

*Full Length Research*

# **Working with communities to address deforestation in the Wondo Genet Catchment Area, Ethiopia: Lessons learnt from a participatory action research**

**Tsegaye Bekele<sup>1</sup>, Kebede Kassa<sup>2</sup>, Tefera Mengistu<sup>1</sup>, Megersa Debele<sup>1</sup> and Yosef Melka<sup>1</sup>**

<sup>1</sup>Wood Technology at Wondo Genet College of Forestry and Natural Resources, School of Forestry, Hawassa University, Ethiopia

<sup>2</sup>Sociology and Focal Person for Population, Reproductive Health and Culture at the Department of Social Affairs, African Union

Accepted 8 November, 2013

Population growth, coupled with unwise use of resources, in developing countries is believed to be a major cause of deforestation and land degradation. The objective of the study was to substantiate the role of local communities towards efficient natural resource conservation and management, on the one hand, and to enhance their involvement in action research and decision making processes, on the other. The study followed a participatory approach to identify peoples' attitudes, behavior and action towards deforestation and degradation of resources. Individual interviews using formal questionnaires were conducted with participants selected through systematic random sampling techniques by using the master-list of each peasant association (PA). A total of 95 respondents have been contacted from all targeted which were adjacent to the forest resources. The results obtained revealed that 96.8% reported that they live in the area since birth, and hence, the number of migrants into the area is very few. More than half of the supply of fuel wood is obtained from plantation (54%), followed by that obtained from the natural forest (19%). The results of the study revealed that about 93% of the activities related to forest management, illegal cutting, and setting fire to rejuvenate the grass for their livestock inside the forest were carried out by men. All in all, women were involved mainly in collecting fuel wood, fruits and mushrooms. Because of shortage of grazing land and other resources, 35.8% of the respondents in the area were engaged in off-farm activities like catering (cafeteria), small businesses, handicraft, daily labor and providing transportation services using donkeys. The study concludes that it was necessary to establish confidence in the community. Once this is done, it is very likely that a responsible and dynamic development process, geared towards a sustainable management of forest resources, may take place within the areas of the participating communities.

**Key words:** Deforestation, fuel wood, off-farm, socio-economics, grazing land.

## **INTRODUCTION**

Many factors contribute to deforestation processes in Africa which have negatively affected on the continent's ability to cope with climate change. These include poverty, illiteracy and lack of skills, weak institutions, inadequate infrastructure, lack of well developed

technology and to access information, limited expansion of primary education and healthcare facilities and others (UNFCCC, 2007). The overexploitation of land resources including forests, increases in population, desertification and land degradation pose additional threats (UNDP, 2006). In the Sahara and Sahel, dust and sand storms have negative impacts on agriculture, infrastructure and health. Ethiopia is one of the many countries severely affected by deforestation. Among the causes of

\*Corresponding author. Email: bekele57@yahoo.com

deforestation, illegal cutting is considered to be the most forest depleting one. Almost every household supplements its income by selling wood in an effort to ensure food security for the family. Wood for this purpose comes from felling forest trees illegally and without any effort to replace felled trees. Part of the reason for the expansion of illegal cutting is attributed to the absence of appropriate forest and landuse policy while the other part can be explained by lack of alternative income-generating opportunities (UNFCCC, 2007). Implementation of the national environmental program that initiated the establishment of regional environmental agencies and institutions by developing the necessary guidelines and laws those promote proper landuse and soil conservation, water resource management, forest resource management as well as wild life and biodiversity utilization and conservation (PASDEP, 2006).

There is a growing agreement among professionals on the interrelationships between deforestation and land degradation, floods, drought, famine and poverty (Harrison, 1992). Population growth coupled with unwise use of resources in several countries is blamed for deforestation and land degradation (UNRISD, 1994). Deforestation is a result of many causes; some natural, but mainly due to human action, such as expansion of agricultural areas, inappropriate land tenure systems and policies, increasing demand for forest products and lack of information and understanding on the value of forests (UNCED, 1992). In Ethiopia, the contribution of forest products is not well documented due traditional collection of information by the Central Statistics Agency (CSA) of Ethiopia which is collecting few data on veneer, plywood and charcoal products only.

