Assessing the Cause and Impact of Land Degradation on Livelihood of the Farmers in Awaro Kebele, Ambo District

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Abstract

In Ethiopia, land degradation is common environmental problem. It is one of the major causes of low and declining agricultural productivity and continuing food insecurity and rural poverty in the country as well as particularly in Oromia region. There is limited information about cause and effect of land degradation in Oromia region in general and, Awaro Kebele in particular. In case to fill this gap, the major objective of the study was to assess the cause of land degradation and its impacts on livelihoods of the farmers in Awaro Kebele, Ambo District, Oromia region, Ethiopia. It was more specifically designed to identify the major causes of land degradation in the study area and to assess the impact of land degradation on crop production and livestock production of rural households. To conduct this study primary data was collected by using household survey. Secondary data was collected from material like published books and unpublished books. The collected data were analyzed by using descriptive statistics such as means, frequency and percentage and narration and explanation of facts were used to analyze qualitative data. The survey data was collected from 99 sample respondent with interview. From the study results the finding identified that the main cause of land degradation are: deforestation, population growth, overgrazing and lack of awareness. As a result indicated the consequences of land degradation in the study area is loss of productive fertile soil, loss of crop productivity, loss of animal productivity, loss of forest and vegetation coverage and poverty. Generally, finding from the study recommended that the government should have to introduce effective forest conservation mechanism through public participation to inform each and every one about the effectiveness of conserving the forest and to design appropriate land use policy and strategy to protect the land from degradation.

Key words: *Land degradation**,** Livelihood**,** Respondents, Crop production and Livestock production*

1.1 Background of the Study

Ethiopia is among the poorest country where land degradation caused damage to its inhabitant. This physical deterioration of its area had left millions of its population in suspicious how to live harmoniously with nature and smooth handling of their livelihood. The fault of land deterioration that was observed in early settlement areas of the north is seems to repeat itself in the remaining part of the country as recent phenomena. Areas abandoned or managed at low levels productivity and affecting 20-50% of the land and some 6 - 11 million people each year. Still land degradation lingers and presents the greatest threat to the survival of the nation (Hurni H. 1996)

Currently in Ethiopia there is land use policy that prohibits farmers from using such lands but not implemented (Eyasu, 2003). Several factors including poverty, land fragmentation, high human and livestock population pressure act more indirectly as driving forces for land degradation. Pressure from human and livestock leads huge removal of vegetation cover to meet increasing crops, grazing and fuel wood demand.

Land degradation, caused by soil erosion and deforestation, presents an obstacle on agriculture hence threatening the rural livelihoods in the country. Bliake as cited in Bekele and Draike (2003:1) emphasize that Ethiopia is the area most detrimentally affected by soil erosion in the world.

Due to land degradation in most developing countries, in particular, agricultural productivity showed a dramatic decline and reached the level beyond the subsistence requirement of a household (Kirui, O. K., & Mirzabaev, A. (2014)).

Both extent and severity of the problem of land degradation spatial variations depending on different relief, ecology, rainfall, land use, land cover and soil types being as proximate and underlying causes (Ayalnen, 2003). About 40-75% of the world's agricultural land's productivity is reduced due to land degradation (Baylis et al., 2012; UNCCD, 2013). Land degradation has negative consequences on agriculture (*Olsson et al.2005*).

Addressing the root causes of the reinforcing cycle of declining crop and livestock productivity, natural resource degradation, high population growth and vulnerability among vast numbers of resource poor farmers is a crucial

challenge facing Ethiopia today (Alemneh, 2003). Therefore, understanding the current status and causes of land degradation is very important (Kirui, O. K., &Mirzabaev, A. 2014).
The current "Intensified Package Approach" has over played the production aspect, with inadequate attention to economic, social and environmental sustainability (Alemneh, 2003).

Sonneveld (2002) simulated several scenarios for the potential production from agricultural land in Ethiopia. Sonneveld (2002) found that the loss of agricultural value due to land degradation between 2000 and 2010 is about $7 billion (or increased by about 12.62%). These previous studies relied on crop simulations with very limited data on farm and farming practices and only measured the direct costs of soil erosion on yield. Moreover, the wide range of estimates reflects substantial uncertainty of the impact of land degradation on agricultural production. Nevertheless, these studies illustrate the magnitude of the problem (Berry, 2009).

1.2. Statement of the Problem

Ethiopia is facing serious problems of land degradation and impacts on livelihood of the population. This problem involves population growth and agricultural stagnation because of soil erosion and nutrient depletion (Alemneh, 1990).The situation of land degradation has negatively affected the agricultural sector to a larger extent and the overall economy as well as the livelihood of its people (Aklilu, 2001).

