on the current conditions of biodiversity in the study area

How do you assess biodiversity abundance from the past to the present?	Frequency	Percentage
Increasing	2	6.25%
Decreasing	30	93.75%
No change	0	0%
I don' t know	0	0%
Total	32	100%

Source:- own survey questionnaires 2024

Approximately 93.75% of FGD households felt that there had been a decline in the amount of biodiversity in their area. This indicates that there has been a decrease in the amount of forest cover, a rise in the loss of biodiversity, and degradation of the land. The topic of the local environmental issues was brought up in the group discussion. The majority of FGD informants listed soil erosion, water scarcity, land degradation, and livestock threats as their top environmental concerns. The majority of FGD members contended that deforestation is the greatest threat to their community, with very few reporting any experience with the loss of wildlife.

4.4. Knowledge and attitude of households on the issue of natural resource management

This section of the study presents the findings from an evaluation of respondents' general knowledge of biodiversity management.

Table 4: The responses of HH on their general perceptions of soil, water, and plant conservation

Questions	Responses			Total
	Yes	No	I am not sure	
What knowledge do you have regarding plant, water, and soil conservation in your area?	100	0	0	100
Do you believe that these are necessary for the survival of your life?	93.75	6.25	0	100
Does managing these resources ensure their sustainable use?	100	0	0	100
Do you have concerns about plant, water, or soil management?	100	0	0	100
Do you follow any procedures in your area to protect these resources?	100	0	0	100
Do you believe that the methods you use to conserve these resources are adequate?	100	0	0	100

Source:- own survey questionnaires 2024 Questions and Answers

Participants in the study are 100% aware of the requirement of biodiversity for their sustainable way of life and 100% aware that biodiversity protection is necessary for sustainable use. Although 100% of people follow their own indigenous methods for managing natural resources, they acknowledge that these methods fall short of what is needed for efficient and long-term management. These realities were reinforced by FGD discussions regarding the duty and significance of natural resource management. Certain households maintain the belief that natural resources will persist regardless of whether they are preserved or not. They believe that because it is a gift from God, human exploitation cannot end it.

However, every participant in the conversation clarifies that they are all 100% concerned about biodiversity management. This suggests that the majority of individuals in the research region are aware of their role in community resource management. This explains why they apply various indigenous strategies for resource management and is more concerned about the resources in their area. The conversation also demonstrated that farmers in the research

region are cognizant of how natural resource management affects both the sustainability of their livelihoods and the yield of their crops. Therefore, the upshot of such attitudes is the creation of indigenous biodiversity conservation practices to deal with the environmental condition. On the protection side, they use the indigenous method of water and soil irrigation, including preventing soil fertility and humidity from eroding; that is, in indigenous knowledge, they call it *Tarka* and *Potaya*, and in addition, they have a place like the highlands to protect wild animals. one of the important finding is that knowledge and conservation of biodiversity are very effective at the indigenous level.

4.5.Indigenous concepts of biodiversity conservation in study area

Indigenous knowledge (IK), as previously defined, is the local knowledge specific to a particular society and the foundation for locally driven decisions about agriculture, biodiversity conservation, and a wide range of other rural community activities. The community's main source of revenue is indigenous knowledge (IK), which also contributes significantly to their social capital. For instance, farmers, primarily in poor nations, have planned agricultural production using their IK in order to guarantee food security and sustained agricultural output across nations (Mascarenhas 2003). Most African countries rely heavily on agriculture as their main economic sector. The potential of IK to increase agricultural output can be measured using the traditional sector, which plants over 90% of the country's seeds (Mushi, 2008). On the other hand, research suggests that a community's indigenous knowledge and customs become more reinforced the more outside technology are used (Lemma and Hoffman, 2005). External information is necessary to support small-scale agricultural output and link it to viable markets. This will strengthen rural lives, raise the standard of living and yield, guarantee food security, and strengthen the national economy (Asaba,2006).

For sustainable agricultural development, a system that incorporates both external and indigenous knowledge systems may be more advantageous. Because indigenous knowledge is mainly preserved in the memories of the old, whose wisdom ages with them, it is quickly lost. Still, external technologies are not frequently deployed, even though they are the focus of most attention (Ngendello et al., 2003). This is a result of the disconnect that exists between farmers, extension, and research. Thus, farmers do not manage their knowledge systems or adopt new technologies to improve farming operations. Policy makers and development planners are beginning to recognize the significance of understanding the

existing knowledge systems and decision-making procedures as they focus on small-scale agricultural producers, especially in relation to indigenous knowledge and development processes. Moreover, indigenous knowledge is sometimes discounted by development professionals as inferior knowledge. But agricultural scientists and planners now know that we can improve farmer-to-staff and researcher-to-extension communication by working with and via indigenous knowledge systems, which we can record.

Development experts are also starting to realize how crucial this knowledge is to fixing agricultural and environmental problems (Asaba,2006) . Currently, many indigenous knowledge traditions face extinction because to the world's rapidly changing biodiversity and the speed at which political, economic, and cultural changes are happening. When a practice adopts too slowly or when it is no longer appropriate for emerging issues, it deteriorates. However, the sole explanation for the decline of such practices is the entrance of foreign technologies. The people most aware of the grief around the impending loss of indigenous knowledge are those who have nurtured and benefited from it. On the other hand, problem-solving strategies can also be harmful to other individuals when skills and technology disappear (IIRR 1996), However, due to many circumstances such as fragmented and falling land holdings and farmers' limited ability to influence research agendas and aims, some indigenous knowledge systems (IKs) and practices are limited. Lack of adequate and well-structured training programs for farmers and extension agents has also been one of the main barriers to utilizing indigenous knowledge. Given the foregoing, it is possible to conceptualize sustainable agricultural production as a continuous process of both qualitative and quantitative progress in farming operations, which must meet present demands without endangering the capacity of future generations to meet their own.

