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ASSESSMENT OF FACTORS AFFECTING THE SUSTAINABILITY OF SOIL AND WATER CONSERVATION STRATEGY IN AMBA SIDIST KEBELLE FARMERS AT ASSOSA DISTRICT, BENISHANGUL GUMUZ REGION, ETHIOPIA

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ABSTRACT

Assessment of factor affecting adoption of soil and water conservation practices important role in deciding options for controlling soil loss. Therefore, understanding farmer's knowledge on soil and water conservation structures and factors that influence their land management practices are important for promoting sustainable land use in the study area. The objective of this study was to assess the factors influencing adoption of soil and water conservation measures. Specifically the study aimed at assessing, quantifying and documenting factors that influencing adoption of soil and water conservation practices. A sample 35 household in the selected kebele of Amba sidist was randomly interviewed. Primary data were collected through structured and semi structured questionnaire. Secondary data were collected from various documents, past researches, the different books, agricultural officers, etc. The analysis based on qualitative and quantitatively on percentage and table description. Farmers of the study area have good awareness of soil and water conservation structure in general and its cases, indicators and the area of their plot of land vulnerable to soil erosion in particular. More over them have effective traditional and modern measures of soil and water conservation structures. However, various factors affecting adoption of soil and water conservation structures such as lack of capital, small size of farm, their farm land, lack of awareness of the farmers, institutional factors, socio-economic and physical factors were observed which obstacle to apply the soil and water conservation structures. Therefore, the study recommends that the alternative mechanisms should be developed to increase and diversify farmers' source of assistances and information. It is recommended that good policy and strategies by the government, corrective intervention from non-governmental organizations aimed at this issues as well as the community's participation on encouraging farmers participation in soil and water conservation practices are very important to solve current poverty, food insecurity and environmental deterioration of the study area.

KEYWORD: Soil and Water conservation, Sustainability.

1 INTRODUCTION

1.1 Backgruond

Soil erosion is one of the biggest global problems resulting both on –site and off-site effects. Soil erosion has accelerated in most parts of the world, especially in developing countries, due to different socio-economic and demographic factors and limited resources (Baskan et al, 2003).The backbone of the agrarian economy in most developing countries is rain fed agriculture. The economic development of developing countries depends on the performance of the agricultural sector and the contribution of the sector depends on who the natural resources are managed. Unfortunately, in the majority developing nation. The quality and quantity natural resources are decries resulting in more severe droughts and floods. Effective integrity SWC management can reduce these effects. Ethiopia is one of the poorest countries in the world (World Bank, 2003).

Its economy is based on mainly agriculture providing employment for over 80% labor force which accounts for a little over 50% of GDP. In fact, agriculture in Ethiopia is not only an economic activity but also way of life for which agricultural land is an indispensable resource upon which the welfare of the society is built. The livelihood of the vast majority of the population depends directly or

in directly on this sector .Such dependence obviously lends to increased vulnerability of the economy problems related to land degradation (wegayehu, 2003).

Most farmers are poor and operate at subsistence level and investment for intensification of agriculture is not well developed in the country. This has created a vicious circle of low productivity land degradation reduces the production potential of the land and this, in return makes it difficult for farmers to produce enough and Land degradation in the form of soil erosion, sedimentation, depletion of nutrients deforestation and over grazing is one of the basic problem facing farmers in the Ethiopia high land and this limits their ability to increase agricultural production and reduce poverty and food insecurity .The integrated process of land degradation and increased poverty has been referred as the downhill spiral of un-sustainability'' leading to the poverty trap(Greenland et al, 1994).

The immediate consequence of land degradation is reduced crop yield followed by economic decline and social stress. Soil erosion is the main form of land degradation, caused by the interacting effects of factors, such as biophysical characteristics & socioeconomic aspects. Degradation resulting from soil erosion & nutrient depletion is one of the most challenging environmental problems in Ethiopia. The Ethiopian high lands have been experiencing declining of soil fertility &sever soil erosion due to intensive farming on steep & fragile land (Amsalu& De Graaff, 2oo4). Recognition land degradation as major environment and socio-economic problem, the government of Ethiopia has made several interventions. As a result, large areas have been converted to terraces, covered by soil bunds, closed by area closures and planted with millions of tree seedlings. Nevertheless, the achievements have fallen far below expectations. The country still loses a tremendous amount of fertile topsoil, and the threat of land degradation is broadening alarmingly (Teklu and Gezahegn, 2003).

