



WOLKITE UNVERSITY

COLLAGE OF SOCIAL SCIENCE AND HUMANITY

DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

**ASSESSMENT OF INDIGENOUS SOIL CONSERVATION
PRACTICES, THE CASE JIDA WOREDA NORTH SHEWA ZONE;
ETHIOPIA.**

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MAY, 2023

WOLKITE, ETHIOPIA

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DECLARATION OF THESIS

This research is a presentation of our original research work. Whenever the contribution of others are involved, every effort is made to indicate this clearly, with due reference to the literature; information derived from the published or unpublished work of others has been acknowledge in the text and a list of reference is given. And we declare that this paper has not been submitted in any form for another degree or diploma at any university or other institutions of tertiary education.

AKNOWLEDGMENT

First of all, we would like to give thank our heartfelt gratitude to God who enabled our to accomplish our work successful. Secondly we would like to our deepest grateful thanks to our Adviser Fekadu (MA) for her helpful comment on this study from beginning to end. Thirdly also would like to express my gratitude to our class friends and also relatively who have been beside our throughout our work by providing moral support .Finally we would like to express our deepest gratitude to all respondents, Arebsa Chifara Keble agricultural and development office for her commitment giving the necessary information that helps forth success of this study.

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Acronyms and Abbreviations

NSHJWADO:	North Shewa Jida Woreda Agricultural Development Office.
FAO:	Food and Agricultural Organization.
GDP:	Gross Domestic Product.
DA:	Development Agent.
ORS	Oromia Regional State.
CSA:	Central Statistical Agency..
NGO:	None Governmental Organization.
MOA:	Ministry of Agriculture.
FGD:	Focus group discussion.
KII:	Key Informant Interviews.
ISC:	Indigenous soil conservation.

ABSTRACT

Soil conservation is the anticipation of loss of the topmost layer of the soil from erosion. Erosion is the main problem of agricultural soil. Seventy five billion tons of are eroded every year from arable lands worldwide. Soil conservation practices are alternative methods in preventing soil loss. Hence, the objective of this study was to assess indigenous soil conservation in the study area. Arebsa Chifara kebele was purposively selected based on soil conservation potentials. Two hundred eight five (285) respondents were randomly selected from the total farming household for the interview. Semi structured questionnaires were used to collect data about respondents demography, soil conservation measures and maintenance of soil fertility. The highest 34.4% respondents practiced contour plowing as erosion control measures and 52.6% use inorganic and 31.6% organic fertilizers to maintain soil fertility. The highest (36.8%) use compost and the lowest (14%) use crop residue as organic source of soil fertility maintenance .Peoples demographic features and indigenous soil conservation practices contributes much to soil conservation to maintain soil fertility. Hence, assessing indigenous soil conservation practices helps to know to what extent farmers use them and how effective those measures in conserving soil. Therefore, indigenous soil conservation is an important measure to protect soil erosion and needs to be used wisely.

Key words: Soil erosion, indigenous soil conservation,

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Soil is one of the most important natural resources where the crops are grown and the environment in which the living things survive (Busari *et al.*, 2015). Soil provides humanity with 98.8% of its food and a broad range of other services, from carbon storage and greenhouse gas regulation to flood mitigation and providing support for our sprawling cities (Kopittke *et al.*, 2019). Rapid human population growth coupled with increasing consumption is placing unprecedented pressure on soils through the intensification of agricultural production, the increasing of crop yield per unit area of soil. Indeed, the human population has increased from 250 million in the year 1000, to 6.1 billion in the year 2000, and is projected to reach 9.8 billion by the year 2050(Kopittke *et al.*,2019). This increasing human population and the current intensification of agricultural practices is already resulting in the unsustainable degradation of soils(Kopittke *et al.*,2019).Major forms of this degradation include the loss of organic matter and the release of greenhouse gases, the over-application of fertilizers, erosion, contamination, acidification, salinization, and loss of genetic diversity. Land degradation caused by soil erosion is the most chronic problem in Ethiopian highlands (Biratu, and Asmamaw,2016).

Like in the other parts of Ethiopia, land degradation in the form of soil erosion, deforestation and intensive traditional cultivation have been a serious problem in the North Shewa particularly in Jida district. This observable fact has highly affected the sustainability of agricultural production and economic development of smallholder farmers in the area. Local peoples have been applying their indigenous to reduce these problems in the area. The various traditional land management systems have undergone unprecedented changes in soil conservation (Assefa and Hans- Rudolf, B., 2016).There for the objective of this study is. Soil conservation practices are categorized into two broad groups: traditional (indigenous) and improved (introduced) practices. Whatever the measures might be, these measures aim to control runoff, harvest water, reduce soil erosion, and improve soil fertility,in the Arebsa Chifara *Kebele*.

1.2. Statement of the problem.

The main soil problem that affects agricultural soil fertility in Ethiopia is erosion accelerated by rapid population growth, cultivation on steep slopes, clearing of vegetation, and overgrazing (Tamene and Vlek, 2008). The annual rate of soil loss in the country is higher than the annual rate of soil formation rate. Annually, Ethiopia loses over 1.5 billion tons of topsoil from the highlands due to erosion which could have added about 1.5 million tons of grain to the country's harvest (Tamene and Vlek, 2008). This indicates that soil erosion is a very serious threat to food security of people and requires urgent management intervention. Farming communities have been practicing different soil conservation activities obtained through experience and indigenous to reduce the soil erosion. In 2009 to 2014 there is indigenous soil conservation practices in Arebsa Chiara kebele. Before that there is no indigenous soil conservation practices. Hence, this study was to assess the gap between indigenous soil conservation practices in the study area.

