

COLLEGE OF SOCIAL SCIENCES AND HUMANITIES

**THE ROLE OF INDIGENOUS KNOWLEDGE IN LAND MANAGEMENT PRACTICE:
THE CASE OF KACHEBIRA DISTRICT, KEMBATA TEMBARO ZONE OF
SOUTHERN NATIONS, NATIONALITIES AND PEOPLES NATIONAL REGIONAL
STATE**

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**A THESIS SUBMITTED TO DEPARTMENT OF SOCIAL ANTHROPOLOGY IN
PARTIAL FULFILLMENT OF THE REQUERMENT FOR THE DEGREE OF MASTER
OF ARTS IN SOCIAL ANTHROPOLOGY**

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JANUARY/2021

JIMMA/ETHIOPIA

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Acknowledgement

First of all, I would like to thank my principal advisor Mr. Disasa Merga (Assistant Professor), and Co-advisor Mr. Tagen Dareje (MA), for their advice, endurance, critical comments and constructive suggestions throughout the course of my thesis work.

Secondly, I would like to thank Shinshicho City administration government who gives this chance to study my Master's degree program.

Then, I would like to express my deepest thanks to my beloved husband Ato Demissie Hankore, for his prayer, support and love for my entire Master's degree journey and taking fatherly care of my children.

I would also like to thank my special mother W/ro Zanebech Sida, for her constant prayer, support and taking care of my newly born baby (Rhoboth). In this I also thank W/ro Lego Hankore, who takes care of remaining children's together with my husband. Additionally, I want to thank my brothers Sillas, Tadiwos and Tariku for their moral and financial support and my sisters, Abebech, Bizunesh and Tesfanesh for their sisterly support.

My special thanks also go to all my friends, Melesa Alemu, Abel Yonas and Yosef Yonas for academic support and the others whom I did not mention their names.

At last but not least, I would like to thank and appreciate to all those participants of this study who supported me by giving real data specially, the Gamesha kebele DA experts Mr. Wondimu Yohannis, and Mr. Abriham Bunne and the all experienced farmers, aged, younger and women FGD informants.

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List of Abbreviations and Acronyms

CSA- Central Statistics Agency

FGD-Focus Group Discussion

IASG- Inter-Agency Support Group

IK- Indigenous Knowledge

IPBES-Intergovernmental Platform on Biodiversity and Ecosystem Service

Kms- Kilometers

KTZ- Kembata Tembaro Zone

Mount- Mountain

SD- Sustainable Development

SLM- Sustainable Land Management

SNNPNR- Southern Nations Nationalities and People's National Region

TEK- Traditional Ecological Knowledge

UN- United Nations

UNCTAD- United Nations Conference on Trade and Development

UNDP- United Nations Development Program

UNEP- United Nations Environmental Program

UNESCO- United Nations Educational, Scientific and Cultural Organization

WB-World Bank

Glossary of Local Terms

Local Terms	Transcription	Semantic/contextual Meaning
<i>Annina ama oosuta</i>	Fathers and mothers son	Brothers and sisters
<i>Adana ishimi oosuta</i>	Father brother sister and mother brother son	Aunts and uncles
<i>Atakaani bari</i>	The day September 16	Women day in which women prepare the known cultural food to celebrate Masaala holy day
<i>Atakaano</i>	Type of food	Cultural food prepared from waasa/kocho, milk and butter, at Women Masaala holy day
<i>Bari dagu</i>	Knowing days number	Practice of using day number division to plant and harvest
<i>Beekanchi bari</i>	The day September 18	Men's day in which the sheemmaata group divides the sloughten Oxen meat to celebrate Masaala
<i>Bonxa uujuu</i>	Mulching	Adding plant leafs in to farming land to maintain soil fertility and to protect soil from erosion
<i>Boohi muru</i>	Check dams	Cutting farmland in to dams to protect soil from erosion
<i>Chagina</i>	Season	When the big circled moon seen from three up to seven days respectively
<i>Duli bari</i>	The day September 17	Men's day in which the sheemmaata group sloughten the Masaala oxen
<i>Ereereen wixu</i>	Mixed farming	A practice of cropping different things together
<i>Fishsha aguru</i>	Leaving Crop residue	Practice of leaving crop residue to maintain soil fertility
<i>Gochcho</i>	Intermediate	Traditional unit of territorial organization
<i>Gots</i>	Institutions	Locally institutionalized teams mainly for funeral process

<i>Hacca giiru</i>	Burning of slight	Burning of slight in farming land to protect soil fertility
<i>Haguu hoga'u</i>	Plough at winter season	A practice in which plough at winter season to maintain soil fertility and to increase crop production
<i>Haqqita kaasu</i>	Agroforestry	Planting trees in farming land to conserve soil erosion
<i>Heera</i>	Institution	Local institution for funeral system
<i>Hixita kaasu</i>	Grass strip	Planting grass near the check dam or in farmland
<i>Hizeena hizoo oosuta</i>	Brothers and sisters son	Brothers and sisters
<i>Iittancha</i>	Type of marriage	Newly married couples are married based on someone wealth or families' wealth and background
<i>Kaashsha kaasu</i>	Vegetation's strip	A practice in which planting of different vegetation's in farmland
<i>Kembaatissa (Kembatigna)</i>	Local Language	The language spoken by Kembata people
<i>Kiilaancho/m aganaancho</i>	Magician	Magician person in who peoples worships
<i>Kokaata</i>	Organization	Biggest traditional unit of territorial organization of Kambata
<i>Lamala</i>	The number seven	Traditional belief of counting the seven ancestors
<i>Lamale sanna</i>	Season	The known/well season to teff cropping
<i>Lankaannina</i>	Aunts and Uncles Sons	Father brother and mother brother sons

<i>ishimi oosuta</i>		
<i>Lankaannina ada oosuta</i>	Aunts and Uncles Sons	Brothers and Sisters
<i>Midu</i>	Abduction	Taking girls by force for marriage
<i>Magano</i>	Super sky God	Creator of everything
<i>Maarashu</i>	Tool	Cultural tool used to plough farmland
<i>Matarashu:</i>	Traditional Tool	Cultural tool used to carry animal dung
<i>Masaala</i>	Holiday	Celebrated around September 16-18 for three consecutive days
<i>Mongo bari</i>	Not full day	The day which cannot be divided for the number two
<i>Muuza kaasu</i>	Banana strip	Planting banana in or surrounding of farm land to protect soil erosion
<i>Qorsiishsha</i>	Type of marriage	Marriage takes place through a preparatory participation of the parents
<i>Reejja</i>	Bulla Grava	Most prominent plant in using vegetation strip
<i>Seera</i>	Code	Totality of code conducting operational throughout Kambata
<i>Sha`lla uujju</i>	Manure	Practice of adding animal dungs in farmland to protecting soil from dryness and to improve crop production.
<i>Sheddeguta hoga'u</i>	Contour farming	Plough of mountainous farming land to protect soil erosion
<i>Sheemmaata</i>	Group	Group who sloughten oxen in Masaala holy day

		together
<i>Su'mma beele</i>	Season	Teff cropping season after August at five or six days
<i>Uullata gashshu</i>	Fallowing	A practice of leaving the land without plough for a year or years
<i>Waasa/Koch o</i>	Type of food	Local food produced from inset
<i>Weesita kaasu</i>	False banana strip	Planting false banana in soil erosion way
<i>Wiima bari</i>	Full day	The day that can be divided for the number two
<i>Woma</i>	King	King of kambata
<i>Xabaru ta'mmu</i>	Using ash	A practice of using ashes to protect soil fertility
<i>Zana Zanu</i>	Field boundaries	Planting different plants in the borders two farming land
<i>Zeemata aguru</i>	Avoiding overgrazing	Practice used to protect soil

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Abstracts

Land degradation is one of the major factors affecting land productivity. Western borrowed knowledge is not solving all problems that humanity faces rather it causes some effects on life. This study conducted on the title the role of indigenous knowledge in land management practice the case of Kachebira district, Kembata Tembaro Zone of South Nation, Nationalities and Peoples National Regional States. The main purpose of this study was to explore the role of indigenous knowledge in land management practices among Kembata society of Kembata Tembaro Zone in the southern region of Ethiopia. The study conducted with the utilization of descriptive type of qualitative anthropological research approach by using both primary and secondary data sources with appropriate data collection methods such as interview, FGD, observation and document review. The upshot of this study includes the importance of various types of indigenous knowledge in land management practices in farmland, in combating soil erosion and maintaining soil fertility to improving livelihood, poverty alleviation and sustaining environment management. Among those practices using animal manure, mulching, agroforestry, mixed cropping, leaving crop residue, slight burning and using ash, check dams, contour farming, banana; inset; grass and vegetation strips, understanding seasonal change and date number division are the major findings. The study concludes indigenous knowledge has significant contribution in land management practice in maintaining soil fertility and combating soil erosion. The study contributes a chord of interests of development researchers and academicians for the further enrichments by this domain of knowledge as Ethiopia has diversified communities with rich indigenous knowledge which pay significant contributions to scientific research.

KEY WORDS: *Indigenous Knowledge; land management; practice; Role; Kembata*

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

The importance of Indigenous Knowledge (IK) is gaining increasing attention emphasizing on the successes of farmers and local peoples as the sources of local solutions in the search for sustainable livelihoods. Its importance in contemporary ecosystem management is also taken as a step to overcome problems of global concern like climate change and unsustainable ecosystem services (Abebe, *et-al.* 2013).

This age-old indigenous knowledge in land management process developed from empirical knowledge and experience of the individual elements of land, of the relations through spiritual and cultural connection to nature is very effective because it is ecologically safe, economically viable and socially acceptable (Yeshambel, 2013). From this, the term indigenous is refers to belonging to a place, originating in and typical of a region or country that the residents of an area were lived, and the term knowledge refers to the classifications that peoples make to understand the reality and meanings attached to their experiences methods developed to adapt a given environment.

From the two terms in combination, the term indigenous knowledge (IK) is defined as a particular form of place-based knowledge of the diversity and interactions among plant and animal species, land forms, water courses, and other qualities of the biophysical environment in a given place (Posey, 2005).

It comes from dynamic mix of past and present invention with a view to the future. It is a way in which the residents of an area have come to understand themselves in relationship to their natural environment and how they organize that folk knowledge of flora and fauna, cultural beliefs, and history to enhance their lives (Semali and Kincheloe, 1999).

It is also called a social capital of the poor, their main asset to invest in the struggle for survival, to produce food, to provide for shelter or to achieve control of their own lives (Pierotti, 2011).

As quoted by the World Bank (1997), Warren (1991) and Flavier (1995) present typical definitions by suggesting: Indigenous knowledge (IK) is the local knowledge – knowledge that is unique to a given culture or society. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural resources management, and a host of other activities in rural communities (cited in Mitiku, *et-al.* 2006).

These days, people in the third world countries faced to many problems, like food insecurity, poverty and land degradation and the others.

Land degradation is one of the world's major socio-economic and environmental problems, affecting one billion people in 110 countries worldwide and is prevalent across about 40 percent of the earth's surface (Yechele, *et-al.* 2018).

IPBES, (2018) in “Summary for policymakers of the thematic assessment of land degradation and restoration” also reported that, land degradation affects the wellbeing of around 3.2 billion people, leading to food and water insecurity and poverty (IPBES, 2018:10).

The consequences of land degradation are high, with widespread loss of biodiversity and ecosystem services. Land degradation caused by erosion is an environmental threat that hampered agricultural production and the causes include over cultivation, overgrazing, over population and deforestation. Followed to this, loss of productive land undermined rural livelihoods and national food securities are common problems (Mulugeta, and Karl, 2010:164).

Western techno- scientific methods are also “in themselves” an insufficient response to today's complex system of socio-economic, political, and environmental challenges (Grenier, 1998:11), rather than as Pokhrel, (2009) states, it dismissed or greatly played down its effect like elimination of natural adversary, toxic residue in food, water, air and soil, degrading soil

environment and ecosystem, animal and human health hazards and ultimate economic losses (Pokhel, 2009).

Therefore, current degradation of fertile soil needs to be halted, so that land can continue to provide enough land-based management services for an ever-increasing number of inhabitants.

In the same way, studies also predict huge costs of future land degradation and emphasize the need to invest in measures that can avoid or reduce the loss of productive land, such as or to restore degraded land, both of which have been shown to be very cost-effective and can create long-term positive benefits (Knowledge hub, 2019).

On another way sustainable land management (SLM) practices is an approach that emphasizes on finding economically viable, socially acceptable, and ecologically sound solutions at a local level. The objective of this approach is to harmonize the complementary goals of providing environmental, economic and social opportunities for the benefit of present and future generations, while maintaining and enhancing the quality of the land (soil, water and air) resource (Tolera, 2011).

This necessitates environmental conservation and sustainability that will be fully realized under the recognition and implementation of indigenous knowledge that ensure acquisition and utilization of local resources by local community (Knowledge hub, 2019).

Therefore, to relive the land, and mitigating the above listed problems and other related issues, indigenous peoples and local community's extensive knowledge to managing the landscapes and the use of different land management practices and techniques contributes to the maintenance and adaptation of farm productive, sustainable and resilient approaches (Yosef, *et-al.* 2019).

Thus, studying the role of indigenous knowledge in land management practices contribute to better understanding on how to sustain ecosystem services, adapt to a given environment and paves the way to integrate indigenous practices into development initiatives. This enables the use of transferable indigenous knowledge, which has the potential to be applied to other sites. It also

paves the way for the protection of indigenous knowledge and their environment (Abebe, *et-al.* 2013).

As Ethiopia is a country with multicultural groups, these cultural groups have their own culture, norms and different system of IK to manage farmland. As a member of the 80 ethnic groups, Kembata is one of the major cultural groups in Southern Ethiopia who have used the indigenous knowledge/cultural system of farmland management.

Thus, the purpose of this study is aimed to explore the role of indigenous knowledge in land management practices on farmland in combating soil erosion and maintaining soil fertility to contributing sustainable livelihood, including food security, poverty alleviation and giving service to economic, social, political and environmental value under the study.

1.2 Statement of the Problem

Land management is very critical to human well-being because it provides a range of biophysical and socioeconomic goods and services that support the sustainability of ecosystem services, livelihoods and greatly other human wellbeing.

Many countries in the world now are facing various types of environmental problems such as land degradation, climate change, biodiversity extinction, air pollution and poverty; even their policies adopted to overcome such problems are also different from each other by its nature (Harishankar *et al.* 2003:186 cited in Melkam, (2015:273).

Human beings are most instruments for the problems. In spite of its very critical importance, soil is losing its productivity and fertility due to erosion either by wind or water, overuse, salinization, use of agrochemicals that leads to irreversible degradation of land and other multifaceted environmental problems. However, indigenous knowledge could play a great full role in natural resources management in general, and in farmland management practice in particular is not applied to overcome such problems.

In the beginning of 21st century, the indigenous knowledge and practices have been recognized as opt path for sustainable development, green economy and environmental conservation as strategies to alleviate poverty particularly in the developing countries. This is because indigenous practices in land management have potential to address the problem at grass roots level as local people have been using for long period of time to combat the problem of soil erosion and to increase soil fertility. However, indigenous knowledge of land management practice of local peoples and its importance to address the problem of poverty is still underutilized.