The adoption of improved soil SWC technologies in developing countries has attracted much attention from scientists and policy makers mainly because land degradation is a key problem for agricultural production (De Graaff et al, 2008). According to De Graaffet al, (2008), there are three phases in the adoption process: the acceptance phase, the actual adoption phase and the final adoption phase. The acceptance phase generally includes the awareness, evaluation and the trial stages and eventually leads to starting investments in certain measures. The actual adoption phase is the stage where by efforts or investments are made to implement SWC measures on more than trial basis. The third phase, final adoption, is the stage in which existing SWC measures are maintained over many years and new ones are introduced on other fields used by the same farmer (Aklilu, 2004).

1.2 Statement of the problem

In developing countries like Ethiopia there is poor way of soil and water conservation practices unlike developed countries (Kessler, 2006).The developing countries do not give more attention to the application of soil and water conservation practices that can limit their living standard associated with economic development. Soil degradation attributed to erosion is one of the serious environmental problems in Assosa wereda specially Amba sadist kebele. Despite the fact that various soil conservation methods such as cover crop, crop rotation, stone bund, soil bun dwere introduces by the government through agricultural district office in Assosa wereda and practices in the field ,the extents of adoption and the sustainability of these measures are not clear and soil erosion continues to be a serious problem leading to low yields due to loss of soil fertility. Intensive farming on steep slope and fragile lands and other factors like population pressure contributes significantly to low agricultural productivity and insecurity and intensification (Assosa wereda agricultural offices, 2006).

1.3 Objective

1.3.1 General Objective

To assess of factor affecting adoption of soil and water conservation practices.

1.3.2 Specific Objective

- To assesses and documents the factors that affect adoption of soil and water conservation practice in study area.
- Assess the farmer's option on improving sustainability of soil and water conservation measures.
- Assess the impact of the exiting soil and water conservation measures on crop yield.

1.4 Research Questions

- What are the major factors affecting that adoption of soil and water conservation measures?
- What is farmers' option on improving sustainability of soil and water conservation measures?
- What are the impacts of the exiting soil and water conservation measures on crop yield?
- What are possible effective measures to be taken for improving soil and water conservation structures?

1.5 Scope of the Study

The scope these study assessments of the factor affecting adoption of soil and water conservation practice in the study area Assosa woreda at amba sidist kebele. It's mainly confined biophysical soil and water conservation structures and its effectiveness on agricultural productivity and determining factors affecting the conduction biophysical soil and water conservation of the study area .The further investigation of all facts are limited due to financial and time constraints and therefore the study is confined to only amba sidist kebele.

1.6 Significance of the Study Area

This research is expected to have important contributions for the study areas. Because it assesses farmer's awareness on the structure soil and water conservation practice in the study area. It creates awareness on the level of farmers' knowledge, attitude and practice about soil erosion and could be used to take solution measure on soil erosion. It gives useful information for ministry of agriculture working to solve soil erosion and other related environmental problems. It's also better understanding of the kind of training required for farmers in soil and water conservation practice in the study area.

2. MATERIAL AND METHODS

2.1 Description of the study area

2.1.1 Location of the study area

The study area of amba 6 kebele found in Assosa wereda, Assosa Zone of Benishangul –gumuz regional state.Its located at adistance of 10 kilometer from Assosa and 671 from Addis Abeba.Its located at 9°, 30 ″-11°, 30″ latitude in north and 34°, 20″-36°, 30″ longitude in the east.

2.1.2 Climate

The geographical zone of the study area is kola agro-ecological zone the main annual rain fall is 219-1858.3 per year and the annual minimum and maximum temperature is range from 14.8 degree celcius-16.3°c and 26 .5°c-30.1°c respectively.