1.3. Objectives of the study

1.3.1. General objective

- To assess indigenous soil conservation measures and to investigate how local peoples have to improve and using the indigenous soil conservation practices (ISCP) measures in North Shewa in Jida Woreda in Arebsa Chifara *Kebele*.

1.3.2. Specific Objectives

- To identify the indigenous soil conservation practices in Jida Woreda, Arebsa Chifara *kebele*.
- To assess the opportunities for implementation and indigenous soil conservation practices in North Shewa in Jida Woreda, Arebsa Chifara *kebele*.
- To determine the challenge of implementation indigenous soil conservation practices in North Shewa in Arebsa Chifara *kebele*.

1.4. Research question

This study tried to answer the following question

- What are the indigenous soil conservation practices in the study areas?
- What are the opportunities for the implementation indigenous soil conservation practices in the North Shewa Jida Woreda in Arebsa Chifara kebele?
- How to determine the challenge for the implementation indigenous soil conservation practices in the North Shewa Jida Woreda in Arebsa Chifara kebele?

1.5. Significance of study

Conservation of natural resource such as soils has been the major concern of the Ethiopian. Due to poor management and integration of soil conservation practice, growth in the number of fed and proportionally low production and productivity led to alarming rates of soil erosion. The study was identified the various indigenous soil conservation practices and modification ever made and modification effect is analyzed on selected area. It was also assessed the farmers perception towards modification, maintenance and integration of indigenous and improved soil conservation practices. Hence, the findings of the study could necessarily contribute to achieve sustainable land management; the integration of indigenous measures with improved conservation technologies through modifying indigenous ones. As a result, policy makers, experts and development agents must built improved indigenous soil conservation practices its ground on the baseline of indigenous practices is benefit from the study. Finally, the study would have been a long-term benefit for those who are interested to know about the several of indigenous soil conservation practices. Therefore, this study is so significant, which assessed and identified the ISC practices, and the improvement effect of practices in reducing soil loss and improving crop land productivity in Arebsa Chifara *Kebele*.

1.6. Scope of the study guide

Since it is not possible to cover the whole aspects of the study area with the available time and resources, it is advisable to limit the study size and scope of the problem to a manageable size. Hence, the study was conducted on Arebsa Chifara *Kebele* soil conservation practices. The findings of the study can be extended to other areas exhibiting similar agro-ecological of indigenous soil conservation practices problem and socio-economic situation with certain level of adjustment.

1.7. Limitation of the study

Different constraints affect the quality of the study. To carry out this study, only one kebele would be selected from the total of 18 *kebeles*, 1000 households were taken as sample of the study which is relatively low in relation to total size of population. All these are limited because of time finance and distance constraints. These may cause some bias on quality of the results when conducting at Woreda level. The second limitation is unavailability some if the relevant local officials and experts at the time of the survey are expecting to create gaps on the information. Despite all these constraints, the researchers would be used various techniques to minimize the negative impacts from the constraints. One of these techniques is triangulation of information from various sources.

CHAPTER TWO

LITERATURE RE VIEW

2.1. Soil erosion.

Soil, the most basic of all resources, is the essence of all terrestrial life and cultural heritage but it was sentenced to erosion by natural and human-induced factors, and it is non-renewable over the human timescale (Lal, 2015). The definition of soil erosion given by the American Soil conservation Association is that soil erosion is the land surface abrasion or the dispersion and removal of soil and rock debris by water, wind, ice, or gravity and forces (USAID, 2000). Soil erosion is one feature of land degradation that affects the physical, biological, and chemical properties of soils. The physical parameters are primarily organic matter content, structure, texture, bulk density, infiltration rate, rooting depth, and water-holding capacity. Changes in chemical parameters are largely a function of changes in physical composition (Sterk, 2002). Biological properties include the soil microbes. As indicated above, soil erosion is both natural and human-induced processes caused by two agents, water and wind. The natural causes of the shift in vegetation, glaciations, climate change are often slow, allowing the soil to adjust or adapt to the new conditions (Iivari et al., 2004). Whereas some human-induced causes are deforestation, cultivation of marginal lands, intensive farming, excessive and indiscriminate use of chemicals, excessive grazing with high stocking rate, population transmigration, and infrastructure development in ecologically sensitive areas, etc. (Lal and Stewart, 1990). In Ethiopia, Soil erosion was one of the major causes of the downfall of the ancient Axumite Kingdom. As the process of soil degradation advanced in the north, people had to move south wards. This process had accompanied by the same spread of soil degradation, partly accounting for the fall of civilizations that flourished further south (Butzer, 1981). Hence, Hurni (1993) describes land degradation due to soil erosion as one of the elements in the decline of the civilizations of Lalibela in the 14th century, of Gonder in the 17th century, and of Shewa in subsequent years (Thomas, 1991).

2.2. Tillage of the soil

In every day when man gathered the fruits of the wild free and via as the found them they gave little thought to the tillage of the soil and even less to possible tillage elements or implements. Latter, the people set about making conditions more favorable for those particular plants. In other words human being attempted to the competition between the wanted or crop plants and unwanted or weeds plants. Over the years, man has devoting many hours of have lab or tillage operations before and after planting his crops (Gustafson, 2005: 25). Under the tillage are grouped all the way of losing siring and even compacting the soil land in urn on the crops that are to be cultivated. The following are some of the purpose of this essential activity as put by Gustafson. Losing the soil because the ordinary crop plants do not thrive in soil hat are hard or in poor filth farmers go to great experience of time and power to loosen them, mainly accomplished by means of various form and type of law.

- Covering crop remains –the left over are plowed over.
- Conserving moisture loose soil takes up more and absorbs it more rapidly than do compact ones.
- Controlling weeds –plowing aids in the control of the biennial and annual weeds.

Aeration of the soil-nearly all tillage operation affects aeration that means they bring about of an exchange of the gases in the soil with those of atmosphere.