The planned aim to identify the causes of land degradation and its impact on livelihood of the farmers was required. However, there were researches conducted on effect of land degradation on farmer's livelihood in the study area but with limited information on its cause. In ordered to fill this gap the study was focused on cause and effect of land degradation on farmers' livelihood in Awaro Kebele. Therefore this study was undertaken to fulfill these knowledge gaps on cause of land degradation and impacts on livelihood of the farmer in Awaro Kebele, Ambo district.

1.3. Objectives

1.3.1. General Objective

The overall objective of the study was to assess the cause of land degradation and its impacts on livelihoods of the farmers in Awaro Kebele, Ambo District, Oromia region, Ethiopia.

1.3.2 Specific Objectives

More specifically the study objectives were to:

- To identify the major causes of land degradation in the study area,
- To assess the impact of land degradation on crop production and livestock, production of rural households

1.4. Research Question

The finding of the study answered the following research questions:

- What are the reasons of land degradation?
- What is the effect of land degradation on livelihood activities of the farmers?

1.5. Significance of the Study

The study is on the assessment of cause of land degradation and impacts on livelihood of the Farmers in Awaro Kebele play a significant role in providing useful information on local land management practice and this study result will help for further research and policy intervention on land degradation and its effects on farmers livelihood and mechanisms to improve degraded land in this study area.

1.6. Scope of the Study

Land degradation is a major problem at national, regional and local level, as well as that of study area mostly on agricultural production.

This study concentrated on assessing the cause of land degradation and its impact on famer's livelihood in the case of Awaro Kebele, Ambo district. The study could be useful for the farmers and the decision makers providing the mechanisms to improve degraded land. The study was limited to ambo

district, Awaro Kebele due to the lack of time and financial constraint to involve the whole district in the study.

1.7. Limitation of the Study

The study has its own limitation in which the collections of information was constrained and harden the gathering of the information these include shortage of time due to the reason that the time for collection information in the study area is competing with classes time and the distance between campus and study area was far and it need more time also. Financial problem is one among the limitation which is identified as risking the transportation from the campus to the study area as well as cost for water and other human need during traveling around the households' home. Also Lack of sufficient resources necessary to accomplish the research and absence of well-organized document and research work on the topic was among the limitation the study. The last but not least was the language constrains, due to the diverse language among group member where most of the members don't speak Afan Oromo which is the local language of the study. The translation of the respondent reply into English was little hard for those who know the local language and it have somehow affected on the work as whole.

3.1. Description of Study Area

3.1.1. Geographical Location and Population Distribution

The research was conducted in Oromia Regional State, West Shewa Zone, Ambo Woreda Awaro Kebele which is located between 8º58'30''N to 8º59'N and 37º52'E, to 37º52'30''E. It was bounded by West Ambo town and by East Meti Kebele and located at a distance of 112km From Addis Ababa toward the West direction. The total population of Awaro Kebele is 15093, out of this, male number is 9133 and female with 5960 (Awaro Kebele agricultural extension office, 2010/2018).

3.1.2. Altitudinal and Climatic Condition

Ambo district is found partly in the Central Highlands Plateau of Oromia /Ethiopia, and partly in the Blue Nile Basin. The surrounding of the study area is featured by varied topography ranging from plain lowland to slightly

rugged terrains. The elevation of the surrounding area varies from 1816masl to 2162masl (Awaro Kebele agricultural extension office, 2010/2018).

3.1.3. Farming Activity

The major farming activity of the study area, like other rural areas of west Shewa zone, are agriculture, mixed farming and livestock production. 85% of the Awaro Kebele population is rural resident. The most widely cultivated crops in the study area includes Maize, Teff, Sorghum, wheat, Barley, oil seeds (lean seed millet), pulses(beans, peas,).Livestock adopt in this study area is cattle, sheep, goat and poultry both for household consumption and market and also non-ruminant animals like donkey, mules and horses for purpose of being using for transportation and income generation activities (Awaro Kebele agricultural extension office, 2010/2018).

3.2. Research Design

The research paper type was descriptive. Olsson, L., Eklundh, L., Ardö, J. 2005 states that descriptive research is concerns with describing the characteristics of a particular object or phenomena. The research design was survey design. Where survey is type of design which taken in to account the entire steps involved in a survey concerning a phenomenon were studied.

3.3. Sampling Size and Sampling Technique

3.3.1. Sampling Size Determination

The numbers of sample households (HHs) were determined by using (Yeraswork Admassei. 1985) formula at marginal error (10%).