2.1.3 Topography

The altitude of area is 580-2731 above sea level and from the total area .75% low land 21% middle land and 4% are high land.

3.1.4 Population

According to the population data 2007 carried out Amba 6 kebeles the population number is 332 male and 297 female totally 629 people lived in the kebele .From this population number the house holder's numbers are 174 people and from thus 126 male and 48 are female.

2.1.5 Land use system

The land use system of the study area Agro-forestry, cropland, grazing land, forest land and degraded land. Different types of vegetation are found, such as eucalyptus, gravellycordia-africanacoffee is the common vegetation cover and the most dominant species are mango in the study area. They are also different types of crop in the area such as tiff, sorghum cacao are commonly cultivated crop in the study area and the most crop type in the study area is maize and enclosures are present in the study area to protect the species diversity and restore the degraded land.

2.2 Sampling Techniques and Sampling size

The study were employed the combination of purposive and stratified random sampling techniques. First, we were selected Amba sidist kebele from other Assosa Wereda kebeles by purposive sampling. Due to lack of money or budget and time constraints and amba sidist kebele is most affected by the problem of soil erosion from other Assosa wereda kebeles by asked Assosa wereda agricultural office. Through stratified random sampling technique were employed to makes population homogenous and get representative data .The stratification were based on wealth status used by the kebele (poor ,medium and rich), age (15-30,30-45, 45-60, 60-80), educational level (primary school ,high school,dipioma and degree), sex (male and female). Out of 174 households from those household 20% were interviewed by using structured questionnaires and randomly interviewed 35 households.

2.3 Method of data collection

The data used this study were obtained from both primary and secondary sources. The primary sources mainly related to adoption of SWC were collected using focused group discussion, field observation, farm household survey, face to face interview; transect walks across each village and etc.

Secondary data from scientific and non-scientific report and UN published materials, proceeding and satirical abstracts and office of the agriculture and water resources at the regional, zonal and woreda level were used as additional source of information. The secondary data were collected from various government offices (regional and district offices), reports, websites, past thesis and related books.

2.3.1 Data collection instrument

Qualitative and quantitative information were collected; the primary information was collected through a well-structured questionnaire, interview and organizing group discussion from the study area.

2.3.2 Focused group discussion

Focused group discussion were held with elderly farmers, village leaders, and socially respected farmers who are known to have better knowledge on the present and past environmental, social and economic status of the study area to substantiate the information collect through individual farmer interview. Through group discussion information on the current status of soil, condition indigenous knowledge of farmers for soil conservation and major socio economic and policy based problems and environmental constraints of soil conservation were collected.

2.3.3 Field observation

Direct personal observation conduct encompasses visiting of cultivated and uncultivated land, topography, vegetation cover, settlement pattern and the over all aspects of soil and conservation practices of the study area with interviewed by the individuals.

2.4 Method of data analysis

In order to address the specified objective and to answer the proposed research questions, the collected data were analyzed, and summarized using SPSS to obtain a means of percentage, tables and graphs. Qualitative and quantitative data were summarized, coded, and analyzed, using SPSS to obtain the central tendency –means percentage and summarized in table and graph .Qualitative methods used to analyze responses that are obtain from questionnaires, structured and semi – structured interview by using quantitative techniques. By using qualitative methods to describe the farmers attitudes towards the structures of soil and water conservation techniques in relation to physical and socio-economic and situations of the study are by using information collect through field observation and focus group discussion. Finally the analyses were supported by with tables and percentage.

3. RESULTS AND DISCUSSIONS

3.1 Descriptive Analysis

This chapter presents the survey data and interpretation of the analytical finding of the 35 sample respondents all reported that have participated in the adoption of soil and water conservation practices. However, the degree of adoption differs widely between households.

3.1.1 Respondent Characteristics

Household characteristics of farmers examined in the study were age, education, marital status, and household head gender, major source of income and famine size. Household size and characteristics are directly related to the supply and demand conditions for basic human needs, such as food, shelter, health and educational facilities which in turn directly or indirectly influence the adoption of improved SWC technologies for a farming system. The aim of choosing these parameters was to obtain the general overview of the characteristics of respondents and how could these influence the adoption of SWC, their sustainability and the impact adoption of soil and water conservation practices.

