academicJournals

Vol. 8(2), pp. 17-24 February 2017
DOI: 10.5897/JSSEM2016.0583
Articles Number: 6AF663862480
ISSN 2141-2391

http://www.academicjournals.org/JSSEM

Journal of Soil Science and Environmental Management

Full Length Research Paper

Community's perception on soil erosion and their participation in soil conservation practices: A case study of Alaltu watershed of Najo District, Ethiopia

Gemechu Yigezu Ofgeha

Wollega University, Ethiopia.

Received 9 June, 2016; Accepted 2 August, 2016

Community's perception of land degradation by erosion is a key social factor that is important in deciding options for controlling soil losses. Therefore, understanding Community's knowledge and their perception and factors that influence their land management practices are of paramount importance for promoting sustainable land use in the study area. Community of the study area have good perception of soil erosion in general and its causes, indicators and the area of their plot of land vulnerable to soil erosion in particular. Moreover, they have good traditional and modern measure of soil conservation methods. However, various hindering factors such as lack of capital, poverty, small size of their land and other socio-economic and physical factors were observed which obstacle to apply the SWC technologies. In addition, Community's perception of importance of modern SWC technologies was very high. However, the way of their perception seems wrong. Because, they perceive that modern SWC is government strategy to rehabilitate highly degraded area through campaigns rather than method of soil conservation on the agricultural land. They consider that the structure occupy large area that it hinder them to fully utilize their highly fragemented farmland due to high dependency on agriculture. Therefore, it is recommended that good policy and strategies by the government, corrective intervention from any concerned organizations aimed at this issue as well as the community's participation on encouraging farmers' participation in soil conservation practices are very important to solve current soil erosion devastations and environmental deterioration of the study area.

Key words: Participation, perception, soil erosion.

INTRODUCTION

Soil erosion studies have gained great prominence because of the potentail threat it has to land resource and crop productivity. Globally, about 80% of the current degradation of agricultural land is caused by soil erosion (Angima et al., 2003). Soil erosion in association with inappropriate land management practices is one of the main factors causing degradation. Poor land management practices and lack of effective planning and implementation for soil conservation are responsible for accelerating degradation on agricultural land (Hurni, 2005).

Intense land cultivation, uncontrolled grazing, and

*Corresponding author: E-mail: dandigemechu11@gmail.com.

deforestation were commonly observed which has been exacerbate soil erosion in the study area. These factors undermine agricultural productivity and frustrate economic development efforts, especially heavy land dependence in low external-input farming systems in the study area similar to other parts of Ethiopian highlands. Community's perception of land degradation is crucially affected by social, economical, environmental and political factors. Factors such as land size, method of land preparation, land tenure arrangement, distance between farm plot and home, education and wealth status of farmers aggravate soil fertility depletion.

Earlier studies have clearly demonstrated that farmers are decisive in social part in achieving sustainable land use in general and SWC in particular through control of soil erosion. However, these studies were conducted under different conditions and none of these studies address communities' perception of soil erosion and the degree at which they are participating in soil conservation to overcome socio-economic and environmental impact of soil erosion in the study area. For successful soil conservation planning, it is however, necessary to identify communities' knowledge and perception of soil erosion and their contribution in soil conservation. The general objective of this research is to assess the communities' perception of soil erosion and their participation in soil conservation practices. Specifically: 1) To identify the current communities' perception and awareness of soil erosion ; 2) To evaluate the local communities' acceptance and adoption of soil conservation technologies; 3) To identify factors affecting their soil conservation decision.

RESEARCH METHODOLOGY

Description of the study area

The study was conducted in Alaltu watershed located in Najjo Woreda of West Wollega zone, Ethiopia. Astronomically, the district is between 9°37'- 9°44' North latitude and 35°14'- 35°40' East longitude. The study area is composed of various land forms such as dissected plateaus, hills, plains and valleys. The district totally lies with in sub-tropical agro-climatic condition. The annual temperature ranges from 18 to 28°C while rainfall amount ranges from 1350 to 1600 mm. The study area is characterized by rapid population growth similar with other parts of Ethiopia; with annual growth rate of 2.9%. About 82% of the total land was used for agricultural activities including forest land which has been supporting 85% of total population. Averagely,72% of an individual income in the woreda rely on crop production and 22% from livestock production, were as crop production and livestock production which are not separated activities in the district.

