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Farmers Perception on Deforestation in Ziway Dugda Woreda, Arsi Zone, Oromia Regional State of Ethiopia

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Abstract:

In Ethiopia, Oromia national regional state has the largest forest resource in the country and has pioneered to the establishment of management initiative system to control the degradation of forest. In 2007 the Oromia Forest Supervision Agency was established to coordinate the establishment of forest enterprises across the region. This study has attempted to examine impacts of deforestation and the challenges for conservation and major causing factors of deforestation in Ziway Dugda Woreda. Four kebeles namely Ubo Weni Bericha, Senbero, Koche Bore and Herera were selected by probability sampling system from four clusters namely Chancho, Ketar Zurias, Dembel and Wayyu. In the course of the study methodological pluralism Ulnas pursued to the research reasonable. Hence, survey of qualitative and quantitative data collection tools used were questionnaire, interview, focus group discussion and field observation. Raw data which collected from field were tallied, structured and systematically framed then analysis was given by summarizing results obtained from finding by theories and policies which are related to forest management and conservation. The study showed that there were a number of factors that have aggravated deforestation in the woreda are charcoal making fuel wood exploitation, clearing forest for farm land and animal grazing. The major environmental problems which are considered as impacts of deforestation in the wereda are flooding and deposition of sandy sediments on farm lands, gullies, drought, drying of springs and reduction of the volume of river and land degradation. Despite the existing problems there are some measures taken to improve the

situation including area closure, patrolling and penalties. However, involving the community over resource conservation and use has been found to be of a paramount importance to reach successful resource use and management.

Key words: Forest conservation, deforestation, Livelihood, Oromiya, Ethiopia

Introduction

World forests have been degraded by about 40%. Since agriculture began (10,000 year ago) three fourths of this loss occurred in the last two centuries. Currently, only 30% of the Earth is covered by forests. Moreover, 3% of the Earth's forest was lost between 1990 and 2005 and the rate of degradation is becoming more serious (UNEP 2002). The battle against forest degradation is getting tough and challenging as the degradation rate worldwide from 2000 to 2005 was about 7.3 million hectares per year, which is the same size of West African country Sierra Leon (FAO 2001).

In the drier parts of Africa, millions of hectares of natural resources are threatened. In the arid north, semiarid south and the Sudano-Sahelian countries and in the drier parts of Cameron, Ethiopia, Kenya and Nigeria Africa's forests and wood lands are also being depleted, threatening one of the continent's most important resources (USAID 2009). However, trees in Africa play an important role in protecting the environment, they are principal source of rural energy and provides countless medicinal and industrial products used in both the home and in small scale industry (Demel 2001).

As result of deforestation, Ethiopia's forests and wood lands have been declining both in size and species richness. Due to the continuing encroachment, it is highly probable that the present fragmented forests in the highlands are much more impoverished in terms of floristic diversity than the forests which once occupied the same site. Deforestation has eroded the

biological diversity to such an extent that some plants are faced with local extinction (FAO 2001).

The Oromia national regional state has the largest forest resource in the country and has pioneered to the establishment of management initiative system to control the degradation of forest in Ethiopia. Accordingly, in 2007 the Oromia Forest Supervision Agency was established to coordinate the establishment of forest enterprises across the region. It is also characterized by forest degradation resulted from expansion of agricultural land and firewood. The consequences of forest degradation are the decrease in productivity of land and household in welfare (FARM Africa 2008).

Farmers in Ethiopia are always in need of more arable land as they abandon their degraded farmlands. They also look for fuel wood since the rural community is still highly dependent on wood for household fuel consumption. The farming community also engages in livelihoods such as charcoal making mainly to get cash and increase their household income. This driving force leads to an intense deforestation. As a result, loss of vegetation has increased and the lands reserved for forests are decreasing. All this leads to low productivity and inability to achieve food self-sufficiency. Hence, the maintenance and increment of our trees cover is of a permanent importance in order to realize sustainable development through improved environmental husbandry (Woldeamlak 2002).