3.1.2. Age

The study found age distribution of farmers varying from 18 to 60 years. Majority of the farmers (47.7) were in the age group of 18-40 years. Where 18% above 60 years, 34.3% were those with age group range from 41-60 years (table1).This implies that most of the farmers were in the economically productive age group and therefore, there is large labor force in study area with potential for adopting SWC practices.

Farmer in the age group (18-60) assumes that to have a good understanding of problems of soil erosion due to information and as a result, usually more interested in soil and water conservation practices.

Table 1: Age of the respondents in Amba "sadist" kebele.

Age	Number of respondent	Percentage
18-40	17	47.7
41-60	12	34.3
Above 60	6	18
Total	35	100%

According to mondara (1998) household members are considered economically productive from the age of 18-64 years. The age groups below 18 years are children who are attending school and others are too young to participate in farming activities. The age group above 64 years is considered less economically active because the member are too old and are not energetic enough to participate in labor intensive production activities.

3.1.3 Education level

The education levels of the respondents are as shown in the table (2).The majority (60%) had no formal education, primary education (25%), secondary education (10%) and higher education (5%). Most of the farmer household heads in the area are not educated and thus have little access to information about newly introduced soil and water conservation practices.

Table 2: Education level of the respondent in Amba "sidist" kebele.

Education level	Number of respondent	Percentage
No formal education	21	60
Primary education	9	25
Secondary education	3	10
Higher education	2	5

3.1.4. Marital status

Table (5) shows marital status of the farmers in the study area. Out of 35 farmers, the highest (72%) were males while 28% were females. Females had smaller percent presentation regardless of the fact that, they are key players in most of the household's farm activities. Probably the reason behind is that, the study aimed at the heads of the households as responsible main decision maker about household affairs. Therefore, except for the few households, which were headed by females which were either widow, divorced and separated, the majority were males. All the interviewed farmers were heads of households. This implies that most useful information regarding the topic in question was obtained because the heads of the household provided it. During the discussion small number of female household heads had almost adopted SWC practice. The main reason women headed households are not involved in the adoption of SWC practices are that female heads have limited access to the information and that socio-economic issues related to traditional social barriers than men. In the area a women takes most of the household responsibility (child care, food processing and harvesting, wedding and bringing water from long distance). Most physical structures in

the area requires a grated delay of labor force for construction which cannot be under taken by women alone. The finding also show that 77% of the respondents were married, 12% single,5% separated and 5.5% divorced, high involvement of married people in agriculture activities could be contributed by the need to generate income to meet family needs. There is good adoption of soil and water conservation practices.

Table 3: marital status and household head gender of the respondents in Amba "sidist" kebele.

Marital status	Number of respondent	Percentage
Single	4	
Married	27	12%
Separated	2	77%
Divorced	2	5.5%
Total	35	100%
Household head gender		
Female	10	28%
Male	25	72%
Total	35	100%

3.1.5 Major Source of Income

Table (4) shows the major source of income of respondent,47.7 farming only,42.9% farming and livestock keeping and 11.4% non-farming activities. From this major source of income is agricultural farming 89.6% the adoption performance of soil and water conservation good understands. When the farmer and family members are more involves in soil and water conservation practices.

Table 4: Major source of income respondent in Amba "sidist" kebele.

Major source of income	Number of respondent	Percentage
Farming only	16	47.7%
Farming and livestock keeping	15	42.9%
Non-farming activities	4	11.4%
Total	35	100%

3.1.6. Household size

According to the study result (table 5), average number of household members for the study villages was 4-6 which were 51.4%,1-3 which were 37% and 11.6 which were 7-10% family important factor in determining the extent to which labor is available in any economic activities and it restricts household ability to access enough food, health services and other basic needs. Therefore, the household with a large number of people are more likely to adopt SWC in comparison to small household size because they are interested in obtaining yields to feed their families.

