

Department of Natural Resources Management

College of Agriculture and Natural Resources

Wolkite University



Assessment of The Role of Community Participation In Soil and Water Conservation Practice In Cause Of Girar Frma Zigbe Kebele, in Chiha Woreda,Gurage Zone of SNNPs Region

A Senior Research Project Program

In Fulfillment of the Requirements for the Course Senior Research Project (NaRM 3163)

BY

<u>Name</u>	<u>ID</u>
1 Hanan Seid	AGR/166/09
2 Endale Wolde	AGR/ 115/09
3 Cheru abebayehu	AGR/ 092/09

ADVISOR:-MR. Tekilil .W (MSc)

Wolkite Ethiopia

June 2019

Acknowledgement

Above all, we thank LORD GOD for giving the strength to start and go through with our studies and for his indescribable gift and hold up and allowing us reaches another step in our career.

We would particularly like to extend our heart-felt thanks and appreciation to our advisor Teklil W. (MSc), for his follow up, devotion of his precious time, valuable suggestions, constructive comments and systematic guidance to improve the content of this paper from beginning to the end.

We would like to extend our grateful acknowledgement to Chiha Woreda Agricultural Officers for their impressive welcome and sharing of ideas for our research. Moreover, farmers in girar frma zigbe kebele are so charming and are really welcoming peoples. Therefore, we would like to forward our sincere acknowledgment for all farmers for their open positive responses.

Table of Contents

Acknowledgement.....	II
Abbreviation/Acronym.....	V
List of Figure.....	VII
List of Table.....	VIII
Abstracts.....	VIII
1. INTRODUCTION.....	1
1.1. Background of the study.....	1
1.2. Statement of the problems.....	3
1.3. Significant of the Study.....	3
1.4. Research objective.....	4
1.4.1. General objective.....	4
1.4.2. Specific objective.....	4
1.5. Research Questions.....	4
1.6. Scope of the study.....	4
2. LITERATURE REVIEW.....	5
2.1. Soil and Water Conservation.....	5
2.1.1 Definition and concept of soil and water conservation.....	5
2.1.2 Principle and importance of soil and water conservation.....	6
2.1.3. Cause of soil erosion.....	7
2.1.4. Conservation and management of soil and water.....	8
2.2. Physical and Biological Soil and Water Conservation Measures.....	8
2.2.1. Physical Soil and Water Conservation Measures.....	8
2.2.2. Biological Soil and Water Conservation Measures.....	8
2.3. Effects of SWC on Livelihoods of the Communities.....	9
3. MATERIAL AND METHODS.....	10
3.1. Description of the study area.....	10
3.1.1. Location and population.....	10
3.1.2. Agro Climate.....	11
3.1.3. Topography.....	11
3.1.4. Soil type.....	11
3.2. Methodology.....	11
3.2.1. Data source.....	11

3.2.2. Sampling Techniques and sample size	11
3.2.3 Data Analysis.....	12
4. RESULTS AND DISCUSSION.....	13
4.1 Demographic and Socio Economic Characteristics of Respondents	13
4.2. Land characteristics and attitude of community towards Soil and Water Conservation practices.....	16
4.2.1 Cause of soil erosion and land degradation	16
4.2.2. Soil and water conservation practice	16
4.3 Biological and Physical soil and water conservation practice.....	17
4.3.1 Farmers participation on soil and water conservation	19
4.4. Factors affecting soil and water conservation practice.....	19
5. Conclusion and Recommendation	21
5.1. Conclusion.....	21
5.2 Recommendation.....	22
6. REFERENCE	23
7. APPENDIX	30
5. Soil and water conservation practice	30
7.1. Soil and Water conservation practice in the study area.....	32

Abbreviation/Acronym

DA	Development Agent
FAO	Food and Agricultural Organization
HHs	House Holds
SNNPR	South Nation and Nationality People Region
SPSS	Statistical Package for Social Science
SWCP	Soil and Water Conservation Practice
SWC	Soil and Water Conservation

List of Figure

Figure 1; Map of Girar frma zgbe kebele	10
Figure 2; Cause of soil erosion caused by physical factor	16
Figure 3: biological soil and water conservation practice	17
Figure 4 ;Physical soil and water conservation practice.....	18
Figure 5; Factors affecting farmer's participation on SWCP	20

List of Table

Table 1: Demographic and Socio Economic Characteristics of Respondents.....	13
Table 2: Farmers response weather they practice SWCP or not	17
Table 3: Reason for non- participating on SWCP	19

Abstracts

Soil erosion is one of the major causes of land degradation that resulted in low agricultural productivity in Ethiopia. Farmers' participation to conserve natural resources in general and soil and water conservation in particular has received little emphasis in Ethiopia. Efforts made in the earlier period activity of soil conservation did not bring about significant results, mainly because of lack of bottom-up approach. Soil and water conservation is essential to protect the productive land of our century where drought, famine and flood causes crop damage every years and also further deterioration of the land. This study was conducted to assess the role of community participation on soil and water conservation practice in Girar fma Zigbe kebele, Cheha woreda, Gurage, zone SNNP region. Using simple random sampling techniques 40 respondents were selected and interviewed. Both primary and secondary data was used. Those data was obtained through; focuses area field observation, interviews, questioners and different data source. Then data analyzed and interpreted by using statics and presented in the forms of percentage, table and graphs. The result shows that the main causes of soil erosion are heavy rainfall, over cultivation, over grazing, cultivation of the steep slope, and deforestation. These causes of soil erosion are also become the strong challenging factors that affect SWC practice. The study also revealed that majority (72.5%) of farmers of the study area were not aware and voluntary to participate on SWCP, this severs erosion hazards and soil fertility decline problems. Also the finding indicates the respondent practice biological SWCP, each of one like; stripe cultivation, crop rotation, afforestation, and follow cultivation. However; 17.5% of respondents do not intended physical SWCP, while 82.5% practiced physical methods as SWCP like one each of: terracing, check dam and soil dam. There was also seen that 80% of respondents affected by lack of knowledge to exercise the different SWCP. Usually to overcome the problems of soil erosion, participating and alerting SWCP is require. Therefore, the most important factors that require immediate consideration for SWC activities in the study area are: firstly, SWC practices as physically and biologically carefully designed and constructed taking into account ground realities in the study sites, secondly, governmental organizations and nongovernmental organizations should give short trainings to the farmers and they should also focus in facilitating experience sharing related to soil and water conservation practice.

Key word; Soil and Water Conservation, Community participation.

1. INTRODUCTION

1.1. Background of the study

Agriculture is the major source of Ethiopian economy where more than 85% of the population lives by farming as subsistence level. However, through time the agricultural productivity becomes insufficient due to different environmental degradation (TaffaTullu 2002). The problem of land degradation is now become one of the most serious problem affecting human kind to produce benefits from a particular land use using a specified form of land management. It is the major cause of food shortage by reducing crop yield (TaffaTullu.2002).