Aforestation attempts in the past had not reversed the downward trends while constant increase in the size of farm lands and their degradation have become the major problems in the land use aspects of farmers of Ethiopia. In the case of the area under study, namely Ziway Dugda Woreda, the devastation of natural forests has been going on still today. Charcoal making and illegal burning of trees, fuel wood cutting and removal of trees for farm land expansion are common in the area (Alemneh 2003). In the aftermath of deforestation in

the area, there is a recent problem of erosion through excessive flooding during the rainy season. (personal observation 2012).

The involvement of communities in the destruction of natural forests through activities like charcoal making and tree cutting for fuel and other purposes are becoming common. There is an urgent need for the conservation of forest resources in the Oromiya region. The important aspects of environmental protection such as maintenance of soil fertility, combating erosion and bringing a sustainable agricultural practice can be addressed with conservation of forest resources. Such environmental services can play a very significant role to a farming community living in the study area.

Considering the above facts the present study was conducted in Ziway Dugda Woreda of Oromiya region in Ethiopia to assess the perception of farmers towards the deforestation and possible conservation practices that need to be followed.

Research Methodology

Description of the Study Area

The study area, Ziway Dugda Woreda is located in Oromia Region, Arsi Zone. Its present name was derived from two words "Ziway" and "Dugda". The name Ziway was derived from both Lake Ziway and ethnic group living in the island of the lake namely Zay. The name Dugda derived from Afan oromo term which refers plateau between two valleys. The study area, Ziway Dugda district is one of administrative units of Arsi Zone. This is found in the western part of Arsi Zone and shared boundary line with East Shoa Zone in the western and north part, Hetosa and Tiyo districts in the eastern parts, Munesa district in the southern part. It also shares its boundary line with Dodota district in the north part. Astronomically the woreda is found between 8^0 05'N-$8^0$25' N and 39^0E-$39^0$45' E. The total area of the district is 1043km^2 and divided in to 29

administrative units of which 28 are rural kebele administration and one is urban administrative unit. Ogolcho is the administrative center of the district. It is found at 160km and 42km from Addis Ababa and Asela (Arsi Zone Administrative Center) respectively (Ziway Dugda Woreda Administrative Office 2012).

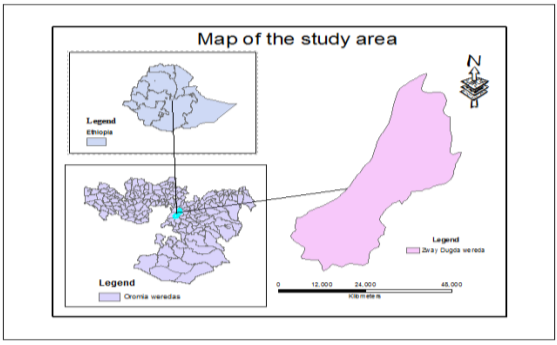

Fig-1: Map of the study area

Research Design

The research method employed in this study was the descriptive survey approach aimed at examining and describing the major situations associated with deforestation in the study area. The study area Zeway Dugda Woreda has a total of twenty nine kebeles; it was stratified into four cluster zones, namely Chancho, Ketar Zuria, Dembel and Wayyu based on their geographical proximity for administrative and other socio-economic purpose by woreda administrative office. Based on this cluster, the researcher took one kebele from each cluster, totally four sample kebeles by method of random sampling techniques. In this research, both primary and secondary data have been used. The primary data was organized from the study area. The main instruments of data collection are questionnaire, interview, observation and focus group discussion, while secondary data was gathered from published (books, journals and periodicals) and unpublished materials

(report and studies) and data organized in concerned sector offices if the woreda and other sources have been used.

Results and discussion

Livelihood sources of the community and their impact on deforestation

Table 1 shows that a great majority, 113 (62.1 %) of sample population, pursued cereal agriculture as the dominant livelihood strategy. The other 18 (9.9 %) of samples identified sale from charcoal and fire wood sale, while 9 (4.9%) want to engage in vegetable and fruit farming; the remaining 38 (20.9%) and 4 (2.2%) are dependent on animal product and trade respectively.