Several studies confirmed that household energy consumption as one of the major cause of deforestation in developing countries. In order to meet their minimum household energy requirements, in many locations people tend to overexploit local forest resources (Solon *et al.*, 1995).

Another cause of deforestation is forest fire caused by both natural phenomenon and deliberate human action. Forest fire destroys hundreds of thousands of hectares of forestland each year. Forest fire has a long history in Ethiopia (Minassie, *et al.*, 2003; Troensegaard, 1989; Ricardo, 1986; Reshma, 1988; Dale and Lundsford, 1989). The largest forest fire in Ethiopia occurred in 2000 in the Bale and Borena Zones which destroyed over 150,000 hectares of natural forests and coffee stands, wild and domestic animals, traditional beehives, harvested coffee and maize, local houses and traditional grain storage facilities (IFFN, 2000).

Management and utilization of natural resources in a sustainable way has become a formidable challenge in developing countries including Ethiopia in general and in Wondo Genet catchment area in particular. Like many other forest areas of the country, the Wondo Genet

catchment area has been experiencing recurrent outbreak of fire and illegal cutting that have huge consequences on the forest resources of the area. The negative consequences of forest fire are immense and they involve loss of species diversity, irregularity of rainfall, and reduction of water for drinking and irrigation; as well as extinction of some wildlife species (USDA, 2000 and 2005).

However, the socio-economic determinants and driving forces are not well investigated while the complexity of the problem calls for a thorough understanding of these dynamics. This research takes a closer look into the social aspects of resource degradation in general and forest fire in particular. By so doing, it is hoped that the outcomes of the research will inform policies, strategies and programmes aimed at preventing forest destruction and enhancing sustainable resource development with active participation of all stakeholders in the area. The experience gained and lessons learnt in the study area will have a significant bearing for participatory resource management in the country at large.

The objective of the study is to understand the role of local communities towards efficient natural resource conservation and management, on the one hand, and to enhance their involvement in action research and decision making processes on the other

## METHODOLOGY

### The study site

This study was conducted around the Wondo Genet natural forest, which lies between two regional states: Oromiya Region and Southern Nations, Nationalities and Peoples Regional State (SNNPRS). Data were collected from 8 Peasant Associations (PAs) in the areas surrounding the forest. i.e. four PAs from each Regional State. The population living in and around the forest zone is structured within three Woredas (districts): Awassa Zuria belongs to the Southern Nations, Nationalities and Peoples Regional State (SNNPRS) whereas Shashemene and Kofele are found in the Oromia Regional State. There are eight PAs namely, Wosha Soyama, Gotu Onoma, Watera-Kechema and Gika-Atoye from Awassa Zuria Woreda; Medo-Ebicha, Kersa and Abaro from Shashemene Woreda, and Bachile Gigissa from Kofele Woreda. The population around the forest area consists of seven ethnic groups. These are: Arsi-Oromo (49.5%), Gudji Oromo (22.1%), Sidama (21.1%), Kembata (3%), Hadya (2.1%), Wolayta (1.1) and Amhara (1.1%) (Zerihun Mohammed, 1999).

The topography of this area is rugged with slopes, characterized by high ridges. The area is located within  $7^{\circ} 13'N$  and  $38^{\circ} 37'E$ . The altitude ranges from 1800-2400 m above sea level. The mean annual temperature

is about 19°C. The area has bimodal rainfall from February to April (short rainy season) and from the end of June to September (long rainy season). The mean annual rain fall is 1200mm. The vegetation of the area is broadly divided into three groups: partially disturbed natural forest, highly disturbed natural forest, and plantation forest. The total area of the forest is estimated to be about 1500ha.