Land degradation, low agricultural productivity and poverty are critical and closely related problems in Ethiopian. Soil erosion is not a new phenomenon, it has been a problem ever since human beings started cultivating the land; in other words, soil erosion is as old as human history (EleniTesfaye 2008). However, the critical problem in all cases is that processes of soil erosion usually undermine the soil resource and remain unobserved until the last stage (Adimassu Z 2012).

This is because erosion is noticed when crop production starts to decline and this usually happens at a very critical phase of soil erosion. Soil erosion is a global environmental problem causing the loss of fertile top soil and reducing the productive capacity of the land and thereby raises the risk of global food security (Asmamow Melese 1998).

Both wind and water erosion selectively have removed the fine organic particles in the soil and left behind large particles and stone. It also negatively affect the natural water storage capacity of catchments areas, man-made reservoirs and dams, quality of surface water, the aesthetic value of the landscape and ecological balance in general (Wogayehu 2003). In Ethiopia soil erosion by water significantly contributes to food insecurity among rural households and poses a real threat to the sustainability of existing subsistence agriculture Degradation resulting from soil erosion and nutrient depletion is one of the most challenging environmental problems in Ethiopia (Teketay D. 2003).

Soil erosion, poor SWC management practices and lack of effective planning and implementation approaches for soil conservation are responsible for accelerating degradation on agricultural lands and siltation of lakes and reservoirs downstream (LudiE 2004.).

Soil and water conservation measures have been carried out in different parts of the country that have been Journal of Environment and Earth Science recommended for minimizing soil loss by erosion (WogayehuGashaw 2006). In this regard, sustainable land management involves more than the use of physical soil conservation measures, it also includes the use of appropriate soil fertility management practices, agricultural water management, forestry and agro forestry practices, forage and land management, and the application of these measures in a more integrated way to satisfy community needs while solving ecological problems (Allen wild 1993,).

In Ethiopia for instance, Agriculture plays a major role in the economy which provides more than 80% of total employment. However, it is only of subsistence nature and production is decreased, and about 1billion tons of the top soil is believed to be eroded annually due to the faster erosion of the top soil (Adimassu Z 2012). Threatening and food deficit is prevalent.

SWC are essential to protect the productive land of our country, where drought, famine and floods cause crops damage almost every year (Barry Pound and EjiguJonfa 2005,) Soil conservation not only increase crops yields but also prevents flood further deterioration of the land. Now day all part of Ethiopia are give the value for soil and water conservation (Amsalu 2007,).

Community has a great important role to conserve soil and water resource. In this regard, one of the main reason conducting this research in girar frma zigbe kebele to assess the awareness and root causes' of the participatory problem and effectiveness of existing soil and water conservation structure in reducing soil erosion. Therefore, this study is assess the role community participation in soil and water conservation practice and to identify the major problems associated with soil and water conservation and to come up with some alternative solution for soil erosion in girar frma zigbe kebele, chiha Woreda . The general objective of the study is to assess the role community participation in soil and water conservation practice in girar frma zigbe Kebele, chiha Wored.

1.2. Statement of the problems

Land degradation, which includes soil degradation, water pollution, nutrient depletion, deforestation and degradation of vegetation cover, is major ecological problem in Ethiopia (Temesgen, 2012). Land degradation and soil erosions are caused by lack of effective SWC practice, in appropriate land use and mismanagement of natural resource. The outcome of those problems brings to decline in soil fertility status lead to diminish agricultural production, increasing food insecurity and low income of stallholder farmers. Soil erosion is the major constraints to sustainable agricultural development in Ethiopia. The magnitude and rate of soil erosion continued to increase despite considerable efforts made during the past three decades in conservation activities (Daniel, 2001).

Despite the fact that massive mobilization of resources for improved SWC practices was carried out, SWC still now not effective as expected. Regardless of Girar Frma zigbe kebele in cheha woreda, to limited community participation, low awareness creation combined with minor integration among stake holder and also failure to understand the effect of soil and water conservation practice resulted in inefficient performance. In addition, the study area faces different factors that limit the agricultural productivity and In many part of the kebele soil erosion is the widespread problems that damage the cultivated lands of the farmers. The application of SWC measures has role in reducing the impacts of erosion, since erosion is one of the limiting factors for productivity and enhancing the productivity of land based on the participation of farmers. Therefore, this study is intended to assess the role of community participation in soil and water conservation practices in Girar frma Zigbe kebele, Cheha woreda Gurage Zone, SNNPR.

1.3. Significant of the Study

The finding of this research can be used as input for research institute, policy maker, academic purpose and also assist local farmers to design effective soil and water conservation technology practices by knowing the adverse effect of not practicing this technology. Moreover, farmers of the study area know the correlation between soil erosion and land productivity as they are two side of the same coin. This help to develop sustainable management of land at all levels.

1.4. Research objective

1.4.1. General objective

- The general objective of this study is to assess the role of community participation in soil and water conservation practices in girar frma zigbe kebele, chiha woreda.

1.4.2. Specific objective

- To assess the attitude of community towards soil and water conservation practices.
- To identify Biological and Physical soil and water conservation practices
- To determine factor affecting implementation of soil and water conservation practice in the study area.

1.5. Research Questions

In order to assess the effect of SWC measures on land productivities the following research question will be answered.

- ✓ What are the attitudes of the community towards land degradation and management practices?
- ✓ What is the Biological and Physical soil and water conservation practices?
- ✓ What is factor affecting implementation of soil and water conservation practice?

1.6. Scope of the study

The study was delaminated to girar frma zigbe kebele,chiha woreda, south gurage zone, SNNPs region Ethiopia to know how the community protects soil and water erosion and its consequence. It also develop the collective action to address soil erosion problems and to encourage the community participation on soil and water conservation practice the soil erosion problems.

2. LITERATURE REVIEW

2.1. Soil and Water Conservation

There are different definitions of soil and water conservation measures separately and/or together (Sanders 2005,). Defined soil and water conservation as a combination of appropriate land use and land management practices that promote productivity and sustainable use of soil and water resources, which minimize soil and water resource degradation. Soil conservation practices involve managing soil erosion and its counterpart process of sedimentation, reducing its negative impacts and exploiting the new opportunities it creates and it is the function of controlling erosion and maintaining soil fertility. Farmers with larger farm land area are more likely to use improved soil and water conservation measures to reduce soil erosion and conserve water in their farm land than farmers with small farm land (KirubelMekonnen and Gebreyesus Belay 2011,).

2.1.1 Definition and concept of soil and water conservation

Soil conservation refers to the protection of fertile top soil from erosion by means of cover crop, terracing, contour farming and crop rotation etc. Soil and water conservation defined as the combination of the appropriate land use and management practices that promotes the productive and sustainable use of erosion and other forms of land degradation (Senders, 2004). Soil and water conservation is not restricted to the protection of the threatened hill side or their rehabilitation by planting of trees. Its scope is much larger and it involves the whole agricultural and natural resources conservation, soil and water conservation includes all forms of human action to prevent and treat soil degradation (B 2013). As (Hudson 2006,) cited in Addisu (2011), the aim of soil and water conservation is to facilitate optimum level of production from a given area of land while keeping soil loss below a critical value and protections of the life supporting capacity of soil such as, soil quality.

