

The Impact of Population Growth on Forestry Development in East Wollega Zone: The Case of Haro Limu District

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Abstract

Deforestation is a growing problem in many parts of the tropical world and one of the affected countries is Ethiopia. The general objective of this study is to assess the effect of population growth on forest resource in East Wollega Zone in general and Haro Limu woreda in particular. The data used for the study were collected from 89 farm households heads drawn from the four kebeles of Haro Limmu district. Probability proportional to size sampling technique was employed to select the farm households from four peasant associations, which were selected by random sampling techniques. Primary data were collected using a structured questionnaire. In addition, secondary data were extracted from relevant sources to supplement the data obtained from the survey. The result of this study reveals that population growth huge impact on forestry development in the ways of expanding agricultural land, using wood as energy sources and satisfying the input requirements in agricultural activity. Respondents use family planning services in reducing the impact of population growth on the forestry development.

Keywords: Population Growth, Forestry Development, Haro Limu, Ethiopia

1. Introduction

Ethiopia with its 79 million (CSA, 2008) people living in a geographical extent of 1.1 million km² has a GDP of US \$ 6.1 billion, 39% of which is contributed by Agriculture, upon which 85% of the population are dependent for livelihoods (Amare, 2013).

Forest is the resource that provides many benefits to the society. In addition to providing wood, forest provide a habitat for wild life, site for recreation, wildness, watershed protection and many other benefits. It can also absorb atmospheric carbon dioxide (Dealon, 1993).

The impact of demographic changes on forests and the environment is often discussed in terms of biological carrying capacity, i.e. the maximum number of individuals that a resource can sustain. However, many factors influence carrying capacity, such as economic development, socio-political processes, and trade, technology, and consumption preferences (Bijendra, 2009).

There has been a steady increase in the population growth rate since 1960 but after 1960's population in Ethiopia started to increase rapidly because of changes in socio-economic conditions in the world (Amare, 2013).

According to Amare (2013) parallel to low socio-economic and rapid population growth, there is land degradation which has affected the country's ecological integrity. For instance, the forest cover of Ethiopia was 40% at the beginning of 20th century but has declined to 2.2% at present. Soil degradation process makes large areas unsuitable for agriculture. Because the top soil and even part of the sub soil in some areas has been removed, and stones or bare rock are left at the surface. Up to half of the arable land in the Ethiopian highlands is estimated to be moderately to severely eroded, and as a result, previously cultivable lands are being (or have been) turned to wasteland (Amare, 2013).

Rapid population growth and the low economic standard of living in Ethiopia have brought in their wake numerous consequences to land cover and use changes, change in climate and hydrological status in the country. In Ethiopia studies have indicated that as there is agricultural land expansion at the expense of other land uses. Ethiopian highlands are fragile and forest, water and its biodiversity is climate dependant, which are currently under stress due to population pressure and mismanagement of natural resources. The poverty stricken economy of Ethiopia needed scientific management of its natural resources and balancing the population to cope up with the climate change and the challenges of the globalization of economy. Thus, there is a need to review the population and environment interrelation at the country level in order to suggest the means to minimize adverse effect of population pressure on environment (Amare, 2013).

Deforestation is a growing problem in many parts of the tropical world and one of the affected countries is Ethiopia. Ethiopia is also one of the world's poorest countries. In addition, the spread of poverty, the environmental degradation especially deforestation is due to local clearing of forest for their personal needs, such as for fuel, hunting, agriculture, and for religious reason. Deforestation is indiscriminate cutting or over-

harvesting of trees for lumber or pulp, or to clear the land for agriculture, ranching, construction, or other human activities (Encarta, 2009)

The direct causes of land degradation are mainly deforestation, overgrazing and over-cutting, shifting cultivation and agricultural mismanagement of soil and water resources: such as non-adoption of soil and water conservation practices, improper crop rotation, use of marginal land, insufficient and/or excessive use of fertilizers, mismanagement of irrigation schemes and over pumping of groundwater. The indirect causes of land degradation are mainly population increase, land shortage, short-term or insecure land tenure and poverty and economic pressure (FAO, 2001). The economic contribution of forest are associated with the production, consumption of goods and services, the supply of fuel wood, construction materials and timber come mainly from forest (Negash, 2003). The rapid deforestation or the declining of forest accompanied by variety of other environmental problems is caused by agricultural expansion and wood gathering. The major factors contributing to deforestation are poverty, low level of income and population growth. For this reason households have to depend on charcoal for their fuel consumption and this is hampering the farmers from using organic manure as fertilizer for their already degraded farmlands. The wide range of topography has contributed to the presence of enormous biological and cultural diversity. One of the solutions proposed to arrest forest degradation in certain area is to introduce the practices of participatory forest management by involving the local people. Therefore, this study attempts to show the effect of high population growth on the natural forest in the Haro Limu and also tries to give some analysis based on finding. The general objective of this study is to assess the effect of population growth on forest resource in East Wollega Zone in general and Haro Limu woreda in particular.