The number of households is estimated to be 7, 000 whereas the total population is about 15,950. Wondo Genet is one of the densely populated areas in Southeastern Ethiopia. The average population density is 588-persons/square kilometer (Zerihun Mohammed, 1999). Average household size is estimated to be seven persons while the average farm size per household is 0.5 ha.

### **Methods of data collection**

The study followed a participatory approach to identify peoples' attitudes, behavior and action towards deforestation and degradation of related resources. The research involved a two-way process: the researchers went with their knowledge about scientific management of natural resources, including mitigation of forest fire; whereas they also brought back tremendous insights from the communities embedded in what is commonly referred to as indigenous knowledge with communities as its repository. At the same time the research process gave communities a chance to voice their concerns on the actual and perceived causes as well as consequences of deforestation in the area with a view to generating participatory solutions to the problem.

The study went through different phases: preliminary consultations, formal questionnaires and focused group discussions. During the first phase, consultation involved a series of dialogues on weekly basis for about two months with elderly community members that included both women and men to get an overview of the general condition of the forest, the deforestation status, and causes of deforestation during the discussion. Discussion was held using the local languages: Oromifa and Sidamifa with members of the community, and in Amharic, with key informants. This pre-research appraisal dialogue provided the research team with a quick understanding of the situation and local peoples' perception of the causes and consequences of forest degradation in the area. It also served as a basis for design of research methodology.

In the second phase, individual interviews using formal questionnaires were held with participants selected through systematic random sampling techniques by using the master-list of each Peasant Association (PA). A total of 95 respondents were interviewed from all targeted PAs which were adjacent to the forest resource under

consideration. A questionnaire was used, with some questions being open ended that focused on such issues as ecological histories, changes in landuse patterns, changes and visible trends in forest resource use patterns, causes of deforestation, forest fire incidence; household incomes, domestic animals, grazing land availability, and off-farm activities.

The third phase, focused group discussion was conducted to supplement and substantiate information gained through the pre-appraisal and individual interviews. Moreover, the discussion also served as a platform for raising awareness on the management of forest and other resources. The discussants included elders and PA leaders. The discussions pinpointed the general historical events that affected the conservation and management of the forest and the future fate of the management aspect as well. Respondents were ranked on wealth status according to land size, number of livestock they own and the amount of agricultural produces of each household. The participation of women in all activities was not encouraged by the community. Accordingly, only 2.1 percent of women took part in the survey which also showed their under-representation in ownership and management of forest resources owing to prevailing socio-cultural conditions which undermine the position of women.

### **Data analysis**

The qualitative data was interpreted using content and context analysis techniques; whereas the quantitative data was analyzed using simple descriptive statistics.

## **RESULTS**

### **Socio-economic characteristics**

Nearly 50 % of the people in the area are illiterate whereas 36.8 of them can read and write. Women assume the largest percentage of illiteracy. In terms of marital status 91.6% of the respondents were married; and polygamy is a common practice in the communities covered by the study. About 50 % of the population is Muslim and the rest are Christians. Regarding family size, 42.1% of the respondents have got seven to ten children, and 17.9 % of them have more than ten children. Only 1.1 percent has no child as yet, which could be due to the early age of the respondents. Culturally, celibacy is associated with a curse and low social esteem. Accordingly, there are no elder respondents who do have at least one child. All this has tremendous implication on the population explosion that contributed to the deforestation of the surrounding landscape.

Analysis of respondents' experience in the forest area by length of permanent residence brought about some conflicting results. It was very interesting to note that 96.8% reported that they live in the area since birth, which suggested that the number of migrants into the area is very small. On the other hand, group discussions revealed that influx of people was also the major problem which entailed shortage of farm and grazing lands. Accordingly, the respondents blamed outsiders rather than their own actions. The difference may be due to the fact that no one would like to be categorized as latecomers for they may assume it has negative repercussion on their future residence in the area. This is because of the stigma attached to being an outsider that goes beyond worries about landlessness.