Soil conservation is the collective efforts of groups or individuals to improve the quality of the soil and minimize erosion and their negative events for example soil that is eroding can be made healthier by planting plants and grass to keep it from washing away. Soil conservation is the prevention of soil loss from erosion or reduced fertility caused by over usage, acidification, salinization or other chemical soil

contamination (Adgo 2013,). Soil conservation generally accomplished with a Variety of management techniques. Some of these including managing surface runoff, protecting exposed soil and protecting downstream water courses from pollution and sedimentation. Soil conservation can ensure that the habitat of area wildlife maintained while protecting water from pollution.

2.1.2 Principle and importance of soil and water conservation

Soil conservation is a preservation techniques, in which determination of soil and its loss are conserved by using within in its, capability and applying conservation technique or protection as well as improvement of soil. In hilly region where land topography has steep slope and is subjected to erosion problem, the vegetation cannot get established. Lack of the vegetation cover on slope soil surface, accelerate the erosion and a large amount of soil is transported in to the stream through runoff. The prevention of accelerated soil erosion (which is the reduction of the rate of soil loss to approximately rate that would occur under natural condition) relies on selecting appropriate strategies for soil conservation which in turn requires through understanding of the process of erosion (Morgan 1981).

Soil and water conservation is important to control the loss of nutrient from agricultural land, to prevent pollution of water bodies, to decrease rate of sedimentation in reservoirs, rivers, canals and ditches and to limit crop damage by wind-blown deposits or burial beneath water. Interest in controlling soil erosion and maintain soil quality has been stimulated by renewed awareness that soil is vital to both the production of food and fiber and global ecosystem function (Nsabimana 2008). Soil conservation has become an integral part of land use and receives support within a social and economic environment which is conducive to the maintenance and improvement of soil capital (Demeke 2009,). The ultimate aim of soil conservation is to obtain the maximum sustained level of production from a given area of land whilst maintain soil loss below a threshold level which, theoretically, permits the natural rate of soil formation to keep pace with the rate of soil erosion (Morgan, 1995).

Primary principle of controlling soil erosion by water includes reducing rain drop impacts on the soil, reducing runoff volume and velocity and increasing the soil resistance to erosion (Tewodros 2009,). There are two technical means for achieving

these principles of soil and water conservation: the barrier approach and the cover approach (Young (1997)). The barrier approach is to check runoff and soil removal by means of contour-aligned barrier. These may be terraces such as soil bunds, fanyajuu, stone bunds, hill side terraces and grass strips hedgerows, barriers either divert runoff into safe channels, such as grassed water ways, or reduce it by promoting infiltration. The barriers are commonly introduced to many new areas of Ethiopia and it has also been practiced traditionally for a considerably long period.

2.1.3. Cause of soil erosion

According to Nobles and Wright (Waugh (1995)), the major leading to erosion are over cultivation, over grazing, deforestation and other. If there is no vegetation cover on the land surface rapid erosion takes place. (Critchley and Siegert (2000)). also described the rain is an important force of erosion like in Ethiopia where rain fall is heavy and sloppy. In addition to above scholars, (Mesfine (1995)), defines the soil erosion cause is the combine effect of topography, climate and anthropogenic practice.

Regarding to study area mention above both natural and manmade factors is also the cause of soil erosion. However according to data obtain from Woreda agricultural offices suggest that deforestation, overgrazing, over cultivation and inappropriate farming practice are the major cause of soil erosion.

The function of terraces in humid area are to decrease the length of hill side slopes and their by reduce erosion allow for sediment to settle. Where as in drier areas it serve to retain runoff and increase water available for plant growth (Schwab 2002.). A conservation technique may be regarded as successful if it reduces the rate of soil loss to less than 20% of the rate without conservation and to less than 10 times 1 year which is the commonly accepted as a tolerable rate of erosion (Young, 1997). In generally there are two ways to conserve soil conservation measure, first on biological soil water conservation and the second one is physical soil water conservation (Humi 1993.).

2.1.4. Conservation and management of soil and water

According to (Ackerman and patton (1992), soil conservation is defined as the particles of arresting or minimizing artificially, soil deterioration and its important has grown because excessive cultivation soil for agricultural production resulted in degradation. In addition to these the pressure exerted by the growing word population on the soil and water resource, soil and water conservation is needed. In addition to Ackerman, According to (FAO (1985), the soil and water conservation are generally grouped under two broad categories means physical and biological measure. Both physical and biological measure have advantage one over the other but also both of them are effective and sustainable soil and water conservation activities.

2.2. Physical and Biological Soil and Water Conservation Measures

2.2.1. Physical Soil and Water Conservation Measures

Physical SWC measure is mechanical barriers constructed on the land surface to protect the soil from the effect of excessive run off. Terraces, stone bunds, soil bunds, cut off drain, fanyajuu and water ways are some example of physical SWC measures (Tewodros, 2009.).

The function of terraces in humid areas are to decrease the length of slopes and their by reduce erosion and allow for sediment to settle, where as in drier areas it serves to retain run off and increase water available for plant growth (Schwab, 2002). Check dams are small and low drop structures built across channel to prevent it from deepening further. The dams decrease the slope gradient, reducing the velocity of water flow and the erosive power of the runoff (Siacinji-Musiwa. (1999).).

2.2.2. Biological Soil and Water Conservation Measures

It is a measure that is applied by covering the surface of the land by vegetation or other dead and live organism to reduce soil erosion, to improve the quality and fertility of the soil (Amanuel (2002). The most commonly used type of biological SWC measures are mulching, strip cropping, cover crop, crop rotation and green manuring (HURNI (1988),

Agro forestry is a land use system that receiving greater attention in many countries to protect the land from various types of degradation and also it is a practices offer considerable benefits for the long term agricultural sustainability (IRAF, 2004). Similar study was carried out by (UNCCD (2003). and reported the result as AF practice used as a tool for achieving sustainable agricultural farming and improving the quality of life of the affected communities while simultaneously reversing the process of environmental as well as land degradation. Crop rotation and intercropping means that the different crops are alternated in the same field and it minimize the risk of crop failure and increase food security when there is insufficient rain fall as well as combining the production of cattle food with food for human consumption (FAO, 2014).