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

Where n= sample of respondent

N =total population

e= marginal error

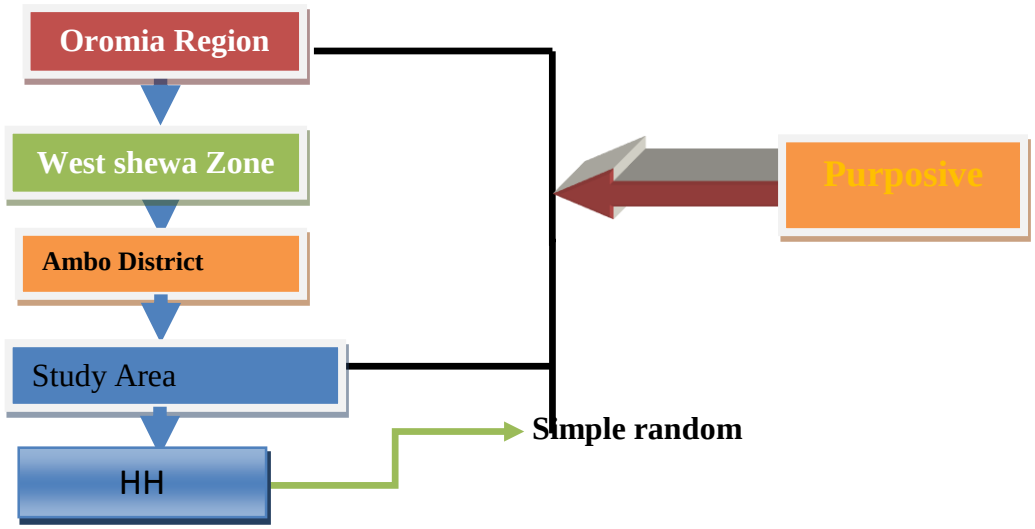
$$n = \frac{15093}{1+15093\ (0.1)^2} = \frac{15093}{99}$$

99 samples HHs was selected for the study from the total lists of Kebele HH using simple random sampling methods.

3.3.2. Sampling Technique

To meet the objectives of this research, purposive sampling techniques was used to select west Shewa zone from Oromia region state, Ambo District Awaro Kebele, because of proximity and conveniences to our university since the researchers have no time and resources to conduct a research at a far distance from here. The households for this research were selected by using simple random sampling methods.

Figure 5: sampling procedure



3.4. Data source and Data Collection Method

Primary Data: Primary data refers to information collected for the first time. Primary data was collected by employing data collection method/techniques like semi-structured interview with households.

Household survey (HHS): In this research Questionnaires were prepared and interview was undertaken with sample respondents (HHs). The questionnaires consists different types which related to the topics of research. The questionnaire prepared first in English and then translated into the local

language of the study area, Afan Oromo (the language that respondent understands).

Secondary Data: secondary data are those which have already been collected and analyzed by someone else. The secondary sources of information for this study include: scientific books, journal articles, published reports, and various government documents, different reliable website, different agriculture and rural development office reports, CSA (central statistics agency) reports and document reviewed at different levels of government organizations were used.

3.5. Methods of Data Analysis

After the necessary data was collected from respondent, it was checked and edited. The data contain both qualitative and quantitative information. Therefore qualitative and quantitative data analysis techniques were employed in the study. After necessary process farther classifications made the qualitative data by using direct quoting and narration and for quantitative data analysis technique the data was analyzed using simple descriptive statistic. This include using frequency distribution and percentage, finally, it was presented using table and interpreted accordingly.

4. Results and Discussion

4.1. Demographic (Socio-Economic) Information

4.1.1. Distribution of Respondent by Sex

Table 4.3: Sex of Sampled Respondents

Sex	Frequency	Percent (%)
Male	87	87.88
Female	12	12.12
Total	99	100

Source; Own survey, 2010/2018

As showed in table 4.1, 87.88% respondents were male and 12.12% respondents were female. This shows proportions of sample respondent males are more as comparing from female respondents.

4.1.2. Age Distribution of Respondents

Table4. 4: Distribution of Respondent by Age

Age	Frequency	Percentage
21-25	15	15.15
26-30	6	6.06
31-35	18	18.18
36-40	12	12.12
41-45	12	12.12
46-50	12	12.12
51-55	3	3.03
56-60	6	6.06
60 above	15	15.15
Total	99	100

Source: Own survey, 2010/2018

Table4.2. shows that the distribution of respondent by age as could be seen from the table 15.15% of respondents more aged 21-25, 6.06% of respondents were aged 26-30, 18.18% of the respondent were aged 31-36, 12.12% of respondents were aged 36-40, 12.12% of the respondent were aged 41-45, 12.12% of respondents aged 46-50, 12.12% of respondents were aged 46-50, 3.03% of respondents aged 51-55, 6.06% of respondents were aged 56-60 and 15.15% of respondents were aged 60 above years old.

4.1.3 Family Size of Sample Respondents

Table 4.3: Number of Family Size in Household Member

Size of household	**Frequency**	**Percent (%)**
1-3	21	21.21
4-6	33	33.33
7-9	33	33.33
10-12	6	6.06
None(single)	6	6.06
Total	99	100

Source; Own survey, 2010/2018

As table 4.3 shows that the response for distributions of the respondents about family size of 1-3 was 21.21%of the respondents, where 4-6, were 33.33% of the respondents and 7-9 and 10-12, were 33.33% and 6.06% of the respondents respectively. In which single have percentage of 6.06.