Indigenous knowledge is defined as the comprehensions, skills, and theories developed by societies with a long history of engaging with their natural environment (Semali & Kincheloe, 2002).A cultural complex that encompasses social interactions, language, categorization schemes, rituals, and spirituality all depends on this knowledge. Indigenous knowledge is defined as "a body of knowledge built up by a group of people through generations of living in close contact with nature" (Kumela, 2007). It refers to the unique, traditional, and indigenous knowledge that has developed inside and around the specific social contexts that are unique to a given area.

Throughout history, indigenous peoples have provided several ecological and cultural services to humanity. According to Melaku et al. (2000), preserving traditional farming methods and knowledge enhances food security, protects the environment, and preserves

biodiversity. Nonetheless, an effective local farming system is essential. There are a few small-scale farms operated by the D'erashe ethnic community. The community relies on these antiquated farming techniques to generate food, correctly preserve items, lessen the demand for public health care, and other purposes. In traditional farming, the procedures include preparing the soil, planting, and harvesting the crops. Farmers still carry out this chore today, using a shovel, rake, or even their hands; oxen tow the tools for them.

Indigenous knowledge is a topic of interest to researchers these days (IK). Because of this, many researchers have tried to figure out how traditional knowledge of communities may be used to maintain biodiversity, which includes soil, water, animals, and microbes, instead of using modern approaches. According to (IIRR 1996), in this particular context, IK is dynamic, always evolving, experience-based, habitually developed over millennia of use, and appropriate for the local environment and culture. In a similar vein, Ajibade (2003) defines IK as having been refined within a particular culture or ethnic group and transmitted from generation to generation in an effort to accomplish objectives within a specific environmental framework.

Indigenous knowledge is the verbally passed down ways of seeing, thinking, and knowing from one generation to the next. The methods of knowing are an outcome of research and development in numerous domains, such as agriculture, medicine, education, animal husbandry, childrearing, and biodiversity management (International Centre for Indigenous Knowledge, 2015). Warren (1995) defined indigenous knowledge as "local knowledge that is unique to a given culture or society" (p. 2; cited in Sithole, 2006). It is the meticulous body of knowledge that residents of a given culture have amassed by the accumulation of unofficial experiences and direct knowledge of the surrounding area. "...embedded in the community's practices, institutions, relationships, and rituals," according to Fenta (2000; quoted in United States), is how indigenous knowledge.

It is the whole of the skills and knowledge that people in a particular region possess and that enable them to make the most of their [natural and social] environment (p. 25). A substantial amount of resources has been set aside to revive the contribution of indigenous knowledge to community construction, as recognized by international agencies such as the World Bank. Indigenous knowledge is applied in a variety of contexts, including customary dispute resolution, farming techniques, community organizing and networking, spiritual services, health protection, soil conservation, neighborhood security, traditional lending for financial support, lab collaboration, and charitable services. Indigenous knowledge is the cornerstone of community-based approaches to problem-solving. In many regions of the world, scientists

and indigenous people are collaborating to improve ecological management in a given area and to close the knowledge gap between traditional and modern science as it relates to development challenges (Reijntjes, 2004).

An untapped resource in Ethiopia's development process is local knowledge. Planners for agricultural development and policy makers, however, are regaining interest in local knowledge and are starting to acknowledge indigenous knowledge systems (Warren and Rajasekaran, 1993). Research has also been done on the worldwide network of indigenous knowledge for the management of natural resources and the significance of incorporating this information into modern conservation and sustainable resource management (Rist and Dahdouh, 2006). One of the findings is sustainable agricultural development, a system that incorporates both external and indigenous knowledge systems may be more advantageous. Because indigenous knowledge is mainly preserved in the memories of the old, whose wisdom ages with them, it is quickly lost also and few small-scale farms operated by the Dirashe ethnic community. The community relies on these antiquated farming techniques to generate food, correctly preserve items, lessen the demand for public health care, and other purposes.

4.5.1. Indigenous biodiversity conservation practices

One of the proposed environmental protection strategies is the use and support of the genius environmental protection method based on environmental knowledge. There are many indigenous methods of environmental protection. One of these methods is the indigenous soil and water conservation art of Dirashe farmers called *Targa*, *kosoma*, *potaya* and *Afa*. This agricultural art is known to farmers who cultivate the *soyo* or kola fields in the rift valley east of mount Gardula. This place is a large agricultural land that is seen in front of the south and west of Chamo Lake when you go from Arbaminch to Konso, Jinka and when you come to the main town of Gardula.

4.5.2. Indigenous Soil and water conservation mechanisms for maintaining biodiversity

Indigenous knowledge in soil and water conservation practices is common in many indigenous peoples of the world. Thus, it is common to see different forms of soil and water conservation practices across the various indigenous societies and peoples of Africa where Ethiopia is part and parcel. Among the many indigenous ethnic groups in Ethiopia having the best experience and worldly known knowledge of indigenous soil and water conservation is the one in the Dirashe people. It is well known that Ethiopia is considered the water tower of the region and the roof of Eastern Africa. As a result, the top soil in many parts of the nation

is severely eroding; nevertheless, the Dirashe people have extremely deep native soil and water-saving techniques that allow them to preserve the soil and water-holding capacity. The Dirashe people have extraordinary expertise of soil and water conservation, which is regarded as the greatest in Ethiopia, Africa, and even the world. This absorption focuses on the traditional knowledge of the Dirashe people in South Ethiopia regarding methods of conserving land and water. Among these are the *Targa* and *Potaya* cultures, crop rotation, terracing, agro-forestry, and other related knowledge. The primary goal of the study is to investigate the Dirashe people's traditional knowledge and practices of biodiversity conservation through soil and water conservation mechanisms, and to provide strategies for preserving this important knowledge for the system of biodiversity conservation Beru 2008. The absorption demonstrates how the community's indigenous methods for conserving water and soil were created over an extended period of time, essentially put to the test, and evolved into their primary means of existence while preserving biodiversity. Furthermore, the Dirashe people are firmly ingrained in their culture and possess a wealth of indigenous knowledge regarding methods for conserving water and land. The community explains its knowledge by equating it with ceremonial significance and integrating it into daily life. On the other hand, the community continued to face difficulties due to the government's incomplete security of land tenure. In actuality, governmental or nongovernmental organizations should look for ways to advance this knowledge. Consequently, the government should develop suitable soil and water conservation mechanisms for maintaining biodiversity based on the D'irashe's people's traditional methods of soil and water conservation. The Dirashe people practice soil and water conservation by using their *Targa* and *Potaya*, which they learnt from wild animals. Previously, numerous wild animals lived in the low ground of the Dirashe community, where the elephant's hoof was located Beru 2008.