2.3. Farming techniques and loss of resources

Resources are destroyed by improper uses through human being. For example, poor farming techniques may lead to erosion and soil depletion. On the other hand, good agricultural practices should preserve and increase the natural fertility of the soil and keep it incite and pass an improved to the next generation. Some techniques may include background farming tools, primitive techniques of tillage that do not consider the herds of the erosion (Refer, and Habib, 2006: 109). Conservation of nature refers to society's effort to secure the rational explanation and renewal of natural resources. It often calls for the optimization of the relationship between society and the environment. Natural conservation entails the identification of causes and effects in the relation between society and nature and involves the

discovery. Neutralization or weakening of negative phenomena in nature due to human interference. For example, farmers in their need of more and water land for farming clear fairst intentionally in searching for survival.

But even through these activities are integral part of their survival, it also leads our natural environment to imbalance with human activities. In addition to clearance of forest, they plow the cleared areas as in very primitive farming techniques which would be very total to the loss of the soil. Thus, the farming techniques have to be these reducing the difficulty of our ecology in general and the soil in particular.

2.4 Soil erosion

Commonly speaking, soil erosion generally refers to detachment and transport of soil and soil materials by water, wind, ice, or gravity water and wind being the major factors. However, this steady and slow process of nature is non-distractive and therefore, known as natural erosion on geological erosion. Geological erosion is not determinate to man's well-being and is wholly by and his control contrary to this, when nature's balance is disturbed by human activities likes large scale cutting of forests, leveling and cultivation. The process of erosion is speeded up manifolds.

This rapid erosion, as a result of human interference is known as accelerated erosion (Singh, 1995; 52). Thus erosion consists I) detachment of soil particles from the surface and II) their transportation, which requires a source to carry the detached particles away. The major variables affecting soil erosion include climate, soil properties, topography, vegetation, and other related factors. Climate variables are precipitation, wind velocity, temperature, humidity, and radiation receipt. Precipitation is the most factors causing erosion through splash and surface run off (Hudson, 1981:22). Erosion by water is quite serious in tropical and sub-tropical countries. Similarly, strong winds mainly in arid and semi-arid areas cause considerable soil through salutation, suspension and surface creep.

2.4.1. The causes of soil erosion

The major cause f the soil erosion in the district is population pressure. This result in removal of natural vegetation in the form of deforestation and overgrazing and more intensive cultivation of the land. The other cause of the soil erosion is topography features insulted erosion are the degree of slopes and length of slope. Erosion occurs in many forms as a result

of several causes Anything that moves, including water, wind, glaciers, animals and vehicles can be erosive. Gravity pulls soil down slope either very slowly as in soil creep or very rapidly as in landslides (Torch 1991:3).

2.4.2. Intermittent erosion

Erosion can be uniform and subtle .Sheet erosion, for example, remove layers after layer a litter at a time untidy a lot of soil has escaped almost unelected. Surface irregularities concentrate the erosive effect of either wind or water in certain spots.

2.4.3. Accelerated erosion

Tilling crop land, grazing pasture or range land or cutting trees nearly always increase the rate of soil erosion. Accelerated erosion reduces the amount of plant growth a soil is able to support (Troch1991:4)

2.4.4. Effects of soil erosion:

Soil erosion which may be called the “creeping death” of the soil is a worldwide problem. It affects the area town streams by flood and sediments and it’s determined to the economy because it lowers the overall income if the turn (Aklilu Amsalu.2000).

- Loss of soil the eroded soil particles may travel from a few centimeters to hundreds of kilometers washed.
- Change of the soil texture erosion causes a texture separation of soil that is eroded from its original position.
- Loss of nutrient the flood deposited materials contains greater proportion of nutrients than the normal soil.

Frequent flood as a result of an increased sedimentation in rivers, there may accrue the flow of water after the banks, flooding the low lands damage for the low land. (Aklilu Amsalu, 2000).

2.5. Soil conservation measures

Soil erosion is most series in hills due to steep slopes, steepness of slopes does not deter anybody taking up cultivation on hills. Combined with cultural and engineering methods such as body taking up cultivation on hills. Combined with cultural and engineering methods such as

bench terracing and stormy terracing of hill slopes along with afforestation and strip corrections and silver cultural practices would not only prevent or reduce the erosion on hills but also improve the lots of people in such area(AbebeHAile,2004).

2.5.1. Afforestation

Forests play an important role in controlling soil erosion. The forest canopy intercepts the erosive force of rain drops and the forest litters protects the soil and helps in absorbing more rating water and thus, reduce runoff.(Triphath,2006).

2.5.2. Bench terracing

For cultivation graded bench terracing is recommended. This measure is suited for slopes ranging from 16 to 33% bench terracing consist of a series of plat forms having suitable vertical drops along contours across the general slopes. Bench terracing is only a supporting particles, it should be implemented with agronomic practices to get higher yield in sustained manner. Cultivation on such slopes without proper soil conservation measures in bound to prove disasters (Panda, 2006:22).

2.5.3. Strip cropping

In strip crissing crops are grown in strips or bonds at right angle to the slopes of the land. Row crops or erosion permitting crops or alternatively planted with close grown crops (erosion resisting crop).this reduces the speed of run-off water coming from erosion permitting strips (Berhe,1996).

2.5.4. Contouring

The term also referred to as contour farming applies to the tillage particles or applying all treatments on the contour in agriculture pasture or range land. Contour farming helps in conservation of rainfall water in low rainfall areas because each row act barrier to the flow of water (Gustafson, 2005).