In general, the following are some economic, social and environmental problems common in the district:- shortage of farmland and grazing dueto poor soil and water conservation techniques, termite infestation, low utilization of modern agricltural inputs, weak credit and extension services, high prevalence of malaria and some diseases and shortage of medicines and medical equipments and general services rendered by health institution, shortage of school, teachers of better quality,teaching materials, poor transportation and communication networks and gradual rising of rate of unemployment. Three kebeles/villages were selected based on the degree of soil erosion, topographic variation and other socio-economic factors affecting soil erosion. Accordingly, Dongoro Buna is the village which is located relatively at steepy slope and affecting by frequent running water during rainy season in the region while relief structure become gentler along Kiltu Mako and Waltate Agar, respectively.

Research design

The study was designed to use descriptive methods. This method was chosen with strong assumption that it is convenient to collect several kinds of data regarding community's perception on soil erosion, opinion on prevailing problems of soil conservation practices and the action they are taking to overcome the problems.

Source of data

The study has used both primary and secondary data .The primary data were obtained through questionnaire, interview and focused group discussion; while secondary data were obtained from books , journals and different reports on human population, agro-ecology, and land use pattern, topography, soil type, and climate are gathered from Zonal and district Agriculture and Rural Development offices.

Sampling techniques and procedures

Discussions were held with the experts in the zonal and district natural resource offices on the condition of soil resource of the study area and present condition of soil erosion in the district. The study site was selected based on the degree of soil erosion, topographic variation and other factors affecting soil erosion; accordingly, three kebeles were selected purposively for the study. Then household's heads selected from each randomly, through discussion with key informants in the village and secondary information. The total households heads in the selected kebeles were 1197. Out of these 10% were selected as respondent which was 120 household heads believing that they can reperesent the entire population due to the homogeneous characteristics of the population.

Data collection instruments

Primary data was collected through observation, structured questionnaire, semi-structured interview and FGD. Transect walks were held in all selected village, guided by the respective key informants, who we also asked to give their opinions regarding soil erosion issues and land-management activities in the area. The checklist of issues that guided our discussions was:

1. Observable erosion indicators (rills, gullies, stoniness, sedimentation, etc.).
2. Existing SWC structures.
3. Slope gradients and land-use patterns (dominant slopes and niches of crops and trees, etc.).
4. General land-husbandry practices (up–down and across slope tillage patterns, pure and mixed cropping systems, etc.).

During the second survey, 120 farm households were interviewed using semi-structured questionnaires. Prior to conducting the interviews, the researcher trained the enumerators on how to conduct the survey and how to interpret and translate the

Table 1. House hold heads sex and age structure, family size and educational level (Respondents=120).

S/N	Kebeles	Total No. HH heads			Age structure of the family			Educational levels of HH heads			
		Male	Female	Total	0-14	15-64	>65	01	02	03	04
1	Dongoro Buna	34	5	39	220	153	11	3	31	5	0
2	Waligalte Agar	37	4	41	229	126	7	5	26	10	0
3	Kiltu Mako	38	2	40	254	50	2	7	22	9	0
	Total	109	11	120	703	329	20	15	79	24	0
	Percentage	90.83	9.17	100	66.7	31.3	2	12.5	65.8	21.7	0

questions. The questionnaire was pre-tested before administration and some re-arrangement, reframing and correction in accordance with respondent level of understanding were done. The issue of community's awareness as soil erosion is taking place on their land, how they identify level of soil loss among different slope position, causes of soil erosion, their perception of consequences of soil erosion, level of awareness and adoption of soil conservation measures, their practices of soil conservation methods, the constraints that hindered soil conservation were collected by this technique. The DA's and Soil conservation experts of the district were interviewed on their status to uphold farmers skills and capacity to participate on SWC technologies. Focused group discussions were held with elderly farmers, village leaders, and socially respected farmers who were known to have better knowledge on the present and past environmental, social and economic status of the study areas, to substantiate the information collected through individual farmer interview.