2. Materials and methods

2.1. Description of the Study Area

Haro Limmu is one of the districts of East Wollega zone. Today this district is sub divided in to 15 farmers associations and one urban center for all its administrative purposes.

Before the year 1998, this district was under the district Limmu but later on Haro Limmu became an independent district with the administrative center at Hero. Being one of the jawi's children, Haro is living around Anger river. Jaws belong to Oromo clan called mocha. Haro is also a woman who where living at a place now a day called Haro town. In Haro youth is also strong & severe, this is because of low socio-economic status of family to manage the youth, limited investment, lack of meaning full education and training, inability to incant work ethic in the youth cultural and psychological constitution, non expansion of investment and mass media infrastructure. The name of this district was derived from the combination of the jawi family Haro and Limmu. Finally, Haro Limmu district was established December 21/4/1998 E.C (HLDFEDO, 2011). This district is contiguous with Limmu in the east, Benshangul Gumuz Regional state in west and Anger River in the south and Ebantu district in the north of the district. This district was located at distance 165 km & 488 km from zonal town called nekemte and Addis Ababa respectively. Today this district is sub divided into 15 farmers associations 1 urban kebele with a capital town of Haro for all it administrative purposes.

In the beginning of the 20th the district was known by the name Haro Limmu but later on Ebantu became an independent district & then Haro Limmu was established as independent district with the administrative center at Haro and Limmu district with the administrative center at Gelila respectively (HLDFEDO, 2011).

2.2. Sources of data, Methods of Data Collection, Sampling and Data Processing and Analysis

In order to analyze the stated objectives both primary and secondary data was used. The main source of data for the study was sample household survey data to be collected from randomly selected households in the study districts. The data was expected to consist of sample household survey, household attributes and socio-economic characteristics and other related information in the study area that is essential for this study. The secondary data sources are annual reports and plans of zonal and the respective district offices. Structured questionnaire was used to collect primary data. Detailed information on household composition and characteristics, environmental problems, and institutional factors was collected through interview of sample household heads.

The study was conducted in Haro Limu district, East Wollega Zone of Oromia Regional State. This district was purposefully selected due to the fact that in this area the environment has been degraded largely because of settlement made from other area. Random sampling technique was employed to draw sample of household heads. From a total of 15 peasant associations in this district four peasant associations were selected randomly.

After deciding the sample area and sampling design it is important to fix the sample size, as it contributes to the cost and reliability of the study. From 15 peasant associations in the district, 4 peasant associations were sampled using simple random sampling procedure which accounts for almost 27 % of the total peasant associations of the study area. Depending on the availability of time and budget to do this paper I was used about 89 households and this was proportionally distributed for selected kebeles based on their number of households.

For systematic random sampling of respondents the sample interval for picking each respondent the

$$k = \frac{N}{n} = \frac{12,834}{89} = 144$$

following formula was used.

Where n is sample size, N is number of population and k is the skip interval between sampled farmers (Kultar, 2007). Each sample was taken at the interval of 144 and the 1st will be drawn using lottery method.

The relevant data being collected was processed and analyzed with tables and percentages and the data analysis method used was descriptive statistics because of its simplicity and clarity.

During analysis and interpretation the following was considered.

- Reasonable explanation for the relations was made.
- Interpreting tasks was accomplished only after considering relevant factors affecting the problem.

3. Results and Discussions

This chapter deals with the analyses and interpretation of major findings of the study on the impact of population growth on forestry development in Haro Limu districts. From all of the respondents 17.98 % were from Sombo Gadisa kebele, 31.46 % were from Gorba Gudina, 41.57 % were from Homi Kelala and 8.99 % were from Rifenti.