No	Types of livelihood	Frequency	Percentage
1	Cereal production and bee keeping	113	62.1
2	Sale from charcoal and fire wood sale	18	9.9
3	Sale from fruit and vegetation	9	4.9
4	Animals products	38	20.9
5	Pity trade	4	2.2
6	Artisans Ship	-	-
	Total	182	100

Table 1 Proportion of households in different livelihood strategies
Source: Filed survey, 2012

The results also pointed that the forest product (charcoal and fuel wood sale) served significant population of the sample, almost 18 (9.9 %). The cutting of trees for planks had eliminated the forest trees that escaped from charcoal and fire wood collection. Tree cutting for fuel and construction purpose causes deforestation of the natural forests of Ethiopia (Degefa and Baudouin 2004). The other livelihood system that was practiced in the woreda are sale of animal products such as milk and butter which account to 38 (20.9%), being followed by sale of vegetables and fruits from traditional and small scale

irrigation production of onion, potato, tomato, sugar cane and papaya (produced in traditional and small scale farming).

No	Involvement period in charcoal and fire wood sale	Frequency	Percentage
1	Never at all	-	-
2	Some times	154	84.6
3	Rarely	28	15.4
	Total	182	100

Table 2 Distribution of household involvement in charcoal and fire wood selling business
Source: Field survey, 2012

Among the respondents in the study area 154 (84.6%) of them acknowledged that they use the forest resources at one time or another mainly as timber by cutting trees for the use of house construction and furniture. However, only 28 (15.4%) of the respondents confirmed that they are engaged in charcoal making and fuel wood selling occasionally. This has created heavy encroachments on the natural forest. Deressa (2008) has studied the vulnerability of farmers to climate change in Ethiopia's seven agricultural-based regional states. The vulnerability of Oromia is attributed to higher frequencies of drought and flood and lower access to technology and infrastructure due to their high population in proportion to what is available.

	Have you sensed the existence of deforestation?	Frequency	Percentage
1	Yes	161	88.5
2	No	21	11.5
	Total	182	100

Table 3 Respondents' perception about the existence of deforestation in the Woreda
Source: Field survey, 2012

According to the data in Table 3 the great majority of respondents approved that the Woreda has serious deforestation problems. Similarly, almost all participants of the

focused group also approved the concept that encroaching on dispersed forest land found in the Woreda has intensified year to year and the most serious disappearance of vegetation cover was aggravated during the downfall of the previous regime and transition to the present government. Hence, the land cover change is common and practical. Information gathered from Woreda Land and Environmental protection office shows that there has been a reduction of forest cover area from year to year while there is an incensement of farm land from early time in the Woreda. Deforestation occurred in Ethiopia starting from an early time due to the level of expansion of agriculture (Badege 2001).

No	Causes of deforestation	Frequency	Percentage
1	Farm land expansion	75	41.2
2	Charcoal making and fuel wood	44	24.2
3	Tree cutting for house hold use	37	20.3
4	Burning of forest to create grazing land	20	11
5	Others	6	3.3
	Total	182	100

Table 4 Sample households' perception about main causes of deforestation

Source: Field Survey, 2012

According to Table 4, out of all respondents, 75 (41.2%) of them pointed out that the lack of more farm land as being the major reason for deforestation. The other 44 (24.2%) identified need for fuel wood and charcoal as being the major reason for it, 37 (20.3%) identified tree cutting for households use, while 20 (11%) pointed that the cause is burning of forest to create grazing land. Reasons like need to control wild animals with fire, need for medical plants were identified by 6 (3.3%) of respondents as a cause of deforestation that occurred in the Woreda. Moreover, the information obtained from focus group discussion indicated that the gap created during the transition of government from unitary to federal government had also created a great loss of vegetation. Two elders from focused group discussion participants also indicated that, "Trees attract

monkeys, apes, and birds which affect their crops, especially maize and barley so in order to avoid these animals, we cut trees" except for scanty bushes. Information obtained from interview also confirms that major causes of deforestation in the woreda are farm land expansion and charcoal making and fuel wood collection. The engagement of farming community in livelihoods such as charcoal making mainly to get cash and increase their household income is a driving force which leads to an intense deforestation (Badeg 2001). Moreover, FAO confirmed that of all woody parts used in the world, half of these goes as a fuel, out of which 80 % of it is used as a fuel by the less developed countries (FAO 2001).