4.1.4. Marital status of respondents

Table4. 5: Marital status of respondents

Marital status	Frequency	Percentage
Single	6	6.06
Married	57	57.57
Divorce	18	18.18
Widowed	3	3.03
Separated	15	15.15
Total	99	100

Source: Own survey, 2010/2018

As table 4.4, show that majority of respondents 57.57% are married while 18.18%, 15.15%, 6.06%, 3.03% are Divorced, Separated, Single, and Widowed respectively.

4.1.5. Educational Level of Respondents

Table4.5: Distribution of Respondent by Educational Level

Educational level	Frequency	Percentage
Illiterate	15	15.15
Capable to Read and write	12	12.12
Primary school	33	33.33
Secondary school	18	18.18
Above 12^{th} grade	2 1	21.21
Total	99	100

Source; Own survey, 2010/2018

Table 4.5, shows the distribution of the respondents based their education. From the whole respondents, the people who are learned primary school and exceeds from others. According to this table the most respondents in the study area are literate and thus would be responsive to mitigate land degradation and restore land degraded.

4.1.6. Size of Farmers Land

Table 4.6: Land Holding Size for Respondents

Size of land in hectare	Frequency	Percentage
0.5-2	27	27.27
2.5-4	44	44.44
4.5-6	7	7.07
6.5-8	4	4.04
8.5-10	3	3.03
None	15	15.15
Total	99	100

Source; Own survey, 2010/2018

As table 4.6 shows that farmer's majority land holding size 44.44% of the respondents is 2.5-4 own land in hectares and 15.15% of the respondents were haven't own land.

4.2. Cause of Land Degradation

According to the data collected from respondents, deforestation was main cause of land degradation in study area. Which is influenced by population growth and put tremendous pressure on the forest, particular close to settlement for fire wood, wood seller, charcoal burning, roofing and household furniture and these have result in depletion of forest and degradation of forest land. With increasing number of people there has not been a related change in the pattern of agriculture, which is still essentially smallholder farmer relying on expanding the cultivated area, often into marginal land, Rather than adopting intensification techniques. There is still a strong tendency to hold wealth as livestock, often cattle, further impacting grazing land. This finding was supported by the idea of UNECA, (1996), population growth can have and has /had deleterious effect on agricultural growth, natural resource management and poverty and land distribution of farmers, which in recent years has been the only means of formally acquiring access to land to accommodate has led to lever fragmentation of plots a reduction of crop field and insecurity. They also replied that the cause such as overgrazing and lack of awareness were there. Similarly, in the study area population growth brought exert crowded of people on land, which impact on the land distribution for farmer to cultivate fresh fertile land (Source; own survey from office, 2010/2018).

4.2.1 Deforestation

According to the most respondent's deforestation is very serious problems in the area and also it is very immediate causes for land degradation. And most respondents show that the cause of deforestation in the area is for searching additional agricultural land, settlement, increasing in population members etc. and around 50% of the respondents says deforestation rate become high as compared to the past time due to the increase in population. The same to this the finding was supported by Teketay, D. (2001) who states that the use of wood and other biomass for fuel and the expansion of agriculture into forested areas fostered a high rate of deforestation and ultimately stripped the land of vegetative biomass exposing it to high levels of soil erosion.

Table 4.7 Respondents about Deforestation Rate in the Study Area

Item	Response	Frequency	Percentage
Deforestation rate in the study area	High	50	50.51
	Medium	24	24.24
	Low	25	25.25
	Total	99	100

Source: own survey, 2010/2018

As above table 4.7 shows 50.51% of the respondents said the deforestation was high while 24.24% of the people responded that the level of deforestation is medium where as 25.25% of the respondents said the deforestation rate is low in the area.

Finally, the researchers understood that deforestation rate is still high and as the result, it leads to land degradation.

4.2.2 Overgrazing

According to most respondents, overgrazing is one of the causes of land degradation because bar lands are eroded freely by both wind and water. This might be due to the fact that, lack of excess land for shifting of gazing of animals, most farmers opt to traditional way of grazing one land for long period of time and it cause the land to expose to erosion either by water or wind due to lack of coverage on the land. The top soil can easily be eroded and it causes loss of top fertile soil and reduction on the growing capacity of land.

Table4.8 Responses of the Respondents on Overgrazing As a Cause of Land Degradation

Item	Response	Frequency	Percentage
Overgrazing rate in the study area	High	34	34.33
	Medium	47	47.47
	Low	18	18.2
	Total	99	100

Source: field survey, 2010/2018

As above table 4.8, shows 34.34% of the respondents said the overgrazing rate in the area is high and 47.47% of the respondents said it is medium while 18.2% of the respondents responded that the overgrazing rate is low. Finally, the researcher understood that overgrazing has a contribution on land degradation.