A/ Protected areas for biodiversity conservation

Taboo place /Dhawura:- *Dhawura* is a very feared and hated thing. In particular, it is a value that informs and warns of major prohibitions that should not be done. If they are done, they are matters that cause great condemnation, demand from the creator and have great consequences. The result is called a "*come*" Beru 2008. *Comey* is very scared. It is believed that seed can destroy manzer. Therefore, issues of *Dhawura* are considered and recognized as fundamental concepts in the cultural law. The types and nature of conditions that can cause coma are well known. Children grow up learning and identifying them from an early age. It is expected that there cannot be a child of Dirashe who does not recognize and know *Dhawura*.

If he doesn't know and implement it, the cultural law system was fine. A person who commits dhawura is hated by both man and creator. It's not just enmity. It's a hereditary sin (*come*). He was become a dirty and humiliated person Beru 2008 . Therefore, he was careful.

The following can be mentioned among the issues known as *Dhawura*:

1/ Abusing, spoiling, stealing, destroying the place, house, burial, turkota (sources), objects, etc. of cultural fathers or leaders.

2/ Abusing, insulting and humiliating elders is my *come*.

3/ Puta (who can be punished and whose sins can be transmitted to the seed stem, adultery, etc.)

4/ I did not know (marrying members of the same clans)

5/ *Amayta* (denying or denying a testamentary gift)

6/ Giving false testimony, swearing falsely, lying that you don't know the truth of what you know, cheating, stealing secretly, etc. all lead to *come*.

7/ Doing activities that defile and humiliate the values of the cultural system.

8/ secretly doing any things that harm human beings, stealing; doing these and other activities is considered a crime. A person who commits *come* was a person who is deeply defiled until he is freed. And the conscience of man does not keep it. He was not. Therefore, we enter into a boring life. Even if a person does not see or know, the creator was follow and does what he does. It is believed to be silent. It was remaining as it has been, but the person who committed the crime was probably getting the punishment. In fact, the longer it lasts, the more painful the punishment is thought to be. Because staying is the opportunity given by the creature for the person to believe, realize his mistake and expose himself. If he can't use that opportunity to save himself from the *come*, he is likely to be punished. Therefore, he is worried and afraid. The threat is expressed somehow. If a person finds out, he was severely punished.

Thus, *come* is a valuable asset that protects and supports the cultural law system. If there is *come* value, there was peace, good governance, justice and development. If the *come* value is lost, vice versa. The value of *come* is decreasing from time to time. The reasons are many. It is know that some of the issues that human beings do while they are aware and trained are

destroying basic human values. This type of mistake is causing damage to all the cultural values of our country. From the above, it is clear that there are various social issues such as misunderstandings, mutual aid and cultural activities that have been managed and managed in the Dirashe community since ancient times. As this is the case with you, it is mentioned that the nine clans have their own clan leader who delivers messages between the clan chief and his followers. In addition, all the clans have their own traditional judicial system.



Figure 1: Taboo place

B/ The contribution of the nine clans to protect biodiversity

It has been mentioned before that Gardula has been extensively analyzed and that there are four nationalities in it and these nationalities have been able to tolerate and help each other and made it beautiful. In addition, it is clear that these nationalities, namely Dirashe, Kusume, Mashole and Mosye, have their own language, culture, history and heritage. Among these ethnic groups, the Dirashe, which is found in the majority of ethnic groups and skins, is a part of the study in this research paper, and based on their extensive knowledge about the biodiversity conservation of the Dirashe community, an indigenous biodiversity conservation method that will be a lesson for the surrounding districts, Zones, and regions as well as for Ethiopia and the whole world was examined. It is clearly available.

In this way, even though it is known that there is leadership in Dirashe by tribes, it is clear that these tribes are still using their own rules and regulations and traditions. When I said that, it was found that a tribe has its own name symbol or totem in animals and plants, so we call it

the dense forest that still exists and is providing services alongside the culture. During the interview, it was found that there are all tribes in Dirashe, and these dense forests serve as burial places for the tribe's followers. In addition, it is known that they are protecting the local ecosystem. However, due to modernity and lack of awareness, some areas are cutting down and destroying the indigenous trees. With this in mind, each of the nine clans has strict areas and areas of taboo based on the photo study and presents as follows.

Aregamita:- When I lead the followers of the kite tribe in a hot climate, their place of shame is that there natural dense plants that can withstand the heat of the valley. Among these plants, there are no modern plants found, and they are covered only by indigenous plants, and it is also know that there are a lot of traditional medicines in these plants. On the other hand, because it is the home of various wild animals, it is not considered by the followers or other communities to take pasture or firewood for the cattle because it is a tabbo and respecting the place is also respecting the tribes and touching the plants and various things in the place is also respecting the tribes and touching the plants and various things in the place is considered as disrespecting the tribe. when a member of the tribe dies, they are also used as burial place (Abdulefeta), 2010 , but no one other than a member of the tribe can perform funeral ceremonies and traditional rituals at that place. In general, these native trees that are protected by the tribes are contributing to the conservation and preservation of biodiversity.