2.3. Effects of SWC on Livelihoods of the Communities

Agriculture is the major source of livelihood of the communities in Ethiopia. So SWC is important to control the loss of nutrient for agricultural land, to prevent pollution of water bodies, sedimentation in reservoirs and limit crop damage by windblown .On the other hand SWC and productivity are highly complementary because conservation of soil ,water and natural vegetation leads to higher productivity of crop and livestock (Kerr 2002.) According to (Adgo, (2013). SWC on livelihood of the communities increase crop production, food security and household income. Farmers who perceive erosion as a problem of productivity expects a positive return from conservation and likely to decide in favor of adopting available conservation technology; on the other hand the farmers who do not acknowledge soil erosion as a problem they will not expect benefits from controlling erosion and it is highly likely that they will decide against adopting any conservation technology (Gbremedhin 2003.).

3. MATERIAL AND METHODS

3.1. Description of the study area

3.1.1. Location and population

The study was conducted in girar frma zigbe kebele chiha woreda gurage zone SNNP Southern Ethiopia. The study area is located 184 km of south west of Addis Ababa, and 26 km away from wolkite town in North East direction. Girar frma zigbe kebele is one of the most densely populated kebeles of chiha woreda .According to population and house censuses of 2007 the total population house hold of the kebele is 3500 of these 1900 of them are male and 1500 of them are females those having 2155 households among this 275 of them are females 1880 of them are male households. (Chiha Woreda agricultural office, 1998)

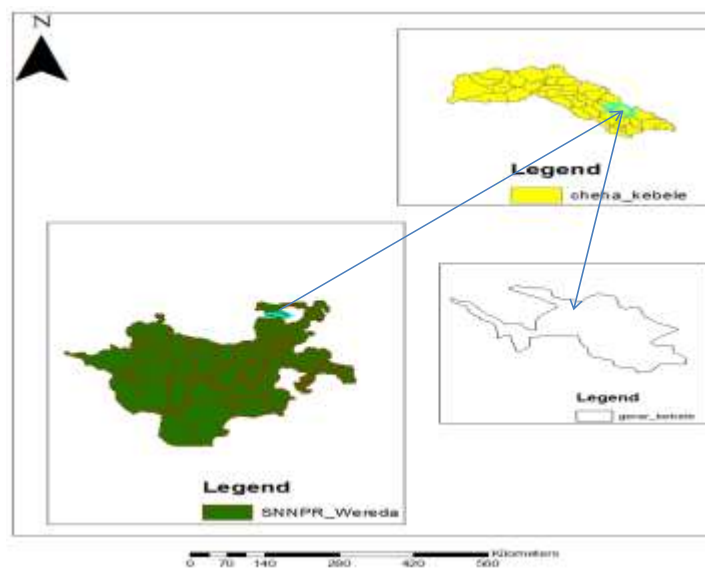


Figure 1; Map of Girar frma zgbe kebele

3.1.2. Agro Climate

The climate condition of the study area is characterized by un bimodal rain fall pattern& sometimes there is unexpected rain fall during winter season. The annual rain fall received with in the area is 700 mm per year and the mean annual temperature ranges between 23&25 degree Celsius respectively. The main rainy season starts from May & lasting the end September. (Chiha woreda agricultural office 1998).

3.1.3. Topography

There is topography variation observe in the area. The central part of the woreda is characterized by flat slope and the other part is characterized by medium slope. Generally the topographical characterized of the study area is ranges between 5 to 7%, and 2200 to 2300 km above sea level. (chiha woreda agricultural office 1998).

3.1.4. Soil type

In the study area the major soil type is endowed with different types of soil, such as sandy clay soil and silt soil with different in their color like Black, brown and Red, the most dominant soil color type is red. (chiha woreda agricultural office 1998).

3.2. Methodology

3.2.1. Data source

The data source used for this study was primary and secondary source. The primary data source was obtained from the sample of HHs by conducting interview, focus group discussion, using questionnaires and direct observation of the study area. Secondary data source was obtained from different source including unpublished and published document, books, articles, journals, reports and electronic web site.

3.2.2. Sampling Techniques and sample size

Sampling technique was applied to select site and draw a representative samples of the HHs for this study. In gurage zone, chiha worda in girar frma zigbe kebele was selected purposively, because of the practice of different agricultural practice related to SWC measure and the existing SWC practice especially in this kebele because of steep slope of the land compare to the other kebele .On the other hand, girar frma

zigbe kebele was selected by using simple random sampling technique. The reason why we use simple random sampling technique is that an easy technique of selecting every samples of community member to assess their perception towards SWCP or it is the simplest and possible types of sampling method for this study.

Probability sampling techniques was applied to select HHs from the target population of girar frma zigbe kebele in chiha woreda.or Based on this formula and to make use of the opportunity of large sample size this study when $N=100$,

$n=N/1+N(e)^2$ where; N = the total population

n = the required sample size

e = the precision level which is = ($\pm 50\%$) Precision Levels

Where Confidence Level is 95%

$$n=100/1+100(0.05)^2=80$$

Based on this formula; the sample size for the study is about 80. However, due to time and budget constraints and to have manageable data for the group, we decided to take 40 samples from the total small land holder farmers in the selected Kebele.

3.2.3 Data Analysis

The collected data was analyzed using qualitative data like descriptive statistics. This technique of data analysis was applied to show the number of respondent that were involved in questionnaires and interview. MS-Excel was used to generate tables. For the informal key informant interviews and field observation notes, and SPSS (Statistical Package for Social Science) to analysis qualitative data and a qualitative analysis was used in the form of table, percent.

4. RESULTS AND DISCUSSION

This chapter presents the key findings of the study. The chapter is categorized under three Sub-sections. The first sub-section provides the socio-economic profile of sampled households. The second sub-section deals with attitude of community towards land degradation and management practices. The third sub-section presents farmers indigenous knowledge on soil and water conservation practices.

4.1 Demographic and Socio Economic Characteristics of Respondents

In this part, the general profile of the sample respondent households is presented as follow. This includes age, sex, educational status, family size and Economic condition. Based on the survey data, the majority of the respondents (87.5%) were male headed households and the remaining ones were female headed households in the table below. This noted that there is positive relationship for soil and water conservation practice as means of labor.

Table 1: Demographic and Socio Economic Characteristics of Respondents

Sex	No of respondent	Percentage%
Male	35	87.5
Female	5	12.5
Total	40	100.0

Age Categories	Frequency	Percentage
26-35	12	30.0
36-45	18	45.0
46-55	10	25.0
Total	40	100.0

Educational Status	Frequency	Percentage
Primary education	14	35.5
Secondary education	6	15.0
Never gone to school	20	50.0
Total	40	100

Income condition	Frequency	Percentage
Income in birr	20	50.5
Income in animal husbandry	15	37.5
Mixed farming	5	12
Total	40	100

Family size	Frequency	Percentage (%)
1-5	8	20.0
6-10	23	57.5
11-15	9	22.5
Total	40	100

As indicated in the methodology part of the study 40 house hold surveys were taken as representative sample. Beside filed survey was made to get the size of each house hold information, The family size indicate that 57.5% of respondents have 6-10 family size, 22.5% were family size of 11-15 which indicated that more labor is applied when the family is larger and thus more family labor is available, there for the largest number of HHs have able to construct SWC measures easily so as to enhance land productivity through improving the soil fertility, reducing soil loss by runoff erosion and conserving enough moisture. The finding of this result similar with (Kruger Hans-Joachim 2009.), in most Ethiopian rural areas, the main sources of labor for constricting SWCs are family members, including wife and children.