Table 5: Household size of respondents in Amba "sidist" kebele.

Household size	Number of respondent	Percentage
1-3	13	37%
4-6	18	51.4%
7-10	4	11.6%
Total	35	100%

3.1.7. Perception and Attitude of Farmers

Perception of soil erosion as a hazard to agricultural production and sustainable agriculture is the most important determinant of effort at adoption of conservation measures. Theoretically, those farmers who perceive soil erosion as a problem having negative impacts on productivity and who expect positive returns from conservation are likely to decide in favor of adopting available conservation technologies (semgala we and farmer,2000;Gebremedhin and swinton,2003).

The farmers generally believed that erosion can be controlled (80%) of respondents. Hence; their lack of interest to adopt the introduced measures cannot be explained by a lack of awareness about the problem and the potential for solving it. The majority of the farmers had indicated soil erosion as an important agricultural problem, yet the majority again was not willingly participating in the construction of different bunds. The implication is that correct perception of the erosion problem may be a necessary but not sufficient condition for farm-level adoption of SWC technologies.

Table 6: Farmer's perceptions of soil erosion hazards in Amba "sidest" kebele.

Perception on erosion	Number of respondent	Proportion of total respondents (%)
Whether soil erosion was perceived as a problem in one a farm		
- Yes	35	100%
-No	0	0%
Severity of the problem, if yes to the above question		
-sever	10	30%
-medium	21	60%
-smaller	4	10%
Extent of impacts of soil erosion on farm production		
-sever	10	30%
-moderate	23	65%
-Has no effect	2	5%
Believing that soil erosion can be controlled		
-Yes	28	80%
-No	7	20%

3.2 Farm Land Characteristics

3.2.1 Land Size and Distribution

Land in the study area is scarce mainly due to population pressure. The farm size varies between 0.25 to2.5ha (table 7).the majority of farmers land size was from 1 to 2ha (table 7).due to this the small farm size, fallow lands are not common and there is also continuously farming practices takes place. Limiting fallow land loses an opportunity to increase soil fertility and reduce soil loss from erosion.

Table 7: Distribution of sample household heads by land holding in Amba "sidist" kebele.

Farm size(ha)	No, Respondent	Percent
Up to 1	8	22.85%
1-1.5	15	42.85%
1.5-2	10	29%
2-3	2	6.3%

3.2.2 Slope Fertility and degree of erosion

Interviewers together with respondents classified each farm plot in to flat (<6%), gentle slop (6-15%) and steep\mountainous (>15%), which requires different types of soil conservation measures to reduce soil erosion. The physical characteristics of farm plots are indicated in table (8). Of the total plots, 30% are flat. This implies that according to soil and water conservation experts about (70%) of the farm plots requires conservation of one kind or other, in addition to volunteer flat and land conservation practices. The respondents have also classified their own plot fertility in to three catagories:low15% , medium 70% and high15% fertility respectively (table 8).This may affect farmer's decisions on conservation soil as fertile in the study area because they want to take better care of fields that give better yield. Only 20% of the plots where severely eroded. Most of the remaining plots were affected the some degree (table 8).

Table 8: Distribution of farm plots by slope category, level of fertility and degree of soil erosion.

	Description	No Respondent	Percentage
Slop category	Flat (<6%)	10	30%
	Gentle (6-15%)	21	60%
	Steep (mountainous >15%)	4	10%
Fertility	Low	5	15%
	Medium	25	70%
	High	5	15%
Degree of erosion	Low	3	10%
	Medium	25	70%
	High	7	20%

3.2.3 Distance between Home and Farm Land

It has been found that distance between the farm land and a homestead is an important factor in the adoption of soil and water conservation practices. In the study area the average walking time from the homestead to the farm land is 25 minutes. The scattered and faraway fields are one of the factors that discourage farmers from adopting SWC practices. Regarding ownership and source of farm land, the survey results showed that more than 75% from kebele, from inherited 15%, from rented or bought 10%.

Table 9: characteristics of farm land in Amba "sidist" kebele.