4.2.3 Population Increase

Together with land shortage, the third basic cause of land degradation based on respondent reply was the continuing increase in population which put big challenge on available land. This limited land resources and increase in rural population as a cause for land degradation show that big number of people to be supported from this land resource is increasing every year. On this issue the respondent was interested in identifying this as a cause of land degradation because their population was in alarming rate which refers to increased pressure of population on land, resulting in small farms, low production per person and increasing landlessness. While this leads to non-sustainable land management practices, meaning the direct causes of degradation. For reasons outlined above, poor farmers are led to clear forest, cultivate steep slopes without conservation, overgraze rangelands, make unbalanced fertilizer applications, and the other causes which will in turn cause deforestation as well as generally land degradation. This finding is supported by Morgan; R. (2005) who states that high population growth and the size of individually owned plots of land is increasing and put tremendous pressure on land resource.

Table4.9 Responses of the Respondents on Population Increase As a Cause of Land Degradation

Item	Response	Frequency	Percentage
Population increase effect in the study area	High	30	30.30
	Medium	45	45.46
	Low	24	24.24
	Total	99	100

4.2.4 Lack of awareness

Focused on the people living in the study area lack of awareness was highlighted as the cause for land degradation. Based on their respond they said about this. The government is not paying attention on what is facing by people living in rural area. Where the government is sitting there with enough knowledge on how to target this both natural and manmade hazard but fail to do that. The only way they used as a coping mechanism on how to target this was traditional way of reducing the soil being eroded which is filling the sack with soil or residue of anything's. This is proved that their intention was to reduce the amount of top soil being washed away during rainy season. In another way due to the increase in sack price in the market the practice is falling short because people have no enough money to buy all sack needed for a given float of farm land.

Table 4.10 Respondent Reaction Lack of Awareness

Item	Response	Frequency	Percentage
Lack of awareness as cause in the study area	High	26	26.26
	Medium	39	39.39
	Low	34	34.35
	Total	99	100

In fact based on the given table above, it show that the percentage of highness effect of the cause is only 26.26 which mean most people in the area reply this as medium and low with percentage of 39.39 and 34.35 respectively.

All in all the people living in the study area did not solely issue out only this four as the causes of land degradation but many more which include, topographic of the land, traditional farming and lack of use technology but with minimum effect than that of the first four.

4.3 The Problems of Land Gradation

Land degradation put tremendous impact on all livelihoods of the farmers especially on crop production, livestock production and productive soil of the area as well as forage for animal feeding.

Table 4.11 Problems of Land Degradation

Types of degradation (problems)	Frequency	Percentage
Soil erosion	26	26.26
Low harvesting	**20**	20.20
Wind erosion	17	17.17
Unmeet forage for animals	8	8.1
Total	99	100

Based on the responses of the most respondents, land degradation is something that it present can't be ignored by anyone in the community living in that area. With their answer to the question either if they believe that land degradation is problem or not was only yes that given to this question by all households' members that was interviewed. After this they have listed out what the problems they faced based on their effect on the livelihood of the household and this problem are, soil erosion, low harvesting, wind erosion, pressure on livestock production, flooding and unmeet forage for animal feeding. The two most important problems that many respondents attention was focused on was soil erosion and crop failure where the percentage is 26.26% and 20.20% respectively. Were The other was not that much important like this two in which wind erosion was 16.16% and livestock production decline and flooding was 16.16% and 12.12% respectively. While the last but not least which is unmeet forage for animal feeding with 8.1 percent.

4.3.1 The Impact of Land Degradation on the Livelihood Activities of the Farmers

Based on the questionnaires, the question on if the land degradation has impact on the livelihood of the farmers was yes for all respondents. The respondent have listed more impact of land degradation on different activities, this are, decline in crop production, unfitted livestock production, productive soil depilation, loss of forest resource and poverty.

Table 4.12 Impact of Land Degradation on Livelihood Activities of the Farmer

Variable	Frequency		Percent
Loss of crop production	42		42.43
Loss of livestock production	22		22.22
Productive soil depletion	16		16.16
Loss of forest resource	11		11.11
Destitution (poverty)	8		8.08
Total	99		100

Source; own survey 2010/2018

The above table show, that the major perceived effects of land degradation on agricultural activities were decrease in farm land available for cultivation which lead to loss of crop production and reduction in farm yields. Many researchers have reported of the decreased in crop yields whereas result of land degradation caused by erosion. Based on the information from all of the respondents that were asked about the effect of land degradation, 42.42% of sample respondents pointed the decline in crop production, which were faced by many people with more challenge of low productivity and low profitability of farmer production (agricultures) which had been characterized by low and stagnant yield and the remaining 22.22%, 16.16%, 11.11% and 8.08% of respondent pointed the loss of livestock production, productive soil depletion, loss of forest resource and destitution respectively.