Methods of data analysis

In this study, descriptive statistics mainly percentage was used to analyze data. Moreover, qualitative method was used to describe the community's attitude toward soil erosion and the elder farmers' critical view of past and present situation of soil erosion problems in relation to socio-economic and political situations of the study area, by using information collected through interview and focused group discussion. Moreover, likert scale method was used in questionnaire part in order to measure attitude of the respondents on indicators of soil erosion and farmers' perception on trends of soil erosion over time.

RESULTS AND DISCUSSION

General background

The socio-economic and demographic condition of the respondents is described in Table 1. Accordingly, 66.7% were below 15 years of age and 2% above 64 years.This indicate, that the study area is characterized by high dependency ratio mainly with young age dependence. The sex structure of the sampled house hold composition is nearly equal (101.2). The average family size was 6.2 persons. Of the total respondents, over half of the respondents (65.8%) have basic primary education while 12.5% were illiterate, and 21.7% completed secondary school and no higher education level among the respondent. Almost all of the interviewed respondents owned land (97.2%) and only 2.8% of the respondent depends on the contract land and non-agricultural activities (mainly natural resources based activities such as charcoal production from wild forests, timber production and other natural resource based economic activities) with only land consisting of roof in their houses.

The mean land holding size of sample household was about 1.1 ha which is closer to the average land holding size of the woreda (1.4 ha). Taking the average household size and average land holdings of the sample households, the per capita land holding was 0.2 ha. Source: Field Survey, 2014 HH-House Hold 1)No education 2)Primary school 3)High school 4)Higher education

Most of the farmers' practices mixed farming system (88%) and only 12% depend on cropping only, while livestock production is not practiced as an independent agricultural activity in watershed. Livestocks are not only used as a means of cultivating land (oxen for ploughing), to produce meat and milk, manure for fertility, but are used as a store of wealth, as a saving method.

Off-farm activities are important economic base of some farmers in the study area which account to 8%. The common types of off-farm employment in the watershed is mostly exploiting natural resource (wood works, charcoal production for market and selling fire wood) Therefore, they don't give due emphases for soil conservation since their livelihood partially achieved through non-agricultural activities. These activities (mainly charcoal production for market) are practiced by people who own very small plot of land. According to the respondents, poverty is very likely to contribute to soil erosion for many reasons. When people lack access to alternative sources of livelihood, there is a tendency to exert more pressure on the few resources that are available to them.

The farmers were asked how livelihood diversification can be coping mechanism for preventing the socio-economic and environmental impact of soil erosion. However, most of them were criticized by those non-agricultural economy because of different reasons. They argued that the common type of non-agricultural economy in the area are natural resource based such as charcoal production which was resulting to the destruction of natural vegetations. Farmers have

Table 2. Community's perception on causes of soil erosion (Physical Factors) (n=120).

Causes		Percentage		
		Dongoro buna	Waltate agar	Kiltu mako
1	Lack of vegetation cover	22.2	37	23.1
2	Runoff	11.1	14.8	26.9
3	Expansion of grazing land	7.4	3.7	0
4	Heavy rainfall	25.9	29.7	34.6
5	Steep slopes	33.4	14.8	15.4

Source: Survey, 2014.

planting trees, non-agricultural people use the natural vegetation by cutting for different purposes. Furthermore, the farmers of dual income system are not active in community based natural resource conservation in general and soil conservation practices in particular.

Community's perception on soil erosion

Community's perception on causes of soil erosion

Almost all interviewed respondents (96.7%) perceived soil erosion as a problem constraining crop production on their farm land. Both physical and socio-economic causes of soil erosion were presented for respondents separately (Tables 2 and 3 respectively). They perceived all estimated factors as the causes of soil erosion; even if the degree of perception toward the variables vary among the respondents within and different kebeles. This may probably be due to variation in method of soil cultivation, gradient of plot of land, land holding system and land size and other socio-economic variation among the house hold. As indicated on the Table 2, in Dongoro Buna , most of the farmers perceive steep slope of their land as the determinant physical causes of soil erosion (33.4%) while the perception on expansion of grazing land as cause for soil erosion was (7.4%) and runoff (11.1%), lack of vegetation covers (22.2%), more rain (25.9%). This may probably due to relief structure of the area which is relatively steep than Kiltu mako and Waltate Agar. Many conservation structures such as cut-off drain, terraces (both level and graded bunds) were observed in this kebele.