### **Patterns of livelihoods and survival strategy**

The communities in the study area are patrilineal whereby ownership of and decision-making on resources is dominated by men. The results of the study revealed that about 93% of the activities related to forest management, illegal cutting, and setting fire to rejuvenate the grass for their livestock inside the forest were carried out by men. As mentioned above, women were involved mainly in collecting fuel wood, fruits and mushrooms.

Landuse pattern has changed frequently in the area. For instance, 96.8% of the respondents confirmed that they have observed major changes in landuse at least once in their life time. The results are similar to findings obtained in the Goto Onema areas of the Wondo Genet catchment by Belaynesh Zewude (2002). Most of the respondents (46.3%) witnessed some major changes within the last ten to twenty years. The type of change varied from one PA to another. 36 % of the respondents have indicated that the land use changed from agriculture to forest land and 26.3% of the Medo Muleta PA respondents have stated that the land use change was from forest to agriculture. The members of this PA were those who have argued that they were pushed from their farm land due to community forest plantation during the military regime. The observed change occurred from farm land to forest while in the rest of the PAs, the change was a movement from forest to farmland indicating a positive future for forest development. There is also a significant change in the types of crops grown. For instance, 65 % of the farmers have shifted from cereal to cash crop in the part of the Awassa Zuria Woredas especially where irrigated farming is possible. Notably, wheat and maize lands have changed into sugarcane, chat, and potato production due to income generating opportunities obtained for these cash crops. However, *inset* (false banana) was also being planted constantly in some areas and there were also sizeable new plantations in some PAs like Bachile-Gigissa in the Wondo Genet Woreda of

the Sidama Zone. False banana is a drought resistant food crop used as supplementary food by the local people mainly in Sidama.

The principal reason for these changes was associated with the increasing value of cash crops over cereals partly in response to population pressure and shortage of farmland at household level. Farm size in the study areas ranged from 0.5 to 1.0 ha for the majority (72.6%) of the respondents. Consequently, large family size households do not usually produce enough to cover their annual food requirements unless they rely on alternative income sources such as forests (Barraclough *et al.*, 1995).

The means of survival of the target communities varied according to the agro-climatic condition of the locality and level of knowledge of peasant-farmers regarding new technologies. For example, in Wosha-Soyama and Gotu-Onoma (gentle slope) cash crop production is the dominant form of economic activity whereas in Abaro and Bachile-Gigissa (steep and moderately steep) production of wheat and barley tend to be the major crops grown.

In the remaining localities, crops such as barley, inset and wheat are the leading crops accounting for 63.2%, followed by such cash crops as sugar cane, chat (*Quata edulis*), coffee and avocado that account for 14.7%. Over 55% of the respondents obtained between 500 and 2000 Birr/ year cash earnings as a supplementary income. Of course, this figure is questionable in Wosha-Soyama and some parts of Watera-Kechema including Gotu-Onema where the income generated is much higher due to sell of chat and sugar cane. People do not reveal such income sources openly due to socio-political and cultural factors including the fear of reduction in their future land possession as well as productivity of the land in general.

Regarding possession of poultry and livestock, most of the respondents (65.3%) do not have chicken at all; slightly more than 25% of the respondents own between one and five chickens; over 55 percent do not have sheep and close to 40 percent keeps between one-and-five goats and/ or sheep. Similarly, sixty percent of the respondents keep less than five heads of cattle. Only forty percent keep equine used for transportation and as a means of running small business.

Despite the fact that the area is suitable for beekeeping (Teklay, 2011), it is not commonly practiced as a means of supplementing livelihoods in the communities covered by this study. Only 13.7 percent of the respondents practice traditional beekeeping around their homestead, some in farmland and along the forest by hanging the bee hives on the branches of *Ficus*, *Albezia* and *Croton* trees. It is reported that these tree species are decreasing in number and area coverage continuously (Addisalem, 2003).