There has been growing recognition of the role of indigenous knowledge in the search for sustainable development in developing countries stressing on the farmers and local peoples as the sources of local solutions in the search for sustainable livelihoods. Their wise use and management of farmland are more important for high demands on food production and satisfy the needs of an increasing world population and protecting environment (Blanco, and Lal, 2008). But still there is the problem of understanding and utilizing the local farmer's knowledge and practices they have used to manage their farmland.

In the same way according to Warren, (1992) indigenous knowledge practices are critical to insure sustainable development i.e. as he states "studying indigenous knowledge systems contributes to gain lessons on climate change, adaptation and lead to incorporate indigenous practices with natural resources development to ensure sustainability" (Warren, 1992: 8). Although a vast heritage of indigenous knowledge about ecosystems and their use exists, it does not appear in the world literature. Oduol, (1995) also underlined the necessity of utilizing and formalizing indigenous knowledge it is not yet fully utilized in the development process.

The other problem is there are many factors that affect indigenous knowledge like cultural, social, demographic, economic, environmental and geographical conditions at different countries in the world. Modernization and migration is also another factor which erodes much indigenous knowledge among local communities (Paniagua-Zambrana, *et al.* and 2014:1). But there are no studies available in factors affecting indigenous knowledge in farmland management practices.

Ethiopia economy is predominantly agriculture and rural based population largely depends on subsistent farming. Poverty alleviation and sustainable development under the principles of green economy is not only the policy option of the country but necessary condition to transform Ethiopian economy and Ethiopians to prudent ways of development. But there are no studies available on the role of IK of farmer's practices in farmland management that contributes to alleviate poverty and improve countries development.

Few scholars study on the role of IK on land management only focuses on conservation of environment, forest, soil and water, ethno botanical plant, carbon sequence and climate change and variability and others in different areas at different time, by utilizing different methods and theories. Such scholars like, Ayaa and Fuchaka and Chadwick *et-al.*, (2016); Shisanya and Getachew, *et-al.*, (2017); Yechele *et-al.* (2018); Yosef *et-al.* (2019); Adimew and Aseffa and Taddesa, (2014); Abebe *et-al.*, and Yeshambel, (2013); Tanyanyiwa, (2011); Mulgeta and Karl (2010); Dialla, (1992); Posey, (2005); and others.

But, this study mainly focuses on the role of IK in land management practices in Kambata Tembaro Zone of SNNPNRS in Kachebira district on farmland management by using qualitative anthropological data approach and the cultural theoretical framework that plays the major role in protecting soil erosion and maintaining soil fertility and then improving sustainable livelihood, food security, poverty alleviation and giving service to economic, social, cultural and sustainable environment in the conceptual frame work of indigenous knowledge in current study area.

Kembata has complex environmental set up and holds natural resources. Most of these resources, however, are under high pressure of human interference and natural factors and threatened by land degradation. Specially, Kachabira district has diversified topographic features such as flat, gentle, sloping plains and undulating to rolling plains with substantial proportion of low to moderate relief hills, with plus to high population number to low size of farmland (Getachew, *et-al.* 2017). But farmers use different measures and practices to overcome such problems by adapting that environment and to make life survive. So, the role of this vast heritage of

indigenous knowledge in land management practices especially in farmland management is not studied.

Based on this, this study intended to describe the importance of various indigenous knowledge practices of farmland management where the local communities were endowed with this knowledge under the study.

Therefore, this study explores the role of IK in land management practice in farmland in case of Kachabira district of Gamesha *kebele* in Kembata Tembaro Zone (KTZ) of Southern Nation, Nationalities and Peoples National Regional State (SNNPNRS).

1.3 Research Questions

The study answers the following basic questions.

- ✓ How do people understand farmland?
- ✓ What are factors that affect farmland?
- ✓ What types of practices are used to manage farmland?
- ✓ How indigenous knowledge of farmland management practice is important?
- ✓ What are the roles of women in indigenous farmland management?

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of the study was to explore the role of indigenous knowledge in land management practices in Kachebira district, in Kambata Tembaro Zone.

1.4.2 Specific Objectives

The overall objective stated above, achieved by the following specific objectives:

- To understand people's view of land and its management
- To explore factors affecting farmland

- To identify type of practices by which farmland is managed
- To describe importance of indigenous knowledge of farmland management practice
- To understand the roles of women in indigenous practices of land management

1.5 Significance of the Study

This study has its own importance to various purposes. The primary purpose was for the partial fulfillment of degree of master of art specialization in social anthropology.

The other purpose was to make aware of the critical importance and effectiveness of indigenous knowledge of farmland management practice to local community to empower them.

And also, as indigenous practices are more specific and unique to every society so that this study helps the development planners to integrate the practices of this area to other area's as indigenous knowledge is found to be transferable and adaptable from place to place.

This study also insists academicians and policy makers to undertake further investigation on the study in order to play their expected role in our country's development particularly poverty reduction and food security.

Finally, this study offers overwhelming contributions in environmental conservation of the country as management of land is one of the critical elements and working with indigenous practices in farmland management is one of the best strategies to achieve environmental sustainability.

1.6 Scope of the Study

This study was limited in terms of theme and geography. Thematically, it is concerning with the role of indigenous knowledge in land management practices on farmland. In addition, geographically, the study was confined only in Kachabira district, particularly in Gemesha *kebele* in KTZ in SNNPR.

1.7 Limitation of the Study

Resource constraints, paucity of time, topographic and climate condition, hardship due to experiences and the anthropological nature of qualitative method that the researcher mainly used bear limitation on the geographical coverage and thematic extent of the study.

Due to this, the other districts and the remaining *kebele* and the other thematic areas exclusively the role of indigenous knowledge in land management practice out of land management practice on farmland was not covered like land management on conservation of forest, soil, water, ethno medicinal plant and others in the study.

The emphasis of this study was related to only farmland management practices of farmers in Gemesha *kebele*. So, the gaps that were uncovered geographical and the thematic areas were recovered either by the researcher or by other scholars for future time.

1.8 Organization of the Study

This study generally contains five major sections.

The first section of this thesis discusses issues that are basic and relevant to the study conducted that is introduction which includes background of the study, statement of the problem, the major research question that the study attempted to answer, objectives of the study, significance of the study, scope of the study and limitation of the study. The subject matter of the second section revolves around literature review, theoretical and conceptual framework that is supportive to the research conducted. And the third section contains description of the study area, an overall methodology that was adopted to scrutinize the issue at hand and the ethical considerations. The fourth section of the study presents the data presentation and analysis of the study. Then the final section of the thesis presents the research conclusion and recommendation.

CHAPTER TWO

2. REVIEW OF LITERATURE

In this chapter, attempted has been made to reviewed different studies which were conducted on the role of indigenous knowledge on land management practice, which related with my research objectives. The chapter has two sections, the first part is empirical literature and the second is the theoretical and conceptual framework of the study.

2.1 Definitions of Concepts and Terms

It is necessary to have definitions of terms and concepts as used in this study for better clarity and understandings. These terms and concepts among other include indigenous knowledge, land degradation, and land management, sustainable land management.

2.1.1 Indigenous Knowledge

Many definitions are stated by different scholars about the concept of IK. Among these as quoted by World Bank (1997) indigenous knowledge is the local knowledge that is unique to a given culture or society. It is the basis for local decision making in agriculture, health, food education and environmental management. It covers local, traditional, non-western beliefs, practices, and customs and usually refers to informal forms of knowledge. It is the knowledge of people of a particular geographical area that has survived for a long period of time (World Bank, 1997).

Other scholars put it: indigenous knowledge refers to what indigenous people know and do and what they have known and done for generations, practices that have evolved through trial and error and proved flexible enough to cope with change (Risiro, *et-al.* 2013).

Posey, (2005) also states that traditional knowledge (TK) this in can say indigenous knowledge typically distinguishes one community from another. TK/IK can also reflect a community's interests. This is particularly true of traditional environmental knowledge, which refers to a

particular form of place-based knowledge of the diversity and interactions among plant and animal species, landforms, watercourses, and other qualities of the biophysical environment in a given place. He also said IK developed elsewhere in unique feature but has been internalized by local people through local processes of learning, testing and adaptation (Posey, 2005).

He also said indigenous knowledge stored in peoples' memories and activities and is expressed in stories, songs, folklore, proverbs, dances, myths, cultural values, beliefs, rituals, community laws, local language and taxonomy, agricultural practices, equipment, materials, plant species, and animal breeds (ibid).

2.1.2 Land degradation

Land degradation is the major factor affecting land productivity. The main causes for land degradation are complex and indorsed to a combination of biophysical, social, economic and political factors in which subsistence agriculture, poverty, and non-literacy can be important causes of land degradation. Expanding population size, diminishing reserves, intensifying under development and continuing global environmental degradation are common causes in developing countries. Land degradation found in every region of the world (Knowledge hub, 2019).

According to the IPBES (2018) "Summary for policymakers of the thematic assessment of land degradation and restoration", it affects the wellbeing of around 3.2 billion people, leading to food and water insecurity and poverty. Land degradation also leads to increased vulnerability to climate change of affected areas and among affected communities. Moreover, competition for the already strained land and water resources is further intensified by a growing world population that is increasingly urban and affluent, which has led to increased demand for food; especially animal products that often have high ecological footprints (Knowledge hub, (2019).

The causes of soil erosion such as deforestation, huge windstorms, bad irrigation methods, overgrazing and other poor farming practices, will result in soil erosion. These practices are: overstocking and overgrazing, lack of crop rotation and removal of vegetation/forest (Vista, 2014).

Wind erosion is also caused by the action of the wind on the soil surface and is the process by which fine soil particles are carried away. It is a serious problem in many parts of the world, especially in arid and semi-arid regions. It affects agricultural land in much of northern Africa and the Near East, parts of southern, central and eastern Asia, Australia, North West China, southern South America and North America (Information for action, 2014).

So, erosion is an environmental threat that hampered agricultural production and the causes include over cultivation, overgrazing, overpopulation and deforestation. Followed to this, loss of productive land undermined rural livelihoods and national food securities. Erosion is extremely costly for developing countries. It is also a common problem in our country and particularly in the study area. In general it leads extinction of flora and fauna which are the main source of life on the earth. Therefore the consequences of land degradation are high, with widespread loss of biodiversity and ecosystem services (Mulugeta and Karl, 2010:164).

Generally factors affecting land productivity includes natural and manmade activities such as poor farming, overpopulation, deforestation, over grazing and natural factors such as land form, climate change and others.

2.1.3 Land Management

Land provides a range of biophysical and socioeconomic goods and services that support the sustainability of ecosystem services, livelihoods, and human wellbeing. However, land degradation and desertification create global threats to fertile land and the benefits that land provides to human society (Knowledge hub, 2019).

For this, to keep cultural and natural landscapes alive and protect cultural heritage, valorize indigenous knowledge and production methods, enhance the aesthetic experience and provide a space for recreation (ibid).

The concept land management refers to soil conservation and fertility improvement activities. As stated by Adimew, (2014), soil conservation, soil fertility management, agricultural forestry

practices, controlled-grazing and several others are typical examples of land management practices (Adimew, 2014).

The knowledge local farmers have about the land is not considered important in soil conservation projects. But land management by using IK is a way to protect our environment healthy and sustainable. So, studying and applying appropriate use of land management practices leads us for sustainable development. If we understand more about how we learn, we may be able to learn to teach well others.

2.1.4 Sustainable land Management

According to (Shisanya, 2017), Sustainable land Management SLM is a knowledge-based process that helps integrate land, biodiversity and environmental management to meet rising food and fiber demands while sustaining ecosystem services and livelihoods. It is an approach that emphasizes on finding economically viable, socially acceptable, and ecologically sound solutions at a local level (Shisanya, 2017).

Sustainable land management was defined by the UN 1992 Rio Earth Summit as “the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions.” Therefore, sustainable land management can promote land management solutions to the problem of land degradation and environmental deterioration (Adimew, 2014).

Studies also predict huge costs of future land degradation and emphasize the need to invest in measures that can avoid or reduce the loss of productive land, such as SLM practices or to restore degraded land, both of which have been shown to be very cost-effective and can create long-term positive benefits (Knowledge hub, 2019). When SLM is seen as an integral aspect in land use planning and policy, SLM can deliver multiple benefits in relation to national development objectives.

Increasing crop production with SLM practices would support policy makers' attempts to reduce national poverty levels and improve the health and wellbeing of communities, while ensuring ecologically-responsible land management practices. At the international level, SLM is an important approach to simultaneously support achievement of land degradation neutrality (ibid). This approach protects and enhances the multiple services and functions provided by land, such as:

Increase food security, especially for small holder farmers, provide energy, provide local fresh and clean water, and support livelihoods.

Improve water availability and quality, store and sequester carbon, mitigate damages caused by extreme weather events or natural hazards, regulate pests and diseases.

Mitigate soil degradation and enhance soil quality, structure, and functioning, enable nutrient and water cycling, enhance primary production and nutrient cycling, provide habitats for species, which increases biodiversity.

The objective of sustainable land management is to harmonize the complementary goals of providing environmental, economic and social opportunities for the benefit of present and future generations, while maintaining and enhancing the quality of the land (soil, water and air) resource (Tolera, 2011).

Sustainability in agriculture and more specifically in land use has been on the top of priority list of natural resource management issues in developing countries. In the same concept sustainable soil management means cropping, pastoral and forestry use of the limited and only partially renewable resources soil, water and plant nutrients to safeguard soil productivity also for future generations and prevent or reverse degradation process (ibid).

2.2 Barriers to Land Management

Rapid population growth, growth of international markets, educational systems, and environmental degradation, and development processes— pressures related to rapid modernization and cultural homogenization are the major current factors (Grenier, 1998).

Impact of modernization and acculturation, they have brought immense change particularly in their adornment pattern, used of modern amenities and material culture. Migration is one of the driving forces of diversification, even amongst those who didn't migrate. Due to this a lot of indigenous knowledge systems are at risk of getting extinct; e.g. (the system of passing on knowledge to young generation by grandparents at an informal gathering) (ibid).

Due to this factors loss of IK has been attributed in part to Western influences including formal education, medicine, political systems, religion and technology. These factors have been corroborated by the United Nations Environment Program (UNEP in 2006), which presented a list of 23 barriers to traditional knowledge in Africa, including loss of or dramatic change to ecosystems, poverty, climate change, emigrations, schools, urbanization, among others (Shisanya, 2017).

To overcome such loss of IK it was the researcher's role to hardly study local community in effects of these factors. In this, this study in some extent focused on factors affecting the role of IK in land management practices in farmland management which are not studied before in the study area.

2.3 Scientific vs. Indigenous Knowledge

It is important to see the difference and similarities of both enquires to get base for this study as scholars are agreed up on. IK is more than science. If science is just a small part of knowledge, treating IK as science diminishes its breadth and value. Science and IK intersect in certain subject areas, such as technology, resource (Grenier, 1998).

In this it is possible to see the differences; Indigenous knowledge relates to specific cultural contexts whereas science has universal theoretical aspirations. Indigenous practice is more inductive, with a 'weak' model of the world (often largely unknown to development outsiders), whereas scientific practice is more deductive, with a 'strong' model and agreed methods of investigation (Sillitoe, 2006).

We cannot assume that the two will be congruent; rather we have to seek contrasts and parallels. We have to reconcile IK, which is broad-based, workaday understanding, with scientific knowledge, which comprises narrow, specialist understanding, in seeking to promote cross-culturally informed research into problems (ibid)

In the face of global environmental change and its emerging challenges and unknowns, it is essential to have access to the best available information and knowledge. While science contributes significantly to understanding earth systems, social systems and their interactions, there is growing awareness that scientific knowledge alone is inadequate for solving the emerging environmental crises (UNESCO, 2014).