The sampled respondent said that, education is the key to life. Thus at every moment of our life; we face various types of problems. At that time we could not solve it. If we were educated, our level of understanding about the short and long term benefits and disadvantages of natural resource conservation works and our level of participation would have be improved. In addition to this, Education plays a great role to understand the causes of soil erosion, consequences of soil erosion and to improving measures of soil fertility, and its conservation practices. From table three, it indicates that majority of the farmers who were living in the study area was uneducated. From the above table three, 35.0% of the respondent were attended

primary school and they was not continues there education because all the households are farmers and they do not have enough time to attend farther education managing their families and farming activities after they were married. The other important reason behind is that with the low level of their economy at their disposal, they could not afford to continue their education. Additionally 15.0 % Attended secondary school and 50.0% were never gone to school.

The study area 50.5% of respondent income gained by sales of crop production, 37.5% of respondent sales of animal feed, the local communities in the study area have a good level by mixing farming system (the integration of crop production and livestock rearing). 12.0% of mixing farming system. As the above table; 4 indicates the local communities more focus on the activities of sales of crop production and income in animal husbandry system than the other activities of farming activities .This activity has positive impact on the land productivity by means to fallow the land. If either crop production or livestock rearing is fail then the farmer can survive by one type of production system.

Beside filed survey was made to get the size of each house hold information, each house hold is dominated by elder who are dependent on their farm land. As indicated on the above table one, 45.0% of the respondent was with the age of 36-45 and 30.0 % of the respondent was with the age of 25-35% in the table above. This clearly reveals most of the house hold is often in productive age groups. They are able to take part in soil and water conservation practices.

Accordingly as the survey also shows that 45% of ages of respondent were between 36-45 and the rest 30% and 25% were between 26-35 and 46-55 respectively. The mean age is 2.95years (table above). this shows that there is large age gap among the respondents however; on average respondents are in the productive age group. The age is also an incentive for a long lasting development of sustainable local practices that have been experienced to adapt soil and water conservation practices in the area of study.

4.2. Land characteristics and attitude of community towards Soil and Water Conservation practices

4.2.1 Cause of soil erosion and land degradation

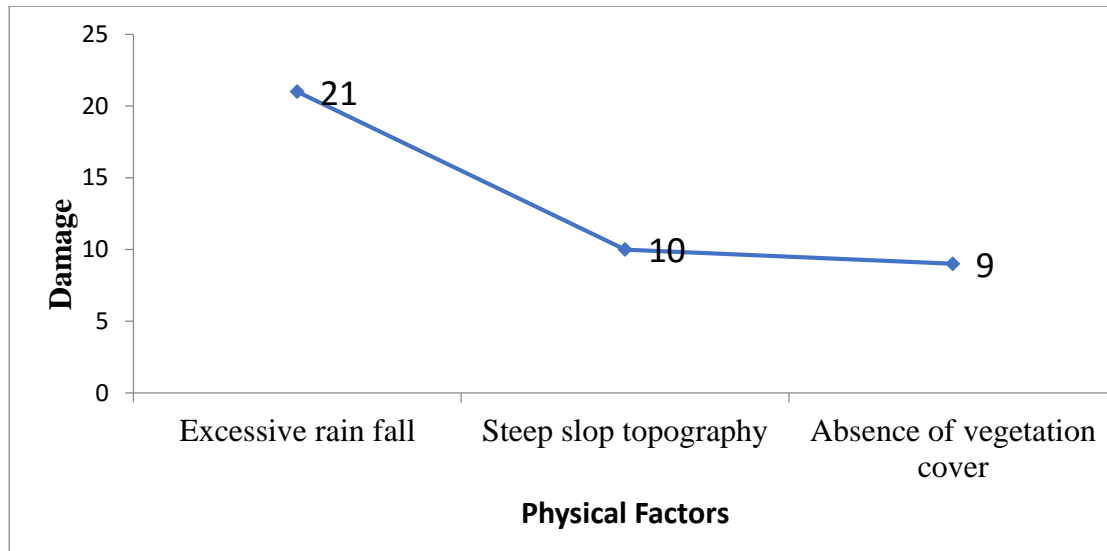


Figure 2; Cause of soil erosion caused by physical factor

As indicated on the above figure 52.5% of the respondent was mentioned that the cause of soil erosion was physical factors such as excessive rainfall, down slope topography, and absence of vegetation. This is in line with (Daniel 2001.) 300-400 tons per hectare per year in highly erodible due to excessive rainfall and also (Hurni,1993.) Reported in Ethiopia.

4.2.2. Soil and water conservation practice

The magnitude of erosion hazards as pointed out by the respondent and noticed by observation is sever on the cultivated land. Furthermore, as it has already pointed out all of the farmers were not aware of these erosion hazards. As indicated on the below table, 72.5.0% of the respondent was responded that, they were not voluntary to practicing on soil and water conservation methods. Which implies even though the erosion damage in the area is in an advanced state, farmers' participation in physical soil conservation activities on their own land is minimal. This shows lack of awareness to soil and water conservation practices in the study area. Of those farmers who responded that they were participating in the conservation activities against their interest were only 27.5% (table 3).

Table 2: Farmers response weather they practice SWCP or not

Item	Respondent		Total
	Yes	No	
Is there any soil and water conservation practice	11	29	40
Percentage	27.5.0	72.5	100

4.3 Biological and Physical soil and water conservation practice

According to survey data, now a day both biological and physical soil and water conservation method are not practicing well and the sample households in the study are not aware well to use different types of SWC measures on their farm plots. As it was indicated in below figure, shows the respondent practice biological soil and water conservation methods like; stripe cultivation, crop rotation, afforestation, and follow cultivation. The traditional hill side terracing, crop rotation and tree planting were the principal SWC measures practiced by the majority of the sample households in the study area. Similarly, (Bekele 1998.) also found similar results in the eastern highlands of the country.