2.5.5. Major problems of indigenous practice in soil conservation

Where were it be, the indigenous strategies that societies develop for the conservation of their environment is shaped by the culture and ecology of that society. North Shewa Jida

Woreda,in Arebsa Chifara *kebele* people's indigenous for the conservation of the soil resource is one of such strategies for coping up with environment adjusting themselves on their culture. Some limitations would be observed on the strategies, such limitations may form the “traditional ‘farming techniques one hand and the land escape structured on the other. The following are some of the short comings of strategies these are; some flood cares, would be have the probability that it would be converted in to guise because of improper contraction.Crop residues may take long time for decomposition and it may make difficult for convenience of farming and others.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. The description of the study area

The study was conducted in Arebsa Chifara *kebele*, Jidda district, North Shewa of Oromia regional state during 2023.

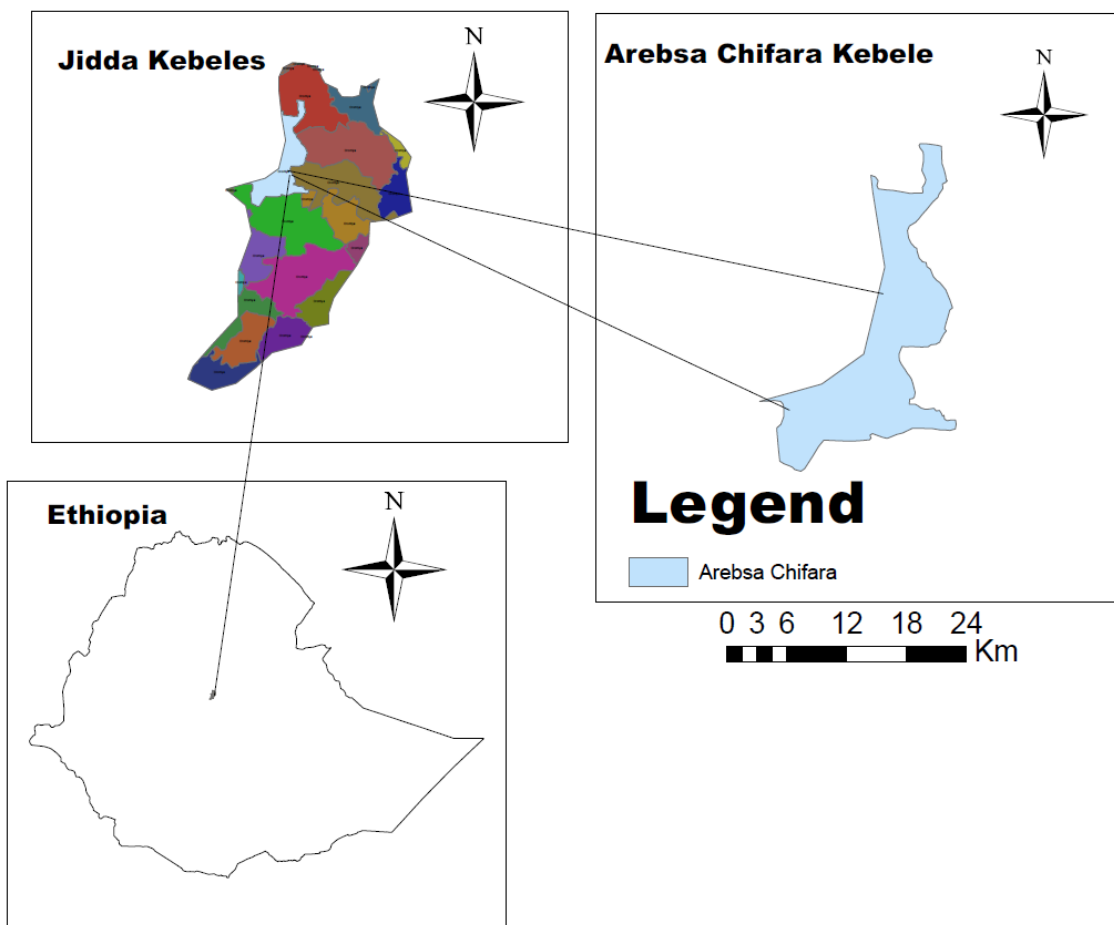


Figure 1: Map of the study area (2023).

Source: Geographical Information System (GIS)

3.1.1. Arebsa Chifara Kebele

Arebsa Chifara *kebele* is one of the administrative unit /kebele in North Shewa zone, Jida Woreda. The Arebsa Chifara *kebele* is found between 9⁰30'35''N latitude and 39⁰02'00''E longitude. It is bounded by Ayida *kebele* in the North, Debali Guda in south, Dega Golba in the east, Engoye Gordoma in the west and Gara Muka *kebele* in the North West.

Elevation ranges from 1180-1210 meters above sea level. Mean annual temperature varies from 10.35⁰c-24.54⁰c and the highest temperature experienced between January and May (JWADO, 2022). Poorly drained clay soil dominates most part of the study area. Some parts are covered by sandy soil of low moisture retaining capacity. The rain fall is bimodal and maximum rainfall occurs in July and August.

3.2. Research Design

This research would be survey design research which include both quantitative and Qualitative approach, Using a combination of quantitative and qualitative data can improve an evaluation by using that the limitation of one types of data are balanced by strength of Another. Those are ensuring that understanding would be improved by different ways of Knowing. Most evaluations were collected by both quantitative data (numbers) and qualitative (text, image), the researchers believe that using both quantitative and qualitative data are help to produce a valid and comprehensive result.

3.3. Source of Data

Primary data were collected from sampled farmers through focus group discussion and interview, observation, and questionnaires. The secondary data was gathered from different references, books, and other related researches, reports and magazines.