Kolita and other seven clans:-The *kosha* and other seven tribe has a special name of *kandle* in the climate of the highlands, where I lead and nurture the followers. Their place of taboo is that there are natural thick plants that are suitable for the climate of the highlands. Among these plants, there are no modern plants and they are covered only by indigenous people. It is also know that there are many traditional medicines in these plants. On the other hand, because it is the home of various wild animals, it is not considered by the followers or other communities to take pasture or firewood for the cattle because it is a tabbo and respecting the place is also respecting the tribes and touching the plants and various things in the place is considered as disrespecting the tribe (Abdulefeta), 2010. When a member of the tribe dies, they are also used as a burial place, but no one other than a member of the tribe can perform funeral ceremonies and traditional rituals at that place.

In general, these indigenous trees that are protected by the tribes are contributing greatly to the protecting and preservation of biodiversity. On the other hand, they also have traditional system implementation areas. These traditional system implementation areas include large

age indigenous trees. It is contributing. In general, all clans have their own places of tabbo and strict places. In these places of tabbo and strict places, all the clans, including members, are contributing to the protection of non- touching and protection, that is, when one tribe respects the alien, our tribe respects his own. Unknowingly, they are protecting the climate, that is, biodiversity, and in the places they protect, they are creating and protecting comfort for wild animals Beru 2008 .

4.5.3 The role of biodiversity conservation and utilization

4.5.3.1 Soil fertility, moisture and erosion control system:

The Dirashe tribe has a scientific tradition of using art to control soil moisture and fertility. Two things make something scientific: One is the procedure. It refers to the state of the work done in a way that is possible and suitable for further work and teaching. The second will be the verification of the feasibility of the work. Is the work or art produced really useful or viable for the intended world? The question is being answered. We are unable to learn and teach science in this way, and we are unable to relate the artistic works of our fathers and grandfathers to modern science. We did not call our fathers and grandfathers scientists who did so much wisdom for us. We perceive science and scientists as not coming from us but from outside. This lack of perception and understanding has kept us from being grateful for the work we have done, from using our knowledge, from improving our existing knowledge, and from achieving more results Therefore, it seems that they were not yet found answers to our problems. The answer to the problems is when they understand that the traditional knowledge and practices that they have the nature of science. When they understand that their methods and results are known scientific work and results,

When they believe that fathers and grandfathers who worked and created them were scientists, and when they think that the efforts we make are scientific, and if the results are confirmed, they are scientists. Problems cannot really be solved without thinking. The Dirashe ethnic group's traditional way of maintaining soil fertility and humidity is called scientific because it meets the abovementioned basic scientific principles Beru 2008. Along the way, it is also important to remember how we can and should teach our children by interpreting science in a simple and accessible way. If we do not connect our traditional knowledge with science, we will have no value. It would be native to expect that a degree, master's degree, or PHD that does not understand and does not explain that our ancestors and grandfathers who created great art will make a difference.

When we return to D'irashe's scientific method of soil fertility and moisture protection, we find three basic knowledge's and methods. They are known as *kawasha*, *tarka*, *potaya*. Beru Gardula history ,pp. 82-84, (2008). although there is no written information that explain the time when they found this wisdom, these farmers of the Gardula mountain area started to use soil and water conservation methods in the olden times when the area was naturally covered with forests and elephants. They explain that it was in the time of prosperity when it was a breeding ground for buffaloes, other wild animals, and birds, and among these wild animals, they learned from the elephant's coat. That is, when they learned from the elephant's coat. That is, when they saw the grain that fell on the bare ground and the grain that the elephant trampled on, the fallen coat was very fertile because it gave enough fruit.

Kawasha:- *Kawasha* is a stone cab. To prevent soil erosion and collapse, as well as to prevent rainwater from entering the soil and flowing on the surface, a rock cover is installed. This is done in the highland area of Dirashe, which is a sloping area. In the past, the nation's agricultural development and work were mostly in the highlands, so the traditional work of *Kawasha's* soil fertility and moisture was prominent. Later, more knowledge and wisdom came when people realized that the lowlands were better for farming and started to settle down.



Figure 2: kawasha

Tarka: It is made from corn and sorghum. After the harvest, the trunk is cut and artistically landed in a rectangular shape on the ground. The width of the rectangle may be approximately three by four meters. In *Arguba*, *Ateya*, *Shelale*, and *Holte* Keble, there was a *tarka* on the farm of a farmer. I found out that the height is thirty meters and the side is four meters (3 m× 4m). By visual estimation, they block the sorghum and corn cane at this width and shape. The cane that is lying down is well done to prevent it from being blown away by the wind. A flood is unlikely to take it away. Because there is no flood water beyond *Tarka* and *kosoma*, it is not a threat. There is no danger that pets will trample on it Beru, *History of Gardula*, pp. 84, 2008. There is no tradition to graze cattle in open areas that are not pastures and to give them grass if they are near pastures. Thus, *tarka* is a rectangular form of soil and water cultivation that is spread out by laying down sorghum and corn canes. *Tarka* does not stand alone. There are other arts that work in *Tarka*. They are as follows: **Kosoma:** The smaller fields of sorghum and corn in *Tarka* are called *Kosoma*. Their

procedure is the same as *Tarka's*. The difference is only a matter of scope. *Tarka* is wide. *Kosoma* are smaller and work in *Tarka*. There may be three to five *kosoma* in one *tarka*.

Potaya:- The land in *Kosoma* is compacted, and the soil close to the underlying cane is made to form a slight ridge in the middle. The soil is flattened like a broad ridge. This divided land is called *potaya* or *pohtait*. This is done in order to increase the capacity of the rain that falls. The rain first collects in the pot. If one *potaya* is full, it goes to the neighboring *potayas*. Saying this, none of the water or soil left the field. Therefore, it can be said that none of the water or soil on the land comes from the farming land. Since there are several *Tarka's*, many *kosoma*, and *potayas* on one farming land, the water has no chance to leave the land except by circulating from one *kosoma* and *tarka* to another and seeping into the ground. And since the soil is covered by the sorghum and corn stalks, not a single handful of soil is removed from a field. The benefits and services of *Tarka*, *Kosoma* and *potaya* can be explained in three or four ways. The simplest and most obvious benefit is beauty Beru, History of Gardula, pp. 84, 2008. The land is beautiful when it is prepared in this way. It makes him happy. It would not be beautiful if they were all the same shape. It can be boring. The second and most important thing is that it helps the water to accumulate widely in the center. When one *Kosoma* is full, it moves to the other and accumulates a lot. It penetrates into the ground. Another advantage is that if one of the *Kosoma* or *tarka* is destroyed by water power, the other will be able to hold it. Therefore, it is described as a traditional art to control water pressure through the three methods.