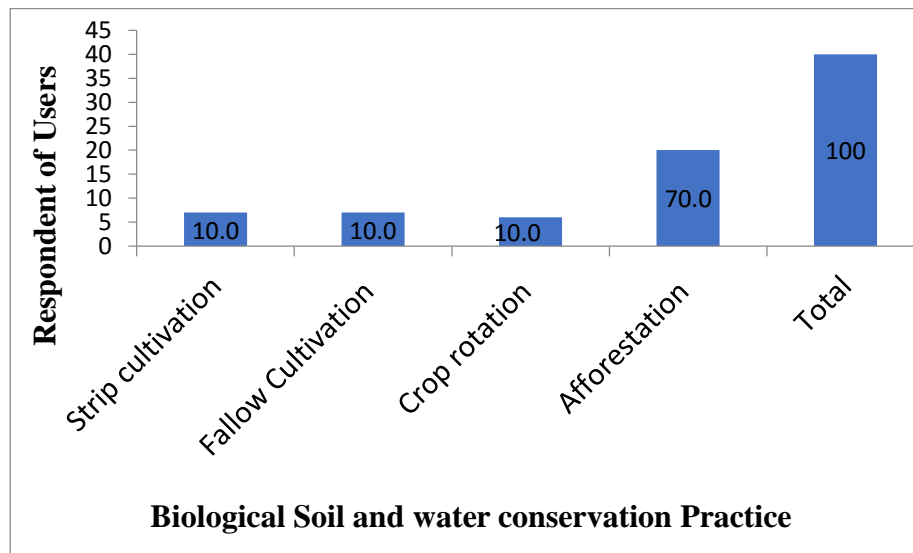


Figure 3: biological soil and water conservation practice

There are also the practices of physical soil and water conservation methods discussed below figure .However; according to survey 17.5% of farmers interviewed did not intend to continue to implement physical conservation technologies in their plots that did not receive treatment with the assistance of the project. This indicates that farmers' adoption of conservation technologies is lower in most parts of the country. These findings reconfirm other studies that argue farmers in developing countries often reject externally introduced SWC technologies because of the inappropriateness to farmers' requirements and local farming systems (Pretty and Shah, 1997)

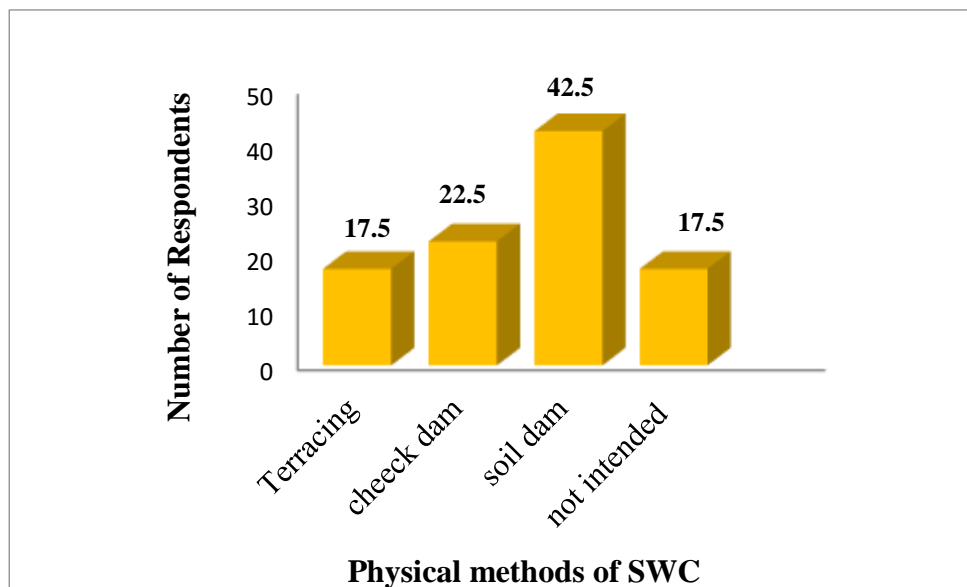


Figure 4 ;Physical soil and water conservation practice

4.3.1 Farmers participation on soil and water conservation

Table 3: Reason for non- participating on SWCP

No.	Reason	Frequency	Percentage
1	Lack of awareness about SWC	32	80.0
3	Lack of sever erosion hazards	8	20.0
4	Total	40	100.0

Farmers' participation on soil and water conservation practice is one of the essential crucial ways to conduct soil and water conservation practice. Majority sampled respondent did not participate on soil and water conservation practice but a few of the respondent participate well. According to response of respondent 20% of the respondent were not participate in soil and water conservation practice because of lack of erosion hazards and whereas, 80.0 % lack of awareness to soil and water conservation practice respectively.

4.4. Factors affecting soil and water conservation practice

According to data obtain from sampled respondent there were different factors affecting farmer's participation on soil and water conservation practice on the study area. Some of the factors mentioned by the respondent were shortage of land and lack of knowledge. As indicated on the below figure, 20.0% of the respondent was mention that the factors affecting farmer's participation on soil SWCP are shortage of land and unavailability of construct maters. When they were constructing different structures the farmer were not got enough materials. Based on survey 80.0 % of the respondent was responded that the lack of knowledge is the other important limiting factor of community participation in the community natural resource conservation activities. This is consistency with (Legesse 2008.) reported, due to the farmers' lack of knowledge and skill to adapt land management technologies and absence of intervention measures by government and non-governmental organizations.

Correspondingly (Pretty 1997.) found out the significant negative effect of shortages of land as farmers' conservation decision, which implies that households with large land size are likely to continue using the conservation approaches.

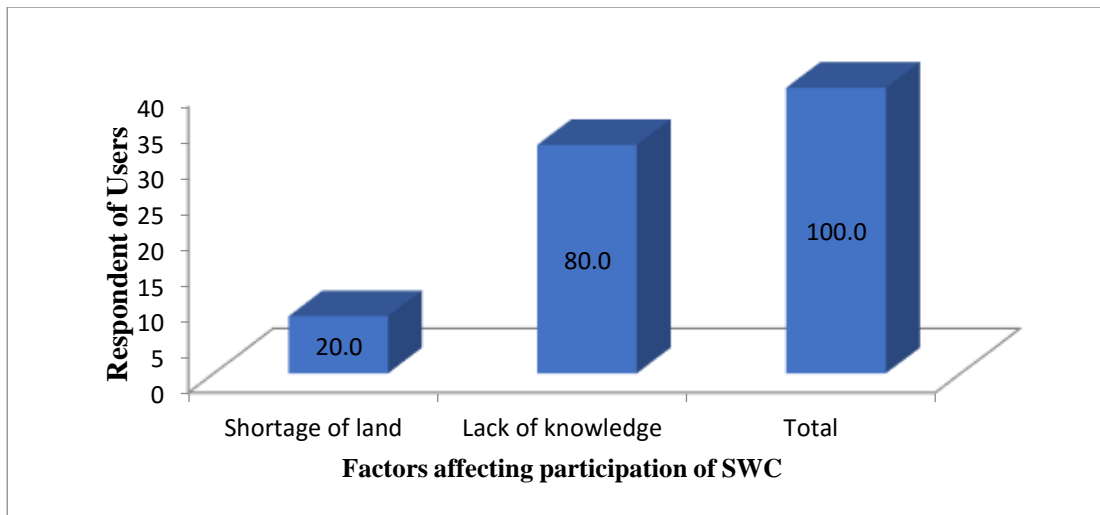


Figure 5; Factors affecting farmer's participation on SWCP

5. Conclusion and Recommendation

5.1. Conclusion

In the study area, most of the HH heads were aged from 25-55 groups, these age groups to have a good understanding on the problem of soil and water conservation, and usually interested in implementing soil and water conservation practices than the other age group especially the female farmers were practiced SWC on the farm land but they are less in number as compared to male farmers. However, the male farmer has more flexibility in their practices of SWC, more opportunity to use new practice of SWC structures and have more ability to deal with the risk takes place on their farm land on large size farm land.