3.4. Data Gathering Tools

Data gathering are tools, they are useful because they provide “a picture” of the geographical environment. The goal of this researchs would be used these data gathering tools to clarify information, processes, knowledge and identified opportunities for continuous improvement

in the role of indigenous in soil conservation in study area. The researchers would be use these opportunities tools like:

A. Interview

Five farmers were purposively selected for the interview. They were recruited from (i) soil conservation management official, (ii) land management officials, (iii) administration official, (iv) environmental protection official and (v) woreda agricultural office. Data were recorded using audio recording, written notes and others.

B. Observation

Erosion types were recorded through visual observation. Rill erosion was seen in most part of the study area. Gully erosion observed in some parts near farmers' field.

C. Questionnaires

Semi structured questions were used to collect data. Open and closed ended questionnaires were used to collect data about indigenous soil conservation.

3.5. Sample size and sampling techniques

3.5.1. Sampling method and size

Arebsa Chifara kebele was purposively selected based on indigenous soil conservation potential. Two hundred eighty five farmers were randomly selected

Selection of sample farmers in the selected *kebele*: Sample farmers were selected from the list of farm households held by the Development Agents (DAs). The sample size of the respondents was determined at 95% confidence level, with 0.08% degree of variability and a 0.05% level of precision, a formula developed by Yamane (1967).

$$n = \frac{N}{1+N(e)^2}$$

Where n= sample size

N=Number of household

(e)= level of precision

$$\begin{aligned}n &= N / (1 + N(e)^2) = 1000 / (1 + 1000(0.05)^2) \\ &= 1000 / (1 + 1000(0.0025)) \\ &= 1000 / (1 + 2.5) \\ &= 1000 / 3.5 \\ &= 285\end{aligned}$$

3.6. Data analysis

Data were analyzed with SPSS (Statistical Package for the Social Sciences). Descriptive statistics such as frequency and percent were used to describe data.

CHAPTER FOUR

4.1. SOCIO ECONOMIC AND DEMOGRAPHIC PROFILE RESPONDENT

4.1.1. Introduction

This chapter discusses the study results based on the survey collected data from the field work. This result would be provided the basis for the formulation of guidelines and recommendations. Pertaining to appropriate responsible policies and measures for maximizing the role of indigenous soil conservation practices in the study area. Interpretation of the main determinants of the role of indigenous soil conservation in soil management and its impact on soil erosion were revealed in this chapter. The main factor of indigenous soil conservation method is, demographic conditions, socio economic (maternal education, marital status and wealth) environmental (type of toilet facility and source of drinking water) and other related determinants such as housing condition health related factors were revealed.

1. Age of respondent

The sampled respondents were categorized in to four different age ranges (Table 4.1). The highest (38.6%) of them are found between 34-44 age ranges. The lowest (28.1%) are found between 44-54 age categories. Age of farmers does affect soil management with younger farmers participated in conservation practice. Oldest farmers responded that they were less participated in soil conservation practice as their age exceeds fifty.

Table 4.2. Age structure of respondents

Age range	Frequency	Percentages(%)
22-34	95	33.3%
34-44	110	38.6%
44-54	80	28.1%
Total	285	100%

Source: Field Survey, (2023).

2. Sex of Respondent

According to the result, male persons accounted for higher (57.9%) of respondents as compared to female with lower (42.1%) of the total respondents (Table 4.2). Sex of respondents influence soil conservation as male respondents were more responsive in the conservation practices.

Table 4.2. Sex of respondent

Sex	Numbers of respondent	percentage (%)
Female	120	42.1%
Male	165	57.9%
Total	285	100%

Source: Field Survey, (2023).

2. Family size

Survey result indicated that family size ranges from 2-7 persons (Table 4.3). The highest (29.8%) of respondents have 4-5 persons. The lowest (9.8%) of them have the highest number of families ranging from 6-7 persons. The smallest size which ranges from 2-3

persons recorded for 18.9% of them. Family size affects soil conservation practices in the study area. Differences in soil conservation observed between household with small and large families. The respondents with largest family conserved soil most. This could be due to the reason that large number of family can simplify their work.

Table 4.3. Family size of sample respondents

Family size range	Number of respondents	Percentages (%)
2-3	54	18.9%
3-4	70	24.6%
4-5	85	29.8%
5-6	48	16.8%
6-7	28	9.8%
Total	285	100%

Source: Field Survey, (2023).

4. Year of farming experience

The maximum year of farming experience ranges from 10-15 years with 29.1% of sampled respondents. About 38.6% of respondents have farming experience that ranges from 5-10 years while 32.3 % sampled respondents have farming experiences which ranges from 1-5 years. Experience in farming is likely to increase the farmers' adoption of soil conservation practices. The most experienced farmers were more responsive in the conservation of soil. The longer the year of farming experience, the more the soil conservation.

Table 4. 4. Year of farming experience

Year of farming experience in range	No. of respondents	Percentage
1-5	92	32.3%
5-10	110	38.6%
10-15	83	29.1%
Total	285	100%

Source: Field Survey, (2023).

5. Marital Status of Respondent people

The result showed that married farmers has the highest (42.1%) with age range of 18-65 years. Non-married respondents accounted for about 33.3% while were 24.6% of the total farmers (Table 4.5). Marital status affects soil conservation activities. Differences between married and non-married ones observed in conservation practices. Married persons were more responsive in conservation practices than non-married respondents.

Table 4.5. Marital and non-marital respondent

<i>Types Marital Status</i>	<i>Age</i>	<i>No. Respondent</i>	<i>percentages (%)</i>
Non-Married	1-18	95	33.3%
Married	18-65	120	42.1%
Other	1-65	70	24.6%
Total		285	100%

Source: Field Survey, (2023).

6. Economic activities

The economy of peoples in the area mainly depends on agriculture. The highest (43.9%) of the respondents are farmers while the lowest (24.5%) are non-farmers. About 31.6% of them

practice both businesses (Table 4.6). Farmers were most responsive in soil conservation followed by persons who practice both businesses.