More *Tarka's* and *Kosoma* work in one farm field. The average width of a *tarka* can be approximately three meters by four. The width of the *kosoma* is estimated to be approximately one meter by one and a half meters. In this way, the fish will work as fast as possible. The land on which *Tarka*, *Kosoma*, is built does not waste a single drop of water. The water is stored in each *tarka* and *kosoma*. The accumulated water gradually seeps into the ground. Thus, soil moisture remains for many months. The benefits of *tarka* and *potaya* are not only to hold water but also to maintain soil moisture Beru, History of Gardula, pp. 84, 2008 . It has other advantages.

1. Increasing soil moisture by controlling rain and irrigation water
2. To prevent soil erosion due to rain and wind, the land with *Tarka* and *Kosoma* does not leave a spoonful of soil.

3. The fallen sorghum and corn stalks rot and mix with the soil. As a result, the fertility of the land increases.

Mona:- Mona means to develop compost. *Tarka* and *Kosoma* are made from sorghum and corn stalks. The sorghum and corn stalks that are covered with soil will not survive due to rain, snow, and wind. The compost also creates nutrient-rich soil. This is called Mona. Mona is an irreplaceable natural fertilizer. Beru, History of Gardula, pp. 84, 2008. In Gidole City, the compost is spread over the land every two or three years. To facilitate this, the route between *Tarka* and *Kosoma* will be changed. This is because the part of the land that has Mona is used for production, and the part that does not have *Mona* is for the next *Mona*. With this wisdom, the land of Dirashe will be developed and spread from time to time. Different information can be seen in the names *Kosoma* and *Potaya*. Mr. Beru, in his book titled Gardula History, pp. 84 2008, says that *Potaya* or *Kosoma* are alternate names, and the meaning is the field of soil that is prepared as a ditch.

In general, *Tarka*, *Kosoma*, *Potaya*, and *Mona* give us the benefits of increasing soil moisture, preventing soil erosion, and increasing soil fertility. Many parts of our country are in trouble if we fail to recognize and expand such a high level of development wisdom in our country Beru, History of Gardula, pp. 84, 2008. The respondents argued that bring this experience and procedures from abroad. If studied this art, recognize, reward, encourage, promote, and develop our local practices, arts, and solutions, our country would be able to get out of its problems in a short period of time. But unfortunately, it seems that they are looking for a solution to the problems. But from another entity n this process, however, the possibility of ever meeting the true solution remains a concern. At a time when the world's land fertility, including the country, is getting weaker year by year, D'irashe's land is increasing year by year Beru, History of Gardula, pp. 84, 2008. At a time when the world's production is decreasing due to the weakening of soil fertility, and in the future it is thought that it will not disappear at all, we find that Dirashe is one of the few, perhaps the only part of the planet, where the fertility of the land is increasing year by year.

4.5.3.2. For land fertility development

It was important to remember here also the different techniques used for soil fertility, moisture, and erosion prevention that we have seen above. *Kawasha* (stone hut), *Tarka* (a wide sorghum made of sorghum and corn stalks), *Kosoma* (a small clod found in *Tarka*), *Potaya* (in *Kosoma*, making a groove to allow the ground to hold water), and *Mona* (a compost of *Tarka* and *Kosoma* sorghum and corn stalks) have fertility. It is remembered that

the mentioned chapter that they are used for rainwater harvesting Beru, History of Gardula, pp. 84, 2008. It is important to remember that the cultural law system is the source of cultural values. In the past, cultural leaders were researchers. They carry out important research and studies by themselves, their people, or from outside. When they prove its usefulness, they teach it to their people and announce it through a proclamation. It cannot be forgotten that this is how they lived when cultural systems and values spread.



Figure 3: During preparation of Tarka and Potaya



Figure 4: After preparation of Tarka and Potaya

4.5.3.3. Development of the sacred forest:

In earlier times, tribal leaders (*poldalas*), *shelas*, and holy *Damas* had their own sacred forests (Abdulefeta 2010). These sacred forests are also known as *apadiseta*. These *apadisetas* were used as burial places, strict places, and forests for the performance of various ceremonies. A tribe used to have more than one sacred place for the service of its members in different areas, and when considered as a whole, it can be said that every part of the nation was covered by a sacred forest. This indicates that the forest found in the forests could only be used for the traditional ceremony or for a well-known leader to inaugurate the people. This strict forest was respected until the Italian invasion and the Derg era. But later, these two external and internal troublemakers happened and managed to influence some areas. In particular, the Derg regime has destroyed the traditional system that protects forest development, causing the area's forest development and cover to fall to a serious level.

Even though Derg has planted and developed a large area of marigold and marigold forest on Mount *Horma-Kalo*, it does not compete and has replaced the former in terms of sustainable development and benefits like indigenous trees. Native trees have many benefits. They are harmless. Sea-trees and sea-pines are known to reduce soil fertility and moisture and, in the

process, dry out the land. Legesse A selection of Ethiopia's indigenous trees, Addis Ababa University Press, page 13, 2010.

4.5.3.4. Springs development:

The source is called *turkit* in the Dirashe language. *Turkits (springs)* and fountains are believed to be sacred. Traditional worship ceremonies also take place in the springs. *Poldalas* (tribal leaders), *shelas*, and *Damas* had their own sources. Doing anything that pollutes and alienates these springs and their surroundings is a dangerous thing. Hence, springs were always seen as clean, surrounded by native trees. When the Derg regime demolished the tribal, *shela*, and *dama* institutions that guarded them and desecrated the places, everything collapsed (Abdulefeeta 2010). Sources have been polluted, and some forests have been deforested. But the sources are still named. The communities of *Gardula* indigenous people have been serving their communities by calling or naming all the sources that the traditional system uses, just as the use of plants has been listed above. These are listed in the following table, as they are the information obtained from the respondents during the interview.