3.1. Impact of population growth on forest

Importance of forests varies in the daily life of people living close to it. For instance, rural populations depend most fundamentally on forests in terms of subsistence, health, income and culture.

Table 1 Participation in controlling impact of population growth on forest

		Participation in controlling impact of population growth on forest		Total
		Yes	No	
Sex of respondents	Female	9	0	9
	Male	67	13	80
Total		76	13	89

Source: Own computation

From the above table it can be observed that about 76 respondents have been participated in controlling the impact of population growth on forest while the rest of respondent have no care about forest development in the district under study.

Table 2 Participation in controlling impact of population growth on forest

		Participation in controlling impact of population growth on forest		Total
		Yes	No	
Educational level	Illiterate	5 (83%)	1 (17%)	6
	<=Grade 4	31 (91%)	3 (9%)	34
	Grade 5-8	17 (85%)	3 (15%)	20
	Grade 9-10	9 (69%)	4 (31%)	13
	Grade 11-12	8 (80%)	2 (20%)	10
	Diploma and above	6 (100%)	0	6
Total		76	13	89

Source: Own computation

According to the above table all of the respondents who hold diploma and above were participated in controlling the impact of population growth on forest. About 80 percent of farmers who attained grade 11 and 12 were engaged in controlling the impact of population growth on forest development. As per the survey data 85 of the respondents s were respond as the district administration have taken corrective measures for cutting trees either by planting other trees or legal action. While 4 of the respondents reflect their idea as there is no action taken by the district for cutting trees.

Table 3. Purpose for using forest

		Purpose for using forest				Total
		Household consumption	Manufacturing materials	Energy such as charcoal	Agricultural materials	
Sex of respondents	Female	1	6	1	1	9
	Male	21	28	11	20	80
Total		22	34	12	21	89

Source: Own computation

According to the above table 34 of respondents' foremost use the forest for manufacturing materials while 22 of them foremost use forest to run their household consumption. By the same way 12 of the respondents use the forest for fulfilling their energy sources such as charcoal and 21 of them mainly use forest for attaining agricultural materials.

As per the survey result shows 84 of the respondents use family planning services in reducing the impact of population growth on the forestry development. While 5 of them have no idea of controlling population growth as it has no impact on forest management.

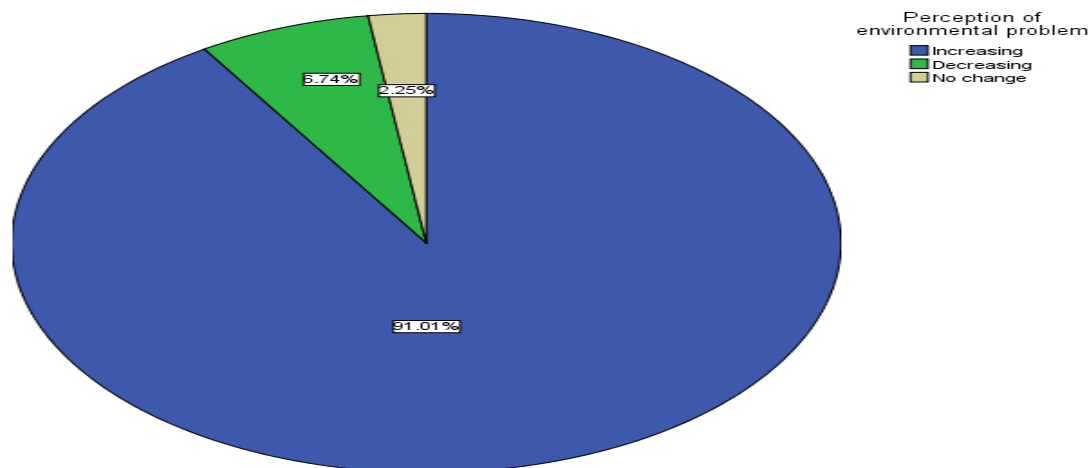
Table 4. Perception of environmental problem

		Perception of environmental problem			Total
		Increasing	Decreasing	No change	
Sex of respondents	Female	8	1	0	9
	Male	73	5	2	80
Total		81	6	2	89

Source: Own computation

From the above table we can see that 81 of the respondents perceive increment in environmental problem, 6 of them perceive decrement in environmental problem and 2 of them perceive as there is no change in environmental problem.