Table 4.6. Economic activity of respondents

Types of Economic activity	No. respondent	percentages (%)
Farmers	125	43.9%
Non-Farmers	70	24.5%
Both Business	90	31.6
Total	285	100%

Source: Field Survey, (2023).

7. Types of Religious of Respondents

Peoples in the study area were categorized in to different religious categories. Accordingly, they were grouped in to four religious types. The percentages of the religious class in order include 38.6% Orthodox, 26.3% Protestant, 21.1% Muslim and 14% another religion (Table 4.7). All respondents from all religious class were responsive in soil conservation practices but Orthodox followers were the most responsive in the conservation.

Table 4.7. Types of Religious of Respondents

Types of Religious of respondent	No. of respondent	percentages%
Orthodox	110	36.8%
Muslim	60	21.1%
Protestant	75	26.3%
Other	40	14%
Total	285	100%

Source: Field Survey, (2023).

4.2. Soil Conservation Measures

8. Farmers agro economic practices of erosion control

Farmers in the study area uses different erosion control methods (Table 4.8). The highest percentage (34.4%) of the respondent farmers use contour plowing for erosion control. About 15.1% of the farmers use water ways construction while 32.3% and 18.2% use terracing and tree planting respectively.

Table 4.8. Farmers’ agronomic practices of erosion control

Conservation practices	No, of respondent	Percentages
Contour plowing	98	34.4%
Terracing	92	32.3%
Tree planting	52	18.2%
Water ways	43	15.1%
Total	285	100%

Source: Field Survey, (2023).

9. Attitudes of the sample respondents towards the soil conservation

The result from the surveyed respondents showed that among the total number of respondents in percentage 23.9%, 26.3%, 31.6%, 11.2 % and 7% had very high, high, medium, low and very low attitudes towards the soil respectively (Table 4.9). The highest percentages of respondents have high attitudes towards soil followed by very high and medium. The lowest percentages of respondents have very low attitudes towards soil in their area

Table 4. 9. Attitudes of the sample respondents towards the soil conservation

How much attention gaining to the soil in your area	No of respondents	Percentages (%)
Very high	68	23.9%
High	75	26.3 %
Medium	90	31.6%
Low	32	11.2%
Very low	20	7%
Total	285	100%

Source: Field Survey, (2023).

4.3. Fertilizers consumptions

10. Use of different fertilizers in the study area

Peoples in the study area use different types of fertilizers such as organic and inorganic fertilizers. Differences in fertilizer use observed among sample respondents. The highest percentage (52.6%) of farmers use inorganic fertilizers such as urea and DAP. About 31.6% of farmers use organic fertilizers which they prepare from locally available materials. The least (15.8%) of them use both organic and inorganic fertilizers (Table 4.10).

Table 4.10. Use of different fertilizers in the study area

Type of fertilizer	No of respondents	Percentage (%)
Organic	90	31.6%
Inorganic	150	52.6%
Both	45	15.8%
Total	285	100%

Source: Field Survey, (2023).

4.4. Productivity of the soil in the study area

11. Production status of soil in the study area

Table 4.11 below indicated farmers' response on production status of the soil in the study area. Highest (31.6%) percentage of respondents said that the productive capacity of the soil is low while 22.8% responded that it is medium. About 7.4% of them responded that the soil is very low in its productive capacity. This may be due to soil erosion aggravated by overgrazing, soil burning, and deforestation.

Table 4.11. Production status of soil in the study area

The productive capacity of the soil	No of the respondents	Percentage
Very high	50	17.5%
High	59	20.7%
Medium	65	22.8%

Low	90	31.6%
Very low	21	7.4%
Total	285	100%

Source: Field Survey, (2023).

4.5. Maintenance of soil fertility

12. Farmers agronomic practices of soil fertility maintenance

The survey result showed that farmers in the study area use various types of maintaining soil fertility (Table 4.12). The percentage of farmers that use those methods: about 36.8% used compost, 28.1% animal dung, 21.1% crop rotation, and crop residue 14% respectively. The highest number of farmers used compost, followed by animal dung, crop rotation and crop residue. Table 4.12. Farmers' agronomic practices of soil fertility maintenance

Soil maintenance methods	No. of respondents	Percentages (%)
Compost	105	36.8%
Crop rotation	60	21.1%
Crop residue	40	14%
Using animal dung	80	28.1%
Total	285	100%

Source: Field Survey, (2023).

4.6. The role of concerned organization in soil conservation

In North Shewa Jida woreda Arebsa Chifara, the only governmental organization lacking action to provide soil conservation measure is the kebele agricultural and rural development office, incorporation with other administration bodies. This organization now a day is providing several soil protection and management strategies such as bench terraces, and also, they provide chemical fertilizer for the farmers at needed a time. Besides to this, we are assisting the traditional strategies in rural development is now striking. It helps for example, the traditionally constructed stone terraces to be developed reconstruction it by organizing farmers. In the community this is pivotal to better counseled the soil and in return improve the production of the society. The major activities that take by agricultural and development office the Arebsa Chifara *Kebele*. These are educating the farmers how to handle to farming activity that would be appropriate for soil conservation; Provide different family took for the farmers; developing erosion controlling techniques such as terraces defiles etc. The contribution that such organization provides is seen effective and crucial for the conservation of the environment.

4.7. Importance of soil assessment

A soil test is important for several reasons: to optimize crop production, to protect the environment from contamination by runoff and leaching of excess fertilizers, to aid in the diagnosis of plant culture problems, to improve the nutritional balance of the growing media and to save money and conserve energy .and increase production.