4.3.2 The Effect of Land Degradation on Crop Production

As seen from study area, the major activity of the livelihood of the people is dependent on agricultural activities. Which rely on crop production, this means the most practiced activity is crop production which was ranked first. The above activities mentioned were the main source of the people livelihood

with the crop production on the top. This could be reasoned out that there is heavy dependence on primary natural resource for economic sustenance in the area. In this case majority of the respondent have reasoned out why the impact of land degradation was negatively affected on crop production. Most of them said the fertile soil is eroded away from open bar land and this reduce the crop collected seasonally which in turn reduce the household consumption. However due to the fertility loss in the soil the crop produced per farm land is reduced.

4.3.3 Effect of Land Degradation on Livestock Productions

In fact there are several reasons that a household to keeps livestock. The primary purposes of herding livestock include provision of draught power, production of dung to use for bio-fuel and production of compost/manure to fertilize farmlands, a form of capital accumulation serving as security against emergencies, to fulfill social obligations such as gift, and provision of dairy and meat products, which have a role in the household income. Therefore, livestock rearing complements crop production and crucial asset diversification mechanisms. Livestock fattening is one of the productivity enhancement mechanism of livestock in the Kebele. Commonly, oxen from farm and sheep are fattened as high income generating activities for some households.

As researchers identified from respondent about the coverage of the livestock the coverage of the animals is small due to that farmer's lack the farm land, pasture land and the existing area is fragmented by land degradation. There is direct relationship between land availability and the number of livestock's. Farmers were forced to limit themselves in holding small number of animals due to shortage in pasture land which in turn influences the prevalence of animal disease because there is no enough food which can help them fight different disease. In another way as stated above that livestock production complement crop production and vice versa, the pressure that land degradation put in to crop production is somewhat the same to that of livestock raising because if the pasture land or animal feeding process is effected it show that there is no meant to feed the animal and animal death will occur. According to respondent response the most and main reason for animal death was due to this shortage of forages which in turn limit the number of animal owned by farmers.

4.4. Suggestion to Protect Land Degradation

Table 4.13: Suggestion to Protect Land Degradation

Variable	Frequency	Percent
Conserving soil and water	27	23.23
Afforestation and reforestation	18	27.28
Covering farmer field by crop residues and animal manure	12	18.18
Covering the end part of steep slope by sack filled with soil or	11	12.12
Other	8	11.11
Total	99	8.08
		100

Source; own survey, 2010/2018

Suitable land management practice deal with the combination of appropriate and suitable use of land and in the process of minimizing the land degradation. (Mulugeta L, 2004). Support this, entire respondent was agreed on land use policy and using land wisely by proper way of feasible. The 23.23%, 27.28%, 18.18%, 12.12%, 11.11% and 8.08% of sample respondent was suggest as the proper land use policy, conserving soil and water, afforestation, sack filled with soil and cover farm field by crop residues and animal manure. And also suggested bush fallow, crop rotation, shifting cultivation, proper and adequate use of fertilizer and effective farmers participation in land use planning and management. This shows that farmers are aware of what is happening in their environmental situation and make effort at controlling land degradation. Mechanism taken from degraded land in to rehabilitation, all of the respondent responded that they should be fenced and protect from animal and human contamination and use reforestation, by using compost and rehabilitation of the degraded land.

5. Conclusions and Recommendations

5.1 Conclusions

As mentioned in the previous chapter the main purpose of this research is to find the major causes and effects of land degradation on the livelihood of the farmers in Awaro Kebele, Ambo district and provide some major mechanisms to enhance and promote the good land use policy. According to this, farmers listed attributed cause for land degradation based on their effect

on the livelihood of the farmers. The paper shows that the study area is characterized by more or less rugged topography and has many ups and downs with high population pressure and scarcity of arable land due to population increase which in turn limit agricultural land.

The respondents pointed out that deforestation; overgrazing, population increase and lack of awareness are the major causes for land degradation. And the soil conservation mechanism that is available in study area was traditional method of soil erosion mitigation which is filling the sack with soil or crop residue to protect the soil erosion in bar and step slop farm land. The livelihood of household was identified as highly affected by the land degradation by affecting the household production both in crop production and livelihood production which in turn impact in house hold consumption.

5.2 Recommendations

Based on the above findings and lessons drawn from the impact of land degradation on livelihood strategies of the farmers and the need to alleviate adverse effects on the livelihood of the farmers, the key remarks are made to be implemented by government, extension agent, community and other concerned non-government organization to target the problem of land degradation. The following amending actions should be taken both by government and other actors to target the problem. These are.