The knowledge of indigenous peoples and local communities – often referred to as local, indigenous or traditional knowledge – is now recognized as essential, alongside science, for developing effective and meaningful action world-wide (ibid).

Ecosystems sustain themselves in a dynamic balance based on cycles and fluctuations, which are non-linear processes. Ecological awareness, then, will arise only when we combine our rational knowledge with an intuition for the non-linear nature of our environment. Such intuitive wisdom is characteristic of traditional, non-literate cultures in which life was organized around a highly refined awareness of environment (Ibid).

The above all ideas shows, science and IK are quite different in some areas and congruent in another area. For this study it was important to create awareness of this vast use of indigenous Knowledge.

2.4 Importance of Indigenous Knowledge

The basic component of any country's knowledge system is its indigenous knowledge. It involves the skills, experiences and insights of people, applied to maintain or improve their livelihood. As Shisanya (2017) states, Indigenous knowledge is part of the lives of the rural poor; their livelihood depends almost entirely on specific skills and knowledge essential for their survival (Shisanya, 2017).

IK is, obviously, most important for the local community in which the holders of such knowledge live and produce. It has been noted to make a significant contribution to sustainable development of local communities, as it is seen as a set of perceptions, information and behavior that guide local community members to use the land and natural resources (Omolere, 2012).

It provides a basis for problem solving strategies for local communities particularly the poor. It is a fundamental representative of an important contribution to global development knowledge. Investigating first what local communities know about indigenous knowledge helps improve understanding of local conditions and provide productive context for activities designed to help the communities (ibid).

There has been growing recognition of the role of indigenous knowledge in the search for sustainable development in Developing Countries. Building on IK can be particularly effective in helping to reach the poor since. IK is often the only asset they control, and certainly one with which they are very familiar (Derbile, 2009).

Studies elsewhere also have found that proper application of SLM practices reduces land degradation and improves productivity of ecosystem services within the targeted ecosystems. In this, utilizing IK helps to increase the sustainability of development efforts because the IK integration process provides for mutual learning and adaptation, which in turn contributes to the empowerment of local communities. Empowerment of local communities is a prerequisite for the integration of IK in the development process (ibid).

In another way incorporating indigenous knowledge into research projects can contribute to local empowerment and development, increasing self-sufficiency and strengthening self-determination). Utilizing indigenous knowledge in research projects and management plans gives it legitimacy and credibility in the eyes of both local people and outside scientists, increasing cultural pride and thus motivation to solve local problems with local ingenuity and resources (Tanyanyiwa, 2011).

Indigenous knowledge technologies and know-how have an advantage over Science in that they rely on locally available skills and materials and are thus often more cost-effective than introducing exotic technologies from outside sources (ibid).

In considering issues related to the protection and promotion of indigenous knowledge, it is also equally important to consider its inter-linkages with ensuring intergenerational transmission and continued access to and sustainable use of the lands and natural resources on which this knowledge is based. Consideration could also be given on how to provide sustained support for enabling monitoring of traditional knowledge in addition to connecting and communicating across scales between on-the-ground practice, national/sub-national decision-making and international understanding (IASG, 2014).

Most commonly accepted is the role of TK/IK in the local or primary sectors of the economy: agriculture and pastoralism, forestry, fisheries, water, and products made from natural resources such as crafts, furniture, housing, and so on (ibid).

Given the fact that a majority of the world's population remain dependent on these sectors for their survival and livelihoods, and for various aspects of shelter, the contribution that IK makes and can continue to make towards sustaining billions of people is quite clear (though not necessarily acted upon in policies and programs of most countries (Kothari, 2007).

For this study, it was important to create great awareness of the importance of this vast heritage of indigenous Knowledge in farmland management practice and recommending to how it will be passed to generations.

2.5 Women's and IK in Land Management

From a development perspective, gender should be considered in research and development planning to improve the status of women. In many cases, development interventions have had negative impacts on women (for example, increased workload or less control over a resource). Any assessment of technology must therefore consider its gender impact Gnerie, (1998).

Another important reason to focus on gender is that knowledge differs from individual to individual, and gender accounts for a lot of those differences (other factors, such as kinship, age, ethnicity, religious affiliation, and wealth, also contribute to the differentiation of individual knowledge). Women and men are socialized differently and often function in different spheres of the community. Women and men often know different things. They also possess different knowledge about similar things, use different communication channels to transfer information, and have different interests and needs (Simpson, 1994) cited in Gnerie, (1998).

In different way it was the culture to adapt any environment individually because as a member of once ecosystem everyone can interact with that environment. In the communication everyone has responsibility to balance a given system of environment. Concerning matters of the living environment, women are often the daily managers, caring for livestock, cultivating specific food and cash crops, collecting wild fruits and leaves, processing, preparing, and preserving food, selecting seeds, and propagating plants are activities assigned to different age and gender groups (Davis, 1995) cited in Gnerie, (1998).

But until recently, women's IK systems were considered inferior to men's or regarded as non-knowledge. The knowledge of women as users and innovators of technology was largely dismissed because of the domestic nature of women's work and the fact that women's

technology tends to be less prestigious software (techniques and processes of production), rather than hardware (tools and equipment) (ibid).

Therefore, in terms of study area women's empowerment through increased productivity must be combined with the management and improvement of natural resources especially farmland management. Some barriers due to cultural and gender division to apply their knowledge was undermined but this will be changed through deep study on the area and by the government interference to empower them.

2.6 Theoretical Framework

This study tries to explain the phenomenon under the study from the perspective of cultural ecology approaches. Ecological structure is conceived as an organization of functions activities that are dependent upon other activities. It is significant that, while theorists of culture and behaviorists have been propounding confused hypothetical versions of functionalism, ecologists have been busy making inductive studies of the functions of communities and correlating functions with aspects of organization, location, and demographic structure. This suggests that the ability to manipulate ideas about function effectively in research develops rather easily after an ecological perspective is adopted (italics inserted), (cited in Freilich 2014).

The natural history approach in anthropology is closely allied to an ecological orientation. Indeed, we might well go along with Bates' view that ecology is "a rather new word for an old subject-natural history" (ibid).

The anthropological interest in describing the whole system logically leads to an interest in the habitat within which "the system" operates. The fact that a natural history approach and holism are completely orthodox in anthropology lends respectability to ecological analysis. The synthesizing possibilities inherent in an ecological frame- work are not least in accounting for its growing popularity. That is, given a growing anthropological interest in establishing "a master formula" (Wolf 1964: 111) and arriving at laws which interrelate a variety of phenomena (Steward 1949; Titiev 1963; Sahlins and Service 1960; et al.); and given that an ecological

framework is large enough to accommodate a great variety of approaches, the growing popularity of the ecology is almost inevitable (cited in Freilich 2014).

The number of linkages that can be made from an ecological starting point are varied and many. As Sahlins has written (1964: 134): "Cultural ecology has an untapped potential to provoke useful thoughts about militarism, nationalism, the orientation of production, trade, and many other specialized developments". Additional linkages from an ecological base include studies of (1) acculturation and diffusion-linked by broadening the meaning of "environment" to include the social environment, (2) animal ecology, (3) rural sociology, (4) bureaucracy, stratification and urbanization, (5) formal organizations, (6) technology, and (7) economy. The nature of ecological links to formal organizations, technology and economy are clear from the description of the province of human ecology by Duncan and Schnore (1959: 135-6), (cited in Freilich 2014).

In the most general terms the framework of human ecology embraces four main referential concepts: population, environment, technology and organization. Organization is assumed to be a property of the population that has evolved and is sustained in the process of adaptation of the population to its environment. Organization tends to be investigated as a ramification of sustenance activities, broadly conceived, which utilize whatever technological apparatus is at the population's disposal or is developed by it. The "naturalness" of the technological link to an ecological framework is obvious in much of the anthropological ecological literature (Freilich 2014).

As June Helm (1962: 630) has written: " Tylor and Morgan, both set forth technological advance as a major referent for stages of cultural development, and it remains a viable and enduring theme in contemporary longitudinal ecological views in anthropology." The links to writings which emphasize technological aspects of social systems attaches ecology to an enormous array of literature (ibid).

The modeling of human or cultural ecological studies after works in animal ecology and human geography leads to the possibility of incorporating into social science a language with many well defined terms-adaptation, ecological niches, predation, parasitism, mutualism, commensalism, rank, dominance, and many others-which can with profit be used for the analysis of social system.

Given the multiple connections which are raised above can be made from an ecological framework, its popularity in anthropology' is understandable.

Also Steward's chief theoretical work was anthologized in *Theory of Culture Change: The Methodology of Multilinear Evolution* (1955), in which he attempted to show that social systems arise out of patterns of resource exploitation which, in turn, are determined by the technological adaptation of a people to their natural environment. Although there are cross-cultural similarities of social change, the exigencies of differing physical and historical settings produce different social manifestations in each case, resulting in what Steward called "multilinear evolution." Similarly, his book *Irrigation Civilizations* (1955) illustrates how the collective labour and centralized authority required for irrigation in an arid climate resulted in increased social stratification and, ultimately, in the development of the state in various areas of the world (<https://www.britannica.com/biography/Julian-Steward>).

From the above concept cultural ecology is based on the idea that a social system is determined by its environmental resources. Based on analysis of the interaction between culture and environment Steward Argue that people who face similar environmental challenges (such as arid or semiarid conditions) are likely to develop similar technological solutions, which, in turn, lead to the parallel development of social structures and political institutions. His strategy shows that environment determines the forms of labor in a society, which affects the entire culture of the group.

The principal concern of cultural ecology is also to determine whether cultural adaptations toward the natural environment initiate social transformations of evolutionary change.

By emphasizing the environment in which humans play their roles and create their institutions, the ecological approach deals with society more realistically and in somewhat more concrete terms than most other approaches.

In this manner, this study shows the kambata peoples cultural practices on farmland management which are developed by the people to protect soil erosion and to maintain soil fertility of farmland by adapting to a given landform and then that helps to increase the need to survive and to overcome challenges of life on that environment; like food insecurity, poverty and other problems and getting multipurpose services and importance that by the concept of approach discussed above.

2.7 Conceptual Framework

On the bases of the theory reviewed above, and the literatures used in this study, a set of conceptual framework has been formulated about how IK in land management practice is constructed in the community under the study especially on the farmland. In the framework of the cultural ecology perspectives, the role of indigenous knowledge in land management practices conceptualized and addressed by the communities, by enhancing a socio ecological system's resilience base on utilization of IK in farmland management practices.

In the reviews of studies in the review literature part also shows that few scholars put their conceptual framework on the importance of IK on land management, only focusing on forest conservation, soil and water conservation, ethno botanical plant, carbon sequestration and others. Like Shisanya, (2017; Yechele *et-al.* (2018); Abebe, *et-al.* (2013); Yeshambel, (2013); Yosef, *et-al.* (2019); Mulgeta and Karl, (2010) and others by using different approaches in different disciplines. But this study conceptualize importance of IK on land management practices on farmland anthropologically that plays the major role in protecting soil erosion and maintaining soil fertility and then improving sustainable livelihood, food security, poverty alleviation and giving service to sustainable environment in the framework of utilization of indigenous knowledge in cultural ecological approach.

The conceptual framework clearly shows that, people perceives land was important resource which is affected by natural or manmade problems like ecological, geographical, demographic, technological and socioeconomic and other factors. But the community under the study develops various methods to overcome such challenges and to make life survive like use of animal manure, mulching, agroforestry, mixed farming, crop rotation, leaving crop residue and others.

These practices are mostly transferred from one generation to another orally and helped to improvement of environment conservation and of soil based ecological service that are unique to other places. The utilization and UN utilization of these vast heritage practices of IK in farmland management is determined by these varied natural and cultural practices, resulting into either sustainable or unsustainable environment. The following model emphasizes the pivotal role that the utilizations of indigenous Knowledge in farmland management practices. See the figure 1conceptual framework model below.

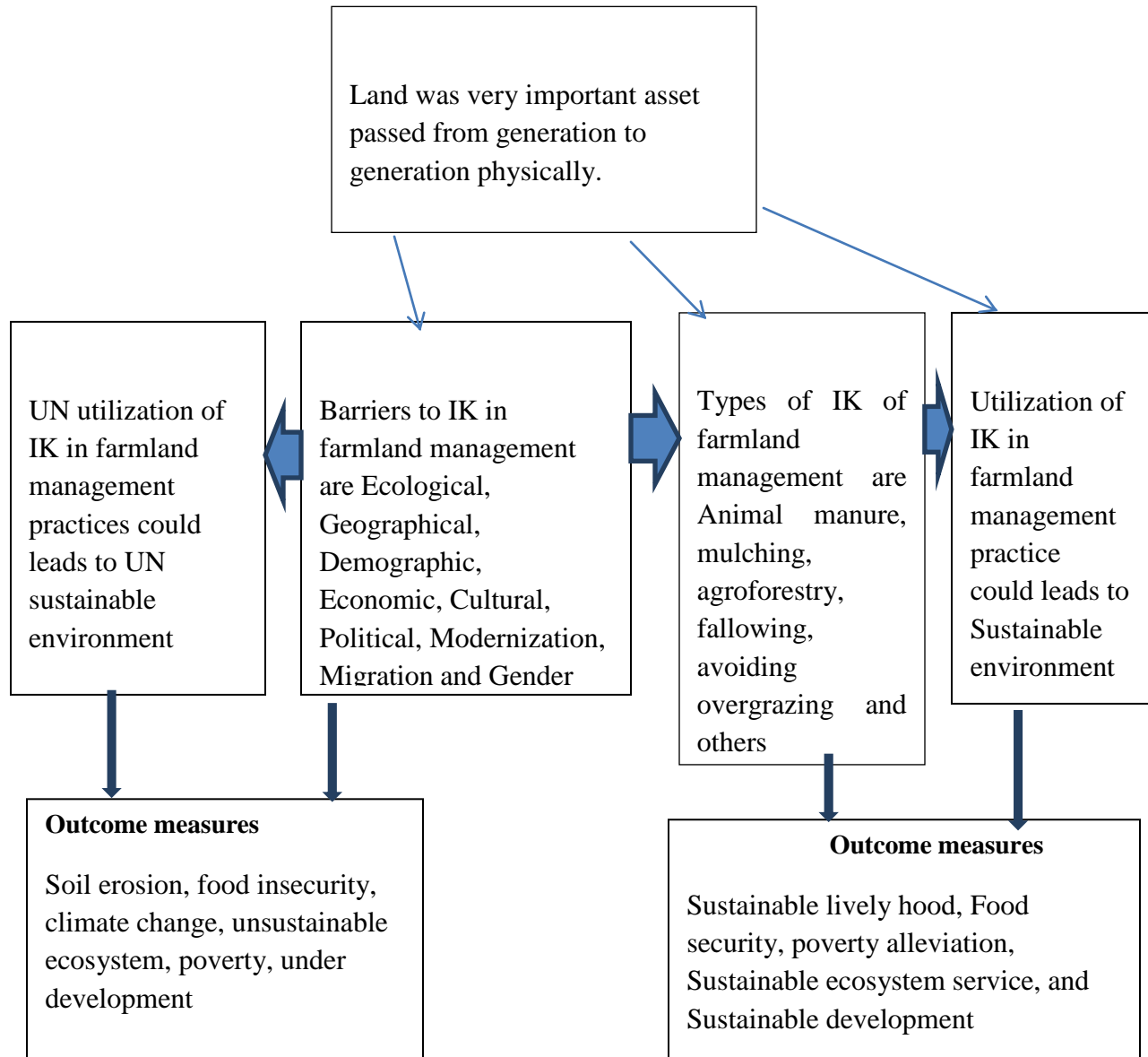


Figure 1 Conceptual framework

Source: Author's own conceptualization (2020).