4.8. The causes of soil erosion.

Most respondents of the study area were reported that the major causes of the soil erosion in the kebele can resulted in population pressure. This results in the removal of natural vegetation in the form of deforestation, overgrazing, and much more intensive cultivation of land. The expansion of agricultural area through generation as a of the steady population growth in the permanent devastation of almost all the highland forests which in turns was to be vowed by high rate of soil erosion. In addition, forest wood in ordered it satisfies the growing demand of population; the populations satisfy this demand by clearing the existing forest. People of rural area clear the forest for the propose of charcoal and present for the

urban delivers. As many of the study area reported, at present this activity is the most widely spread in the *kebele*.

The other cause of soil erosion in the study area is the topographic feature, that influence erosion is the degree of slope and length of slope. As explained in chapter three of this paper the study area is dominated by the slope and undulation landscape. This has a great contribution for run off. As water flows down slope, it is not only increases by volume but also the velocity of run-off increased due to increase in slope gradient. This indicates that the run-off is the longer slope to down slope. During the rainy season, this area is exposed to soil erosion and losses very large quantities of soil in every year.

4.9. Agents of soil erosions

There are two agents of soil erosion. That is by. run off and wind Among these agents' run-off is the dominantly absorbed in the study area and has a serious problem. It is initiated and accelerated by many factors. These are; the rain fall intensity occurs with higher intensity and amount during the main rain season (June, July and August,). In this month the amount of precipitation is greater than the limitation capacity of the soil and creates the expressive run-off which carries detached particles of topsoil and finally resulted great soil erosion. The vegetation covers have been declining over the recent period in response to the intermittent deforestation carried out for agriculture, a grazing purpose due to the livelihood/survival pressure arising from the rapid increase of population. The region or study area largely made of rugged terrain which accelerated the velocity of run-off. The people of the study area almost entirely dependent up on the agriculture. It was identified from most of these people that their quality of living standard is go hand with quality soil found in the area. The soil erosion of the topsoil (fertile soil) directly influences the living of farmers by reducing the productivity capacity of the land. Many of the respondents reported that erosion of soil does not only affect the lives of rural communities but also reaches urban population because the fact that the urban dwellers were directly depended up on the resources found on the rural areas. Soil generosity and the living standard of peoples are inversely proportional because if the rate of soil erosion is increased. The quality of living standard of people is decreased and vice versa.

Therefore, more specifically the following table shows the attitudes of people of the study area towards the soil resources.

4.10. Rate of erodibility

Farmers in the study area perceived that the existence of the soil to it felt affects over time, the proportion of different soil type changes with time. In the past loam soil dominating is fast changing that the area covered by clay loam is increasing, while that of the loam soil is decreased. Change is attributed mainly to soil erosion and tillage intensity. Exposure of the sub soil, reduced soil depth, reduced yield, high input requirement, change in stream water quality and quantity. They also explained that, when a loam soil was exposed. it means that top soil was removed due in catchment of soil erosion increased from time to time.

4.11. The limitation of the indigenous strategies of soil conservation

Indigenous soil conservation practices have played great role in conserving agricultural soil and contributed much to soil fertility. Terracing which is constructed across erosion gradient reduce removal of soil by holding soil in its place. Contour plowing which is practiced on steep slope reduce run off and soil erosion. Water ways on the other hand, controls erosion where farmers make canal to prevent erosion. In spite of their advantages, such methods also have some limitations. Terracing narrows farmland by occupying much area which could be used for crop production. The water ways that may be produced in a far distance from one's farmland will be damage for another person's farmlands, which may be produced in a far distance one's farmland will be damaged for another person's farmlands, which may result in conflict among farmers in the society. Crop residues may take long time for decomposition, and it may be difficult for convenience of farming.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. Conclusion

Soil conservation is the prevention of loss of the top most layer of the soil from erosion. Demographic features such as age, sex, family size marital status, farming experience and economic activities affect soil conservation practices. Older farmers and male households with long farming experiences contributed more to conservation of the soil. Largest families afford greater amount of labor to simplify the practices. On the other hand married person who depends on farming activity conserve more than non-married and non-farmers. Erosion control measures and soil fertility maintenance were also assessed. The soil erosion prevention measures include contour plowing, tree planting, and terracing and water way construction. Contour plowing was mainly used by most farmers followed by terracing, tree planting and water way construction. Fertility maintenance of the soil practiced by farmers includes compost using, crop rotation, crop residue and animal dung using. Compost and animal dung were used by most farmers for the maintenance purpose. Most farmers use indigenous soil conservation practices along with soil fertility maintenance methods. Hence indigenous soil conservation practices have unlimited role in conserving agricultural soil.

5.2. Recommendations

Since our existence on earth is full of trouble and in convenience, we on our parts also struggle to serve in such environment. This can be made possible only through or culturally adjustment based on our indigenous about the nature generally. The North Shewa Jida woreda, Arebsa Chifara, peoples cultural discoveries of the native strategy for soil conservation is one integral part of such adaption which is made possible through culture. We have already seen the indispensability of the local stagger for soil conservation, and we have also observed that there is several limitations of the strategy. Therefore, in order to make the strategies effective more than ever, the following points can be considered as a recommendation, to be considerably applied. These are:

- Since most of the area land escape is sloppy agricultural offices in cooperation with the local community have to make their contribution for the development and high effectiveness of the traditional erosion control measures allowing mixed or combined application that means the traditional with modern strategy.
- A wide range of effort has to be made in order to change the traditional farming techniques and tools.
- In order to adopt whatever modern soil conservation strategy of any organization, whether governmental or non-governmental, shouldn't undermine local knowledge of the people.
- Wide range promotion activities have to be done for the North Shewa Jida Woreda, people's soil conservation strategy by different organization of the concerns.

These concerned organizations have to do more too educative the farmers on wise use of soil and should provide them with some modern erosion control strategies in order to assist the indigenous one.