Slopes affects peoples awareness and perception of soil erosion. This is in line with what were observed in the field, the erosion features such as rills and gullies were denser in Dongoro Buna than Waltate Agar and Kiltu Mako and farmers awareness were high. In general, according to the findings, communities awareness and perception on causes of soil erosion are mixed and highly influenced by their real physical and socio-economic condition. According to DA's, different people and thier livilihoods depends on different activities and are living in the study area, and they behave differently. Farmers those their livilihoods are directly related with soil condition, have good perception on cause and effects of soil erosion. They relate soil erosion with different factors such as slope of land , topography, vegetation covers etc. However, non-agrarian have wrong perception on cause and effects of soil erosion and how their activity affect the environment in general and soil condition in particular (how forest deplation exarbate soil erosion). This was realized by FGD discussion that they have no intention to conserve the vegetation; rather they need to shift their settlement to where these resources are available.

Among socio-economic causes of soil erosion, rapid population growth were the most peceived factor. It ranked first (35%) followed by lack of fertilizers (31%). According to the farmers, population growth increases the demand for land and contributes to farming on steep and fragile soils, and land fragmentation which resulted to erosion problems. On the other hand, limited access to knowledge of viable soil management options, is the lack of capacity to invest in soils especially in fertilizers, and having less ability to bear risk constrained by farmers attempt to improve soil.

Community's perception on indicators and severity of soil erosion on their farm land

Even if all respondents perceive problem of soil erosion on their land, their attitude toward its severity shows remarkable differences among the surveyed three kebeles. In Dongoro Buna, most of the farmers reported the severity of soil erosion on their land as severe (86.3%) and only 13.7% said moderate while no respondent says low and undecided. In Kiltu Mako, 56.3% said severe, 18.7% moderate and 15% said undecided and 10% said low. In Waltate Agar, only 37.5% of the respondents said severe and more than half of the respondents (50%) describe the severity as moderate, 12.5% says low. This indicate that topography influence farmers' perception of severity of soil erosion. However, regardless of their gentle slope of land, farmers of Waltate Agar have good perception of severity of soil

Table 3. Communities' Perception of Causes of Soil Erosion (Socio-Economic Factors).

S/N	Expected socio-economic causes of soil erosion	Rank in percentage				
		1st	2nd	3rd	4th	5th
1	Proximity to farmland	8	10	9	38	35
2	Land tenure system	15	22	7	26	30
3	Lack of organic fertilizer	31	28	29	8	4
4	Lack of education /awareness	11	9	22	27	31
5	Increased cultivated area due to rapid population increase	35	31	33	1	0

Source: Field Survey, 2014.

erosion. Because, no respondent said the severity is undecided.

Farmers' perception on indicators of soil erosion on their land were described. Accordingly, 65% of the respondents strongly agreed that reduction in crop yield indicate existence of soil erosion on their agricultural land while 7.5% perceived as undecided. Among the respondents, no one disagree with the effect of soil erosion on crop production. Soil color change as indicator of soil erosion strongly agreed by 36.3% of the respondent while 55% agreed, 2.5% say undecided, and 6.2% disagreed with the soil color change as the indicators of soil erosion. Most of the farmers were strongly agreed with formation of small depression (rills) as an indicator of existence of soil erosion (63.8%) and 22.5% agree with the indicator while only 13.7% were disagreed. 71.2% strongly agreed that gullies development is the indicator of existence of soil erosion on their lands. Presence and absence of weed is one of the indicators of soil erosion. However, most of the respondent undecided (76.3%). They attached existence or absence of weed with another factors rather than the effect of soil erosion. In general, farmers have good perception on indicators of soil erosion as a problem that limits soil productivity.