Graph 1 Farmers perception of environmental problem



3.2. Causes and Consequences of Deforestation

According to Johnson and Chenje (2008), deforestation is when a once forested area gets removed for the use of agriculture, pasture, urban development, logging, or wasteland. When this destruction of a natural environment occurs, a degraded ecosystem is likely to follow. A degraded ecosystem is the result of a loss of habitat and a reduction in biodiversity. Also, the erosion of soil is usually a consequence of deforestation.

People have been deforesting the Earth for thousands of years, primarily to clear land for crops or livestock (Julie M, 2009). Although tropical forests are largely confined to developing countries, they aren't just meeting local or national needs; economic globalization means that the needs and wants of the global population are bearing down on them as well. According to Julie M (2009) the direct causes of deforestation are agricultural expansion, wood extraction (e.g., logging or wood harvest for domestic fuel or charcoal), and infrastructure expansion such as road building and urbanization. Rarely is there a single direct cause for deforestation. Most often, multiple processes work simultaneously or sequentially to cause deforestation.

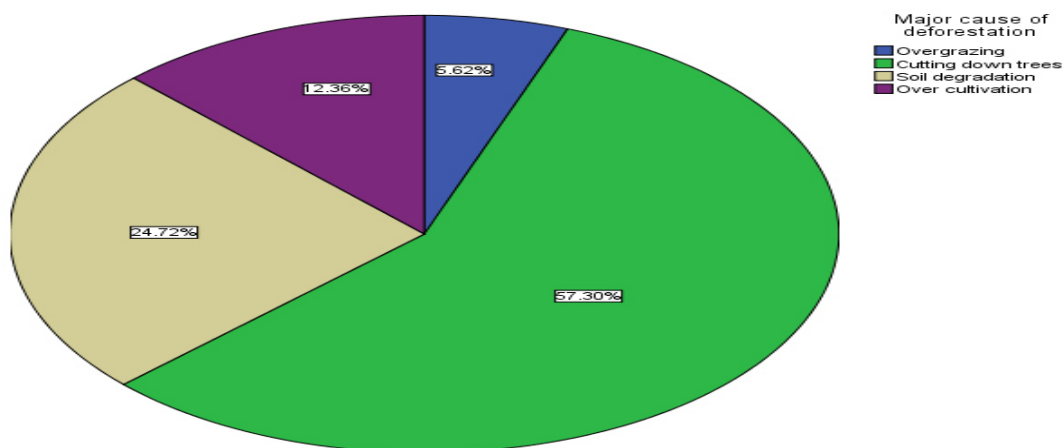
Deforestation releases carbon, principally as CO₂, to the atmosphere as the organic carbon stored in trees and soil is oxidized through burning and decay. Other greenhouse gases, such as CH₄ and N₂O, are also emitted as a result of the conversion of forests to agricultural lands (R. A. Houghton, 2004).

Table 5 Major cause of deforestation

	Major cause of deforestation				Total
	Overgrazing	Cutting down trees	Soil degradation	Over cultivation	
Sex of Female respondents	1	3	3	2	9
Male	4	48	19	9	80
Total	5	51	22	11	89

Source: Own computation

Graph 2 Major cause of deforestation



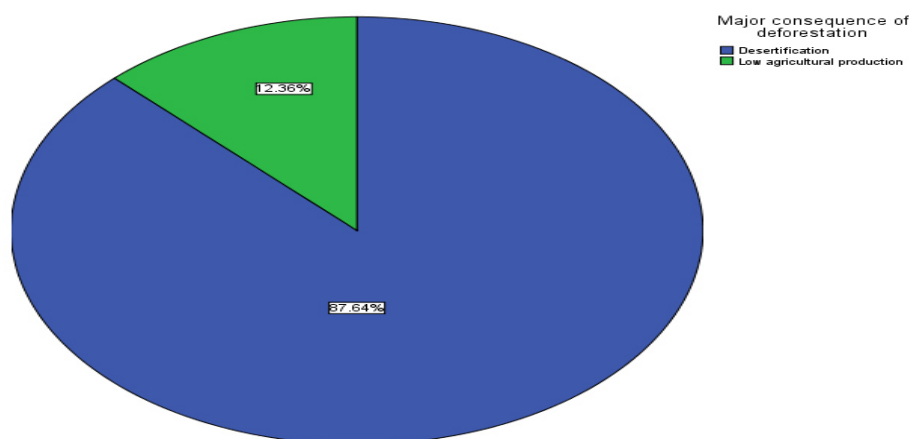
As per the result of the survey of this study the major consequences of deforestation in the study area are desertification and low agricultural productivity.