CHAPTER THREE

3. RESEARCH METHODOLOGY

This chapter presents the section of general description of the study area, the overall strategy which lies behind the choice and the use of research methods and finally, the section of the ethical consideration.

3.1 General Description of the Study Area

3.1.1 Location

Kambata is located in the southern region of Ethiopia in Kembata Tembaro Zone, and consists of eight main woreda or (districts) and four city administrations known as Durame, Shinshicho, Hadero and Doyogna. The neighboring zones that border the zone Kembata Tembaro are Hadiya to the North and Southeast, Dawuro to the West, Wolayita to the South and Hallaba special woreda to the east. From the eight districts in the Kembata Tembaro Zone, Kachebira district is the one that this study conducted. It bordered on the south by an exclave of the Hadiya Zone, on the southwest by the Wolayita Zone of Boloso Sorro woreda, on the west by Hadero Tunto, on the northwest by the Hadiya Zone of Duna woreda, on the north by Doyogna and Angacha, and on the east by Kedida Gamela.

The district lies between 07°12'30.1" - 07°17'08.3" N and 37°47'48"- 37°50'30.6"E degree north and east longitude in Kembata Tembaro zone of SNNPRS (Getachew, *et-al.* 2017). The capital of this district (Shinshicho Town) is found 327 Kms away from the country capital Addis Ababa and 117 km away from the regional capital, Hawassa and 17 km from the Zone capital Durame. Before 2008 E.C Shinshicho Town is the capital city and the administrative center of Kachebira district. In 2008 Shinshicho Town reformed in to Shinshicho City administration. Still now a day the town serving as the capital of Shinshicho City administration and both the administrative center of Kachebira district and Shinshicho City administration. This district has totally 21 rural

kebele. Among those *kebele*, this study conducted in Gemesha *kebele*. This *kebele* bordered by the North, Zogoba *kebele*, by the North East, Lada *kebele*, by the East, Shinshicho Town, by the North West, Mino *kebele*, by the West, Lesho *kebele*, by the South, Buge *kebele* and by the South West, Walana *kebele*. The following maps were the locational map of the study area. See locational map of study area below.



Map-1 Map of SNNPR



Map-2 Map of Kachebira district



Map-3 Map of Gemesha kebele

Locational map of study area

Source: Southern region towns and house profile, (2014).

3.1.2 Origin and History of Kembata

The original site of Kembata settlement is believed to be at Mount Hambaricho, the most important mountain in Kembata. First settlers of Mount Hambaricho were people who might have migrated from present day of Amhara, Oromia, Wolayta, Sidama and Gedeo. It is believed that the mountain provided an attraction to the first migrants, who had initially intended to stop over for a while and hunt and gather food. Then they apparently decided to settle down for good (Abebe, *et-al.* 2015).

How and when the name 'kembata' come in to being and what it means is not adequately explained by written historical records. The term “Kembata” originated from the expression “*kambat*” which according to oral tradition means “hear this is the place we lived”, i.e. an “ideal” place where the first migrants wanted to settle.

According to Kembata oral tradition the first settlers of kambata comprised seven houses which were believed to have evolved eventually into the original seven tribes of Kembata which settled on Mount Hambaricho. Those are, *Ebejena, Efeghena, Fuga, Goroma, Hin-iera, Saga and Tazo*. Because of these the number seven “*lamala*” is commonly used in kambata culture still in different ways. For example “*kambaati lamala*” meaning kambatas seven or what called *Gogota* that was the selective group from all kambata for conflict resolution (ibid).

The biggest traditional unit of territorial organization of Kembata is “*kokaata*” while the smallest is “*heera*”. *Kokaata* is an assembly-like structure covering the territories of several *gochcho* which was territorial organizations and *heera*. *Kokaata, gochcho* and *heera* are not strictly hierarchical although they are functionally symbiotic. “*Seera*” is the totality of code of conduct operational throughout Kembata. It is an unwritten body of rules and procedures binding on the community members with regard to all patterns of relationships (Abebe, *et-al.* 2015).

The Kembata kingdom was ruled by long line of its own kings known as “*Woma*”. King Dagoye, from Oyeta clan, was one of the famous kings known for expanding Kembata territories. The last

independent king of Kambata was king, *Woma Delbatao Degoye*, who was killed while resisting Emperor Menelik II's invasion towards the end of 19th century (ibid).

3.1.3 Ethnic Composition

Kambata generally have three ethnic groups, such as Kambata, Tembaro and Donga. But there are also other ethnic groups who come from other parts of ethnic society. These include Hadiya, Welayta, Amhara, Tigre, Sidamo, Guraghe, Gedio and others. According to 1994 census, the four largest ethnic groups in number include kambata, Hadiya, Welayta and Amhara.

3.1.4 Population

Kembata is one of densely populated area in Ethiopia. According to the 2007 Ethiopian national census, this ethnic group has 630,236 members this means about above half a million.

Overcrowding and scarcity of farmland remain as the main problem for the inhabitants. Due to this a sizable portion of the population lives outside Kambata territory, including in resettlement areas such as kaffa, Bonga, Gambella and others and also they migrated to south republic of Africa and other worlds countries to improve their lively hood (Abebe, *et-al.* 2015). According to central statistics agency of 2007 the population of Kachabira district is 115,579, out of which 58,778 are female (i.e. 50.86 %); this shows women are greater than men in number (CSA, 2007).

3.1.5 Economy

The livelihood of Kembata is based mainly on mixed farming while off-farm labor, commerce and craftsmanship are additional activities. This means they are dominantly based on farming and animal raring. The majority of the people are farmers.

False banana/*Inset* plant constitutes the base of their subsistence economy. The cultural food produced from inset was known as "*waasa*" or *Kocho in Amharic*. It was the earliest base of economy next to *coffee*, and *Ginger* among this people. These cash crops are produced and

presented to central markets. Banana, Mango, and Avocado are the most recent one and serves as source of income generation and home consumption. They also cultivate many crops such as barely, wheat, maize, *teff*, sorghum, peas, beans and vegetables like cabbage, tomato, and potato used as dominant for both base of income and home consumption. Livestock such as cattle, donkey, horse, goat, sheep, and hens are the most widely reared animals.

3.1.6 Language

The mother tongue of Kembata people was *kambaatissa (kembatigna)* which is grouped in to Cushitic family. It belongs to east high land Cushitic and grouped with Tembaro, Alaba, Sidama, Gedeo, Hadiya and Burji. The other commonly spoken languages in the study area include Tembarigna, Alabigna, Hadiyagna, Amharigna, wolaytigna, rarely Sidamigna, and Gediogna.

3.1.7 Health Service

In former times, most of the Kambata were dependent on their traditional natural medicine. In the face of the fact that, most of the medicinal herbs are no more available - because of the drastic deforestation - most of the Kambata are taking advantages of the modern medicinal facilities, provided that they have the necessary money to pay for treatment (Abebe, *et-al.* 2015). But still most or not less than half of the peoples uses traditional medicines for them and for all their domestic animals.

Different traditional medicinal plants like *angambisha (damakase)*, *tuumo*, *tenadam*, *suunfa (fento)*, *bulo* and many other local plants and some animal parts like hyena dung as well as its internal and external parts are served as traditional medicines for most diseases as well as illness.

Most of the people perceive some disease is caused by the break dawn of the supernatural order as well as the respective gods. In general perception of health in the study area shows there was equal attention of health in the side of biomedicine professional way and traditional one.

Peoples also perceive that being a member of some group is a healthy. This means in their attitude someone is not a member of some group he/she was not healthier. In the Kachabira there

are different traditional healers who have protection to give health service traditionally. These are bonesetters, birth attendants, herbalists, and others.

3.1.8 Religious Composition

Kambata people have religions and religious institutions that they created and believe on them to protect and guarantees the continuity of human beings by helping them to invent institutions whereby they master economic and environmental difficulties and defend themselves from external enemies. For Kambata "*Magano*"- super sky God is the creator of earth, man and everything in the universe and control their day to day existence and activities.

Kembata people traditional religion was polytheistic which only represent belonging people. These include belief in nature, human and man-made things. Peoples worship in the magician person known as "*kiilaancho or maganaancho*" who means magician, "*kaalicha*" who means healer, in "*abba hakkan*" which mean worshipping in big tree, for example the tree "*dagale*" in Tembaro. Still, people worshiped on the tree *dagale*; the others include "*arrichchoonii aganchchoonii*" which means worshipping on the sun and the moon, by the big caw, on stone, ancestral sprits like on "*wotaa, woriika, jaara, jaacho*" and the others (from informant).

At the time of infortune, peoples worship their respective God and goddesses and they call what they want from them and for future hope they believe on them. The belonging magician for belonging clans are "*Abbaa sareecho*" of *womaallo* clans, "*Jaara*" of *Gajja* clan "*Wotaa and Woriika*" of family sprites. The most venerated place in Kambata people includes "*kittosi foolooccaancho or fadu and Hindrikion* in the top of hambaricho mountain (Aman 2002:13-14).

Now a day this earliest religion is not practiced by most peoples because of the new Christianity (religion). But also some peoples still go to the magician persons for their difficulties. When someone lend something from someone and cannot back it for him/she he called to the magician then when he/she did not go to that area and back the things he/she become died.

According to 1994 census most of Kachabira peoples are Christians. Among these Protestants, Ethiopian Orthodox Christianity, and Catholic were the known one.

3.1.9 Kinship Structure

The Kambata kinship structure is both patriarchal, and matriarchal. The basic unit of kinship pattern is based on the two pairs of correlative oppositions and three types of familial relation (consanguinity, affinity, and descent).

The meaningful structural unit or the building block of elaborate kinship systems includes the relations between brother/sister, and father/mother son, mother's brother/sister's son, and father brother/sister son that is the incest taboo, and the avunculate as its corollary not to marry each other. In the kinship terminology these are called "*hizeena hizoo oosuta and annina ama oosuta as*" "*hizaakata*" that means brothers sons and sisters and father and mother sons said to be brothers and sisters, *lankaannina ishimi oosuta and lankannina ada oosuta* as mother brother son and mother sister and father brother son and father sister sons said to be aunts and uncles that means "*ishimmata*" and "*lankaannaakata*".

3.1.10 Marriage Rule

In Kambata, marriage is undertaken between non relatives (exogamy). It is incest taboo to marry from relatives. Most of this society practices monogamous marriage, but there are also some polygamous marriages due to conflicts between families, and if there are more than one land/house. Types of marriage in Kambata culture includes:

One "*qorsiishsha*", this type of a marriage takes place through a preparatory participation of the parents. This type of marriage was shared during fourth father's generation. It is usually initiated and arranged by the parents of both families and is not necessarily based on the love of the ambitious couple. In the modern conception love is an individual self-realization. It is presupposed that she will love him and he will love her. Their children set the seal on this love. But in this type love is not individual wish but based on parents.

Two “*heeranchcha*” is another kind of marriage which is being frequented and which is advantageous for both parties. This kind of marriage is based on the friend and love of the boy and the girl. *Heeranchcha* is informal and is based on the agreement of the girl and boy. If he is rich or he has rich parents, he dares to marry a girl who belongs to a socially higher class but who is economically poor. This is unthinkable in the formal type of marriage. If someone from a socially higher class marries somebody from a lower class, it is a serious disgrace and social demotion for the members of the family, lineage and clan of the former.

The third one of marriage type is called *midu* (abduction), which never respects the freedom of choice of the girls. That means taking girls by force.

Fourth one is *iittancha* (lovers) type of marriage. In this type of marriage both newly married couples themselves makes decisions to marry each other specially based on wealth. If she/her family are wealthy or if he/ his family are wealthy this two couples become married.

3.1.11 Family Structure

The family structure is mostly affine family structure. Extended family structure is also common i.e. all the relatives with any special case live together this means there is also blood and consaginal family structure in which it was not forbidden that relatives become the member of that family due to different special cases/factors.

It is the culture that people helps someone if he/she was relative of that family who have no home or have no power to work among the community. If there are home-produced, economic or other problem the relative of that person never let him. They live together. In this the total number of once family was all the members of relatives who live with that family plus to father, mother, son, daughter and the relatives.

3.1.12 Ritual in Kembata Culture

The ritual "*Masaala*" is a known holiday that frequently celebrated once a year from September 16 – 18 for three consecutive days in kambata community. It was taken as the entrance of New

Year among kembata. In this ritual the member of family and other relatives who is far from his family comes to celebrate the day together from everywhere.

The day 16 is the women's day that it called "*atakaani bari*" in which they prepare cultural food from product of inset that was called waasa and bu'lla with milk and butter commonly known as "atakaano". The next day, is the day 17 that is said to be "*duli bari*" which is men's day in which they sloughten big oxen by forming group from four to ten commonly known as "*sheemmaata*". And the last day is the division day that it called "*beeqqanchi bari*" in which the member of sheemmaata groups divides the whole oxen meat.

3.2 Research Method

Social research is aimed at answering a research question by means of a research strategy and a method (or methods) of data collection and analysis. In this it is better to see some deference between research methodology and research method. According to Kitchen and Tate (2000), research methodology means a coherent set of rules and procedures that are used to explore a problem within the framework of philosophical approaches. In addition, Mikkelson (2005) also argues that a research methodology includes the tools and techniques of data gathering and analysis.

Therefore, methodology is the strategy or plan of action which lies behind the choice and use of particular methods. Methods are the specific techniques and procedures used to collect and analyze data. This research use qualitative one. I selected this method based on the reason that it gives emphasis to the process of the research from its beginnings of problem selection or identification to its completion.

As Creswell, (1994) states, by using this method the researcher plays a pivotal role in constructing concepts, theories, and principles out of details of discussions, interviews and observations (Creswell, 1994:166). It is interested in meaning, notably, how people make sense out of their lives experiences etc. Moreover, the researcher as a member of a study community,

he/she is the primary instrument of data collection and analysis. The researcher present in person among the people and observe institutions or record behavior in its natural settings.

The other reason that forces me to choose this method is that, it describes what are actually practiced in the study area. The interest of the researcher lies in the process, meaning as well as in the insight to be gained through words or illustrations rather than numbers or statistical measurements.

I would say some of the reasons I mentioned above give clue as to why I selected the qualitative research method. In line with this, I collected and analyzed the data. In the sub sections below, I discussed in details about research design, study participants, sampling method, data sources, and data collection methods, method of data presentation and analysis and ethical consideration.

3.2.1 Study Design

It is obvious that using appropriate research design is a key step to achieve the research objectives. According to Creswell (2007), qualitative method is developed in the social sciences to enable researchers to study social and cultural contexts within which they live. It also enables the researcher to view events, actions, norms, values... from the perspective of the people who are being studied.

As its characteristic this approach is used to collect data about human live realities, experiences, behavior, attitude, emotion and feeling, organizational function, social movement, cultural phenomena and their interaction with nature in social world by understanding meanings from informant points of view. So, this study designed as descriptive type of qualitative anthropological research approach as it thoroughly describes indigenous farmland management practices in Gemesha *Kebele* in Kachebira district in KTZ of SNNPNRS.