Source of land	No, Respondent	Percentage
From kebele.	26	75%
From inherited	7	20%
From rented or bought	2	5%
Other sources	0	0%

3.2.4 Types of major crops

The major, stable cultivated crops are maize (40%) of the plots followed by "dagusa" and "teff"(30%) and (20%) of the plots respectively (table10).

Table 10: major types of crops in the study area.

Major types of crops	No Respondent	Percentage
Maize or sorghum	14	40%
Dagusa	11	30%
Teff	7	20%
Others	3	10%

3.3 Soil and water conservation practices in the study area

Various major soil and water conservation practices (traditional and improved) have been identified by the local development agent in the study area. The use of improved soil and water conservation measures is a recent development.

3.3.1 Traditional and newly introduced SWC practices

Until recently, traditional soil and water conservation practices have often been ignored or under estimated by development agents, researchers, soil and water conservationists and government staff (IFAD, 1992).farmers uses a number of traditional and improved soil and water conservation technologies in the study area. These technologies include applications of manure, traditional and newly introduced cut-off drains, plantation of both traditional and newly introduced trees, soil bund, leaving crop residues and fallowing on the farm. The traditional soil and water conservation methods refer to practices build up farmers' indigenous knowledge and experience. They include, intensive cultivation, zero-grazing, agro-forestry, forestry (woodlot), furrow irrigation, trash lines, grass strips, minimum tillage and biological.

3.4 Factors Affecting the Adoption of Soil and Water Conservation Practices

There are different factors related to the adoption of soil and water conservation structure measures such as:- personal factor, socio-economic, institutional and bio physical factors which affect farmers' decision to adopt improved and traditional soil and water conservation structures.

Personal factors in relation to adoption of SWC: The personal factors that are considered in relation to adoption of SWC included age, education and family size.

Age of the respondent: There were there age group among SWC adopters and non-adopters:-young people ages between 18-40, middle\ ages 40-60 and old above 60 years.(table1).most of the farmers in the study area belong to the young and the middle aged groups which is an indication that there is a sufficiently large labor force in the study area.

45% of young were the SWC adopter, those among the middle age 50% were the adopters. However, adoption among the old people was 100% adoption among the old people was high compared to other age groups because the project provided labor to all farmers aged above 60 years for construction of contours and planting cover crops. This showed that, increase in number of years one lives is accompanied by decrease in energy or strength and ability to provide labor through there is increase in experience in understanding on the important of SWC and thus increase adoption of the conservation measures among farmer.

Education level: Among respondent 43% of farmer is without formal education adopted the SWCM whereas 34% of farmers who had the level of primary education adopted SWCM, 14% second education and higher education is 9%.from this no formal education is higher percentage compare with the educated farmers. The adoption of SWCM is low, due to farmers no formal education no knowledge for SWCM, lack of acceptance, lack of awareness from the study area is high number of farmers have no formal education. So, that lack of adoption of SWCM.

Family size: The family size of households has an impact on soil and water conservation practice. Moreover as population increases, land holding per household gradually decreases which turn has a negative impact on soil and water conservation. From the study are the household family small in number that is good for adoption of soil and water conservation practices. Because all farmers participate in most of the time agricultural farming, so soil water conservation practice increase it is positive impact.

Institutional factors in relation to adoption of SW: Institutional factors consist of; visits by development agent (OA), technical training, land tenure and distance to market.

Technical support: The level of technical support provided to farmers in terms of visit by extension staff, was significantly related to the adoption of soil water conservation practice in the farmer. However, the relationship was weak and decreases the adoption of SWC practices. This implies that increase the number of visits increase in the adoption of soil and water conservation practice.

Training on soil and water conservation management: Training was among the institutional factors which have strong positive and significant relationship with adoption of SWC practices. This implies that attendance to SWC practice training was associated with increase in the adoption of SWC practices. In the study area the respondent says that,

training is very important for any intervention to succeed, because it make farmers become aware of the important of controlling soil erosion by using soil conservation technology and easily adopt them.