In the study area soil erosion is mainly caused both human and natural factors like excessive rainfall, steepness of slope and the natural of topography are the major factor for soil erosion.

The result of this study indicates that the majority of the farmers were not voluntary to participate in soil and water conservation due to different cause such as lack of awareness. But some of the farmers participated in soil and water conservation practice to reduce soil erosion.

The result of the study indicated that because of shortage of land, lack of awareness, and constraint materials and other they was not participate on soil and water conservation practice well.

5.2 Recommendation

Soil Water Conservation measures have role in enhancing the land productivity in many dimension, but in the study area there were more soil water conservation measures related problems. Therefore, to minimize this problem the researcher recommends the following as a solution.

Farmers' approval will be obtained if they are genuinely involved in all stages of problem identification, alternative solutions prescription, implementation and evaluation of effectiveness and efficiency of the solutions..

Small land size was one of socio economic factor that influence farmer's decision to maintain soil-water conservation structures. So, to apply the success of SWC in the area, agricultural research, agricultural DA, and agricultural officials were provide awareness for enhancing the implementation of soil-water conservation structure in the study area.

Soil and water conservation practice and methods does not happen at equal level in all part of the study area of Girar frma Zigbe kebele. Therefore, agricultural expert should be address the practices of SWC in all part of Kebele by giving rewarded for appreciate farmers.

According to the information obtain from the respondent the government and non-government not supporting well. So the government and non-government organization should be cooperating in a forestation and reforestation programs and soil and water conservation practice with the community and should give short trainings to the farmers and they should also focus in facilitating experience sharing.

6. REFERENCE

Ackerman and patton, A. S. ((1992),). environmental degradation of sixteenth annual.A strategy for physical Recovery Northeast.

Adgo, E. A. ((2013).). Impacts of long term soil and water conservation on agricultural productivity: the case of Anjenie watershed, Ethiopia.

Adgo, E. A. (2013,). Impacts of long term soil and water conservation on agricultural productivity: the case of Anjenie watershed, Ethiopia.

Adimassu Z, M. K. ((2012).). Effect of soil bunds on run off, soil and nutrient losses, and crop yield in the central highlands of Ethiopia. Land degradation Dev.Doi: 10.1002/Idr. 2182.

Adimassu Z, M. K. (2012). Effect of soil bunds on run off, soil and nutrient losses, and crop yield in the central highlands of Ethiopia. Land degradation Dev.Doi: 10.1002/Idr. 2182.

Alex Inman. (2006.). Soil Erosion in England and Wales: Causes, Consequences and Policyoptions for Dealing with the Problem. Discussion Paper prepared for WWF-UK.

Allen wild. (1993,). Individual and community soil Conservation technique 2nd Edition. Longman Group UK Limited: UK.

Amanuel. ((2002).). soil and water conservation manual for RCCMA Kenya.

Amsalu, A. (2007.). Best practices in soil and water conservation in Beressa watershed, highlands of Ethiopia. Ph.D.Thesis, Wageningen University, Netherlands.

Amsalu, A. (2007,). Best practices in soil and water conservation in Beressa watershed, highlands of Ethiopia. Ph.D.Thesis, Wageningen University, Netherlands.

Asmamow Melese. (1998). traditional soil classification and management in Ethiopia. .

Awulachew, S. ((2010).). Improved water and land management in the Ethiopian highlands and its impact on downstream stakeholders depends on the Blue Nile.

B, A. (2013). Factors influencing the adoption of soil conservation practices in north western.

Balana, ,. M. ((2010).). Assessing the sustainability of forest management: an application of multi-criteria decision analysis to community forests in northern Ethiopia. J. Environ. Manage. 91, 1294–1304. doi: 10.1016/j.jenvman.2010.02.005.

Barry Pound and EjiguJonfa. (2005,). Soil Fertility Practices in WolaitaZone,Southern Ethiopia: 28p.

Bekele, S. (1998.). Peasant Agriculture and Sustainable land use in Ethiopia. Economic Analysis of Constraints and Incentives for Soil Conservation.Agricultural University of Norway. Dissertation no: 1998:1.

Critchley, W., & Siegert, K. ((2000).). Water Harvesting. FAO, Rome Development and Environmental Protection, Volume 2 and 3, Final Report,.

Daniel, D. (2001.). Soil and water conservation Manual/Guideline for Ethiopia. Soil and Water conservation Team, Natural Resources Management and Regulatory Department, Ministry of Agriculture, Addis Ababa, Ethiopia.

Demeke, B. (2009.). Economics of soil erosion and conservation. Review of literature and aDynamic Non-linear optimization Model with Risks and Uncertainties: A Case study for Ethiopia. M.Sc. This is in Environmental Economics. Wageningen Agricultural Univers.

Demeke, B. (2009.). Economics of soil erosion and conservation. Review of literature and aDynamic Non-linear optimization Model with Risks and Uncertainties: A Case study for Ethiopia. M.Sc. This is in Environmental Economics. Wageningen Agricultural Univers.

EleniTesfaye. (2008). Continued Use of Soil and Water Conservation Practices: a Case study in Tulla District, Ethiopia, Erosion and Soil & Water Conservation Group, Wageningen University, Wageningenur.

FAO. ((1985).). Soil and water conservation for sustainable agricultural systems. In the state of Food and Agriculture. Rome, Ital.

Gbremedhin, B. S. (2003.). Investment in soil conservation in North Ethiopia, the role of land tenure security and public program of agricultural

economics<http://www.fao.org/landandwater/agll/glasod/glasodmaps.jsp>.

Hudson, .. (2006.). soil and water conservation in semi-arid area Fire ecology and management of phrygana communities in Greece, In:Mooney, H.A. and Conrad, C.E. (coors), Proc. Symp. Environmental Consequences Fire and Fuel Manage in Mediterranean.

HURNI, H. ((1988).). “Degradation and conservation of the resources in the Ethiopian highlands”, in Mountain Research Development, Vol. 8, No. 2/3, pp. 123–130.

Hurni, H. (1993.). Land degradation, famine, and land resources scenarios in Ethiopia. World soil erosion and conservation. Cambridge university press: Cambridge, UK; 27-62.

Hurni, H. (1993.). Land degradation, famine, and land resources scenarios in Ethiopia. Worldsoil erosion and conservation. Cambridge university press: Cambridge, UK; 27-.

Kerr, J. (2002.). Watershed development, environmental service and poverty alleviation in India. World Dev., 30: 1387-1400.

