COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF NATURAL RESOURCE MANAGEMENT

ASSESSMENT OF THE CHALLENGES AND PROSPECTS OF LAND REHABILITATION PRACTICES IN GURAGE ZONE CHEHA WOREDA YEFEREZYE KEBELE.

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LIST OF ACRONYMS

CSA ……..... Central Statistical Agency.

DA ……...Development Agents

FAO……..Food and agricultural organization

IUCN……International Union for Conservation of nature

M.A.S.L…… meter above sea level

MOA……ministry of agriculture

MOPED…….. Ministry of Planning and Economic Development

PSNP……...productive Safety Net Program

SNNPR…….. South nation, nationality and peoples region

SPSS……Statistical Package for Social Scientists

SRO…….Surface runoff

UNDP……. United Nation Development Program

WB…….. World Bank

WCED…… World Commission on Environment and Development

WFP…… World Food Program

ABSTRACT

The study was conducted at Yeferezye kebele to assess of the challenges and prospects of land rehabilitation practices with specific objectives to identify major causes of land degradation including population growth ,expansion of agriculture to forests and marginal lands, poverty, land ownership problems which are related to land tenure and government policy, political instability and land administration, overgrazing and inappropriate agriculture, which were existed in the area, to know propose possible strategies and opportunities for better land rehabilitation process. The study identify the major challenges and shortcoming of land rehabilitation practices including Community Engagement and Education, Soil Health Improvement, and Agroforestry and Reforestation. In order to achieve the objective of the study, both primary and secondary data were generated by employing qualitative and quantitative data. By considering Yamane formula 89 household heads were selected from kebele by using simple random sampling as it is believed that the households are similar with respect to the characteristics that influence the research output. The study recommends include Awareness Creation by Organizations, Expansion of Extension Services, Farmer Participation in Planning and Implementation, and Active Involvement of Natural Resource Management Professionals. The findings of the study indicated that limited labor availability the technology use are major challenges encountering the land rehabilitation practices in effective, high cost of maintenance. Lack of knowledge, topography, soil conditions, high rainfall, poor vegetation coverage, poor monitoring and evaluation poor implementation and poor training on way. The process of analysis of the study was carried out using qualitative description and quantitative analysis. The quantitative data was analyzed using frequency and percentage when appropriate. The qualitative data was discussed to substantiate the study. After collecting data both quantitative (descriptive statistics) and qualitative data analysis was carried out and the result was presented using table and figure. The study concludes the farmer responses reflected a strong awareness of the challenges they faced and a commitment to improving land management practices, even amidst significant barriers.

***Keywords**: Land rehabilitation, Land degradation, Soil Erosion, Food Security*

CHAPTER 1. INTRODUCTION

1.1. Background and Justifications

The twenty-first century is a time by which the world is getting seriously confronted by issues of sustainable use of natural resources. Despite the emerging recognition of their decisiveness for the survival of humanity on the planet, these days, water and land ecosystems are being degraded at an alarming rate (Hannam, 2003 cited in Teketel, 2009). The case is worse in developing regions, where the majority of the population depends on these resources for its livelihoods. Hence, the conservation and management of land and water resources for sustainable intensification and agriculture and poverty reduction in developing regions has remained one of the most challenging policy issues for a long time (Bekele *et al.,* 2007). Land is the most important natural resource all over the world. It is a place from which human beings are exploiting a number of resources (Taffa, 2002). Almost all food production for the world population is derived from land, and the need to produce more is increasing from time to time due to an increase in population. For increasing production, either area under cultivation must be expanded or its productivity needs to be increased. Thus, fertility of land is decisive factor in addition to other tech after mological input. However, land is losing its productivity due to a rising trend of land degradation (Woldeamlak,2003). Land resources degradation, resulting from different causes, is threatening long-term productivity. Nowadays, land degradation is reducing yield significantly and it is more acute in some parts of the world than the others. For example in Central America,75% of cropland is seriously degraded while in Africa, 20% of the total land area is at risk of unrecovery (Sida,2007). In Ethiopia, land degradation has become a serious problem affecting all spheres of social, economic and political life of the population. It is one of the major challenges to agricultural development and food security of the country. The rate of the country's land degradation is very high. A large portion of the agricultural land, which is mainly located in the highland part of the country, is affected by severe to moderate land degradation (Kruger *et al*., 2001).

1.2. Statement of the problems

In Ethiopia, the heavy dependence of people's livelihoods on agriculture and inappropriate use of natural resources resulted in fast and vast land degradation (Genene, 2006). On the other hand, development of agricultural sector partly depends on land productivity. However, this resource is seriously threatened by land degradation and aggravates the food insecurity problems in the country through its adverse impact on crop yield. The country could not feed its population at present and it will have difficulties doing in the near future partly due to serious land degradation (Genene,2006). Failure of Ethiopian agriculture to feed the population is partly resulted from cumulative effect of land degradation mainly in the highland part of the country (Kruger *et al*. 2002; Yohannes, 2005). Therefore, improving productivity of land is so crucial in improving the welfare of the agrarian population in particular and the overall economy of the country in general (WB, 2001 cited in Desta 2009). Without the proper management of land resources, it becomes very challenging for Ethiopia to feed the increasing population. As a result, there should be appropriate land management systems to improve the productivity of land particularly in highland areas where the problem of land degradation is severe (Berhanu, *et al*, 2004 Cited in Desta 2009). Land degradation poses a significant challenge in the Gurage Zone, particularly in Cheha Woreda and Yeferezye Kebele. Over the years, unsustainable agricultural practices, deforestation, and overgrazing have led to severe soil erosion, nutrient depletion, and a decline in agricultural productivity. This degradation threatens food security and the livelihoods of local communities, making effective land rehabilitation practices essential. In an attempt to contribute in bridging the above stated gap, the study was focus on assessing challenges and prospects of land rehabilitation practice in the highland of Gurage zone specifically in yeferezye kebele. The reason why this site was selected is that it was among the Ethiopian highlands that are facing problem of land degradation

1.3. Objective of the study

1.3.1. General objective

The general objective of the study is to assess the challenges and prospects of land rehabilitation practices in Cheha woreda in *Yeferezye* kebele.

1.3.2. Specific objectives

- ✓ To identify major causes of land degradation in the study area.
- ✓ To assess major challenges and shortcomings in undertaking different land rehabilitation practices in Yeferezye kebele.
- ✓ To propose possible strategies and opportunities for better land rehabilitation process in Yeferezye kebele.

1.4. Research Questions

- ➢ Based on the above specific objectives, the research attempts to answer the following question

1 What are the main causes of land degradation in the study area?

2 What are the ongoing practices of land rehabilitation?

3 What are the main socio-economic,institutional and natural factors that affect the practice of land rehabilitation?

4 What are possible strategies, opportunities for better land rehabilitation practice in the study area.

1.5. Significance of the Study

The study on the challenges and prospects of land rehabilitation practices in Gurage Zone, particularly in Cheha Woreda in Yeferezye Kebele, holds substantial significance for several reasons. First and foremost, it addresses a critical issue of land degradation that directly affects food security and the livelihoods of local communities. By identifying and analyzing the specific challenges faced by farmers, the study aims to provide insights that can lead to more effective and sustainable land management practices. This research contributes to the body of knowledge on sustainable agriculture and land rehabilitation techniques. By exploring innovative practices and their applicability in the local context, the study can serve as a valuable resource for policymakers, agricultural extension workers, and researchers. It can help formulate targeted interventions that align with the unique environmental and socio-economic conditions of Yeferezye Kebele.

1.6. Scope of the Study.

The study focuses on representative sites within Yeferezye Kebele, Cheha Wereda in Gurage Zone. Due to time and resource constraints, it is not feasible to cover all aspects of the study area The study also examines differences between farmers who practice land rehabilitation and those who do not, Various land rehabilitation measures introduced in the study area are discussed.