Table 6 Major consequence of deforestation

	Major consequence of deforestation		Total
	Desertification	Low agricultural production	
Sex of Female respondents	6	3	9
Male	72	8	80
Total	78	11	89

Source: Own computation

Graph 3 Major consequences of deforestation



All of the respondents were well aware of the impact of the population growth on deforestation in the study area. Some of the respondents were also mentioned the real situation exist before and after the settlement of the settlers since the number of the population was increased after their settlement. About 88 of the respondents were used forest in order to satisfy their energy requirement as a wood. This is the major problem that contributes to increment in deforestation. When I was conducted interview with respondents the local and district administration was not engaged in taking measures on this area.

Table 7 Common energy usage

		Common energy usage		Total
		Wood	Charcoal	
Sex of respondents	Female	9	0	9
	Male	79	1	80
Total		88	1	89

Source: Own computation

As explained on the graph below, the major causes of deforestation in Haro Limmu district was cutting trees, over cultivation, soil degradation and overgrazing. Overgrazing is more common in drier areas of the tropics where pastures degraded by overgrazing are subject to soil erosion.

4. Conclusions and Recommendations

Deforestation is a growing problem in many parts of the tropical world and one of the affected countries is Ethiopia. The rapid deforestation or the declining of forest accompanied by variety of other environmental problems is caused by agricultural expansion and wood gathering. The major factors contributing to deforestation are poverty, low level of income and population growth.

The general objective of this study is to assess the effect of population growth on forest resource in East Wollega Zone in general and Haro Limu woreda in particular. The data used for the study were collected from 89 farm households heads drawn from the four kebeles of Haro Limmu district. Probability proportional to size sampling technique was employed to select the farm households from four peasant associations, which were selected by random sampling techniques. Primary data were collected using a structured questionnaire. In addition, secondary data were extracted from relevant sources to supplement the data obtained from the survey.

In carrying out this study, it can be hypothesized that most of the population growth members participating in forestry which may be affect forest or not and there is impact of population growth on forestry in this area to decided the effect of the forest beneficiary.

Although Ethiopia has a large population that is increasing rapidly, the constant chopping down of forested areas to convert to agricultural land needs to either decline or use more sustainable methods. Converting forests to farms is obviously necessary for food production, but soon the environmental impacts resulting from the degradation of land will be too much to bear for the people in Haro Limu and other neighboring districts. The impact of demographic changes on forests and the environment is often discussed in terms of biological carrying capacity, i.e. the maximum number of individuals that a resource can sustain. The rapid deforestation or the declining of forest accompanied by variety of other environmental problems is caused by agricultural expansion and wood gathering. The major factors contributing to deforestation are poverty, low level of income and population growth.

Population growth has contribution immensely to resources degradation especially as it affect the forest ecosystem. It was observed that forest resources in Haro Limmu district are under a serious depletion due to population growth and human encroachment in the forest ecosystem. However, there is urgent need for the various stakeholders in environmental resource management to provide a mechanism that would prevent the forest ecosystem from further depletion in the area.

As per the result of survey most of the respondents have been participating on forestry development. This is towards the hypothesized concept which explains most of the population growth members participating in forestry which may be affect forest or not. It is also known that the population growth huge impact on forestry development in the ways of expanding agricultural land, using wood as energy sources and satisfying the input requirements in agricultural activity.

The other result of the study is the linkage between population growth and deforestation. In this case the respondents of the study responds that people was engaged on cutting down trees and the soil was degraded as a result of overgrazing and over cultivation. Therefore there is deforestation as a result of continuous increment of population.

The rate of human disturbances on the forest ecosystem in Haro Limmu district has generated serious environmental problems in the area. Therefore, to avert this problem, the following measures are hereby recommended:-

- Population increase should be checked through family planning methods, this would cut down the large family size.
- Proper environmental education should be imparted to the people so that the people can appreciate the importance of sustainable environment.
- The inhabitants should be encouraged to carry out wildlife and ecosystem conservation.
- Since almost all of the respondents were using wood as energy source, this has great impact on forest development. So, the local and district administration should have take a measures on this activity as they are taking measures on those who have cut the forest for expansion of agricultural land.

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