Since, the study is interested in gaining a rich and clear understanding of people's experience with adopting a less formal and less rigid approach than that of used in quantitative research. In addition, the study wants to go free beyond the initial response of interviewee. For this reason, in

order to achieve the objectives, this study undertakes cross sectional in time dimension, using qualitative data type that was realized through interview, FGD, document review and personal observation. Therefore, it describes, the existing facts of the role of indigenous knowledge in land management practices on farmland under the study that the study peoples are experienced to manage their farmland to protect soil erosion and to maintain soil fertility.

3.2.2 Study Participants

In qualitative research, participants are mostly selected by researchers purposefully that will best help them to understand the problems and research questions (Creswell, 2009). Experienced farmers in using indigenous farmland management practices, the *kebele* natives of aged farmers who depends on farmland and whose age above fifty (50), young farmers whose job depends on farmland and their age above twenty-eight to forty-nine and married women's who are from member of farmers and government experts from Kachabira district of agriculture and natural resource management office and development agents of *kebele* were selected purposefully.

3.2.3 Sampling Method

Many qualitative researchers and writes argue that there is no hard and fast rule as to how many samples would be taken for a qualitative study. Therefore, purpose of the study, time, resource, data saturation and interest to participate were the determinant factor for the site and sample size taken for the study. As Berg (2001) stated, under purposive sample, researchers use their knowledge or expertise about some group to select subjects who represent this population. Therefore, purposive sampling technique was used in this study to get data from available sampling the informants and the site in the study area.

From the eight districts in Kambata Tambaro Zone, Kachebira district was selected as the study area and from twenty one rural *kebele* in this district, Gemesha *kebele* was purposively selected as a sample of the study, based on the information availability, reliability, and with plus to the anthropological nature of qualitative research approach of few people with deep study. The

Resource availability of valuable informants who have a long period of experience of indigenous knowledge in farmland management practices and as it is near to the researcher that helps to gain access to research or archival sites by seeking the approval of gatekeepers, individuals at the research site that provide access to the site and allow or permit the research, forces me to select this area.

In this kebele there are three *gots*/ sub *kebele*. From each *gots* three, three farmers who are experienced by indigenous farmland management practices were selected purposively. Among these *gots* again three focused group discussions; one FGD with aged farmers in one *got*, the other FGD with young farmers in the other *got* and third FGD with women in the third *got*, were selected based on age, sex and the background they practiced to manage their farmland; each group having eight(8) members. Again two government experts, one from the district of agricultural and natural resource management office and the other from development agents of the *kebele* were taken. All participants were select purposively.

Thus, the study's sample size would be the number of selected representatives of experienced farmer households and the number of each FGD members in the three *gots* and the two experts the district and the *kebele* agent.

So, the total sample size would be the target of three times three 3×3 which is nine (9) households, three times eight 3×8 which is twenty four (24) FGD members and the two (2) government experts, which in total, thirty five (35). Therefore, the sample of above study participants represents the target population and this also represents the population of the study.

3.2.4. Data Sources and Data Collection Methods

3.2.4.1 Data Sources

Relating to the role of indigenous knowledge in land management practices by using an anthropological approach, both primary and secondary sources of data were employed in this research to obtain the required data for conducting the research. The researcher undertook in-

depth interviews, FGD and made use of observations as primary data sources to eradicate bias and prejudices and refers published and unpublished materials such as books, journals, thesis, dissertations, articles, reports, and others as secondary data sources that best help the researcher to understand the research problem and used to cross check the data in this research.

3.2.4.2 Data Collection Methods

Data collection process in qualitative study handled carefully to maintain its credibility, transferability, dependability and conformability (Guba & Lincoln, 1994, p.114).

Drawing on qualitative research approach, this study employed both primary and secondary data collection methods. Primary data were gathered through in- depth interviews, focus group discussion and personal observation based on the nature of research participants and study to maintain the data credibility and transferability. Secondary data were collected through critical review of related literature and documents to maintain conformability and dependability. Both primary and secondary data were organized thematically and were analyzed through systematic interpretation and cross- checking of the different data sources through the use of triangulation to increase the validity and reliability of the findings. I selected informant - based on purposive sampling technique. Secondary data sources used for theoretical perspectives, conceptual framework and the general background of study area. The methods employed for data collection consisted of four major methods. These methods include: interview, focus group discussion, observation and document review. The applicability of these methods was used as follow.

3.2.4.2.1 Interview

I made in-depth interviews with experienced farmers in farmland management on the issue of how they understand farmland, factors affecting farmland, types of farmland management practices and its effectiveness, and women part in farmland management practices and others which are established during interview and the other interview with government expert from Kachabira district of agricultural and natural resource management office and the *kebele* development agent on the issue of what farmland management seems like, factors affecting

farmland, types of farmland management practices and the role of women in farm land management and the same issue during interview.

I prepared an interview guideline as well as probes to guide to make the interviews more conversational rather than being only a solicitation for responses. Before starting interview the identification documents and permission letter were checked and the intentions of the study be clearly stated. The interview guide line was prepared in English language and translated to Amharic language and the researcher conducted the interview with the local language that is “*kambaatissa*” or *kembatigna*.

The guided questions to be shared beforehand with the interviewee and the investigator tells to stick to them, which the researcher agreed upon, but in the course of the interview the researcher follows some interesting leads. These are an assurance that the information given would not be used for politically related matters. Asking for the interviewee’s name and permission to audio-tape the interview was also done during pre-interview.

Once a rapport established the researcher isolates important issues and asks to expand on them. The diversity and cultural background of the interviewees encourages the researcher to be flexible while interviewing, and to follow leads that suddenly raised issues of importance that had not been anticipated. The researcher used voice recorder photo camera with the assistant to record based on the consent of participants to get wider information that helps for the data analysis. At the same time the researcher takes important notes while interviewing the respondents. The interview has continued or no time restrictions until saturation point reached in collecting maximum data. Figure 2 below shows that the researcher was interviewing the government experts. See picture 2.



Figure-2 In-depth interview with government experts

3.2.4.2.2 Focus Group Discussion (FGD)

The focus group discussions were used with the aim to increasing the consistency of information gathered from in depth interview that helps to understand issues with consensus and variation among the participants of discussion. I organized three FGD in three gots, based on age, sex and Knowledge. One FGD with aged farmers, the other with women and the third one with young farmers in order to get deep knowledge of their practice on farmland management on the issue of how they understand land and its management, factors affecting farmland, types of farmland management practices and its effectiveness and the responsibilities of women in farmland management practices.

The researcher guided the group's discussions by facilitating the groups to generate ideas on how they had been managing their farmland by using indigenous practices. The group discussion was recorded based on the consent of the groups to analyze the data. Picture 3 below shows the researcher collecting the data from young farmers FGD on the issue guided for them based on the consent of them to record the photo. See picture 3 below.



Figure-3 Focus group discussion (FGD) with young farmers

3.2.4.2.3 Observation

The researcher observes the practices of participants with personal participation in the research site. The routine activities and practices of farmers on their field are observed. The researcher gets wider understanding of activities of farmers on their farmland. The pictures of their practices are recorded with their consent for the further information and analysis of data collected from the fields. The observation conducted together with taking field notes on the

behaviors and activities of individual farmers on their interest for the practice of different indigenous farmland management practices and its associated issues.

3.2.2.2.4 Document Review

During the process of research, the researcher reviewed related literature on indigenous land management practices of the different parts of Ethiopia and the world and for theoretical and conceptual framework and general back ground of the Kembata people. These documents reviewed both from published and unpublished materials of official reports and private documents e.g., personal articles, diaries, theses and books.

3.2.5 Method of Data Presentation and Analysis

Data analysis in qualitative research consist of preparing and organizing the data for analysis, then reducing the data into themes through a process of coding and condensing the codes, and finally presenting the data. In this study, the data collected from different sources were presented and analyzed by using cods, titles and other measures in order to make analysis simple readable and understandable in the form of narration. The findings checked and summarized with careful evaluation and interpretations of data collected from course of actions of research made under the study.

3.3 Ethical Considerations

Creswell, (2007) stated, how ethical considerations needs to be given a critical weight in all stages of research such as before conducting the study, at the beginning of the study, during the stage of data collection, in the stage of reporting the data and finally publishing it.

It is clear that people vary in their beliefs, explaining, norm, rule and understanding all the way of life. This study conducted in the Kembata community and within their respective correspondence, i.e. on their possession and in their farmlands so that the researcher gives due respect to local community's ways of life. The researcher keeps their confidentiality, noninterference on their cultural life and obtained consent from research participants for

undertaking this study besides they were assured that they would be informed about the proceedings of this study, keeping their autonomy, respect for their rights, dignity and culture. Therefore, this study have no way disturbed the natural setting of society and not undermined their culture.

CHAPTER FOUR

4. DATA ANALYSIS AND PRESENTATION

This chapter presents about the data analysis and presentation section. As the purpose of this study was intended to describe the importance of various indigenous practices of farmland management; thus to explore the role of IK in land management practice in farmland, each specific objective that are stated on the first section of this study that needs to answer the basic research questions of the study therefore presented, analyzed and discussed in this chapter, that are achieved through information gathered from different sources and analyzed through qualitative method of analysis in the form of narration as follows in its sections and sub sections below respectively.

4.1 Perception of Peoples on Land and its Management

As the data gathered from informant shows, land were life for them. As the informants' stated they all depend on land, that what they eat, drink, wear, shelter all are from what they work on or invested and gained from it. Their domestic animals depended on what is gained from land/soil. What they used to prepare their food that was fuels was from land. So, all activities of humans and animals life on the earth were dependents on the land.

As one of the informant states, '*maganu manna koocheeii buchchiichcheet*, this means 'God created human being from land'. *Rehee jaataa fakal aaganoo buchchaaneet* this means when he will become died he also turns back to the land/soil'. This shows there was big relation of human beings and the land/soil.

They also stated, God also ordered the man, work on it and use it. As they said, "*uullata hujantumboochchii qorambumboochchii gorrru afanonne*: this means 'if we don't work and take care of this resource, we become hungry'. We can't participate in social, cultural political and any institutional and individual activities". So this, people work on it and used it for many

purposes. This means even if they do not work on land they will not get anything and cannot live in general.

According to the interview and FGD participants of the study, Land -*Uullat* was very important and the major thing for human beings. So, according to their view land was created before man and man was created from land so land and peoples are relatives for them.

During the data collection, one informant said that:

‘Ka magani aassancha qorambumboda heii dandinambanii maganu gagunkusin amu’rranonne’; this means, if we don’t take care of this gift (land) we do not live at all and God he himself blames us. This shows that they protect the land to live and to protect it as it was the gift of God.

In this manner people under the study feels like, God Grievance was considered as main reasons for land degradation. That means, when people passed God command and made sin, God aggravated and gives very high rain fall or not give any rain. Then during high rain fall erosion degrades the top part of farmland soil and what are produced on it. And during no rain fall the land become dry and no working on it, and life’s on it become die, then people become hungry. Then poverty can be speeded as they stated.

As the informants of the study states, in the culture of kambata, land was very dignified resource that was passed from father to son physically. So, every one protect this resource for thinking of future generation. According to informants of interviewed and FGD participants, people in the study area protect their farmland by undermining what to get for today and for tomorrow and what and how the next generation succeeds their life. By assuming this, they protect their land to survive their life and the next generations. They believe that after leading the current life in farm, it has the role that plays sustainability of life of future. Unless and otherwise lacking of understanding on farmland management practice affects all people life on the earth.

As all interviewed experienced farmers of research participants states, the land of kambata are surrounded by different fruits and trees that have playing the major role in managing the land and

in improving the livelihood and food security of the community. Fruits like banana, mango, avocado, papaya and others are knowingly cultivated in the study area. These fruits have been used for home consumption as well as income generation and also as forage for cattle and for other so many values with plus to environment protection. According to the Freilich (2014), the perspective of cultural ecology explained this as; ecological structure is conceived as an organization of functions activities that are dependent upon other activities.

The FGD participants, also supposed that land was good and it would be protected, because it was the only thing that was the main asset for humans. As they stated if they do not protect the land they do not get what to eat, drink, shelter and wear and the others in general to succeed their life. They teach their children up to degree or any level by farming and investing on land. They pay government tax and also participate in social, cultural, institutional, political and personal possessions affairs depending on land and what is invested and produced on it.

Pierotti (2011) defines indigenous Knowledge as; it is also called a social capital of the poor, their main asset to invest in the struggle for survival, to produce food, to provide for shelter or to achieve control of their own lives. In this regard, as the data of the experienced farmer participants and all the FGD participants shows, land was the gift from God that human beings works on it, walks, leaves and uses from it.

According to Tolera (2011), sustainability in agriculture and more specifically in land use has been on the top of priority list of natural resource management issues in developing countries. In the same concept sustainable soil management means cropping, pastoral and forestry use of the limited and only partially renewable resources soil, water and plant nutrients to safeguard soil productivity also for future generations and prevent or reverse degradation process. This according to the researcher interpretation, land especially farmland were the only renewable resource which can protect each activity on the earth with taking wise protection attitude on measures and practices that used for land management in improving soil productivity and combating soil erosion.

According to the interpretation of the study, the data gathered and realized through the different sources of the study also shows that, every activity on the earth is dependent on land not only for today but also for future. This means, land was very important natural resource if wisely used and managed, if not, it could affect the life at all in the earth. So, land was free asset that was given for humans to builds today and tomorrow. So this, people should protect their land to fulfill the effort of their need. Therefore, for this study, it was the mind case to take care of this asset and to invest on it.

4.2 Factors Affecting Farmland

In affecting indigenous farmland management and conservation practices the following factors identified in the study area. The data gathered from different sources shows that most of these factors are associating with ecological, demographic, cultural, social, economic and other related aspects. Among others the following are the major problems including other interrelated aspects in the study area.

4.2.1 Land Degradation

As the informants stated, lands have been degraded due to severe over farming; overgrazing and deforestation resulted in severe decrease in productivity and fertility of the soil. Such threats to land have been causing desertification of the land, changing of seasons and degradation of environment in general and that leads to poverty.

Another reinforcing problem that has caused land degradation especially soil erosion in the farmland has been deforestation; as interviewed respondents stated, community in study area usually cut off vegetation cover for increasing farmland, wood work, home construction and other household and commercial purposes due to the increase in number of inhabitants. This suddenly as well as gradually leads to soil erosion and environment problem.

As stated in Knowladge hub (2019), land degradation is the major factor affecting land productivity. The main causes for land degradation are complex and indorsed to a combination

of biophysical, social, economic and political factors in which subsistence agriculture, poverty, and non-literacy can be important causes of land degradation. Expanding population size, diminishing reserves, intensifying under development and continuing global environmental degradation are common causes in developing countries. Similar to this, the data collected from informants of the study states that, land degradation are the main reason for alarming decrease of soil productivity, crop production and other related problems that was mainly caused by natural and manmade problems. The major reasons of land degradation in the study area includes: “*buchcha Zoofu oroosu*”, soil erosion, “*jeechchaaka dooranchu*” seasonal change, ‘*buchcha godda’u*’ or “*higisa hoga’u*” land overuse or over farming, *hoogimagga hoga’u* poor farming and “*haqqita muru*” deforestation due to the increase number of inhabitant. The consequence of this factors leads to food insecurity then poverty comes to spread.