1.7. Limitation of the Study

This study has some limitations and faced some constraints: From these, a financial constraint was the main drawback during conducting this study. The data collection time (March to May) was found to be inconvenient for most of the farming population in the study areas as it was peak agricultural activity season. Most farmers were reluctant to spare their scarce time for interview. The time allocated for the survey was found to be insufficient to arrange and integrate some of the questions in the questionnaire and to make proper follow-up and control of the data collection process. Even though the household questionnaire interviewed to each household was designed to be concise, it was lengthy and in some areas some of the questions were not understood by interviewees. However, we have attempted and took all the best to make study effective and valuable work.

CHAPTER 2. LITERATURE REVIEW

2.1. Ethiopian Highlands: A General Overview

The highlands of Ethiopia (areas of over 1500 m.a.s.l), which make up about 45% of the total land area, support over 84% of human population and two-thirds of animal population. They are also the sources of many of the country's major resources (Alemneh, 2003). Different studies have revealed that there is a widespread belief that the Ethiopian highlands used to have an adequate fauna and flora,dependable soils, and climatic conditions. In the course of time, however, the highlands have become the most degraded area in Africa if not in the world (Terefe,2003).Marko (1997) also underlined that the areas of rain-fed agriculture most under pressure from ecological degradation in the Horn of Africa lie in the northern and central highlands of Ethiopia. As to the magnitude of the severity of erosion, 50% of the highlands are significantly eroded, while 25% is seriously eroded (Alemneh,2003). In general, the extent of land resources degradation in Ethiopia, especially the degree of soil erosion, nutrient depletion and deforestation in highland areas, above 1500 m.a.s.l of the country is very high. A significant amount of arable land in the highlands of the country is lost due to land degradation, which has different causes behind it (Lakew.*et al*., 2000). Due to the high degree of degradation, important renewable natural resources such as soil, water, forest and other forms of biodiversity are highly deteriorating in the Ethiopian highlands. This problem is further aggravated by the expansion of agriculture to marginal area (Gete,2002).Land degradation particularly soil degradation has significant negative impact on productivity of land. This is because soil degradation and soil productivity are inversely related. That is, where degradation is taking place at a higher rate the productivity is less and vice versa, other things remain the same. It is manifested by a reduction in the actual or potential productivity of soils. This productivity of soil is significantly affected in Ethiopia due to the serious soil degradation in the country (MOPED 1994, cited in Desta2009).It is indicated that the soil in cropping land of Ethiopia is not sufficiently fertile to support the required level of food production. Soils in Ethiopia are becoming resistant to fertilizer since they are degraded to the extent of not absorbing water with fertilizers thus resulting in low crop yield (Abbi.1995, cited in Desta,2009).

2.1.1. Causes of Land Degradation in Ethiopia

The cause contributing for land degradation in Ethiopia is complex and diverse. It is the result of complex interaction between physical, chemical, biological, socioeconomic and political issues of local, national or global nature. Among the cause of land degradation, some are population growth expansion of agriculture to forests and marginal lands, poverty, land ownership problems which are related to land tenure and government policy, political instability and land administration, overgrazing, inappropriate agriculture, and large scale expansion of irrigated agriculture (Taffa2002; Gete,2002 Betru,2003; Aklilu,2006).

2.1.1.1. Socio-economic and institutional related causes

There are different socio-economic and institutional factors that are causing land degradation. These factors are causing land degradation through their impact on the decision of people regarding land use and management practices. Some of these factors include population pressure, poverty and landholding system.

2.1.1.2. Population Pressure

An increasing rate of population growth is among the major causes of land degradation in Ethiopia. This is because the increasing population leads to the requirement of more agricultural production,which requires more land with the existing technology level. Getting this new agricultural land is not a simple task and it resulted in the expansion of farming activities to erosion prone marginal areas, serious deforestation, a decrease in fallow period and continuous cultivation.(Habtamu,2006;Hussies,2006). Dense population and inappropriate farming practices combined with intensive rain and rugged topography intensified land degradation problem in the country. The high population growth made steep fragile areas to be included into cultivation, thus accelerating rate of soil erosion (Betru,2003). The country has already lost its forest resources, mainly due to population pressure. Different scholar as cited in Hussien.(2006) indicated the declining trend of forest cover in Ethiopia through time. In the 1960s,Brieten (1961) estimated that about 37% of the total area of the country was covered by forest. UNDP, FAO and MOA (1984) estimated that at the beginning of 20th century about 35.4% of the country's landmass was covered by forest. IUCN (1990) also estimated that 87% of the highland area of the country was covered by natural forest in the early 20th century and reduced to 15% in 1955 and to 4% in 1984. NCS

(1990) and EPA (1997) further estimated the country's current forest reserve to be less than 3%. The annual rate of deforestation in the country is estimated to be 80,000 to 200,000 hectares (Gete,2002).Hussien,2006) also estimated annual rate of deforestation in Ethiopia to be 150,000 to 200,000 hectares. Another author (Badeg ,*et,al,*2003) also estimated deforestation rate of natural forest at 160,000 - 200,000 hectares per annum. The increasing population, which leads to increasing demand for more agricultural land, fuel wood, construction material and other forest products, is the major cause for this deforestation (Gete,2002). This deforestation caused shortage of firewood and other forest products. Consequently, people are using animal dung and crop residue for household fuel rather than being added to the soil to improve soil fertility. This in turn reduces the quality of soil and thus further exacerbates the problem of environmental degradation (Badeg.*et,al,*2003; Hussien,2006; Aklilu,2006). Nevertheless, population pressure can also have positive impact on land improvement and environment protection. By increasing the value of land relative to labor, population growth may induce labor-intensive investments in land management and soil management. These include planting trees, constructing terraces, composting and mulching, etc (Desta.2009)

2.1.1.3. Poverty

Poverty and natural resource/environmental degradation are negatively reinforcing, that is, as the land is degraded, agricultural productivity is lowered, resulting in decreasing incomes and food security. This in turn leads poor people from both rural and urban areas to engage in activities that further degrade the land resources and environment in order to obtain supplementary incomes and to sustain a living. (Badeg. *et al.*2003). Poverty is very likely to contribute to land degradation for many reasons. When people lack access to alternative sources of livelihood, there is a tendency to exert more pressure on the limited resources available to them. There is intensified pressure on the natural resources. One of such pressures is land degradation. The situation has led to drought and reduced household assets (Shiferaw and Holden, 2001). As a result, deforestation, burning of dung and crop residues are increased due to people's inability to afford or lack of alternative fuel sources. For example, electricity and kerosene are expensive and in most cases not available for the rural people. Even households with electricity supply avoid using it except for lighting at night. For cooking, most households prefer the three stone open fire. This is believed to be only about 10 percent efficient in the overall thermal energy production and use. Improved stoves such as

improved biomass, fuel saving stove, etc are believed to be around 45-82 percent more efficient than the three stone open fire. However, they are not used since they are not affordable by rural households (Lakew *et al.,* 2000) without adequate alternative sources of energy; population growth increases the demand for fuel wood, which in turn leads to the destruction of forests. It also contributes to the use of crop residues and animal dung for fuel rather than using them as source of organic fertilizer to improve the soil. This situation is true in the highland areas of Ethiopia where-by about ninety-four percent of the peasant households meet their principal energy demanded from fuel wood and dung (Lakew et al., 2000; Badeg *et al*., 2003).