Table 5: spring water

No	Name of spring water	Person
1	haqe cholite	Cholite
2	haqi elle	Elle
3	haqi phaqa	Phaqa
4	haqi raphana	Raphana
5	haqi mushaye	Mushaye
6	haqi eutussana	Eutussana
7	ayiga silayiga	Silayiga
8	haqi elayisayita	Elayisayita
9	haqi yonibata	Yonibata
10	haqi marikinite	Marikinite
11	pisha waqo	Waqo
12	pisha agafari	Agafari
13	ayiga tego	Tego

14	ayiga azshe	Azashe
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Source: - Own Survey 2024

4.6. Ways to preserve biodiversity and take care of plants

As the land of Dirashe has three types of climates, many types of crops are grown, as well as different types of plants and trees. *Komole* (Dega), *kitole* (wyinadega) and *soyo* (Qola) Air force bases are located in the nation's territory. Beru, history of Gardula, page 13, 2008, Let's eat in the parts of Gidole town of dega and wyinadega, potatoes, cabbage barley, beans, peas, onions and other crops are grown. In the lowlands, sorghum, maize and teff are the main crops. *Konota*(white sorghum), a popular product, is widely available in this part of the lowland Rift valley. Likewise, the main location of the tree called *kolgawhusheta Halekota* (indigenous name), moringa or shiferau (Amharic pronunciation) appears to be the lowlands of Dirashe.

The chat plant seems to be spreading widely in the highlands and the lowlands. At the same time, plants such as coffee and bananas grow in the fertile land of Dirashe. Regarding trees, there are still many large types of trees in the Horma- Kalo mountain range and associated high places. Evidence indicates that in the past, indigenous trees, including Habesha pine, were abundant and widespread. Hansemo Hamela, history of the Drashe people in the south Ethiopia's Traditions and Customs, page 33, July 1993 some places still have native trees. But it can be seen that modern trees such as sea-tree, sea-pine are also dominating the mountain. It is known that these trees are a threat to soil fertility and water resources, so they may have a negative impact on the natural fertility of the mountain in the future. It seems inevitable that we will be in trouble at some point if we have not already done so to create a developmental forest cover that recognizes this problem.

The indigenous communities of *Gardula Zone* are carrying out the various indigenous knowledge that they inherited and obtained from their ancestors, and these operations include cultural observance, diet, dress, happiness and sadness, farm maintenance, wildlife, and domestic animal care. Their histories show that they are preserving these and passing them on to the current generation. On the side of Bella, these people can also see the ways they learned from wild animals. These are the traditional methods of breathing music from plants and the arrangement of plants from animals and birds. In addition, they learned the traditional grain storage pit (*polota*) from *Tazma* and the traditional method of applying soil and water from wild animals. This shows that human beings get and learn different knowledge from

wild animals and plants. In addition, they practice traditional medicine by observing birds and chickens and saving themselves from various predators, natural disasters, and man-made events. On the other hand, they are protecting their local environment, which means that they are protecting their environment by planting different native trees before the arrival of modern plants such as eucalyptus, fern, cedar, etc Beru 2008.

These indigenous trees have different climatic properties for the area, so they are used in identifying and studying different plants, i.e., planting and caring for those that are suitable for the climate. Among these, the upland (Komole) climate, the middle climate, and the lowland are called *Soyo*. Therefore, these air properties grow different plants; that is, they are established by water, leaves, and sun. The plants that exist or grow in the middle and lowland areas do not grow in the same way as the plants that grow in the middle and lowland areas do not grow in the highlands. As a result, these people in *Gardula* study this climate and identify and plant the ones that are suitable for the plants in order to preserve and protect their environment and biodiversity in this situation Ferw 2009. The types of plants we follow and take care of according to the climates listed above are listed in the table as follows from the interview.

Table 6: **Plant species**

NO	Amharic name	Indigenous name
1	Girawa	<i>Pashaya</i>
2	Bisana	<i>Dotaya</i>
3	Dashilde	<i>Paritante</i>
4		<i>Danidaba</i>
5	ye absha tide	<i>Qasoti</i>
6	Warika	<i>Fofaya</i>
7	Tikure enchet	<i>Ohoma</i>
8	Digitaa	<i>Helebanti</i>
9	Waniza	<i>Otaya</i>
10		<i>de'ishe</i>
11	Bissana	<i>Patiya</i>
12	yegirawa wonidime	<i>Phutaya</i>
13	Woyira	<i>Egerite</i>

14	Shenibeqo	<i>Shanibaqote</i>
15	Qerikeha	<i>Layima</i>

Source: - own survey

Table 7: The main and big trees that are being planted in Qola (soyo) area

No	Scientific name	Amharic	Indigenous name
1	<i>Olea europaea subsp- cuspidate</i>	Woyira	<i>Egerite</i>
2			<i>Oyibiya</i>
3	<i>Cordial Africano</i>	Waniza	<i>Otaya</i>
4	<i>Prunus Africana</i>	tikure enichet	<i>Choliba</i>
5	Moringa	Moringa	<i>koligawushet/halakote</i>
6		Warika	<i>Fofaya</i>
7		yemachdi enchet	<i>Qoyira bachte</i>
8	Acacia	Girari	<i>Choliba</i>

Source: - Own survey 2024

In the above tables, in the highlands and in the lowlands, there are paintings that contribute a lot to the relationship and blood ties with each other. A sister, meaning an aunt in Amharic translation, chooses a girl and marries her son. After she has done this, she reconciles with the child and tells the parents about it. After that, the parent separates everything from her offspring. After that, he goes to dowry. The money was paid today, and in those days, if I am in the highlands or *Komole*, it will be called *Dashelde (partanta)*, and if it is in the Qola area, it will be called *Morunga (Kolgaushet, Haleko)*. It is what it calls for. After these plants are given to the girl's father as dowry, they are called by his name.