References

- AbebeHAile,(2004).cultural practices reduce the erosion.
- Akilu Amsalu (2006). Caring for the land: best practices in soil and water conservation in Beressa watershed, highlands of Ethiopia PhD thesis, Wagenigen University Netherlands.
- Aklilu Amsalu and De graaff.J.(2006). Farmers views of soil problems and their conservation measures at Beresa watershed, Central high lands of Ethiopia. Agriculture and uman values 23: 99-108.
- Amemiya Min,and Stewart Melvin .(2002). Soil management to control erosion. Iowa state university. University extension, publication pm.901e(on line). URL: <http://www.afron.iastate.edu/courses/Agron212/soil-erosion>.
- Assefa and Hans- Rudolf, B., (2016). Soil management to control erosion.
- Berhe (1996) Twenty years of soil conservation in Ethiopia personal overview .SIDA regional conservation unit.
- Biratu, and Asmamaw,(2016),most chronic problem in Ethiopian highlands.
- Busari *et al.*,(2015) environment and living things survive.
- Butzer, (1981).spread of soil degradation and fall of civilizations .
- Eyasu Elias(2002). Farmer's Perceptions of soil fertility Changes and Management .institute of Sustainable Development. Addis Ababa.
- FAO (2006).Global resources assessments (2005). Progress towards sustainable forest management, FAO, forestry paper No.147.Rome (press).
- Gustafson A.F.(2005). Soil an soil Management.New York Cornell University press. operations before and after planting his crops .
- Messenger and Churning (199).African mountains and high lands; African mountains association Wort Corine.
- Habib Mohammed (2006).Introduction to economic Geography.
- Hurni (1993) describes land degradation due to soil erosion.
- Hudson, 1981:22. Erosion by water is quite serious in tropical.
- Kopittke et al.,(2019). Rapid human population growth.
- LDD,(2004).Soil erosion modeling. Land Development Department, Thailand.
- Lal,2015, soil erosion by the American Soil conservation Association .

Lal and Stewart, (1990). Infrastructure development in ecologically sensitive areas, etc.

Iivari et al., (2004). climate change are often slow, allowing the soil to adjust or adapt to the new conditions.

Mananas Melisse(1992). Traditional Soil classification and management in Eastern Wallega Addis Ababa.

Mekuria Argaw ,(2005). Forest conservation- soil degradation- farmers' perception nexus: Implications for sustainable land use in the South west of Ethiopia .Ecology an Development series No. 26.2005.

Singh,(1995; 52).Thus erosion consists I) detachment of soil particles from the surface and II).

Sterk, (2002).chemical parameters are largely a function of changes in physical composition.

Tamene and Vlek, 2008, soil conservation in Ethiopia.

Triphath,(2006).the soil and absorbing more rating water.

Torch 1991:3.Gravity pulls soil dawn slope either very slowly as in soil creep or very rapidly as in landslides .

Thomas. 1991. Ethiopian Ecology.

Refer, and Habib, 2006: 109. Conservation of nature refers to society's effort to secure.

Patriarch, R.P (1993) .Soil erosion conservation and management And new age interaction.

Panda,S.C (2006). Soil management and organic farming. India Milagros.

USAID, 2000. Soil erosion and land degradation that affects.

. Yamane (1967). Formula developed.

APPENDIX

WOLKITE UNIVERSITY

COLLEGE OF SOCIAL SCIENCE AND HUMANITIES

DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

Dear respondents

This questionnaire is prepared mainly to gather data about the role of indigenous in soil conservation, the case of Arbsa Cifara kebele. The successful (Achievement) of the objective of the research largely depends on your honest and correct and correct response. The result of the data is only used for academic purpose (BA degree). Therefore, you are not identified by any means do not write your name in any part of this questionnaires. The questionnaire will take few minutes.

Thank you so much for your cooperation!!

.Name

Choose the best answer letter

1. The Age respondent that has more responsible in soil assessments?

.A .22-34. B. 34-44 . C 44-54 D None

2. In Arbsa Cfara kebele who respondent are very large and very assesse soil conservation practices?

A. Mal e B. Female

3 .In Arebsa Chifara kebele Marital status in indigneouis soil conservation are?

A.Married B. Unmarried C. Other D .all .

4 . People in Arebsa chifara kebele are more depend up on the economic activity?

A. Farm B. non-farm C. both business D.all

5 . In Arebsa chifara kebele respondent whose are more responsible in indigneous soil conservation?

A. Religion protestant B. Muslim C. Orthodox D. Others

6. Is there soil erosion in your area? A.Yes B. No

Fill blank spaces

1 .On question six if your answer is yes, what is the cause?

4. What are the indigneous soil conservation you have been practicing?

3. Do the people of Arebsa Chifara *kebele* know practices of indigenous soil conservation?

Yes No

4 .On the question 3 if your answer is yes, by what mechanisms?

5. How much attention is given to your indigenous of soil conservation in Abersa chifara kebele?

Very high high medium low very low

6. What type of organic fertilizer do you use in this kebele?

7. How much the productive capacity of the soil is ?

Very high high medium low very low

8. Do the transitional methods that you apply have a negative impact on cultivated lands?

Yes No

If your answer is yes how _____.

9. If the answer for question no. 8, what contour measures do you apply to solve the problem?

10. What traditional methods do you employ to rest soil fertility?

11. What methods do you use to prevent your crop land from water loding?

12. How do you know when soil losses its fertility?

13. What are the major problems in implementing indigenous to soil conservation?

14. From whom do get the support in implementing this practice

15. How do you evaluate your indigenous in soil conservation?

16. How do you transfer your indigenous the next generation?

17. What are the possible ways through which indigenous in soil conservation can be promoted?