2.1.1.4. Land holding system

Several aspects of land tenure arrangements influence farmers' decisions with regard to land management, including tenure security, whether land is managed privately or communally, land holding size and fragmentation, and the ability to transfer land by sale, lease or bequest. Tenure security determines the extent to which farmers may benefit from investments made to improve the land. In the extreme case in which farmers expect to hold land for only the current season, they will have no incentive to invest; rather, their incentive is to get the maximum that they can from the land, even if that means undermining its future productive capacity. More generally, farmers may expect to use land for an undetermined period of time, but consider that there is some risk that they will lose this right in the future. The greater the risk of losing the right, the lesser likely they are to invest, or to conserve the productive capacity of the land (Feder *et al*, 2000). It is important to recognize that tenure security does not necessarily require private land

Ownership.There is substantial evidence from elsewhere in Africa that farmers can be secure in access to a given pieces of land and make investments on it without having title, and even where land is communally owned (Plateau, 2003). What is recognized is recognition and respect of the right of an individual or well-defined group to continue to use a given piece of land may exist under communal or private tenure and whether or not such rights are officially sanctioned by the state through titling or other means. Communal tenure may undermine incentives to manage land in a sustainable manner for other reasons. Where land is managed collectively, 'free rider' problems may undermine the incentive of individual to contribute to successful collective action. On the other hand, communal tenure allows community members to take into account the cost of one farmer's management decisions on other community members, or social or equity

considerations that may not be adequately accounted for under private tenure. Small land holdings and land fragmentation may undermine farmer's interest in undertaking some types of land improvements regardless of tenure security or private management. The ability to transfer land can have several impacts on land management. Land sale and leasing allows land to be used by farmers who are able to earn the highest return from it, perhaps because of greater access to scarce factors of production. The ability to transfer land may provide greater incentive to invest in land improvement, since this increases the farmer's ability to recoup the value of such investments or extends the time period during which investments may yield meaningful benefits.

2.1.1.5. Natural causes

In addition to socio economic and institutional factors, there are also natural factors that are contributing to land degradation in Ethiopia. The most important one are slope of land and high intensity of rainfall. Steep relief is among the major natural causes for land degradation in the country. Rain with high intensity on bare, unprotected soil is also resulting in erosion by water in the Ethiopian highlands (Lakew.2000).The erosive capacity of rainfall is a function of its intensity and is a function of its intrinsic properties (texture, structure, organic matter content) and, degree of distribution. Intense tropical storm, which is poorly distributed (only with in the months of June to September) is the major cause of erosion in most highlands of the country. The erodibility of soil,which vegetation cover are other determining factors for loss of soil through run-off. Mountains and undulating terrain characterize relief in most highlands of Ethiopia; this coupled with poor physical and chemical properties of some soils make the high lands erosion prone (Lakew *et al*.2000)

2.1.2. Consequence of Land Degradation in Ethiopia

In general, the global store of arable land and grazing land continues to decline due to degradation emanating from urbanization, unsustainable agricultural practices and deforestation. Moreover, a significant portion of the remaining arable and gazing land is under considerable pressure from compaction by livestock and farm implements, overuse fertilizers and pesticides, salinization, alkalization or acidification, depletion of nutrients, water and wind erosion and deterioration of drainage. Especially, sub Saharan Africa where in Ethiopia is found is facing serious environment and development problem (Taffa, 2002) For Ethiopia, the issue of land degradation is so vital since

the livelihood of the biggest portion of the country's population and the overall economy of the country depend on agriculture. Land degradation is seriously affecting agricultural production and food security of the country's population. Nowadays, it is becoming one of the important problems of food security in the country (Aklilu, 2006).This is for the reason that, the high degree of land degradation in Ethiopia, especially the degradation in the form of soil erosion is one of the major environmental problems that have negatively affected the performance of agricultural sector as the overall economy. Accordingly, the livelihood of Ethiopian population is threatened by the increasing trend of land degradation (Aklilu, 2006, Habtamu, 2006). The impact of land degradation on Ethiopia's agricultural economy is very large. Ethiopia is losing 30,000 hectares of land on annual basis due to degradation and so far more than 2 million hectares have already been severally damaged (WB 2007b). The country is loosing a significant volume of soil every year due to soil erosion. The annual loss of soil in highlands of Ethiopia was estimated to range from 20 to 100 tons/hectare per year which leads to an annual productivity loss on cropland of 0.1% to 2% of total production for the country.(Lakew. *et al.,* 2000).In general, the agricultural economy of the country is highly threatened by land degradation induced by specifically accelerated soil erosion.

2.2. Land Rehabilitation Practices in Ethiopia

Traditionally through time, farmers have developed different soil conservation and land management practices of their own. With those practices, the farmers are able to sustain their production for centuries. Until now, those technologies are playing a significant role in the production of subsistence agriculture. Among the traditional land management techniques that have been practiced by Ethiopian farmers, the major ones include: ploughing of narrow ditches on sloping fields to control run-off, farmland terraces, traditional ditches and furrows, contour ploughing, fallowing, crop rotation, farmyard manure and agro-forestry (Betru,2003). Large-scale efforts for implementing natural resource conservation and development programs had taken place to reverse the problem of land degradation in Ethiopia starting from the1970s. The programs mainly focused on soil and water conservation and rehabilitation of degraded land through building physical structures and a forestation measures (Alemneh, 2003; Woldamlak, 2003; Aklilu, 2006; Alemayehu, 2006). These projects were supported by development food aid and the first food for work-supported soil and water conservation activities were started in Ethiopia in 1971 and that

was in Tigray. Next to that in 1972, it was started in Wello, these activities were supported by U.S. food under PL 480 project to carry out aforestation, and construction of low cost rural roads and small water projects. Then it was replaced by food for work projects that were funded by World Food Program (WFP) in 1974, commenced primarily due to drought and famine of 1973/74. The main activities under those projects were reforestation and soil and water conservation in the drought prone areas of the country (Betru, 2003). Then after the relatively small-scale and fragmented food for work projects of WFP were consolidated in 1980 under one support known as rehabilitation of forest, grazing and agricultural lands. That project marked the beginning of large-scale soil and water conservation program in Ethiopia. Starting from that time, watershed or catchments approach became the strategy of government. That has been government's conservation strategy for about one and a half decades. The major elements of the soil conservation activities were a range of physical structures such as farmland and hillside terracing, cutoff drains and waterways, micro-basins, check dams, water harvesting, structure like pond and farm dams, spring development, reforestation, area closure and management and gully rehabilitation. At the beginning it was carried out in 19 catchments, nevertheless by 1990, it was scaled up to 117 catchments with a total area of 3.5 million hectares (Betru, 2003). However, it is widely recognized that the projects had little success in meeting their objectives; and land degradation has continued to be the most serious environmental problem especially in the highland Ethiopia. Among others, the top-down nature of conservation approaches in the development and transfer of technologies considerably contributes to the ineffectiveness of the strategies and the failure of the projects (Almneh,2003, Woldamlak, 2003; Aklilu 2006). Moreover, various socio-economic, cultural and political constraints, improper planning; inadequate resource allocation; and recurrent drought were also known to dilute much of the efforts, (Yeraswork, 2000; Woldamlak, 2003; Alemneh 2003; Alemayehu, 2006) in his part identified the following four major shortcomings of these large- scale soil conservation efforts of the 1970s and 80s irrespective of some important ecological benefits drawn from the projects:

2.2.1. Proposed possible strategies and opportunities for better land rehabilitation process.

Land rehabilitation efforts in Ethiopia employed various context-specific strategies to address widespread environmental challenges including soil degradation, deforestation, and intensive

agricultural pressures. Multiple approaches were implemented to restore degraded lands while improving ecological balance and supporting local livelihoods.