He takes care of the tree and uses it until he reaches the dowry money. While carrying out their indigenous activities, they strengthen their social ties, and on the other side, they help to protect their local ecosystem, in addition to allowing them to protect their biodiversity. As these *Gardula* tribes are divided into nine clans, these clans also have animal totems and plant symbols. They use these plants for various indigenous functions, such as weddings and mourning. During weddings, they break the leaf, hold it on their heads, and perform rituals on it. However, the response given by the historical fathers during the interview states that they are also promoting and calling the plants through their tribe, and they are indirectly protecting the species of plants. In addition, this is described in the table below

Table 8: The clans name and their plant symbol (totems)

No	Clans name	Plant symbols	Amharic
1	<i>Kolayta</i>	<i>Phutaya</i>	ye girawa wondime
2	<i>Arkamayt</i>	<i>(Laaw) phtiya</i>	Bissana
3	<i>Elayt</i>	<i>(Laaw) phatiya</i>	Bissana
4	<i>Kalayta</i>	<i>Phutaya</i>	ye girawa wonidime
5	<i>Malit</i>	<i>Phashaya</i>	Girawa
6	<i>Kansit</i>	<i>Phashaya</i>	Girawa
7	<i>Karchit</i>	<i>(Laaw) phatiya</i>	Bissana
8	<i>Ketaye</i>	<i>Phashaya</i>	Gerawa
9	<i>Karit</i>	<i>(Laaw) phatiya</i>	Bissana

Elders and people who are familiar with the stories told us that the ancestors in the community are using various indigenous knowledge and methods to preserve the biodiversity of their environment and that they are preserving the biodiversity with different ideas. These have been analyzed in different ways, that is, it has been possible to put them in the form of analysis and tables, but on the other hand, on the protection side, even though the land (farmland) did not belong to them, these grandparents planted and nurtured plants, naming them after themselves and preserving the life of the plants.

Table 9: plant and their possessive

No	Scientifics name	Amharic name	Indigenous name	Person
1	<i>Erythrina abyssinica</i>	Korch	<i>Te'itti</i>	Seke
2	<i>Erythrina abyssinica</i>	Korch	<i>Te'itti</i>	Paqala
3	<i>Ficus vasta</i>	Warika	<i>Fofaya</i>	Negash
4	<i>Ficus vasta</i>	Warka	<i>Fofaya</i>	Gnrige
5	Wood	Enchet	<i>Qoyira</i>	Heniche
6	<i>Ficus vasta</i>	Warka	<i>Fofaya</i>	Holitabo

Source: - own survey 2024

The Dirashe indigenous ethnic group their clans, symbols (totem) and indigenous name of animals

Table 10: clans name and their animals and non-animals symbols (totems)

No	Clan	Animals and non-animals	Indigenous name of Animals, non-animals and symbols(totem)
1	<i>Kolayta</i>	Cow, Mouse and Birds	<i>Ogate, Tabaya and Habira</i>
2	<i>Kalayta</i>	Lion and Tiger	<i>Karima and Qairant</i>
3	<i>Arkamayta</i>	Sun	<i>Ototi</i>
4	<i>Elayt</i>	Goat and pig	<i>Orgeti and Mashte</i>
5	<i>Karchit</i>	Calabash and Qo'qe	<i>Dhnte and Qirete</i>
6	<i>Kansit</i>	Pigon	<i>Hale</i>
7	<i>Malit</i>	Sheep, monkey and black snake	<i>Helema, Qelilayite and Makapori</i>
8	<i>Karit</i>	Mule, Hyena, Dog and Donkey	<i>Kaniget, Orayite, Hera and Harete</i>
9	<i>Ketaye</i>	Kidney	<i>Dhussa</i>

Source: - Own survey 2024

If they find the reptiles, birds and wild animals listed in the above table on the roads, farms and other places where they are not working, they do not kill them because they have a high respect and place in the community because of the tribe's, symbol, that is, because one respects the tribe of the protector, and in the same lick, those representative animals also give them a place by breaking leaves and throwing them on the animals. Likewise, if the animals are knocked down, they will be from far away and they will praise you by saying that your house will be warm, but they will not disturb them. But nowadays, some individuals are neglecting the respect due to religion and modernity and are killing and them animals.

Domestic and Wild animals

Sheep, goats, cows and bulls, chickens, donkeys and mules are reared in the area. In the past, the area was densely forested, so there were many wild animals, including elephants. Currently, many of the above mentioned wild animals are not seen in the area. It is said that there are non-venomous snakes in the upper and lower parts of the valley, and poisonous snakes in the lower part. Hippos and crocodiles are still found in the area along with *pakade* (chamo) Lake.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATION

5.1 Conclusion

The main purpose of this study is to study indigenous knowledge, practices, and knowledge of biodiversity conservation, or to preserve and promote this knowledge for the next generation. Indigenous or local knowledge refers to a complete body of knowledge (Mushi, 2008), know-how and practices maintained and developed by peoples, generally in rural areas, who have extended histories of interaction with the natural environment. It provides the basis for local-level decision-making about many fundamental aspects of day-to-day life. In the study area, and the rest of the world, indigenous knowledge has great benefits and contributions to the conservation of biodiversity in history, culture, society, and nature, and it has a significant role in the study area. In the preservation of biodiversity, especially indigenous knowledge, they play a significant role in creating a favorable climate, ensuring that plant species do not disappear and that animal species do not disappear and migrate.