Community's perception on trends of soil erosion and its effects on their living conditions

Most of the respondents (89.7%) perceive that the rate of erosion is too much increasing over time. They identified shortage of cultivable and grazing lands as matter. Farmland have been highly fragmented in to insignificant size of plot for newly emerging house hold heads through inheritance of land for children. Finding of new land is impossible since all land available for cultivation is occupied, even the land along the steep slope are taken for the settlements they said. Therefore, intensive cultivation exposed their land for erosion. According to them, if the land cultivated again and again without fallowing, it has a probability of been easly affected by soil erosion. Almost all respondent (94.1%) reported that crop yield has been too much decreasing from time to time. No respondent perceive that their production is either increasing or remain constant throughout 20 years. They indicate as their living condition is deteriorating from time to time due to decrease in production resulting from soil erosion.

Previously, crop production mainly coffee, sesame, maize, teff, wheat and barley were the source of income in addition to home consumption. But now, except coffee which seasonally flactuate in productivity based on general climatic condition,other crops are not sufficient to feed their children.

Soil conservation practices in the study area

Situation of soil conservation practices in the study area

There were different conservation structures constructed on the individual farmers land and outside the farm lands. Commonly observed conservation structures were both traditional and modern methods. Modern conservation structures were mainly constructed on the fragile lands outside of cultivated and grazing lands. They believed that the construction of modern soil conservation measure locally known as '*dega'* took place by the government through campaign. According to woreda's Agriculture and Rural Development, the farmers are resistant of adopting SWC technologies; because it consume large areas of their farm lands. Mainly, the farmers of steep slope area highly resist the design of terraces constructions. Because as the steepness of the slope increase, the gap between the structures are expected to close to one another which result in the occupying of their land by the structures. Sustainable Land Resource Management Programs (SLMP) is an important organization work under woreda's Agriculture and Rural Development office organized and funded by CIDA in ten micro-watershad of Najjo Woreda (2012). The activities of the program include:

1. Organizing training and workshops on land resource conservation and management activities.

2. Hill-side degraded area closure activies through Community mobilization and financial support to the farmers. Both physical (cut-off drain,bund stabilization and micro-basin development) and biological (afforestation, reforestation, agroforestry, grassed water-way) structures are constructing in ten micro-watershed of the woreda.
3. Establishment of user group inline with conservation activities-*"integrated economic and ecological development"*. Mainly they use biological conservation methods for dual purposes. For example, the grassed water-way uses as conservation methods and fattening of bull while afforestation, reforestation, agroforestry done by flowering plants used for beekeeping and other activities (multi-purpose tree seedling).

Communities' participation on soil conservation practices

Most of the farmers in the study area (87%) believe that erosion can be controlled were only 23% reported as impossible. The same number of respondent were also asked wether they are preventing their land from soil erosion devastation and only 56% reported as they are practicing the conservation methods. These indicate that significant percentage of the farmers (44%) is not conserving their land. The most important method of soil conservation in the study area was cultivating along the contour (30%) followed by terracing (38.75%) which is commoly observed. According to DA's, there are two types of terracing practicing in the study area through community mobilization. First, level-bund which is used to retain water in relatively dry areas. The second is graded band which is commonly practiced in areas of excess run-off and accessibility of river outlate. The DA's realized that the farmers clearly know where to establish which structure based on the condition of their farmland.

Contour ploughing is used separately or in combination with other conservation structures such as plantation of trees and cut- off drains. In the study area, a contour ploughing has been carried out using the ox-drawn plough. Hence, it is part of the normal farming activity; it needs no extra labor and time for construction and unlike other methods such as cut-off drain and terracing, it doesn't take large areas. Probably, it is the reason why the largest percentage of farmers uses the method since it does not require resource and time in addition to cultivating land. Most of the interviewed people know the fallowing method; even most of them believe that it is an indigenous soil conservation method. However, only 2.5% of the respondents were practices due to shortage of land. Leaving crop residues on the field after harvest is another traditional practice used by the farmers in the area. However, this method is no longer applied because the importance of crop residues is increasing from time to time due to shrinking in size of grazing land and shortage of fuel wood. Thus, farmers are intended to use the residues for fodder of livestock and source of energy.

Highest percentage of the farmers in the study area (32.5%) agreed that the reason for the inability to conserve their land was lack of capital followed by poverty 28.3%. Similarly, 12.5% of the respondents said policy related problems, only 11.2% attached the problem with physical feature of their land, 9.2 % said climatic conditions, 5.8% related with effectiveness of off-farm activities (those preferring non-agriculture activities). However, the factors are perceived by all farmers differently which can be concluded from fair distribution of the percentage throughout the factors. These indicate that farmers are aware of their low level of soil conservation and factors hindering them to practice.