In addition the data collected through observation and focused group discussion revealed that there was dense forest covered with various species and they have diminished due to the deforestation and now a wide area of the woreda is covered by shrubs and grass, then converted to farm plots. One can still observe the remnants of natural forest in the woreda in Ogolcho Kidist Silase Church, on the hill of mount Bericha, Gachenen, and Tullu Dimtu and other inaccessible gorges such as Ketar river valley. These patches of natural forest were not affected by human activities because those are found in steep gorges and valleys were humans cannot reach.

Impacts of deforestation and alternative livelihoods for community in the woreda

Currently, the awareness level of the communities on negative impacts resulting from deforestation is high. Farmers know that deforestation can bring serious land degradation.

No.	How is the fertility of your plot?	Frequency	Percentage
1.	Declining	91	50
2.	Very poor	70	38.5
3.	Moderate	16	8.8
4.	Very fertile	5	2.7
	Total	182	100

Table 5 Distribution of sample respondents based on fertility of their land

Source: Field Survey, 2012

In addition, from time to time increasing population is also asserting high pressure on farmland resulting from low fertility and pushing them into a difficult and thorny future. Focus group discussion with development agents, woreda Land and Environmental protection office experts and elders revealed that there was no single and simple answer for the problem. For instance, those living in Arata, Dugda Batu are less affected than those settled at the foot of hilly area of Bericha and Gachenen. This happens because a number of factors favor those on plateau of Arata and Dugda Batu than those at the foot of hilly area. The steep slopes make the running water gain force as it reaches near the foot of the hilly area and becomes inescapable causing gullies and all types of erosion at the foot of hilly area than on the top. Flooding is another danger experienced in the valley lands. According to Demel (2001), a rugged topography, which is washed by torrential downpour of rain, erodes top soil and makes zero vegetation and backward land seriously affected by erosion.

No.	Environmental problems experienced	Frequency	Percentage
1.	Loss and decline of fertility	99	54.4
2.	Erosion problem	53	29.2
3.	Shortage of rain	20	10.9
4.	Drying up of springs and of water	10	5.5
	Total	182	100

Table 6 Distribution of respondents' perception about impact of deforestation

Source: Field Survey, 2012

Table 6 shows that there was loss and decline of fertility in the study area. Respondents also pointed that there was a problem of erosion, drying up of springs and water were drying up and shortage of rain, resulting in dryness of the climate in the woreda. Moreover, information collected from observation

endorsed that the lands found at the base or foot of hilly areas were very deep and formed wide gullies by running water. The problem of intense erosion has washed away the soil so severely that rocks were out cropped and exposed over the hilly areas. The flooding is seriously experienced at the bottomlands, when the running water reaches the level ground than on the steep slopes. Moreover, all lands found at the base of elevated area and especially towards the gorges of river Ketar, show very deep and wide gully formation by running water. The problem of intense erosion has washed away the soil so severely that one finds out cropping rocks exposed all over the gorges of river Ketar.

No.	What are the major causes of Environmental degradation in this area?	Frequency	Percentage
1.	Deforestation	116	63.7
2.	Climate change	53	29.1
3.	God's (Allah) wrath against our sins	13	7.2

Table 7 Respondents perception about environmental degradation
Source: Field Survey, 2012

Regarding Table 7, it shows that, from the total number of respondents, the majority, 116 (63.7 %) of them perceived deforestation as one of the causes of environmental problem. 53 (29.1%) identified general climate change as one of the major factors for the creation of environmental problems in the area. The remaining 13 (7.2%) perceived that it was a divine curse from God/Allah. This demonstrates that the majority among the community knew that deforestation can cause serious environmental problems. Thus, the most serious environmental problems the people have witnessed in the area were: change of climate, severe erosion, deforestation, drought and extreme dryness, loss of huge trees. Similarly the perception of farmers was confirmed by the studies of Berhane and Agajie (2006), Campbell (2006), when they rightly asserted that deforestation

resulted in the declining of the level of moisture of farm land, which is directly associated with soil productivity and quantity.