Directly and indirectly, there are benefits to the entire world when biodiversity was protected through indigenous knowledge (Semali & Kincheloe, 2002), which will help people stay during their lifetime. These benefits include a favorable climate, a reduction of soil erosion, allowing decaying organisms in and above the ground to live, preventing the extinction of animal and plant species, and preventing the extinction of all living and non-living things and their habitats. By creating a situation for them. In addition, when biodiversity is preserved and the climate is favorable, biodiversity conservation also plays a role in preventing dependence on foreign countries. On the protection side, it indicates that they are contributing to all foreign countries in terms of indigenous knowledge. This study is clearly exploring the benefits and contributions of indigenous knowledge and practices to biodiversity and contributing to productivity and a comfortable climate for farmers. This is also to encourage to pay more attention to indigenous knowledge, practice, and care in the preparation of this research paper. This purpose is the main center and basis of it and it solves the problems that arise in a smart and widespread manner with the help of indigenous knowledge.

This research paper indicates that the activities and results of indigenous knowledge, activities, and care of biodiversity are being protected and passed on to the next generation and are being affected by other influences. Some of the communities (indigenous) in the area

they do not have enough awareness about biodiversity. That said, they plant and take care of water, soil, and native trees on their own, and on the other hand, even if they don't plant, they have the knowledge to take care of the trees, and they also dreamed of it. With their indigenous knowledge, they prevent erosion and damage to plant species, springs, and soil. They used to play with their knowledge of the tribe Beru 2008. This means that they are naming the species of plants and animals with their own tribal names and respecting each other, as there is mutual respect between the tribes. Even if an individual does not have land near a river or near water, he can plant plants under his own name, and this knowledge still exists and the trees and water are still being used by the community.

Those who have not implemented this indigenous law were taking care of the planted tree without uprooting or cutting it and by supporting its purpose by being by its side and gaining knowledge. But if it is a spring, they call his name and use it for drinking or for different activities. For example, if there is natural or man-made damage to the tree or the spring, the whole community will be on his side and condemn the person who damaged it and correct it Beru 2008. There is a chance that the indigenous knowledge in the area will become scarce because it was primarily passed down orally from generation to generation. Indigenous knowledge of the local community has been vanishing due to cultural transition and the arrival of the younger generation due to a lack of documentation and preservation.

5.2 Recommendation

The study's conclusions have led to the forwarding of the following suggestions.

- ❖ Since local communities play a crucial role in biodiversity conservation, it would be advantageous to include local knowledge, customs, social administrative structures, and practices in the conservation effort. This can be achieved through forming alliances for cooperative issue solving and methodically enhancing and changing indigenous knowledge via the use of technology.

- ❖ The viability of conservation efforts for the regional ecosystem and agricultural systems is a determining factor. Therefore, although top-down planning fails to support good natural resource management at the local level, establishing and executing culturally relevant and participatory development initiatives would prevent expensive errors.

- ❖ Appropriate documenting and recording of indigenous knowledge would be beneficial for its long-term preservation and application. Universities, the environmental community, and the federal and local governments may all have a role in appreciating, safeguarding, and defending the region's indigenous knowledge base.

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Appendix
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QUESTIONNAIRE

INTERVIEW GUIDING QUESTIONS PREPARED TO CONDUCT STUDY ON
INDIGENOUS KNOWLEDGE AND PRACTICE OF BIODIVERSITY CONSERVATION
AMONG D'ERASHE PEOPLE OF SOUTH ETHIOPIA

Dear respondent

My name is Asfaw Alemu, I will graduate in Dilla University in School of graduate studies Department of indigenous studies. This study has an intention of investigating the indigenous knowledge and practice of biodiversity conservation as a part of indigenous knowledge. It will be conducted in Gardula zone, specifically focusing on D'erashe ethnic group. It has a plan to document and provide description on the mechanisms of providing assistance for individuals or members of the community who were knowledge to cultural, social, as well as individuals. This guiding question is prepared to elicit knowledge of informants on biodiversity conservation. Taking this in to consideration I am going to have broad discussion on relevant issues indicated under the objective of the study. If you don't mind, I will recorded/ audio tape the discussion. The purpose is to ensure that I don't miss anything you say since it has high importance to the study. In the course of conducting the study what we have discussed will be kept confidential and it will be used only for research only. You consent and anonymity will be considered. Are you willing to continue in the mentioned way?

Instructions:- No need of writing your name and indicate your answers with a check mark (√) and write correct answer in the appropriate space provided.

Section A: Background Information

1. Sex: - Male Female
2. Age: Lessthan20 21-35
 50 and above 36-49
3. Educational status: A. blow12 B certificate
D. degree and above

4. Marital status A. married

B. single

C/ widowed

Section B: This section of the questionnaire explores your knowledge, attitude and practices with regard to the biodiversity conservation (fill blank spaces or circle your choices where you get alternatives).

5. Do you hear about biodiversity conservation before?

A. Yes

B. No

6. If yes, what are major types of knowledge you use for conserving biodiversity? -----

7. What are the sources of this knowledge?-----

--

8. Can you tell me the strategy you use in terms of species?-----

9. How do you prepare yourself for conserving biodiversity?-----

10. Do you know the procedures followed to conserve biodiversity?

A. Yes

B. No

11. If yes, Can you tell me the procedures you follow to conserve biodiversity? -----

12. What must be conserved in biodiversity?-----

13. Do you list down what type plant, trees, animal and natural habitats to conserve biodiversity on the high land and low land of the community? -----

14. What is the influence of the conservation on the community?

- Positive:-----
- Negative:-----

15. How can religion or indigenous cult conserving biodiversity?-----

16. What kind of knowledge do they use to conserve biodiversity?-----

17. Can you tell me the role of culture to conserve sacred area that has contributed for the conserving biodiversity? -----

18. Can you tell me the role of members in social institutions in providing biodiversity? -----

19. What kinds of roles do the community to conserve biodiversity? -----

20. How the farmer can conserve farming land, water, and the naming system species? Can you tell me the indigenous naming system of plant and animal species? -----

21. Is there any principle in your area which governs knowledge of biodiversity conservation?

A. Yes

B. No

22. If yes, Can you tell me the main principles which guide to conserve biodiversity in your locality, clan, kinship system, villages and neighborhood? -----

23. What are the principles which help you to provide biodiversity conservation? -----

24. Can you tell me the benefits you gained or were gaining from biodiversity in your life or community? -----