Acceptance and adoption of soil conservation technologies

According to interviewed DA's, awareness creation have been taking place by the experts to implement newly introduced soil conservation technologies on their lands. This is done before community mobilization to participate on soil conservation campaign. The campaign has two types of committee organized from the farmers (technical committee and auditing committee). Then, the farmers who implement the structure accordingly on their farmland during awareness creation and without enforcement are considerd as the models and selected to be the member of committees. The duties of technical committee is to identify and select the site where to establish which structure and when according to the training given for them by the woreda's soil conservation experts. From this, it is possible to conclude that the committee selection is not by the consent of the community which makes the approach top-down.

Moreover, the training for preselected farmers based on their execution of the technology is not enough and it may result biase and disregard the role of others. The farmer who implement first may not be knowledgeable and those unable to implement may not floosh rather they are affected by other economic and no-economic factors. As newly introduced, all of the farmers know about SWC technologies which they defined as the government strategies in order to rehabilitate the degraded land. Most of the farmers describe the technologies as very important (94%). However, only 2% of the respondents ever participated on SWC technology demonstration, field days and workshops before. This 2% were probably those selected from the community as technical committee to be trained and design areas to establish the conservation structures.

Half of the respondents (52.5%) reported that the technologies were effective in arresting soil erosion. Similarly, 57.5% believed that the new SWC technologies

had the potential to improve land productivity. Nevertheless, acceptance of the technologies as effective measures for controlling soil loss and as having potential to improve land productivity cannot warrant its adoption on the farm. While acceptance depends more on the design characteristics of the technologies as related specifically to effectiveness, farm level adoption of the measures depends also on several socio-economic and institutional factors. Therefore, the farmers who implemented some conservation measures in their plots were interviewed how they measure the effectiveness of SWC technologies. They described as they observed a better growth and development of crops mainly along the structures where fertile sediments were trapped. They also evaluated that the amount of sediment trapped by the structure was very high which would be taken away out of the field if that conservation structure were not built.

Almost all farmers of the study area (92%) expressed their interest to continue maintaining the established structures. They have interst to apply the SWC technologies in the rest of their farm fields (plots that were not treated by that time), but only 42.5% of the respondents expressed that they had plan to implement the SWC technologies. The condition of traditional indigenous soil conservation methods and its effectiveness when compared with newly introduced soil and water conservation (SWC) technologies were the point presented during focused group discussion. They argued that both have their own place of effectiveness. The traditional methods particularly contour ploughing in combination with cut-off drain were effective on the farm lands while they are practicing the newly introduced technologies (construction of terracing along steep mountainous area and communal grazing land) through campaign on designed areas by the experts. They express the construction of the terracing as the government method for rehabilitation of degraded land rather than the soil conservation practices. This was realized by most observed structures were constructed on the isolated rugged areas. These indicate that farmers misunderstood the importance of newly introduced SWC, and they were not willing to construct on their farm land but only on the highly degraded areas as the means of rehabilitation.

Factors affecting communities'acceptance and adoption of soil conservation technologies

Farmers' acceptance and adoption of soil conservation technologies in Alaltu watershed of Najjo woreda was affected by various factors. The most important perceived factor was small size of the agricultural land (47.5%), the new technologies require too much labor to implement (15%) and 6.3% identified other factors which are not included in the list. These include lack of time to implement; that they focus on day to day activities rather than sustainability of their land, lack of financial and material support, disappointments with local leaders and committee that they enforce to construct and maintain only on their own degraded land, and their clan rather than where problems are abundant. Only 5% and 8.7% of the respondents believe that land tenure insecurity and lack of knowledge are hindering them not to implement conservation practices, respectively. The most important reason is a small size of their land which they believe that establishing conservation methods on small land is not advisable.