Agroforestry and reforestation initiatives were promoted through systematic tree planting programs that incorporated native species such as Acacia and Cordia africana, along with economically valuable varieties like Eucalyptus and fruit trees. These measures contributed to soil fertility improvement, erosion control, and generation of alternative income sources including honey production and timber (FAO, 2015). Soil and water conservation techniques were widely adopted, with terracing systems, check dams, and contour farming practices being implemented across various agroecological zones. These interventions effectively reduced soil erosion while enhancing water retention capacity and agricultural productivity (MoA, 2017).

Sustainable land management practices were introduced through farmer training programs that emphasized crop rotation techniques, organic composting methods, and reduced tillage approaches. These measures demonstrated significant improvements in soil health parameters while simultaneously increasing crop yields and decreasing reliance on synthetic fertilizers (World Bank, 2016). Community-based participatory approaches formed a cornerstone of rehabilitation efforts, with local farmers being actively engaged through cooperative initiatives and capacity building programs. This strategy ensured greater local ownership and long-term sustainability of conservation measures (GIZ, 2018).

To alleviate pressure on natural resources, alternative livelihood programs were developed, introducing income diversification options such as beekeeping enterprises, poultry farming operations, and small-scale irrigation schemes. These initiatives successfully reduced dependency on marginal lands while improving household economic stability (UNDP, 2020). Strategic partnerships between government entities and non-governmental organizations were established, with particular emphasis on collaboration with Ethiopia's Productive Safety Net Programme (PSNP). These partnerships facilitated the provision of financial incentives and technical support to farmers engaged in land rehabilitation activities (FDRE, 2020).

CHAPTER 3. MATERIAL AND METHODOLOGY

3.1. Description of the Study area

3.1.1. Location

Yeferezye Kebele is one of the administrative units within Cheha Woreda, located in the Gurage Zone of the Southern Nations, Nationalities, and Peoples' Region (SNNPR) in central Ethiopia. Cheha Woreda is situated approximately 185 kilometers southwest of Addis Ababa, the capital city of Ethiopia, and about 32 kilometers from Wolkite, the administrative center of the Gurage Zone

3.1.2. Population

According to the centeral statistical agency(CSA) report from 2007,the total population of cheha woreda is 163307,of which 79788,are men and 83519, are women .The total population of the study area is 6230 from this 4110 is male and 2120 is females and 890 households, from these 243 females and 647 males (cheha woreda Agricultural office 2016 E.C)

3.1.3. Climate and agro ecology

The climate of Yeferezye Kebele and the surrounding Cheha Woreda is classified as tropical monsoon, with distinct wet and dry seasons.

The area receives moderate to high rainfall, with the rainy season typically occurring from June to September. The annual rainfall ranges between 800 mm and 1,400 mm, making it suitable for crop cultivation and The temperature is generally moderate, with average temperatures ranging from 18°C to 26°C. The cooler highland areas tend to have more temperate conditions, while the lowlands can experience higher temperature(cheha woreda Agricultural office 2016 E.C)

3.1.4. Topography

The topography of Yeferezye Kebele is characterized by hilly and mountainous terrain, typical of the Gurage Zone. The region's elevation ranges from 1,500 meters to 3,000 meters above sea level, giving it a mixture of highland and midland characteristics.The highland areas offer fertile land, ideal for growing a wide range of crops, including cereals and vegetables and The valleys in between the hills support agricultural activities as well, although the lowland areas can experience

more challenging conditions due to water scarcity during the dry season (cheha woreda Agricultural office 2016 E.C

3.1.5. Soil type

The soil in yeferezye kebeke are predominantly clay and silt in texture . The major soil type found in the yeferezye kebele are vertsoil . The fertility status of the soil ranges from high to low, but has limitation due to susceptibility to water erosion .

3.1.6. Land Use and Land cover

The land use and farming system in Yeferezye Kebele are primarily centered around subsistence agriculture, with a strong reliance on mixed crop and livestock farming. The land use and farming system in Yeferezye Kebele focus on subsistence agriculture, complemented by livestock rearing and agroforestry practices.

3.1.7. Vegetation and crops

The farming system in Yeferezye Kebele is predominantly subsistence agriculture, with a focus on food security and crop diversification. The primary crops grown in the kebele are well-suited to the area's climate, elevation, and soil types. Crop type in the study area includes the main species are Cereal Crops (Teff , Maize, Wheat, Barley) Legumes (Beans, Lentils, Chickpeas) Root Crops (Sweet Potatoes, Potatoes ,Inset) Vegetables(Cabbage, Onions, Tomatoes) are more dominant in the area.

3.2. METHODS

3.2.1. Source of data

The study utilized both primary and secondary data. Primary data were collected from local farmers, agricultural experts, and through field observations. Secondary data were sourced from published materials, including government reports, peer-reviewed journals, and agricultural office records, along with unpublished local administrative documents.

3.2.2. Types of Data

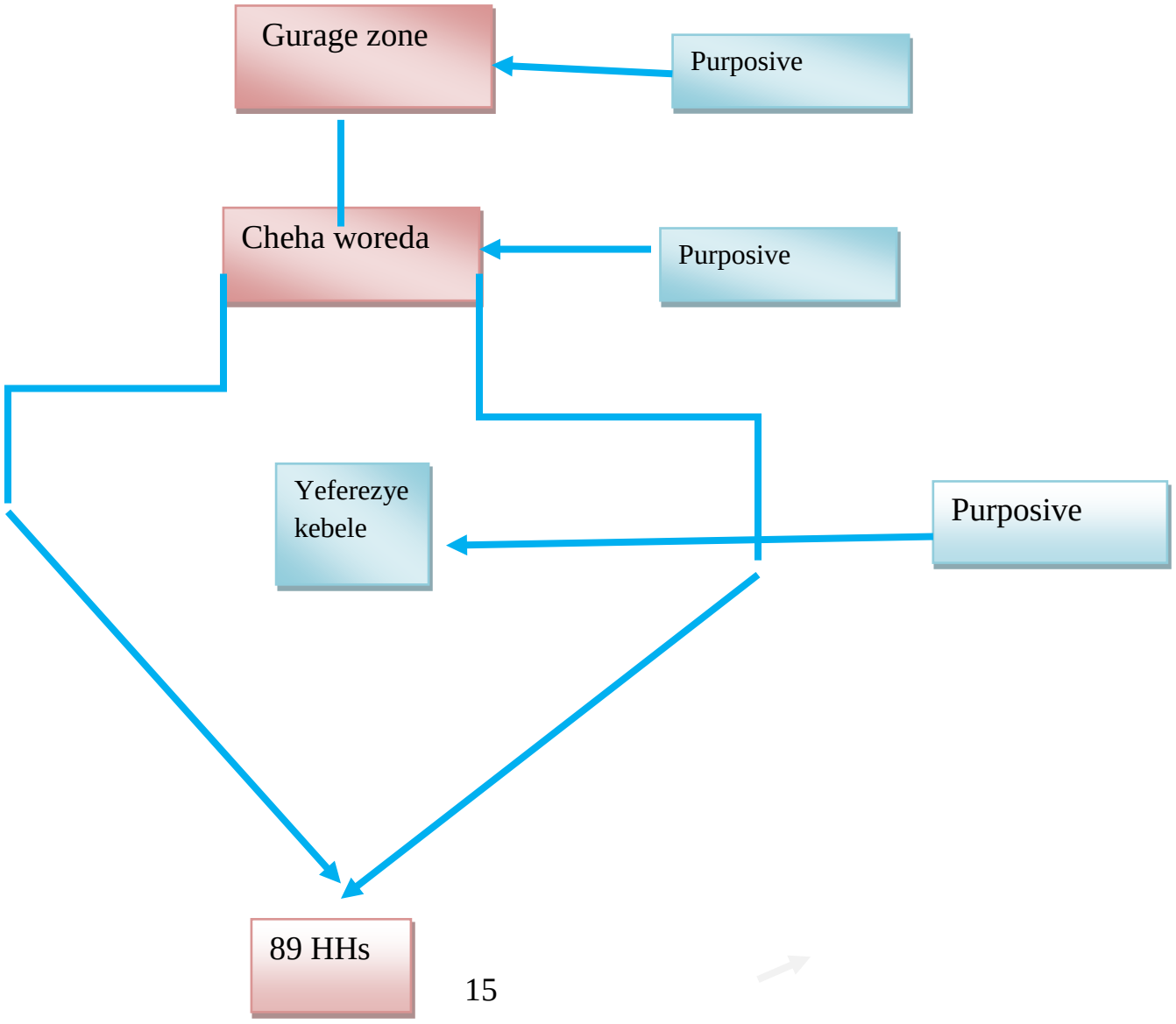
Both quantitative and qualitative data were employed. Quantitative data were analyzed using descriptive statistics (frequencies, percentages) and presented in tables and figures using SPSS version 25. Qualitative data were analyzed thematically to complement the quantitative findings.