Table 8 Respondents' perception about methods of forest conservation

No	What are mechanisms used to stop deforestation in the woreda?	Frequency	Percentage
1.	Stopping tree cutting	47	25.8
2.	Penalty and imprisonment	44	24.2
3.	Stopping fire wood and charcoal making	91	50
	Total	182	100

Source: Field survey, 2012

As shown in Table 8, there were different types of conservation measures applied in the woreda. Among the sample households, 91 (50%) perceived that reducing the use of fire wood and charcoal making as a measure of conservation while 44 (24.2%) and 47 (25.8%) revealed that penalty and imprisonment and stopping tree cutting respectively can be measures of conservation.

However, the information gathered from interview indicated that, apart from initiating hard resistance, these measures have been known to create a feeling of revenge and alienation in rural communities. To conduct a successful conservation, one must be able to understand the role that rural communities can play in preservation. A solution to the dilemma encompasses designing a plan that shows and empowers rural community's ways for sustainable extraction (Furze 2000).

Moreover, almost all participants of Focus group discussion also suggested that *area enclosure* is advantageous to the problem. Related studies confirm that the *area enclosure* is the process of restoration and rehabilitation of degraded ecosystems by natural means. Betru et al. (2005) stated that in the Ethiopian context, the degraded land should be excluded from human and livestock interference and could be used for

rehabilitation allowing cutting grass and collection of fuel wood from dead trees and developing bee breeding.

No.	Perception about past forest conservation	Frequency	Percentage
1.	Aggravate deforestation	35	19.2
2.	Caused them anger	17	9.3
3.	It is a policy which ignore the people	51	28
4.	It is very important to the area	79	43.5
	Total	182	100

Table 9 Respondents' view about conservation measures in the woreda

Source: Field survey, 2012

As data shown in Table 9, 79 (43.5%) of respondents viewed that the measure that had been taken in the past was very important, whereas 35 (19.2%) viewed that the measures taken in the past have aggravated the deforestation, 17 (9.3) have stated that such measures have caused them anger and 51 (28%) stated that the measures were viewed as a policy issue and ignored the people. Focus group discussion participants also suggested that even though it was not perfectly successful, the existing conservation has its own role for the remnants of the forest land in the woreda.

Summary

This study has had the objective of investigating the determining factors for a successful establishment of conservation in Ziway Dugda. The increasing deforestation shows an exacerbating vulnerability to different socioeconomic activities of the society. An increase in population with the demand of farmland expansion, charcoal making and fuel wood and the coming of pastoralists with high number of camels' herds to the area from East Shewa Zone during winter ("bega") season has put a pressure on the existing natural forests. The deforestation that occurred in the woreda is the result of many livelihood practices. However farm land creation, charcoal

making, fuel wood collection activities and pastoralists' camels that came from Asebot area of East Shewa Zone get out of control. Among the major causes for deforestation, wood for construction or fire also play a significant role. The research finding points that in the case in which alternatives for livelihood generation are not recognized there will be a greater chance of failure of forest resource conservation in the woreda. Conservation measures practiced by the woreda concerned measures such as stopping tree cutting through the imposition of fines. There have also been restrictions and fines for selling charcoal in the market, yet these have not proved an effective solution to preserving the natural forest. The communities declare that they have a positive attitude towards the natural forest but some of them express their fear that forests may bring unwanted occurrences, like wild animals, which affect their farmland and domestic animals. Equally, the communities believe that forests have uncontestable environmental benefits, such as improving the microclimate of the area and bringing more rain.

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