They noted that constructing terraces or bunds on small size farmland is believed as adding another problem greater than erosion problems. Farmers do not recommend constructing physical structures on very small croplands. Farm experiance was another factor affecting acceptance and adoption of the technology. However, 95% of those selected farm experiences explained it negatively on their comments. Accordingly, experienced farmers are resistant to accept and adopt newly introduced SWC. Moreover, they commented that, farmers of severe erosion area are active to accept and adopt newly introduced SWC technologies than the farmers found in the less affected area by soil erosion. Farm size also affects the acceptance and adoption in such way that the farmers of small plot of land do not have willingness to practice the conservation measures.

Conclusion

The current trend of land degradation by soil erosion is a threat to food security, and Alaltu watershed is not an exception. Community of the study area were characterized by poor socio-economic conditions. The farmers on the watershed suffer from severe erosion. Different features of soil erosion indicators mainly rills and gullies were dominated. Basic natural resources like soil, water and vegetation cover in the watershed are highly deteriorating. The community has good perception of problems of soil erosion as a problem constraining production on their farm land. They were able to identify the physical and socio-economic causes of soil erosion. However, their perceptions of causes were varying among surveyed kebeles. The most perceived causes are the steep slope, deforestation and run-off in Dongoro Buna, Waltate Agar and Kiltu Mako, respectively. The trends of soil erosion devastations has an alarming increase on their farm land. As a result , their production is decreasing from time to time which reduce their production at subsistence level, enforces them to change their livelihood to non-agricultural activities basically to forest utilizations.

Most of farmer believed that erosion can be controlled.

However, the significant percentage (44%) are not practicing in any soil conservation activities due to lack of capital, poverty, policy related problems , physical features of the land etc. SWC technologies were well-accepted by the farmers as effective ways of arresting soil erosion, and as it has the potential to improve land productivity. However, the way of acceptance seems wrong; because, they perceived the government strategies to rehabilitate the degraded non-agricultural land rather than farm land. The important factors affecting communities' acceptance and adoption of SWC technologies include the small size of agricultural land, the technologies require too much labor to implement, lack of time, lack of financial and material disappointments with local leaders.

RECOMMENDATIONS

Even if farmers have good perception of prevalence of soil erosion in their farm land, they attached its existence mainly with what they can observe physically such as rills and gully formations. Therefore, it is important to enhance farmers' awareness of other indicators of soil erosion in addition to physical conditions of their land. Farmers have good perception on trends of soil erosion over time and its causes. However, they have no intention for livelihood diversification and other methods of coup upping with the problems of land fragmentations. Therefore, any concerned body should intervene to encourage farmers in reversing the problems and adopt alternative livelihood so as to reduce pressure on land resources.

So far, farmers hardly undertake action to reduce erosion. Therefore, if corrective measures are not taken to tackle the existing situation, more land will become unsuitable for crop production and put even more strain on the existing resources. Farmers should be motivated to adopt the newly introduced SWC technologies. The approaches to expansion of SWC technologies should not be top-down coercively. It should be participatory and depend on the indigenous knowledge of the farmers. In general, any policy and program aimed at land resource management in general and soil conservation in particular has to give due attention and priority in mobilizing farmers to manage and use the land resource in a sustainable way.

Conflict of Interests

The authors has not declared any conflict of interests.

ACKNOWLEDGEMENTS

Above all, I thank my God for helping me throughout my life. Special thanks go to Wollega University which gave me financial support to conduct this research. The author would like to express his deepest gratitude to Mr. Tesfaye Muluneh for his technical support. The research was carried out in Najjo woreda, Ethiopia. Would like to acknowledge the support of woreda's Agriculture and Rural Development Office for their support in providing necessary information, different resources and relevant data collected from the study site with their valuable advice. The author is also grateful to the data collectors.

REFERENCES

Hurni H (2005). Implications of Changes in Population, Land Use and Land Management for surface runoff in the upper basin area of Ethiopia. Res. Dev. 2:147-154.

Mulugeta T (2002). Determinants of household food security in Eastern Oromia, Ethiopia: the case of Boke district of Western Hararghe zone. MSc Thesis Presented to the School of Graduate Studies of Alemaya University: 118-119.

Najjo Woreda Agriculture and Rural Development Office (2012). Annual Report on Natural resource Conservation of Najjo, Woreda.Najjo, Ethiopia.

Najjo Woreda Administration Office (2012). Profile on the Socio-economic Condition of the Woreda. Najjo, Ethiopia.