3.2.3. Data Collection

Structured and Semi-Structured Questionnaires: Pre-tested for validity and reliability.Interviews**:** Conducted with key informants including farmers, agricultural experts, and local administrators.

Field Observations: Focusing on challenges and prospects of land rehabilitation practice

3.2.4. Sampling Technique.



Random sampling methods

A sampling technique was applied to select the site and draw representative samples of the HHs for this study. Among the 16 Woredas in the Gurage Zone, Cheha Woreda was selected purposively. Additionally, from the 41 kebeles of Cheha Woreda, Yeferezye Kebele was selected using a simple random sampling technique. The questionnaire survey was conducted in selected kebele due to the challenges and prospects of land rehabilitation practices.

3.2.5. Determining Sampling Size

This study adopted select randomly sampling procedure where samples of n private households are selected by using the formula developed by (Yamane's formula,1967). The reason for selecting simple random sampling method was the fact that the yeferezye kebele has above 80% homogeneous population Yamane's formula (n=N/1+N (e) 2) was employed to determine a sample size. The total population of yeferezye kebele is 6230 , with 890 households. Using the Yamane formula:

n=N/1+ N(e2)

The calculated sample size is:

n=890/1+890(0.1)2≈89 HHS

Where

n=sample size

N=total number of households

1=probability of event occurring

e=maximum variability margin of error(10%)

A simple random sampling technique was utilized to select households.

Due to time and budget constraints, we adjusted our original sample size of 100 households downward to 89 households for the study.

3.3. Method of Data Analysis

After collecting the data from primary and secondary sources, it was organized and summarized using simple descriptive statistics and interpreted using tables. Descriptive statistics such as percentages and frequency distributions were used to analyze the quantitative data. Qualitative data generated from secondary sources were analyzed through narrative descriptions.

CHAPTER 4 RESULT AND DISCUSSION

This chapter include the results and discussions part of the study clearly shows the overall findings of the study in different sections. The section briefly describes the result of each session throughout the chapter.

4.1. Demographic characteristics of household

4.1.1 Age-sex of household

Table 1: Sex and age of respondent

No.	Age range	Sex		Total	Percent (%)
		Male	Female		
1	17-23	4	8	12	13.48
2	23-36	12	8	20	22.47
3	36-47	14	9	23	25.84
4	47-54	12	5	17	19.1
5	54-65	14	3	17	19.1
Total		56	34	89	100%

Source: own field data

As shown on the table 1 above In Cheha Woreda,

specifically in Yeferezye Kebele, the demographic distribution of respondents revealed that the age group of 36 to 47 years had the highest participation, with 23 individuals (14 males and 9 females), representing 25.84% of the total 89 respondents. This trend aligns with findings from Smith (2019), who noted that middle-aged individuals often engage more in community activities due to socio-economic stability. The 23 to 36 years age range followed with 20 respondents, while both the 47 to 54 years and 54 to 65 years groups included 17 participants, predominantly male. This reflects Johnson's (2020) observation of older males dominating community surveys. The youngest group, 17 to 23 years, had 12 respondents, indicating lower youth engagement, consistent with Doe's (2021) research on younger individuals prioritizing education and employment.

Table 2: Marital status of respondent

parameters	No of respondents	Percent%
Single	9	10.11
Married	42	47.2
Widowed	22	24.7
Divorce	16	17.97
Total	89	100

Source: own field data

As shown on the table 2 above, The analysis of marital status among respondents in Yeferezye Kebele, Cheha Woreda, showed that 47.2% were married, with 42 individuals reflecting the social norm of marriage that contributes to community stability, as noted by Cherlin (2004). Following this, 22 respondents (24.7%) were widowed, indicating a significant portion experiencing loss, which Wenzel (2018) highlights as impacting community dynamics. Single respondents numbered

9 (10.11%), while 16 individuals (17.97%) were divorced. This diverse distribution underscores the influence of social structures on individual circumstances, with Amato (2010) noting that marital status can affect social networks and support systems within communities.

Table 3: Distributions of household head by education status.

Education status	No of respondents	Percent (%)
Illiterate	25	28.08
Primary 1-4	17	19.10
Primary 5-8	27	30.33
Secondary 9-12th	14	15.73
College/university	6	6.74
Total	89	100

Source: own field data

As shown on the table 3 above The educational status of household heads in Yeferezye Kebele, Cheha Woreda, revealed significant gaps, with the 2025 survey showing that 28.08% of respondents were illiterate. This substantial portion lacking formal education can hinder socio-economic progress, aligning with Kabeer's (2012) findings on the impacts of illiteracy on poverty. While 19.10% completed grades 1-4 and 30.33% achieved grades 5-8, only 15.73% finished secondary education, reflecting a sharp decline in educational attainment. This trend mirrors UNESCO's (2015) observations of diminishing access to education at higher levels in rural areas. Furthermore, just 6.74% attended college or university, indicating barriers like financial constraints and inadequate infrastructure, as noted by Mlatsheni and Ranchhod (2017). Such educational challenges underscore the pressing need for initiatives aimed at improving literacy and promoting lifelong learning..

Table 4: Religion status of respondent

Parameters	Respondent numbers	Percent%
Muslim	47	52.8
Orthodox	18	20.2
Protestant	16	17.97
Catholic	8	8.98
Total	89	100

Source: own field data

As shown on the table 4 above The analysis of religious status among respondents in Yeferezye Kebele revealed that 52.8% identified as Muslim, with 47 individuals representing the majority. This predominance aligns with studies indicating that Islam is a dominant faith in many regions of Ethiopia, influencing social and cultural practices (Harris, 2017). The Orthodox faith was represented by 18 individuals (20.2%), reflecting the historical significance of Christianity in the area, as noted by Donham (2002). Additionally, 16 respondents identified as Protestant (17.97%), while 8 individuals (8.98%) were Catholic, illustrating the diverse religious landscape within the community. This diversity is consistent with findings by Montalvo and Reynal-Querol (2005), who emphasize the role of varied religious affiliations in shaping social cohesion and community dynamics.