4.2.2 Soil Errosion

The data obtained from interview and FGD participants, reveal that their lands had lost very important part of top soil and fertility owing to soil erosion that had been taking place at veryfast pace. They state that the very same land which had accounted for ribust harvest a couple of years ago now capable of yielding very few. Such pace of losing soil fertility had never seen before. Even after doubling the agricultural inputs, the results were not seemed better. They asserted that it was mainly due to very fast and increasingly soil erosion and land degradation. To restore this degraded land they fallow their lands for years to together to allow normal process to augument soil fertility which is as they had reported costing their livelihood severly. This is because of mostly from natural factors like errosion due to high rainfall.

The respondants of the study also states, among the soil erosion types, sheet erosion which was caused by rainfall when farmland were uncovered by crops or vegation and unuseless practice of land management process.

The Ethiopian summer time/from June to August was found to be the most soil erosion season of the year as rainfall raised during this time in the study area was considered to be the major cause of sheet erosion.

The other one is gully erosion had widened the loss of top productive soil by water erosion as stated by the respondents. The gullies from various directions expanded the rivers in size that had taken away large amount of productive soils from farmlands located in river basins in the form of slide of land in river banks. Farmers had demanded fast solutions to mitigate this life threatening problem by leaving and clearing what are produced around there before highrain fall season.

Bank erosion has been the other form of land soil erosion that was frequently happening in the farmlands. In the study area, bank erosion often posed challenges to the lives of people in various ways, as rivers usually had been at their full flows during rainy season. These have been noticed highly practiced in river delimiting farmlands to protect landslide of edge of river, which fasten loss of soil. Edge grass saved the soil taken away from the farm lands; hence, it has been performing an effective role in combating soil erosion. It was also the main cause for loss of peoples lives and their belongings what are produced on their farmland. At this season the only solution is leaving grass land at their cropland bordering area and planting simple plants which can not be affect farmland soil in order to block erosion ways.

As respondents stated wind erosion were found to be the most prominent problems that caused productive soil in each year to degradation in the study area. At the time of Ethiopian autumn there was occurrence of wind and dryness of top soil at the same time. The top soil come to erosion easily when it was again uncovered with plants and trees. Most of time this type of erosion was protected by planting banana strip, avocado, mango inset and any type of plants around farmland.

In the other way, respondents of government experts stated that the severity of the soil erosion and land degradation were the prime reason for increase of price in food items in the market. They apprehended further increase as well as shortages in agricultural products. This is because

of lack of peoples understanding on land management rather than conflicting on a piece of land and between land boundarry was the main problem of people for land degradation by erosion.

According to the idea of Vista (2014), the causes of soil erosion such as deforestation, huge windstorms, bad irrigation methods, overgrazing and other poor farming practices, will result in soil erosion. These practices are: overstocking and overgrazing, lack of crop rotation and removal of vegetation/forest. In simial way to this as the interpritation of the study and the data presented agreed in somewhere on theVista foundation. Among the problems of land degradation, erosion which washed away top soil which was more productive part; hence, farmers were forced to plow thoroughly in order to replace lost soil. This has resulted in dryness of the land. This has created nasty circle of soil lose. High rain fall in summer season and wind during dry season are also the major factors of soil errossion undrer the study.

4.2.3 The Effect of Modern Fertilizer and Working Materials

4.2.3.1 The Effect of Modern Fertilizer

The data of experienced farmers and FGD respondent shows that, to increase crop production and to get timely necessities, using modern fertilizer is well as the y states. But modern fertilizers not distributed timely plus to its cost were very high year to year and the date already passed fertilizers are distributed. These kinds of fertilizer do not develop the soil fertility and do not increase crop production. This disturbs their plan to season change of dependency. Due to this most of farmers do not use it.

In this, one experienced farmer whose name is Mogas Markato share his experience by saying:

‘I have seen two type experiences in my practice; that are the new modern fertilizer that is the day not passed and the old one that was the day already passed one. There was a big difference between them when I used the two. At old one cropped crops are very weak almost not grown. But the crop cropped by new one gives good production. But the problem is it can’t improve the land for a long period of time when it was used only once.

Due to this I opted to use indigenous practices like using animal manure, mulching or any other practices that can improve land fertility as well as crop production for a long period of time’.

When this was translated, modern fertilizers are fail to use when they are expired and even they are not expired they should be use constantly to get good production. But as like manure when the used once they cannot improve the soil fertility for long period of time.

This informant also states that;

‘Not only these but also the main problem of this modern fertilizer was its acidity. Some food causes health problem in human and animals that were produced using modern fertilizers. He also said, even the soil could not give production unless these fertilizers were not used constantly. This means the soil were burn it over when it used constantly. When it does not used in each production, then the fertility of that land become low and production itself become low. Due to this we mostly accepted the indigenous Knowledge of farmland management practice like animal manure, mulching and others in terms of landform or resource availability’.

When the idea of this informant translated, modern fertilizers acidity can bun the soil and the products produced by this fertilizers can cause health problems on humans and animals.

As stated by Pokhel (2009), Western techno- scientific methods dismissed or greatly played down its effect like elimination of natural adversary, toxic residue in food, water, air and soil, degrading soil environment and ecosystem, animal and human health hazards and ultimate economic losses. In line with this the informant data also shows the effect of modern fertilizer on the soil, on human and animal health and on the products produced by using it in decreasing the yield was the major factors to farmland management.

4.2.3.2 The Effect of Working Materials

According to the data gathered from interview, the issues of lack of modernized working materials/tools are also the main problems affecting farmland in the study area. As the informants states there was lack of improved working materials to protect their farmland. For example "*maarashu*" the ploughing tool, "*matarashu*" which is traditional tool used to carry animal dungs to long far away areas, "*baaldit*" which was water holding equipment used to place and distribute waters, "*tikit*" which was used to hoe the vegetation's, "*kaltu*", "*forku*", and "*akaafu*" which was digging and hoeing tools which was used to dig out the land.

These working tools cost increment was another very challenging problem for land management for them. As they stated the cost of *maarasha*, *kalta*, *forka* prices are increased from ten birr to more than one hundred to five hundred in the market from year to year. For example *kimblo kalta* was five hundred now day in the market. Due to this until we can buy it we forced to work the earlier one which was not hoe and dig the land in good way. Due to this the cost of some food items in the market increased.

As June Helm (1962: 630) has written: " Tylor and Morgan, both set forth technological advance as a major referent for stages of cultural development, and it remains a viable and enduring theme in contemporary longitudinal eco- logical views in anthropology." cited in Freilich (2014). In this regard as informants stated poor practicing of farming when the technological materials are poor itself and not improved one it leads to poor land management and low product yield. In this angle the increase in amount cost of fertilizers and working materials time to time was the other very challenging factor that affects farmland.

In general, according to all data collected from all sources shows that, the increase in population number, landforms, climate change, improved technological materials and political, economic, religious and social factors are the main problems that can affect farmland. All these factors listed above needs the application of more conservational and management measures and practices under the study. So this, the study peoples are developed their indigenous knowledge of

farmland management practices to manage their land in order to challenge the problems and to make life survive which are discussed below in its section.

4.3 Types of Farmland Management Practices

Informants of the study state that, there are generally two types of farmland management practice or systems among kambata society. These are scientific/modern land management practice and indigenous/local one. But I select indigenous farmland management practice which is the main purpose of this study; since they are the most widely and commonly used land management practices in the study area because of its effectiveness and answering a problem of food security, source of income, environment protection and also other wellbeing. The following are the major types of indigenous farmland management practices.

1. Use of animal manure (*Sha'lla uuju*)

According to data obtained from all study participants, cattle manure is an integral component of soil fertility management in the study area. People in the study area rely on this practice as low cost and easily available alternatives to inorganic fertilizers. As these community were known by livestock; the most common sources of manure in the study area were excreta from tame animals living alongside with community such as cows, horses, sheep, goats, donkeys and poultry waste.

Farmers widely applied manure in their farmland, those which were available near to their lands in their garden for crop and vegetation production. This shares the idea of cultural ecology approach of Julian Steward as cultural ecology is based on the idea that a social system is determined by its environmental resources. As the informant's states, farmers were applying fresh manure on crop land before sowing or planting the vegetation's. For instance, crops like inset, banana, avocado, mango coffee, etc.; farmers use manure before planting and after planting that vegetation's to improve soil fertility and production of crops.

The data gathered from experienced farmers and aged FGD respondent, reveal that once applied manure in their land was found to serve as fertilizer for minimum of 3-4 years. The quantity and

quality of manures available are the major factors limiting its contribution to increased crop yields. The use of animal manure requires that farmers own livestock as the market for their farmland management because of adequate amounts applying available manure leads the farmland productive. In the above idea, I found that as stated by Tanyanyiwa (2011), Indigenous knowledge technologies and know-how have an advantage over Science in that they rely on locally available skills and materials and are thus often more cost-effective than introducing exotic technologies from outside sources.¹

Participants in FGD also reported that they make their farmland productive by adding manure from a wide range of organic materials including plant residues (maize Stover, bean straw, grass trash, tree/hedge cuttings and banana pseudo stems), animal manures and kitchen waste. They stated that by animal manure they mixing these organic materials and they decompose it for four to six months and then apply it in the farmland. Most of the time the model farmers decompose many types of residue with animal manure and by the following seasons, they distribute and apply it in their farmland. Then when they plough the land, then they mix this compost with soil. After that they work what they want to produce. This increase production and mainly protects soil from any harm.

The researcher has witnessed this practice in the study area by observing what is acted in practical. This practice were most commonly used type of practice in which as cattle are the

¹As the data during interview the other use of livestock is they used as an asset for the owners. They also uses as source of income and for social, economic, ritual and political value of different livestock are stated. During holy days and different wedding ceremony, medicinal cases or other affairs they also used as meat production.

most common asset for them in terms of giving manure for their land and base for their production. See picture (1).



animal manure

Picture-1 Use of

Source: Photo by Author, April 14/2020 in Gemesha kebele.

2. Mulching (*Bonxa uuju*)

According to data from interviewed farmers and FGD participants, community in the study area had been practicing mulching for long time to enrich soil fertility and to get good production. During season of cultivation, prior to planting/sowing, farmers applies the leaves of the branches of bigger trees on the farmland or placed down the leaves of simple vegetation planted adjacent to their farmland.

This resulted in enriching soil with good fertility which improves the productivity of soil in one hand and increases the production of yield on another hand. Some farmers had preferred to hoe their vegetation than using pesticides to mulch the soil. They used to inter the unwanted vegetation on the soil so as to maintain soil fertility enrichment.

As the respondents stated mulching is an effective method of manipulating crop-growing environment to increase yield and improve product quality by controlling weed growths, ameliorating soil temperature, conserving soil moisture, reducing soil erosion, improving soil structure and enhancing organic matter content.

Farmers in the study area uses special plant leafs from the branches of banana (*muuza*), *masana*, *wanza/waanja*, and any quickly decomposable plants. As they stated banana plant have malt purpose in this practice. After taking edible part the remaining parts of banana mainly uses for animal as forage to take their dung to improve soil fertility and to protect soil erosion when it placed on the way of erosion and again when it decomposed in the form of mulching it make the soil fertile.

The picture taken during observation below shows the practice of mulching. In the picture below you see farmers used the plant banana leaf to mulch the soil. After some days or month this leafs become decomposed and mixed to soil then increase the fertility of soil. See picture (2).



Picture- 2 Mulching

Source: Photo by Author, April 06/2020 in Gemesha kebele.

3. Agroforestry (*Haqqita kaasu*)

According to the data observed during fieldwork in the study area, agroforestry has been seen as frequent practice that helped a lot to sustain soil fertility and improve crop production. Farmers cultivated a variety of selective trees on their farmlands for increase of crop production. Once they plant some type of plants in the farmland this plant stays for so many years.

As stated by informants of the study, this practice had various advantages in soil conservation and maintenances. The big trees grown inside the farmland helps to moisture the farmland by shedding leaves that protects the crops or vegetation from direct sun light heat, protect land from heavy rainfall that might have been erodes the soil and by their wider branches it protects farmland from dryness. This practice also protects the erosion of soil by wind during dry season.

Among the trees cultivated in crop land, the most prominent ones are, '*masana*'/*Korch* in Amharic, '*waanja*'/*Wanza*, '*oddoorra*'/*Girar*, '*qiltuta*'/*shola* and '*odeeta*'/*Warka* that the study respondents stated. These trees protect flood problems and high evaporation of water. The supportive functions of this practice include improving nutrient and water cycling. Inside such trees, local community sowed crops and plant vegetation's.

²As the informants states indigenous agroforestry has play a role in increasing productive ecological functions as it diversifies food supply throughout the year. It reduces the effects of drought and famine, and it plays a significant role in climate change mitigation and adaptation.

² According to the study informants, agroforestry had various advantages beyond maintaining soil fertility and productivity, the cultivated trees grown for the use as the source of income

On the other way the role of this indigenous agroforestry practice extends to contributing to strong cultural values through growing of culturally preferred crops, increasing homesteads aesthetic value through improvement of landscape beauty. The following picture shows this measure under the study. In this picture the tree masana were used as agroforestry in the farm. This tree were very commonly used practice among kambata for agroforestry. See picture (3).

generation, house construction, wood work, and firewood by replacing other trees in the form of reforestation.



Picture-3

Agroforestry

Source: Photo by Author, April 01/2020 in Gemesha kebele.

4. Crop Rotation (*Dooranseenan wixu*)

According to data gathered during field work the use of crop rotation is another widespread phenomena in the area. According to informants, crop rotation is used by the farmers for different reasons including to increase soil fertility, thereby improved crop yield. As they stated crops which are used rotatinally where maize or ground nut, then *teff* and sorghum. At first round ground nut or maize was cropped then *teff* or sorghum. This practice was common among the people in the study.

The participants of the study also states that farmers of the area know that this method improves soil fertility and can be achieved by alternating high residue producing crops with the growing low residue producing crops. As they stated, the resuedue of the crope also used as forage for cattle and source of income. For example the resuedue of *teff* used for both source of income, as forage for cattle as well as home consumption. The same as true for others crop resiedue that have economic as well as other values.

As the participantes stated, fore example the recidue of maize used for fuel and as a cattle forage, for the feul and then burned ashes and the dungs of cattles again added in farming land to improves soil fertlity. The ground nuts uses for home consumption as well as source of income. The recidue also used as a forage for cattles.

5. Fallowing (*Gashsheenan wixu*)

According to the data obtained from informants, fallowing has been found to be practiced in the study area in conditions where the land have been over used and lack its productivity. As the informants stated farmers followed the practice of leaving the land for one or two-three years without farming. The left land which were uncultivated had been fallowed for some those years till they recovered from degradation and dryness. Farmers allowed grasses to grow on the farmland and ploughed the land whenever the grasses have grown. This practice helped their lands to repair their fertility earlier than the period allowed for fallowing. After ploughing the leaved land, they crop and then harvest good yields.

According to informants of interviewed and FGD participants stated, when compared to other indigenous mechanisms, fallowing had been least practiced among small farmers. Most of farmers preferred to other form of indigenous mechanisms to maintain soil fertility. This is because as informants stated fallowing is applied with a very limited extent since land scarcity is stated to be a major constraints to production in the area with increased inhabitants and with low size of farmland.

The field observation data also show few piece of farmlands are leaved to fallow. The following picture shows this practice in the study area that was captured durind field observation. When I am observing the practice of fallong were practicee ammong some farmers who have some large sise of farmland or o person who have any additional work untill the land followed. See picture (4).



Picture-4 Following

Source: Photo by Author, April 01/2020 in Gemesha kebele.