- The government should have to introduce effective forest conservation mechanism through public participation to inform each and every one about the effectiveness of conserving the forest.
- The percentage between deforestation and afforestation should be balanced by good policy from the government or by making reforestation project available and clear to the farmers
- Government should have to improve the educational level of household members to allow the family unit to make the right choices about their livelihoods, including access to new technologies to use the existing land more efficiently; adoption of new varieties to enhance crop productivity; and family planning to reduce the pressure on limited resources.
- High priority should be given to family planning action to decreasing population growth.

❖ Government should identify opportunities to improve reporting mechanisms to let the farmer know what causes their suffering and how to tackle the problem as well as reporting from farmer to government about the stage of land degradation.

❖ Government should advance the community participation for the conservation and management of bar land to reduce the soil erosion.

❖ Government and other actors must have to create other employment opportunity to rural youth to minimize the dependency on land resource.

❖ Government should enable to improve farmer to implement land use policy or by renewing or creating of new land use policy which will meet the needs of peoples.

❖ Local farmers should adopt Anti-free grazing land and improving the feeding of animals to minimize land degradation caused by overgrazing.

❖ Government should evaluate and check the right application of the land use policy and strategy in the farmers systems

Reference

Abalu, G.I. 1997. Meeting Future food and Agriculture Needs of Sub-Saharan: A Policy Issue and Orientations, Ethiopian Journal of Agricultural Economics. Vol.1, No.1.

Aklilu Dalelo 2001.Degradation of Natural Resource in Ethiopia.Assesment of student awareness and views. Addis Ababa

Alemneh Dejene. 1990. Environment, Famine and Politics in Ethiopia. A view from the village. Boulder: Lynme Bienner Publishers, Inc.\

Alemneh Dejene. 2003. Integrated Natural Resources Management to Enhance Food Security:

Ayalneh, D, 2003. Integrated national resources management to enhance food security.

Badeg Bishaw. 2001. Deforestation and Land Degradation in Ethiopia Highlands: A strategy for Physical Recovery. Oregon state University Corvallis NE African Studies Vo.8, No. 1 (New Series) 2001. pp. 7-26.

Baylis, K., Jolejole, M. and Lipper, L. (2012). Land Degradation's Implications on Agricultural Value of Production in Ethiopia: A

Look inside the Bowl. Presentation Papers at the International Association of Agricultural Economists (IAAE) Triennial Conference, Foz do Iguacu, Brazil, 18-24 August 2012.

BEKELE.W, and DRAKE. L, 2003. Soil and water conservation discussion behavior of subsistence farmers in the eastern highlands of Ethiopia: A case study of the Hunde Lafto area. Addis Ababa, Ethiopia.

Berry L (2003). Land degradation in Ethiopia: its impact and extent in Berry L, Olson J. and Campbell D (ed): Assessing the extent, cost and impact of land degradation at the national level: findings and lessons learned from seven pilot case studies. Commissioned by global mechanism with support from the World Bank.

Berry, L. 2009. Land Degradation in Ethiopia: Its Extent and Impact. Global Mechanism and World Bank.

Blaikie, P. & Brook field, H. 1987. Land Degradation and Society. London:

Methuen.D.L. Johnson and L.A. Lewis 2007Land Degradation: Creation and Destruction, 2nd edition, Rowman and Littlefield, Lanham, Boulder, New York, Toronto, Oxford,.

Constable, M., 1986. Ethiopian highlands reclamation study: Development strategies. Ethiopian Highlands Reclamation Study Working Paper 24. Land Use Planning and Regulatory Department, Ministry of Agriculture, Addis Ababa, Ethiopia. 274 pp.135

Demel T, Fetene M, Abate A (2003). The state of the environment in Ethiopia: Past, present, and future prospects. Environ. Environ. Change Ethiopia.

Dessalegn Rahamato.1996. Land, population and Environment, what is the issue? IDR, Addis Ababa University.

Dregne, H. E. (1991). Human activities and soil degradation. Semiarid Lands and Deserts: Soil Resource and Reclamation, 19, 335.

EEPC. (2002). Koka dam sedimentation study: recommendations report. Ethiopian Electric Power Corporation. Ethiopia: Addis Ababa.

EPA (Environmental protection Authority). 1997: The conservation strategy of Ethiopia, volume The Resource Base, its utilization and Planning for sustainability. Addis Ababa.

Eswaran, H., R. Lal and P.F. Reich.2001.Land Degradation: An overview. In: Bridges, E.M., I.D, Hannam, and L.R. Oldeman, F.W.T

penign de vries, S.J. Scherr, and S.Sompatpanit (Eds.).Responses to land Degradation. Proc. 2nd international conference on land degradation and desertification, KhonKaen, Thailand.Oxford Press, New Delhi, India.