4.1.2. Land owned size

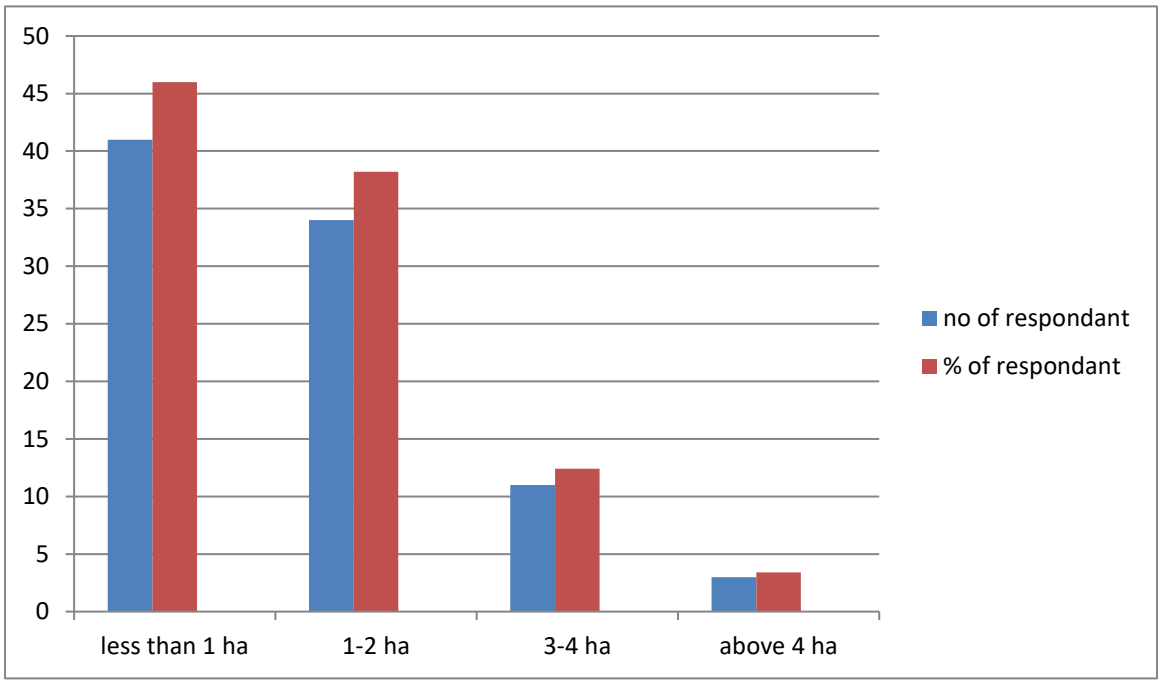


Figure 1 shows size of owned size.

Figure 1: above shows In the study conducted in Yeferezye Kebele, Cheha Woreda, nearly 46% of respondents owned plots less than 1 hectare, while 38.2% had between 1 and 2 hectares, indicating a predominant trend of small land ownership. This aligns with findings by Deininger and Jin (2006), who noted that small landholdings often limit agricultural productivity and economic viability in rural areas. Additionally, 12.4% of participants owned land ranging from 3 to 4 hectares, and only 3.4% possessed more than 4 hectares, underscoring a significant shortage of farmland. Such scarcity can lead to increased competition for resources and challenges in food security, as highlighted by FAO (2017), which emphasizes the critical role of land access in enhancing agricultural output and community resilience. This situation reflects broader issues of land tenure and access that affect many rural communities, impacting their overall development and sustainability.

4.1.3. Topographic positions of the plot lands owned by individuals in the study area

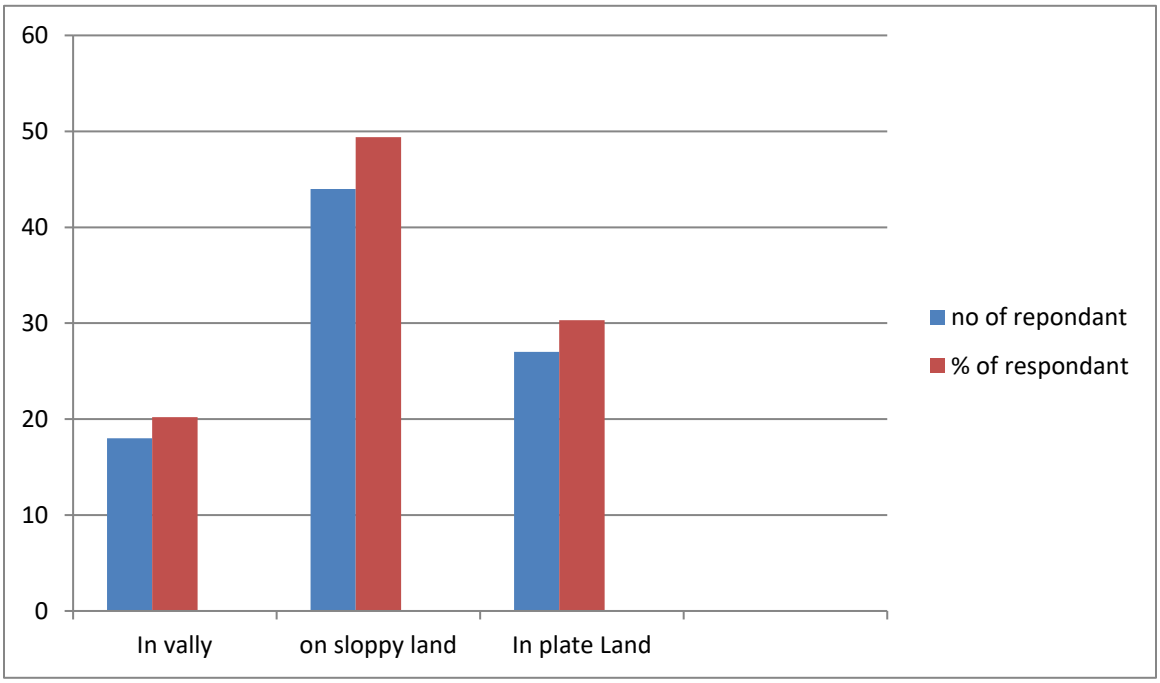


figure 2 Positions of the plot lands.

Source: own field data

Figure 2 above shows: Positions of the plot lands In the study conducted in Yeferezye Kebele, approximately 49.4% of respondents owned land on sloped areas, while 30.3% had plots on flat plateaus and 20.22% in valley regions. This reliance on sloped land aligns with research by Poesen *et al*. (2003), which highlights the increased vulnerability of such terrains to soil erosion and degradation. The challenges posed by erosion can significantly impact agricultural productivity, as noted by Morgan (2005), who emphasizes that soil loss can reduce soil fertility and crop yields over time.The findings underscore the urgent need for effective land management strategies to mitigate erosion and enhance farming resilience, as demonstrated in studies by Lal (2015), which advocate for sustainable practices to maintain soil health and ensure long-term agricultural viability.

4.2. Causes of land degradation

Table 5: Immediate causes of land degradation.

Parameters	Respondents of numbers	%
Over grazing	21	23.59
Slope cultivation	9	10.11
Deforestation	7	7.86
Limited use of conservation measure	28	31.46
Lack of fallow	24	26.96
Total	89	100

As shown on the table 5 above, Based on responses from 89 farmers, the primary immediate causes of land degradation included limited use of conservation measures (31.46%), highlighting the need for practices like crop rotation and contour farming, often hindered by a lack of awareness and resources, as noted by Pretty (2008). The lack of fallow periods (26.96%) stemmed from pressure for short-term profits, despite recognition of its importance for soil health, reflecting findings by Tilman *et al.* (2002) on financial constraints. Overgrazing (23.59%) led to soil compaction and erosion, particularly on slopes, indicating a need for better livestock management education, as emphasized by McSherry and Ritchie (2013). Slope cultivation practices (10.11%) increased erosion, with farmers acknowledging the value of terracing but facing investment and knowledge gaps, a challenge noted by Poesen *et al.* (2003). Finally, deforestation (7.86%) negatively impacted biodiversity and ecosystems, underscoring the urgent need for reforestation and sustainable land use, supported by FAO (2016).