6. Mixed Cropping (*Ereereenan wixu*)

As informants of the study states mixed cropping was widely used in the study area and helps to have overwhelming contribution in preserving soil fertility. Some crops and vegetables which were cultivated in the same land in which they were supporting one another and grew simultaneously were referred to as *ereereenan wixu* (mixed cropping). As data gathered from the informant's shows this was found that some familiar crops have given more produce than plants planted singly.

According to the interviewed informants, farmers whose lives have been based on small scale farming mostly developed this practice of mixed cropping system in his or her piece of farming land to have survived life. In cases mixed cropping involves cultivation of various vegetation's and crops together like, *coffee*, 'buna' maize 'bokola', beans 'baakeela', etc. and banana 'muuza', inset 'weesita' and *gudarre* 'gabiza'.

As the data gathered during field observation shows, mixed cropping was found to be widely practiced among relatively small land holding farmers. They used to practice mixed cropping as they have been getting variety of yields from piece of farmland by mixing crops and vegetation's on one side and simultaneously maintaining their soil fertility on the other hand.

According to data obtained from observation, farmers used to mix two or more crops together with some root edible plants. The great majority of the cases are a mix of maize and groundnuts or *gudarre*, *coffee* and *jinger*, *coffee*, *gudare* and banana, *inset*, *gudare* and maize, *inset* and banana.

Informants of the study stated that, mixed cropping in the area helped the potential to reduce erosion by having a crop on the land for a longer period of the year on one hand and protecting food security at the same time at the same season. It served for them to cultivate different crops at one time on a single farmland. However, the crops in the area are widely similar growing seasons and thus the potential for this benefit is not as such. Nevertheless, the inclusion of leguminous plant may improve its nitrogen fixation process for cereal crops, like pea, bean and others. In the time of observation the researcher observes most of research participants were found to be rich experience in mixed cropping in a piece of farmland to maintain soil fertility and productivity. The following picture during field observation shows, maize, *gudare*, and *inset* are grown together. See picture (5).



Picture-5 Mixed

cropping

Source: Photo by Author, April 09/2020 in Gemesha kebele.

7. Field Boundaries (*Zana zanu*)

The data obtained from interview and observation shows, dividing line in farmland and planting simple plants between boundaries, and the land before and after the ridge is the property of two different individuals as well as a single individual. It is also common to see ridge covered with grasses or some simple plants between plots of farmland. These plants may be indigenous traditional medicinal plant, edible, constructional or environmental recreational plant.

As participants of the study states this practice is important for soil conservation which can reduce the intensity of erosion in the farmland.

According to data from informants of the study, most of the time they plant useful plants like *waanja/wanza*, *grar*, *gravilia*, avocado, banana, mango, and other fruitful plants. Leafs of these plants uses to maintain soil fertility as well as the plant protects soil erosion.

As the informant's states, this practice also helps not only to manage land but also uses for economic, social, political, cultural and environmental aspects or values.

The primary purpose of this practice was to protect soil from erosion on one hand and on another hand to fulfill their entire need. The picture bellow indicates this practice as farmers used planting simple vegetation like avocado, gravilia, mango in the farmland. ³See picture 6 below.

³ As informants states they can earn income, pay taxes, fulfill institutional as well as individual requirements, aesthetic and good environmental values.



Picture -6 Field boundary

Source: Photo by Author, April 01/2020 in Gemesha kebele.

8. Avoiding overgrazing (*Zeemata aguru*)

As aged farmers discussion data and experienced farmers interview, croplands used to lose its productivity when cattle were allowed to overgraze. This has exposed the land for erosion of soil by wind and water. As they stated before fourteen years ago, there was a great part of grazing lands. During that time people graze cattle's in their respective grazing lands. Due to fast increments of population number, these grazing land become farmland. Then grazing cattle after harvesting crops come to be the problem for land management. For this reason farmers in the study area have not allowed intensive cattle grazing on their farmland. Thus, this helped them to deter faster losing of top soil from farmland. The picture below shows this practice that was taken during field work observation. In the picture the farmer left the land with the residue by not overgrazing. See picture (7).



Picture -7 Avoiding overgrazing

Source: Photo by Author April 01/2020 in Gemesha kebele.

9. Leaving crop residues (*Fishsha aguru*)

According to data obtained from informants of the study, leaving crop residues had been used as one of the indigenous ways of protecting soil and maintaining its productivity. As they stated, after harvesting crops, leaving the residue of crop in farmland without using it for another was practiced for various purposes. Among this various purposes, protecting soil erosion and maintaining soil fertility was the main one. As informants stated, farmers left the residues of crops like, maize, wheat, sorghum, *teff*, etc. during harvesting time. The residue left helped

detering loose of top soil from erosion, either by wind or rain. This practice also used to give good yield. The data obtained from interviewed farmers witnessed that they have been using this method to sustain the productivity of soil in the one hand and arresting soil loss by wind in another on the hand by this traditional method.

10. Slight burning and using Ashes (*Hacca giiruna xabaru ta'mmu*)

According to participants of the study, this method was practiced to add productive nutrients to soil. As they states farmers had been collecting residue of crops which do not decompose easily during harvest and burnt it on their farm fields.

The data obtained from informants and observation shows, farmers had been collecting ashes from kitchen to maintain the soil fertility of the farmland in their possession and they also get ashes from burning of different types of plant leafs as well as solid waste products. They apply these ashes during ploughing, cropping and hoeing and mix it with the soil. As the informant's states, this is not only for protecting soil fertility but also to get high production. Farmers in the study area practice this method because of the reason that it was easily founded from their kitchen or burning of wastes and residue.

According to the informants farmers also buy ashes from market that the municipal office burns the solid wastes products from urban areas to clean the surrounding. I observed this practice during my field observation. The following picture was taken to witness this mechanism in the study area. In the picture below the farmer were distributing the ashes after he burns different solid wastes. See picture (8) bellow.



Picture -8 slight burning and using ash

Source: Photo by Author, April 14/2020 in Gemesha kebele.

11. Checking dams (*Boohi muru*)

According to informants of the study, cutting of farmland into dams practice was a type of land management mechanism in which it highly protects the land from erosion. The data obtained from participants of the study and the field observation shows, farmers in the study area had built check dams on the waterline of erosion to combat erosion of soil by flood.

The informants of the study also states, using check dam practice was common by planting local trees like *masana 'korch'*, *reejja 'bula grawa'*, etc. surrounding the check dam to minimized strong down flowing flood which arrested losing top fertile soil. They also states, grasses, bananas and trees are planted surrounding the check dam to protect land degradation on one hand and uses for home consumption, cattle forage and income generation on another hand.

12. Contour farming (*Sheddeguta hoga'u*)

According to the study participants, contour farming is one of the practices in which community under study area has been using for long time in protecting soil from erosion. As interviewed informants and FGD participants argued, farmers in high lands of study area had been arresting soil erosion by ploughing horizontally and ploughing as curves adjacent to main water ways was a common practice in the areas.

As the informant's states, farmers believe that this practice minimized the pressures of flood that take away soil from farmlands. As they said, they do not know how much rain was coming. By assuming this, they believe that the high rain fall could not erode the top fertile soil from farmland when the land was ploughed by this system.

13. Banana Strip (*Muuza kaasu*)

According to the study participants, practice of planting lined banana in or surrounding farmland was one of the most effective indigenous practices of combating soil erosion maintaining soil fertility. As the data obtained from informants and observations shows, farmers had been extensively using planting lined banana in farmland to protect flood.

As the participants of the study banana strip has multidimensional benefits beyond soil erosion, protection and maintaining its fertility. As they stated farmers considered, banana as drought adapting vegetation and they planted extensively in farmland like terraces on land. ⁴As data from observation shows banana strip was widely used indigenous mechanisms in the study area. The picture below shows this practice that was witnessed during observation in the field. In the picture you see farmers' plant lined banana in the farm. This helps them to protect soil erosion and to maintain the fertility of the soil and then again protect their food security and other wellbeing. See picture (9)

⁴ As stated by informants, the other benefit of practicing banana strips was it uses as a source of food for people as well as cattle's. People used edible part and the other part uses for cattle as forage. The other benefit of this practice was it uses as a source of income generation. As informants of the study states the major source of income was banana. One good banana now was sales birr from hundred to four or five hundred.



Picture -9 Banana strip

Source: Photo by Author, April 01/2020 in Gemesha kebele.

14. False banana/*Inset Strip (Weesita kaasu)*

According to the data from informants of the study, farmers in the study area were protecting loss of soil by planting lined inset/false banana adjacent to erosion ways. As they state horizontally lined planted inset prevent erosion of soil by floods flown vertically. The data of

informants and observation revealed that farmers have been widely used inset strip in order to arrest soil erosion and protect food security.

It was the one of the major practice to protect soil erosion during high rainfall. The data gathered from informants also shows that *inset* strips were protecting soil from wind erosion during winter/dry season by blocking/minimizing wind pressure. Thus it was found as an effective mechanism in combating soil erosion. As it is known that kambata was one of known region in planting inset. The byproduct of inset also uses for many purposes. Among these their cattle mostly depended on this plant then their dung also used to make soil fertile and then to improve production.⁵The following pictures show this traditional practice. In the picture you see false banana were planted as a lined form. This mainly protects soil erosion and maintains its fertility and also used for other purposes as discussed above. See below in picture (10).

⁵ Informants of the study demonstrated other crucial benefits of Enset strip. Among these benefits Enset used as for home consumption at firs level and also to generate income, and for medicinal purposes as well as a source of food for cattle. The known cultural food the so called waasa or in Amharic kocho was produced from inset. In the kitchen work its leaves also uses as instrument for food production. Fiber was transported to other areas. This improves their income generation.



Picture -10 false banana/Inset Strip

Source: Photo by Author, April 20/2020 in Gemesha kebele.

15. Grass strips (*Hixita kaasu*)

According to informants of the study, grass strip are very important indigenous land management practice that helps the potential to reduce soil erosion by having a grass on the farmland for a longer period of the year. As the data obtained from informants of the study and observation shows, farmers were accounted to experience grass strips mainly to arrest soil loss by erosion.

As the informants states they used line planting of grasses inside their farmland, in line adjacent to erosion ways. As informants of interviewee and FGD participant's data, these grass strips found to be a better practice in minimizing flood effects. As they states lined grass acted as filters and prevented flood taking away of top productive soil. ⁶Picture 11 below shows this practice that the community under the study practices. In the picture lined grass mainly used to protect soil erosion and maintain the fertility of the soil. It is also important to improve the other wellbeing. See picture below.

⁶ The other importance of this practice was it also used for cattle as forages, for income generation and for home constructions.



Picture -11 Grass strip

Source: Photo by Author, April 20/2020 in Gemesha kebele.

16. Vegetation Strip (*Kaashsha kaasu*)

As participants of the study states, lined vegetation cultivation between farming land was widely seen in larger farmlands in size in the study area. As the informants states this vegetation strip like other indigenous land management practices, have been played the major role in protecting soil erosion and also maintain soil fertility. As they said this vegetation helps blocking strong flood and wind erosion. Besides their leaves did lichen soil that also increases fertility of soil.

According to interviewed informants and FGD participants, during rainy season, this vegetation found to play its role to protect soil loss by erosion and during winter season, farmers were practicing cutting down vegetation to cover harvested land; this in turn helped enriching soil fertility and increasing production yield. Among the vegetation's '*Bulla Grawa (reejja)*' was most prominent plant in the study area. The picture below shows this practice. See picture (12). In the picture you see simple vegetation's like bulla grawa/reejja and masana planted as the line form. This is to protect the soil erosion and to maintain the fertility.



Picture -12 Vegetation Strip

Source: Photo by Author, April 20/2020 in Gemesha kebele.

17. Plough at winter season (*Haguu hoga'u*)

As the informants of the study states, farmers have no overloaded works in the farm during winter season. According to informants, at this season farmers plough their farmlands to increase soil fertility and to get high yield of products. As they stated, when the first rain was come on they plough again and again and then at the harvest crops as soon as without the use of modern fertilizers and application of agrochemicals. At this time the land did not affected by erosion and also gives high yield without. This method was common to all farmers if they have time to plough the land at this time.

According to informant's, this method was very effective and is important to reduce the amount of cost in terms of labor, money and time. As they stated, the one who have a pair of oxen he always said to be a wealthy man. Because he plough at winter season and when the rain started to rain, he crops good crops which are inherited from before ancestors or he himself put it; without any moreover of modern fertilizers. Then the crops rapidly reached to re-use. During harvesting time he gets good yield of production. As the informants states maize are knowingly used crop by this practice. This practice was commonly used among farmers.

18. Understanding the well season (*Agana dagu*)

According to data obtained from interview and FGD participants, understanding the well season to making any plantation as well as cropping activities was the known practice among the kambata community. It was traditional ecological knowledge or belief system in which soil do not touched in these seasons because they believe that they do not get good output or it was a good season to give good output.

Semali and Kincheloe (1999) defines IK as it is a way in which the residents of an area have come to understand themselves in relationship to their natural environment and how they organize that folk knowledge of flora and fauna, cultural beliefs, and history to enhance their lives. This means as informants stated, understanding well season was easy to know the seasons

to crop as well as to harvest and to protect the soil from harms; for example the season of "chagina" was the one in which there was no good output if any activities are done.

In their belief system as they states, at the time of "*chagina*" season, the sign of moon plays the role in farming or harvesting in each month. As they said this sign was clear for all; what was happening were when the big circled moon was seen from three to almost seven days nothing will be done. After these days, the shape of the moon becomes small and become its normal true shape.

According to the informants, another advantage of understanding the season of "*chagina*" was very important practice to cut or not to cut plants. As they states when trees are cut down in these days it will become simply breakable and the remaining part do not grown. Even the taken parts of the tree become easily broken because of the animal which ate the inner part and also the remains part do not grown if grown it will become dry. After this days are passed and plantation takes place and cut down it will become grown. The broken part also becomes hard.

As the informants stated, the month July '*hamloo*' was another special season not to touch the soil and made any activity. If made it will become dry or cached by some insects and failed to production. As the informants states the month *Pagume* was also another season in which nothing farming activities will be done in this month.

In these month's hoeing vegetation and cutting trees are not advisable because the vegetation come to dry and reaming parts of trees will not be grown for future. This disturbs the soil value of farmland till resilience of the harmed crops. In their ecological Knowladge they do not touch soil in those months. It was only advisable to hoe inset because of it can protect air born disease in such months.

According to the participants of the study this practice was passed orally from generation to generation and was the most acceptable among the community. This knowledge was also transmitted from first ancestors or fathers to son.

19. Using day number division (*Bari dagu*)

Informants of the study states, days in kambata divided hooked on odd and even, this means not full and full day. In their belief system the day which is divided to two was called ‘*wiima bari*’ that means full day. The day which is not was called ‘*mongo bari*’ which means odd day.

As data of participants of the study, it was the practice of the people that any tree planted at odd days and harvested at full days. This is because as the informants stated they believe that if any activity done on odd days it will grow well and gives good yield and if harvested at even days it will become high yield. And when crops are harvested at odd days it could not be stay for a long period of time. The informants states that this practice is important of wasting time and power to manage farmland by simply understanding the days and to made activities.

As they states the number one, three, five, seven, nine, eleven, thirteen fifteen, seventeen, nineteen, twenty-one, twenty-three, twenty-five, twenty-seven and twenty nine in one month are the best day to plant trees and to crop and said to be odd days. The rest days are harvesting days in one month and said to be full days.