KirubelMekonnen and Gebreyesus Belay. (2011.). Maejo International Journal of Science and Technology: Impact Assessment of Soil and Water Conservation Measures at Medego Watershed in Tigray, Northern Ethiopia. 5(03), 312-330.

Kruger Hans-Joachim, B. a. (2009.). Creating of indigenous SWC measures in Ethiopia. In Chris Reij, Ian Scoones and Camill T. (ed). Sustaining the soil: Indigenous SWC in Africa, Earth publication. London.

Legesse, G. (2008.). The Impact of Sustainable Land Resources Management on Agricultural Production and Rural Livelihood: The case of Dabe Dongore, East Shoa Zone. M.Sc. Thesis (unpublished), Addis Ababa University, Ethiopia.

Ludi E. ((2004).). Economic analysis of soil conservation: case studies from the highlands of Amhara region, Ethiopia. African studies series A18. Bern: Geographical Bemensia. pp.416.

Ludi E. (2004.). Economic analysis of soil conservation: case studies from the highlands of Amhara region, Ethiopia. African studies series A18. Bern: Geographical Bemensia. pp.416.

Mesfine. ((1995).). Soil and water conservation programs in Ethiopia. Master thesis Erosion and Soil-Water Conservation Group and Environmental Policy Group submitted in partial fulfillment of the degree of MSc in Environmental Sciences at Wageningen Unive.

MoARD. ((2005).). Community Based Participatory Watershed Development: A Guideline. Addis Ababa Ethiopia.

Morgan, R. (1981). Soil Conservation: Problems and Prospects. John Wiley & Sons, .

Nsabimana, D. L. (2008). Soil carbon and nutrient accumulation under forestplantations in Southern Rwanda.African Journal of Environmental Science and Technology.2 (6):142-149.

Pretty, J. S. (1997.). Making Soil and Water Conservation Sustainable: From Coercion and Control to Partnerships and participation. Land Degradation and Development 8, 39-58.

Reusing, M. T. (2000.). Modelling Soil Loss rates in the EthiopianHighlands by Integratation of High Resolution MOMS-02/D2-Streao-data in GIS.Journal ofRemote Sensing.Vol.21 (9).

Sanders, J. a. (2005.). Public Policies for Shifting to Intensive Systems of Crop Production in Sub-Saharan Africa.Training Manual.

Schwab, G. D. (2002.). Soil and water conservation Engineering. John wiley and sont, Newyork, USA.

Siacinji-Musiwa. ((1999).). Conservation Tillage in Zambia; Some Technologies, Indigenous Method and Environmental Issue, Kaumbutho and Simalenga publishers, Harare Zimbabwe. Available at <http://www.atnesa.org>. .

TaffaTullu. (2002). Soil and water conservation for sustainable agriculture. Addis Ababa, Ethiopia. A case study in Fijian Cane Farmers. Journal of Agricultural and Resource Economics. Journal of Agriculture and Resource Economics. Final revision rece.

TaffaTullu. (2002). Soil and water conservation for sustainable agriculture. Addis Ababa, Ethiopia. A case study in Fijian Cane Farmers. Journal of Agricultural and Resource Economics. Journal of Agriculture and Resource Economics. Final revision rece.

Teketay D., M. F. (2003). The state of the environment in Ethiopia: Past, present, and future prospects. Consultation papers on environment No. 1. Addis Ababa.

TekluErkossa and GezahegnAyele. (2003.). Indigenous Knowledge and Practices for Soil and Water Management in East Wollega, Ethiopia. UniversitaetHohenheim, Soil Science and Site Ecology, Germany and DebreZeit Agricultural Research Centre (DZARC), Ethiopia.

TemesganTadessDeressa. (2012). Measuring the Economic Impact of Climate Change on Ethiopian Agriculture: Ricardian Aproach, (World Bank: Policy Research Working Paper 4342, September 2012).

Tewodros. (2009.). Soil and water conservation module in Ethiopia.

Tewodros. (2009.). Soil and water conservation module in Ethiopia.

UNCCD. ((2003).). Community level workshop on best practices in Agroforestry and soil conservation, Palapve ,Botswana, 2-4 December 2003; Available from Secretariat Website: [www. Unccd.int](http://www.unccd.int), accessed. (Date accessed: 15.09.09).

Waugh. ((1995,)). Geography on integrated approach. Wagening Agricultural University, the Netherlands, Compiled lecture notes. 310pp.

WOCAT. (2007.). World overview of conservation approach and technology.

WOCAT. (2007,). World overview of conservation approach and technology.

Wogayehu, B. a. (2003). Adoption of soil and water conservation measures by subsistence farmers in eastern, Ethiopia, presented at the 17 World congress of soil.

WogayehuGashaw. (2006). Determinants of Farmers Decision on Soil and Water Conservation Practices in Dire Dawa Administration.Unpublished master's thesis, AlemayaUniversity.Ethiopia.

WoldeamlakBewket. (2007.). Land Degradation and Farmers' Acceptance and Adoption of Conservation Technologies in the Digil Watershed, Northwestern Highlands Ethiopia. Social Science Research Report Series –No- 29. OSSERA. Addis Ababa.

Young, A. ((1997).). Tropical Soils and Soil Survey. Cambridge University Press, Cambridge Cambridge University Press.

7. APPENDIX

Questionnaire

This questionnaire was prepared as an instrument to conduct an academic research for fulfillment of Bachelor of Science (B.Sc.) degree in natural resource management in Wolkite University Department of Natural Resource Management. The main objective of the research was to assess the role of community participation in soil and water conservation practice. Therefore, the information you would provide is very important for research. Furthermore, the information you gave was used for only the academic research.

The following question answered by the respondent

A. General Information

1. Sex 1. M 2. F

2. Age

1. 15-25 2. 26-35 3. 36-45 4. 46-55

3. Level of education

1. Primary school 2. secondary school 3. Never go to school

4. Family size

1. 1-5 2. 6-10 3. 11-15

5. Household economic condition.

1. Income in Birr or quintals

2. Income in animal husbandry

3. Mixed farming

4. Cause of soil erosion and land degradation

1. Physical factor 2. none

5. Soil and water conservation practice

1. Is there any soil and water conservation practice

1. Yes 2. no

6. Reason for non- participating on SWCP

1. Lack of awareness about SWC

2. Very small land size

3. Lack of sever erosion hazards

7. Factors affecting soil and water conservation practice

1. Shortage of land 2. Lack of finance 3. Lack of knowledge

4. Unsuitability of farm land 5. Health problem

6. Lack of available material

8. What is biological soil and water conservation practices?

1. Strip cultivation 2. Contour ploughing 3. Crops rotation

4. A forestation 5. Fallows cultivation

9. What are physical SWCP?

1. terracing 2. Bench terrace 3. Cheek dam 4.soil dam



7.1. Soil and Water conservation practice in the study area