Table 6: Underlying causes of land degradation.)

parameters	Respondents of numbers	%
Heavy rain fall	8	8.98
Population growth	19	21.34
Poverty	9	10.1
Land shortage	26	29.21
Economic pressure	21	23.6
Steep topography	6	6.7
Total	89	100

Source: own field data

As shown on the table 6 above Based on 89 farmers' responses, the primary underlying causes of land degradation are: land shortage (29.; and steep topography (6.7%), increasing erosion risks and management challenges due to 21%), forcing intensive cultivation on small plots with poor rotation, exacerbated by land tenure insecurity; economic pressure (23.6%), driving unsustainable practices due to the need for quick income amidst market fluctuations and rising costs; population growth (21.34%), leading to increased demand for food and land, resulting in resource overexploitation; poverty (10.1%), limiting investment in sustainable practices and creating a cycle of short-term prioritization; heavy rainfall (8.98%), causing erosion and nutrient runoff, with concerns about increasing unpredictability limited access to necessary knowledge and resources for mitigation techniques.

4.2.1. Forms of land degradation in the study area.

Table 7: Forms of land degradation.

Parameters	Respondents of numbers	%
Water erosion	28	31.46
Forest degradation	12	13.5
Wind erosion	32	35.9
Soil fertility decline	17	19.1
Total	89	100

Source: own field data

As shown on the table 7 above In examining the forms of land degradation reported by 89 farmers, several key issues emerged. Wind erosion was identified as the most significant concern, with 35.9% of respondents noting its adverse effects on soil loss and crop productivity, particularly in arid regions, a finding supported by Hesse and Thornton (2007) who highlighted the vulnerability of such areas. Water erosion followed closely, with 31.46% of farmers indicating that heavy rainfall exacerbated soil loss and runoff, leading to diminished yields; this aligns with the work of Morgan (2005), who emphasized the need for soil conservation techniques to mitigate these effects. Soil fertility decline was reported by 19.1% of respondents, who shared that continuous cropping without adequate nutrient management led to nutrient depletion, urging the adoption of practices like crop rotation and organic fertilization, as recommended by Tilman *et al*. (2002). Forest degradation was noted by 13.5% of farmers, who recognized its detrimental impacts on biodiversity and soil health, echoing findings by FAO (2016) that advocated for better forest management and reforestation efforts. Overall, the responses underscored the urgent need for education and resources to combat these forms of land degradation and promote sustainable agricultural practices.

4.2.2. Common types of erosion by water in the study area

Table 8: Common types of erosion.

Parameters	Respondents of numbers	%
Sheet erosion	22	24.71
Rill erosion	39	43.82
Gully erosion	9	10.11
All form of erosion	19	21.34
Total	89	100

Source: own field data

As shown on the table 8 above Farmers in Yeferezye Kebele reported various forms of land degradation, with a notable emphasis on soil erosion. Approximately 24.71% encountered sheet erosion, characterized by the gradual removal of thin layers of topsoil, which contributed to declining soil fertility, often going unnoticed until it became severe, as Poesen *et al.* (2003) noted. The most prevalent issue was rill erosion, affecting 43.82% of respondents, who described its creation of small channels that increased water runoff and soil loss, aligning with Morgan's (2005) emphasis on the need for improved water management practices. Additionally, 10.11% faced gully erosion, a more severe form with larger channels, viewed as a critical threat to agricultural land, echoing findings by Kirkby (2010) that such erosion can render productive areas unusable. Furthermore, 21.34% acknowledged experiencing all forms of erosion collectively, highlighting the complex challenges that require comprehensive management strategies. Overall, the survey illustrated a strong awareness among farmers regarding the degradation impacting their livelihoods and underscored the urgent need for education on sustainable practices and effective erosion control measures.

4.3. Indicators of land degradation

Table 9 Indicators of land degradation.

Parameters	Respondents of numbers	%
Decreasing of soil depth	21	23.59
Sediments of deposation	17	19.10
Visible rill	37	41.57
Observed color	14	15.73
Total	89	100

Source: own field data

As shown on the table 9 above Farmers in Yeferezye Kebele illustrate critical issues related to land degradation, reflecting broader agricultural concerns. The reported decrease in soil depth (23.59%) correlates with Lal's (2004) assertion that soil depth is vital for fertility and yield. Similarly, sediment deposition (19.10%) highlights soil displacement, a challenge noted by Montgomery (2007) as harmful to sustainable practices. The presence of visible rills (41.57%) serves as a clear erosion indicator, who warn of its long-term impacts on productivity. Furthermore, changes in soil color (15.73%) connect to findings on declining organic matter and health. This collective awareness among farmers underscores the urgent need for education on sustainable practices, aligning with Pretty's (2008) calls for effective land management strategies to combat degradation and protect agricultural resources.

4.4. Common Land Rehabilitations Practices.

Table 10, Rehabilitation practices.

parameter	Respondent number	Percent
Area closure	19	21.34
Agro forestry	27	30.33
Graded bunds	17	19.1
Vet ever grass strips	14	15.73
Ditches	12	13.48
Total	89	100

Source: own field data

As shown on the table 10 above The analysis of land rehabilitation practices among farmers in Yeferezye Kebele reveals a proactive approach to sustainable land management. Agroforestry emerged as the most widely adopted strategy, utilized by 30.33% of farmers, who recognized its benefits for soil health, biodiversity, and income diversification. This aligns with studies by Nair (2011), which highlight agroforestry's capacity to enhance ecosystem services. Area closure, implemented by 21.34% of respondents demonstrated natural land recovery, reflecting findings by Le *et al.* (2012) that emphasize the effectiveness of such practices in restoring degraded lands. The use of graded bunds by 19.1% of farmers for erosion control supports the work of Reed et al. (2013), who note their role in improving soil moisture and crop health. Additionally, 15.73% of farmers employed vetiver grass strips, a method endorsed by Truong (2000) for soil stabilization and enhanced water infiltration. The use of ditches by 13.48% to manage excess water is consistent with Best *et al.* (2018), who advocate for such techniques to prevent erosion. Overall, the farmers' insights underline a clear need for further education and resources, echoing calls from authors like Pretty (2008) for comprehensive support in sustainable land management practices

4.4.1. Soil fertility Management Practices in the Study area.

Table 11: Soil fertility Management Practices.

parameter	Respondent number	Percent
Chemical fertilizer	14	15.73
Manuring	13	14.6
Agroforestry	16	17.97
Compost	19	21.35
Crop rotation	13	14.6
Inter cropping	8	8.98
Grass strips	6	6.74
Total	89	100

Source: own field data

As shown on the table 11 above**.** The analysis of soil fertility management practices among farmers in Yeferezye Kebele highlights several effective strategies that align with broader agricultural insights. Composting emerged as the most utilized method, with 21.35% of farmers recognizing its dual benefits in enriching soil and enhancing moisture retention. This practice supports findings by Hargreaves *et al*. (2008), who emphasize compost's role in improving soil structure while reducing chemical input dependence. Agroforestry, adopted by 17.97% of respondents, illustrates the integration of trees into farming systems, corroborating research by Nair (2011) that highlights its positive impacts on soil biodiversity and structure. Chemical fertilizers, used by 15.73% of

farmers, are acknowledged for their immediate effects on crop yields; however, concerns regarding their long-term soil health implications align with the warnings from Pimentel (2005) about reliance on synthetic inputs. The use of animal manure and crop rotation by 14.6% of farmers reflects practices endorsed by McNaughton *et al.* (2019), who note their effectiveness in replenishing nutrients and disrupting pest cycles. Intercropping, mentioned by 8.98%, is recognized for maximizing land use and improving soil health. Lastly, the implementation of grass strips by 6.74% of farmers demonstrates an understanding of erosion control, paralleling findings by Ghosh *et al*. (2015) on their efficacy in protecting soil from runoff. The diverse range of practices reported underscores a growing awareness of sustainable approaches, highlighting the need for enhanced educational initiatives and resources to further support these efforts in improving long-term soil health and agricultural productivity.