Eyasu, E. (2003). National assessment on environmental roles of agriculture in Ethiopia. Unpublished Research Report Submitted to EEA, Addis Ababa.

Eyasu, E. (2003). National assessment on environmental roles of agriculture in Ethiopia.

Fitsum H, Pender J and Nega G (1999). Land degradation in the highlands of Tigray and strategies for sustainable land management: Socio economics and Policy Research Working Paper 25. International Livestock Research Institute.

Gebreyesus B and Kirubel M (2009).Estimating Soil Loss Using Universal Soil Loss Equation (USLE) for Soil Conservation planning at Medego Watershed, Northern Ethiopia. Journal of American Science. 5(1):58-69

Hurni H (1996) land degradation, famine and land resource scenarios in Ethiopia high lands mountain research and development27-62 Cambridge University press136.

IFPRI, 2005. International food policy research institute) poverty and land degradation in Ethiopia.

Kirui, O. K., &Mirzabaev, A. (2014).Economics of land degradation in Eastern Africa (No. 128). ZEF Working Paper Series. Center for Development Research (ZEF), University of Bonn, Germany.

Ludi, E. 2002. Economic Analysis of Soil and Water Conservation: case studies for the highlands of Amhara Region, Ethiopian African Studies series A18, Universty of Berne, Switzerland.

Ministry of Agriculture and Rural Development (MoARD). 2007. Thematic papers on Land Degradation in Ethiopia. World Bank Publication.

Morgan, R. (2005). Soil Erosion and Conservation Text Book, 3rd ed. National Soil Resources Institute, Cranfield University

Morgan, R.P.C 1995. Soil Erosion and Conservation.2nd ed. Longman Group.UK limited.Mulugeta L (2004). Effects of land use change on soil quality and native flora degradation and restoration in the highlands of Ethiopia. Implication for sustainable land

management. Ph.D. Thesis. Swedish university of Agricultural Science. Uppsala, Sweden.

Mulugeta L (2004). Effects of land use change on soil quality and native flora degradation and restoration in the highlands of Ethiopia. Implication for sustainable land management. Ph.D. Thesis. Swedish university of Agricultural Science. Uppsala, Sweden.

National Review Report (2002). Government of Ethiopia, Addis Ababa.

Nkonya, E., Gerber, N., Baumgartner, P., von Braun, J., De Pinto, A., Graw, V., et al. (2011). The economics of land degradation: Toward an integrated global assessment. In F. Heidhues, J. von Braun, & M. Zeller (Eds.), Development economics and policy series (vol. 66).Frankfurt A.M., Peter Lang GmbH.

Olsson, L., Eklundh, L., Ardö, J. 2005. A recent greening of the Sahel—trends, patterns and potential causes. Journal of Arid Environments 63(3): 556-566.

Sonneveld, B. G. J. S. 2002. *Land Under pressure: The Impact of Water Erosion on Food Production in Ethiopia.* Shaker Publishing. Netherlands.

Teferra, R.1999. Environmental Problems and Policies in Ethiopia.A survey in IDR 25th Anniversary Proceeding. Edited by Tegegne G.E. et.al Addis Ababa.

Teketay, D. (2001). Deforestation, wood famine, and environmental degradation in Ethiopia's highland ecosystems: Urgent need for action. Northeast African Studies, 8(1), 53–76.

Temesgen G, Amare B and Abraham Mahari (2014a). Population dynamics and land use/land cover changes in Dera District, Ethiopia. Global Journal of Biology, Agriculture and Health sciences. 3(1):137-140.

Tesfaye Beshah. 2003. Understanding Farmers: Explaining Soil and Water Conservation in Konso, Woliata and Wello, Ethiopia Unpuplished Ph.D. Dissertation Wageningen University and Research Center.

UNEP/GRID (United Nations Environment Program/Global Resource information Database). 1992 world Desertification London: Edward Amold.

United Nations Convection to Combat Desertification [UNCCD]. (2013). Economic Assessment of Desertification, Sustainable Land Management and Resilience of Arid, Semi-arid and Dry Sub-humid Area. In Westerberg, V., Olsen, N., Stoeckli, V., Jaquet, S., Roth, A., David, E., Baker, L., Castillo, V. and Shim, K. (Eds.), 2nd Scientific Conference of United Nations Convention to Combat Desertification and Global Risk Forum Davos, ISBN 978-92-95043-65-7, Bonn, Germany. Unpublished Research Report Submitted to EEA, Addis Ababa.

WMO (World Meteorological Organization) (2005).Climate and land degradation.http://www.wmo.int/web/wcp/agm/agmp.

Yeraswork Admassei. 1985. Food – for Work in Ethiopia. A socio economic Survey AA: AAU,IDR.

Yesuf, M., Mekonnen, A., Kassie, M., & Pender, J. (2005). Cost of land degradation in Ethiopia: A critical review of past studies