As the informants data the seven days in kambata in a week termed as *sanna* (Monday), *magisanna* (Tuesday), *orooba* (Wednesday), *hamusa* (Thursday), *harba* (Friday), *hoffata* (Saturday), and *abbata* (Sunday). Among this days day Monday, Wednesday and Friday are taken as an odd days as they stated.

According to the data gathered from informants, any cropping activities done with in these days and harvested out of these dates give good yields. Even they also stated if any traditional medicinal activities are also practiced in or at these days it was very important to cure any disease. If used out of these odd days any traditional medicine could not cure any diseases.

According to the study participants the commonly known of understanding day number division in kambata was the season of cropping *teff*. This was termed as "*Lamale sanna*". During this

season dates are arranged by days and in to season in one month/ August/, which is started from the season of tenth which takes ten days from the beginning of the month.

The land feature like dry soil, mostly crops in tenth season then less dry land type crops at the ninth season which takes nine days up to the ones season respectively and then no name season what they call "*su'mma beele*" this means no name that was the five or six days after August in each year what it call "*Pagume*". The season seventh Lamale sanna was known one as a good season for cropping teff.

Yosef *et-al.* (2019), in their study asserted that, to relive the land, and mitigating the problems and other related issues, indigenous peoples and local community's extensive knowledge to managing the landscapes and the use of different land management practices and techniques contributes to the maintenance and adaptation of farm productive, sustainable and resilient approaches. Adimew (2014) also identify that, soil conservation, soil fertility management, agricultural forestry practices, controlled-grazing and several others are typical examples of land management practices. In this regard, I found that Kembata people are aware of maintaining or conserving their farmland through their own land use measures and soil management systems and practices which are discussed above in their respective sub titles.

4.4 Importance of Indigenous Knowledge in Farmland Management Practices

Participants of the study stated that, indigenous knowledge for farmland management was easily transferred from their former fathers to son that improves the health and wellbeing of communities and protects land degradation. For example, one of the informant states that, 'the crops that our ancestors transferred to as was growing one crop now and gives well yield at every years. But that of modern crops distributed by government agriculturalists and any non-governmental agency are very problematic. Among these problems either they are expired or not matched with the farmland. In addition to this the modern crop are not power full in terms of protecting human health. Rather causes many health problems'.

Informants of the study states that the cost effect of modern fertilizers, as well as the distribution of already expired fertilizers and crops forces them to apply indigenous farmland management.

According to the informants, this method gives good yield than that of modern one. As they stated they easily understood their ecology and well used the time and seasons based on this knowledge. In terms of cost, good yield, labor and time saving, it is economically, politically, socially, and ecologically, very effective.

As data gathered from participants, aged farmers whose age was from 45 years and above appeared to be more aware of these practices and states old men and women have knowledge about effectiveness of indigenous farmland management practices.

As the data shows their rich experience they have known very well, how to plow, how to sow, how to harvest, how to hoe and how to increase soil productivity in all seasons. As the informants states they easily understood their locality better than others.

According to data obtained from informants, young's aged from 28–49 years had less knowledge about the importance of indigenous farmland management practices. This is because in terms of low size of farmland, they take as migration as a solution to borrow others knowledge rather than indigenous. In addition to this they stress on timely problem solving ways for life. But land management was not matter for them. Due this, to improve their life most of them migrated to urban areas as well as south republic of Africa and other world countries or Ethiopia's resettlement area like Arsi Nagele in Oromia region, Gambella, Kaffa, Bonga.

As the view of young FGD participants, the importance of farmland management practices was sustaining land, raising income and gives high productivity and in this it was cost effective, efficient and sustains farmland for long period of time. But they appreciate practice by which its timely problem solver. The reason that the youth lack such knowledge is that the elderly reserve a lot of information from the formers so that they can continue acquiring economic benefits from their knowledge of indigenous farmland management practices.

These all above information verify results that younger people have less knowledgeable about indigenous farmland management practices and older people have known indigenous practices better than new generations, as they have well understood the practices which have been practiced from generation to generation and impacting new generation to fall in their line.

Tolera (2011) states that, the objective of sustainable land management is to harmonize the complementary goals of providing environmental, economic and social opportunities for the benefit of present and future generations, while maintaining and enhancing the quality of the land (soil, water and air) resource. Also Adimew (2014) proclaims that, increasing crop production with SLM practices would support policy makers' attempts to reduce national poverty levels and improve the health and wellbeing of communities, while ensuring ecologically-responsible land management practices. And also he states that at the international level, SLM is an important approach to simultaneously support achievement of land degradation neutrality. In similar this scholars', as the data from data collection sources of the study, I found that indigenous land management practices are very important for generation to generation by improvement of humans wellbeing's in general and of soil-based ecological functions in particular. The land also used without harming throughout the year.

4.5 The Role of Women in Indigenous Farmland Management Practices

The data collected from the interviewed participants and FGD shows that, the women of the Kambata are almost entirely dependent on their husbands. But in the all farmland activity women are the major role players. As the informants state some of these roles include preparing all the food for her husband as well as for working groups, fetches water and prepare coffee and equally participate in managing farmlands and conserving the crops.

As women FGD participant states, they always have contact with farmland by gathering food, in medicinal cases, and finance and take care of protecting the vegetation and the entire crop until for output using. They also cultivate equally with their husband. Again aged farmer FGD

participant states, women mainly take major part by distributing animal manure, protecting and conserving crops and farmland.

They also stated, Women know more about when crops are harvested, fruits are cut and which plant was used as a curable medicine for which disease and exchange the product of farmlands to finance.

As the data gathered from the study participants shows that most farmers were males, women roles have been entitled to reproductive and household activities due to age old culture and traditions. Especially, women whose husband died or divorced by some cases only manage their farmland equally or greater than other male farmers. They play the overloaded roles not less than male farmers. Informants of the study also reveal that, the difference between women and men can be attributed to the fact that customarily, men are inheritors of ancestral land among communities inhabiting in this area and hence are stronger on managing land than women. But Women can never inherit ancestral land in the area. Land was inherited by sons of the home. Girls are expected to get married elsewhere when they become of age.

Simpson (1994) argues that, it was the culture to adapt any environment individually because as a member of once ecosystem everyone can interact with that environment. In the communication everyone has responsibility to balance a given system of environment. Also in concerning matters of the living environment, women are often the daily managers, caring for livestock, cultivating specific food and cash crops, collecting wild fruits and leaves, processing, preparing, and preserving food, selecting seeds, and propagating plants are activities assigned to different age and gender groups. But until recently, women's IK systems were considered inferior to men's or regarded as non-knowledge.

He also states the knowledge of women as users and innovators of technology was largely dismissed because of the domestic nature of women's work and the fact that women's technology tends to be less prestigious software (techniques and processes of production), rather than hardware (tools and equipment). Belachew, (2001) also put that some discriminating

functional differentiation and labor divisions are usually backed up by traditional values, beliefs and customs that undermine women's position within the household and in the communities by "naturalizing" their incapability to perform some activities and hold some social positions. Based on this regard in the study area I found that women empowerment through increased productivity must be combined with the management and improvement of natural resources individually especially in farmland. Among them land was inherited by sons of the home. They discriminated by property ownership and their home control and administrative role. Always their husband controls what is produced from their farmland, social connections with others and all other activities. But due to some challenges to cultural and gender division to apply their knowledge was undermined. No one gives attention to take as a role. They are discriminated by their function to farmland to control activities done on it.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The central focus of this thesis was to explore the role of indigenous knowledge in land management practices in Kechebira district in Kembata Tembaro Zone in their considerable practices of indigenous farmland management.

The economic activity of the people in the study area is very dependent on subsistence agriculture, which includes rearing of domestic animals and cultivation of crops. The overall farming system is strongly food crop production oriented that operated manually by use of man power and oxen for land preparation.

Community under the study perceives land should be protected to fulfill the effort of their need.

A number of factors contribute to farmland management practices in the study area, are significantly from the geographical and socio-economic condition of the rural population, high intensity of rainfall combined with poor farming system, demographic and technological factors.

The findings of the study revealed that Kembata community has developed a long lasting indigenous practices and knowledge in farmland management especially in maintaining soil fertility and combating soil erosion. It also discloses that the indigenous farmland management mechanisms in the community are basically tested its efficiency and become their survival strategies.

There are various options of indigenous mechanisms of farmland management practices by combating soil erosion and maintaining soil productivity and fertility in the study area. These are : using animal manure (*sha`lla uuju*), mulching (*bonxa uuju*), agroforestry (*haqqita kaasu*), mixed cropping (*ereereen wixu*), leaving crop residue (*fissha aguru*), fallowing (*gasheen wixu*),

using field boundary (*zana zanu*), slight burning and using ash (*hacca giiruna xabaru ta'mmu*), avoiding over grazing (*zeemata aguru*), crop rotation (*dooranseenan wixu*), contour farming (*sheddeguta hoga'u*), check dam (boohi muru), planting lined banana (muuza), inset (weesita), grasses (hixita) and vegetation (*kaashsha kaasu*) and understanding the ecology of the locality- a good season and day number division, were commonly practiced in the study area.

Therefore, this indigenous farmland management practices helped to improve the society's livelihood and maintained their life styles for long time. This knowledge helped them to adapt and combat any environmental challenge according to the degree and nature of the problem that might have been occurred throughout their life in the past.

Woman of kambata people plays their role together with their husband in farmland management. Specially, women, whose husband was died, equally manage their lands with other male farmers. But their role that they play and the place they have given for women are not matched. They lack power to control what are produced on farmland. This shows there was lack of understanding that they have playing the major role in land management and have the right to control and inherit lands.

To generalize, this study has concludes that indigenous knowledge has significant contribution in land management practice in combating soil erosion and protecting soil fertility and improving human's livelihood and environmental sustainability.

5.2 Recommendation

Based on the finding, the researcher forwarded the following recommendation.

Land was very important resource and main asset for a human that was passed from father to son physically. But the Knowledge of managing it was mostly passed through orally that was most effective than that of modern one. The wide going of modernization has posed a challenge to local cultural practices. So, it is important to the community to give awareness about the importance of this indigenous farmland management practice, and to transfer this heritage for the

next generation. And, it is also important to academic researchers to undertake the further investigation on the issue.

The major challenges to land management practices are significantly from the geographical and socio-economic condition of the rural population, high intensity of rainfall combined with poor farming system, demographic and technological factors which are most commonly affect farmland. It is important for the government to provide necessary support in terms of giving improved services for farmers to encourage sustainable utilization of indigenous farmland management measures.

Indigenous farmland management practices are important in many ways such as improvement of humans wellbeing's in general and of soil-based ecological functions in particular. It also plays a big role in the sustainable development of once country. So, it is important to development researchers and academicians to play further role in studying the countries diversified ethnic groups Knowledge that can be easily taken to other part of the country and the remaining uncovered topics in the study area under the study.

In the study area, this study has discovered that, IK plays critical role in farmland management practices; that is part and parcel of land management practice and environmental conservation; thus, it is highly appropriate to incorporate IK in current Ethiopia's extensive soil conservation activities with conventional mechanisms under operation.

Women play equal roles with their husband in land management practice. They know more, about when crops are harvested, fruits are cut and which plant was used as a curable medicine for which disease and exchanging the product of farmlands to finance. But their role that they play and the place they have given for them are not matched in terms of property ownership. Thus, the government should also take part to develop this very base knowledge of women's by the studying and giving awareness to empower them.

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Appendix

Appendix I

Jimma University College of Social Science and Humanities Department of Social Anthropology

Dear informants, Aberash Gebre Orshiso is currently studying at Jimma University in partial fulfillment of the requirements for the degree of master of art in in Social Anthropology. This interview questions are prepared in order to collect data on “The Role of Indigenous knowledge in land management practices in case of farmland management in Kembata Tembaro Zone Southern Nations Nationalities and Peoples Regional States, Ethiopia, particularly Kachabira district of Gemesha kebele. Hence your genuine responses for these interview questions are highly essential for the successful work of the study. The questions have no any hidden agenda or political motive but rather intend to gather information, which shall be availed for academic research. During the process of conducting the study, the interviewer assures confidentiality and their responses only be used for academic and research purposes. For your cooperation thank you.

Name _____ Region. _____ Zone _____ Woreda/district _____ Kebele
_____ Ethnic group _____ Job _____ Farming
experience in year _____ Date _____ Sex _____ Age _____

Interview Questions and Guideline

1. How you see your farmland?
2. Would you mind to list the main factors that hinder your farmland?
3. What practices do you use to maintain your farmland management?

Modern mechanisms Indigenous mechanisms mixed mechanisms

If your answer to question 3 is ‘modern mechanisms’ what are these mechanisms, their benefit and their drawbacks on your farming system?

A. Mechanisms

B. Benefits

C. Drawbacks

If your answer to question 3 is ‘indigenous practices’, what are those practices/mechanisms, and their importance,

a. Practices/mechanism

b. Importance

4. What are the main challenges that affect indigenous practices in your farmland management?

5. Could you tell how the indigenous practices help to improve the livelihood of the community?

6. Would you believe women’s play their role in indigenous farmland management practices?

Appendix II

Jimma University College of Social Science and Humanities Department of Social Anthropology

Dear respondents, Aberash Gebre Orshiso is currently studying at Jimma University in partial fulfillment of the requirements for the degree of master of art in in Social Anthropology. This FGD questions are prepared in order to collect data on the Role of Indigenous knowledge in land management practice in farm land management in KembataTembaro Zone Southern Nations Nationalities and Peoples Regional States Ethiopia, particularly in Kachabira district of Gemesha kebele. Hence participants are most appreciated for their genuine opinions in this open discussion scenario among the participants. The questions have no any hidden agenda or political motive but rather intend to gather information, which shall be availed for academic research only. During the process of conducting research, no personality shall be identified and exposed and confidentiality of your views will be assured.

Name _____ Region. _____ Zone _____ Woreda/district _____
Kebele _____ Date _____ Sex _____ Age _____
Ethnic group _____ Job _____

Guideline for Focused Group Discussion

1. How you see your farmland management?
2. What type of practices you use to manage farmland?
3. What is the importance of these practices?
4. How farmland management practices serves as the main sources of food for you?
5. How farm land management practices improve your lively hood?
6. How these practices are main source of income for you?
7. What role women have plays in farmland management practice?

Appendix III

Jimma University College of Social Science and Humanities Department of Social Anthropology

Dear respondents, Aberash Gebre Orshiso is currently studying at Jimma University in partial fulfillment of the requirements for the degree of master of art in in Social Anthropology. This is question guideline for development agents and agriculture and natural resource management expert's interview prepared in order to collect data on the Role of Indigenous knowledge in land management practice in farm land management in KembataTembaro Zone Southern Nations Nationalities and Peoples Regional States Ethiopia, particularly in Kachabira district of Gemesha kebele. Hence participants are most appreciated for their genuine opinions in this open discussion scenario among the participants. The questions have no any hidden agenda or political motive but rather intend to gather information, which shall be availed for academic research only. During the process of conducting research, no personality shall be identified and exposed and confidentiality of your views will be assured.

Name _____ Region. _____ Zone _____ Woreda/district _____
Kebele _____ Date _____ Sex _____ Age _____
Ethnic group _____ Job _____

Guideline for development agents and agriculture and natural resource management expert's interview

1. What farmland management seems like in the area?
2. What are the major factors that affect farmland?
3. What type of farmland management practices are widely used in the area?
4. What is the attitude of the people on indigenous farmland management practices?
5. Would you mind women's part in land management?