3.4.1 Bio Physical Factors Influencing Adoption of SWC

Topography: The steeper the slope, the more, the need to adopt SWC among the farmers. For example it is shown that, none of the farmers whose farm lands were located on flat land scope practiced SWC technologies. However, those farm lands located on gentle, moderate, steep and very steep scopes had higher adoption percentages. From the study area the soil water conservation expert says that the adoption of SWC is increase with increase slope of the land and the reverse is true in none adopting of the SWC practices.

Types of soil erosion: There are different types of soil erosion in the study area. From the area the soil and water conservation experts says that there are three types of soil erosion in the study area such as, sheet erosion, rill erosion and gully erosion. Among the farmers who suffer from sever gully erosion are more involved in conservation work because they had to conserve their soil from erosion and to prevent the total loss of the land.

Fertility of farm lands: Soil fertility status among the farm lands with respect to adopting SWC practice was another bio physical factors that influenced adoption of SWC practices. The relation between statuses of farmers farm lands that had been practicing SWC was significantly different from those who had not been practicing SWC. The failure of adopt SWC resulted in to 100% low fertility. The relationship between adoption of SWC practice and improvement in soil fertility was positive and strongly significant. In attempt to improve soil fertility, farmers in the study area had been practicing SWC like construction of fanayju and soil bund as observed in Amba sidist kebele.

4. CONCLUTION AND RECOMMENDATION

4.1 Conclusion

The current trend of land degradation by erosion is a treat to food security in the study area of Amba sidist kebele.farmers of study area was characterized by poor socio-economic condition. This can be realized by: dependency on subsistence agriculture with no or rare livelihood diversification where more than 92% of the people depend on only agriculture, the demographic condition (large family size and high dependency ratios), poor land holding system and other socio-economic condition of the study area described. Farmers of the study area have good perception of soil erosion as a problem constraining production on their farm land. Most of the farmers where able to identify the physical and socio-economic causes of soil erosion.however,their perception of cause were varying among surveyed kebeles. The most perceived because are the step slop, deforestation and run off.

Most of farmer believed that erosion can be control. The numbers of farmers participating on soil and water conservation among the respondents were more than half are participating soil water conservation methods. Some are not participating soil and water conservation method due to various factors. Such as lack of capital, poverty, policy related problems, physical features of the land, age of the people, institutional factors. The most important factors affecting farmers' acceptance and adoption of soil and water conservation structure in the study area include:-the small size of agricultural land, the structures require too much labor too implement, lack of time, lack of financial and material, disappointments with local leaders. They suggested many things expected from both the government and farmers themselves. Such as material and expert support from the government, continuous training of the structures and farmers should be have ground rule for the construction and maintenance of structure. Adoption of soil water conservation measure is significantly influenced by both personal socioeconomic, institutional and bio physical factors. However, some of the socioeconomic and institutional factor (access to credit facilities and land tenure)did not have significant influence on adoption of soil and water conservation.

4.2 Recommendation

With the reference to the above result and conclusions, the following are made. Educating farmers about soil and water conservation measures. The study recommends that training programs should be arranged to address the challenge in sustainable manner. The approaches to expansion of soil and water conservation structures should not be top-down and coercively, it should be participatory and depend on the indigenous knowledge of the farmers. Sustainable and participatory soil and water conservation structures must be developed to reduce degradation and achieve the productivity of the eroded land. Government should develop a mechanism for initiating the process of land consolidation. That is instead of plowing fragmented pieces of land farming continuous pieces of land.

The concerned stakeholders and partners found at different levels should be attempting to address those factors affecting adoption of soil and water conservation practices. Farmer's awareness on the indicators of soil erosion must be enhancing in addition to physical conditions of their land. Government or NGO's should provide alternative source of fuel (electricity, natural gas). So that natural vegetation and crop rest due would be saved and used for soil and water conservation. Farmer's opinions should be well thought-out for sustaining and scaling up of soil and water conservation practices. This should be the duty of all stakeholders whose concerted efforts would build farmers capacity to adopt various technologies which are targeted at sustainable increase in crop production, productivity, household income and food security

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