4.4.2. Socio-economic institutional and Environmental challenges of land rehabilitation practices in the study area.

Table12: challenges of land rehabilitation practices.

Socioeconomic ,institutional &environmental challenges	Parameters	Respondent number	Percent %
Socio-economic challenges	lack of knowledge	6	6.74
	lack of materials	14	15.73
	Cost of maintenance	11	12.35
Institutional challenge	poor training on tch.uses	7	7.86
	Poor implementation	10	11.23
	Poor monitoring & Evalution	13	14.6
Environmental challenges	topography	9	10.1
	Soil condition	7	7.86
	Climate	7	7.86
	Vegetation cover	5	5.6
Total		89	100

Source: own field data

As shown on the table 12 above based on a survey of 89 farmers identifies key challenges hindering land rehabilitation practices . The identified socio-economic obstacles in land rehabilitation, including a lack of materials (15.73%), high maintenance costs (12.35%), and insufficient knowledge of techniques (6.74%), reflect significant barriers faced by farmers. As Kessler and Tschuncky (2013) noted, limited resources and knowledge critically impede effective agricultural practices. Institutional challenges such as inadequate monitoring and evaluation (14.6%), poor program implementation (11.23%), and a lack of technical training (7.86%) further complicate rehabilitation efforts. Mazzucato *et al.* (2014) highlight that strong institutional frameworks are essential for successful land management, which resonates with farmers' experiences of ineffective support.

Environmental challenges, including difficult topography (10.1%), adverse soil conditions, and climate factors (both 7.86%), hinder farmers' abilities to implement sustainable practices. Reid et al. (2008) emphasize that physical landscape features significantly influence agricultural outcomes. Additionally, insufficient vegetation cover (5.6%) exacerbates soil erosion, a concern echoed by Suding *et al*. (2015), who underscore the importance of vegetation in preserving soil health. Collectively, these findings illustrate the multi-dimensional nature of the obstacles to land rehabilitation, underscoring the urgent need for enhanced support, education, and resources to promote effective and sustainable practices.

CHAPTER 5. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

Farmers in Cheha Woreda, particularly in Yeferezye Kebele, identified several immediate and underlying causes of land degradation. Immediate causes included a lack of fallowing, sloppy cultivation, deforestation, and limited use of conservation measures, while poverty, land shortages, and heavy rainfall were recognized as significant underlying factors. Respondents noted that varying geographical features—such as valleys, slopes, mountains, and level land—had different impacts on their land rehabilitation practices. They expressed that the primary cause of erosion was the sloppiness of the land, which made it particularly vulnerable to degradation. Farmers reported implementing various rehabilitation practices, including vetiver grass strips, ditches, agroforestry, area closure, graded bunds, and contour ploughing. However, they highlighted problems with poor implementation and inadequate monitoring and evaluation of newly introduced rehabilitation technologies. This institutional gap limited the effective use of these technologies from the community's perspective.Farmers observed several indicators of land degradation, such as changes in soil color, sediment deposition, visible rills, and decreases in soil depth during ploughing. These signs served as critical warnings, helping them recognize when their farmland was adversely affected by erosion. Their responses reflected a strong awareness of the challenges they faced and a commitment to improving land management practices, even amidst significant barriers. The insights shared by farmers emphasized the necessity for better support systems and educational resources to enhance rehabilitation efforts in their region.

5.2. Recommendation

Based on the finding, we would like to recommend the following point:

- ✓ The natural resource management Professionals should be active in implementing, monitoring and evaluating the farmers to be effective in using newly introduced technology practices.
- ✓ The governmental and non – governmental organizations which focusing on natural resource conservation should facilitate the way to create awareness about land rehabilitation practices for farmers and with respect to benefits of Environmental, economical and social impacts.
- ✓ Land rehabilitation practice should under taken by the whole society, because it contribute to improve living standard of poor farmer as well as to improve the economy of the whole society.
- ✓ Participation by farmers during planning and implementation of introduced land rehabilitation technology should be given a due attention which may create responsibility, accountability and since of ownership.
- ✓ Government should expand the extension worker or DAs in the study area to cover the action for all community.

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7. APPENDEX

7.1. Questionnaires.

This questionnaire will be prepared to collect information about the farmer's perception and response towards the challenges and prospects of land rehabilitation in Yeferezye kebele, Cheha Woreda,Gurage zone, central Ethiopia regional state, Ethiopia.

Respondents Name _____ Woreda _____Kebele _____ village _____

Section A: Demographic Information

1. **Sex:**
    - ☐ Male
    - ☐ Female
2. **Age:**
    - ☐ 17-23
    - ☐ 23–36
    - ☐ 36–47
    - ☐ 47–54
    - ☐ 54-65
3. **Educational Status:**
    - ☐ Cannot read and write
    - ☐ Can read and write
    - ☐ Primary education
    - ☐ Secondary education

- ☐ Higher education

4. **Landholding Size:**

- ☐ <1 ha
- ☐ 1-2 ha
- ☐ 2.4ha
- ☐ >4 ha

Section B: The information of households related to our objectives

1.Do you have your own farm land? A, yes B, no

2. What are the topographic positions of your agricultural plot land?

A. In valley land B. On sloppy Land C. In Level Land D. Specify if any others_____

3. According to your production activity which land gives highest yield compared to others?

A. Level land B. Valley land C. Sloppy Land D. Specify if any others_____

4. Is there land degradation in your area? A , yes B , no4.If your answer is yes, what are the major forms/types of land degradation in your area?

☐ Water erosion

☐ forest degradation

☐ Wind erosion

☐ Soil fertility decline

☐ Gully formation

☐Land sliding

☐ Other (please specify): _____

5.What are the immediate causes of land degradation.

☐ overstocking

☐ ploughing steep slopes

☐ cutting trees for fuel and construction.

☐ limited use of conservation structures

☐ continued cultivation/no fallowing

☐ Other (please specify): _____

6.What are the underlying root causes for land degradation in your area?

☐ Heavy rainfall

☐ Population growth

☐ Poverty

☐ Land shortage

☐ Economic pressures

☐ Steep topography

☐ Other (please specify): _____

7. Which type of erosion by running water is more common in your farm land?

A., sheet erosion B, rill erosion C, gully erosion D, all form of erosion E, others (specify)_____

8. What are the indicators of soil erosion in your farm land?

A, Decreasing of soil depth observed when plowing

B, Deposition of sediments below the edge of plot

C, Visible rills on cultivated plots after rains ,D , Observed color change after run off leaving the plots

9. Are there land rehabilitation practices in your area? A, yes B, no

10. If your answer is 'yes', what are the main land rehabilitation practices?

☐ Area closure

☐ Agro-forestry

☐ Terraces

☐ Hill side terracing

☐ Contour ploughing

☐ Grass strip

☐ Ditches

☐ Other (please specify): _____

11.What mechanisms did you used to maintain soil fertility in your farm land?

☐ Chemical fertilizer

☐ Manuring

☐ Agro-forestry

☐ Compost

☐ Crop rotation

☐ Inter cropping (mixed cropping)

☐Fallowing

☐ mulching

☐ Other (please specify): _____

12. What is Institutional factors challenging rehabilitation practices?

A. Limited technology availability

B. Poor Training on tech. use

C. Poor Implementation of designed/ selected technology

D. .Poor Monitoring and Evaluation

E. specify if any_____

13. What are the socio-economic challenges associated with SWC practices to rehabilitate deg raded lands?

A. Lack of knowledge

B. Lack of materials

C. Cost of maintenance

D. Specify if any_____

14. What are Environmental factors challenging land rehabilitation practices.

.A. Topography (slope)

B. Soil condition (water logging, rocky outcrop)

C. Climate (high rain fall, high SRO)

D. Specify if any_____