On the other hand, illegal cutting for lumber has become a growing source of income especially among the unemployed youth in the community. This, in turn, has threatened the survival of the forest which may

**Table 1.** Grazing land owned by the communities in the Kebeles/PAs

Kebele/PA	Ownership of grazing land			
	yes	no	irrelevant	Total
Wosha	2	15	0	17
Gotu	0	8	2	10
Wotera	4	3	2	9
Gika Toye	4	3	0	7
Bachile	8	0	0	8
Abaro	3	9	0	12
Kersa	4	5	0	9
Muleta	5	18	4	23
<b>Total</b>	<b>30 (31.5%)</b>	<b>61(64.2%)</b>	<b>4 (4.2%)</b>	<b>95 (100%)</b>

disappear within short period of time if the practice continues unabated.

This implies that pressure on the forest resources is increasing unless measures such as family planning and the culture of saving are integrated into appropriate forest management programmes.

### Resource status and trend

Of the 95 respondents, about 31 % indicated that they own grazing land of their own for their cattle, 64 % have no grazing land even if they have some cattle and the remaining 4 % have neither cattle nor grazing lands at all (Table 1).

Most of the respondents expressed their concern about inadequacy of the grazing land they privately own. For the majority of the respondents, the ownership of grazing land was so inadequate unless they produce cash crops for their living.

Because of shortage of grazing land and other resources, 34 individuals or 35.8 % of the respondents in the area were engaged in off-farm activities like catering (cafeteria), small businesses, and handicraft, daily labor and providing transportation services. However, about 64.2% of the respondents are not involved in off-farm activities at all owing to the scarcity of employment outside the farm. The annual income of the local people living in the adjacent Awassa Zuria Woreda could cover the whole year without having any deficit monthly and yearly. In the contrary, the income of the community living in Shashemene and Kofele Woredas could cover only between 5 and 8 months. Only a few of the households in this area could sustain a maximum of 9 to 11 months. The deficit is compensated by borrowing from relatives, local money-lenders, use of inset for food, cash from wood sale, migration to other areas; and very few obtain their food from food aid when available.

When asked about changes in their livelihood status, 46% of the local respondents said it has improved;

whereas some 45% reported that their livelihood condition did not improve at all. In terms of locality, the livelihood of Awassa Zuria community has shown improvements as compared to Shashemene and Kofele Woreda communities. This is because, as indicated elsewhere, those living in Awassa Zuria Woreda mainly produce cash crops all the year round and they generate cash income to purchase food items from the market. In this Woreda, only a small number of the respondents indicated that there was no change in their livelihood conditions over the last decade. This suggests that rural communities around big urban centers, such as Awassa, could generate additional incomes from off-farm employment opportunities. However, the people producing and selling cash crops have a problem of cash administration. They get money and spend it within very short period of time.

In terms of determining the livelihood or wealth status of people, those individuals who could sustain themselves without any external support all the year round were identified in rich categories. These include individuals who have inset, chat and coffee, or a farm size of one hectare or more, and a good number of cattle. Households which could cover their food requirements for 9 to 12 months, own a farm land between 0.5-1.0 ha and have some chat stands, inset, and some heads of livestock are considered as middle income households, whereas those households that suffer from food shortage for most of the year, own no animals or have land less than 0.5 with no cash or sizable food crops are categorized as poor. Such households face extreme food shortage during lean seasons especially from June to October. In general, some 66% of the households suffer from food shortage, particularly those in Shashemene Woreda.

### Experiences in tree planting

About 87% of the local people in the study area plant

trees around their homesteads. Few people (12 %) do not plant trees due to shortage of land or complete landlessness. The most commonly planted tree species is Eucalyptus for construction and fuel wood purposes. *Cupressus lusitanica* and *Grevillea robusta* are planted by some people for construction and lumber production. Ownership of plantation trees by individual households ranges from 100 to more than 500 trees around their homesteads. Some people in Shashemene and Awassa Zuria Woreda have plantation with more than 2000 trees per household around their homesteads. The source of seedling of the wood lots is mainly from seeds collected by the farmers themselves from plantation forests in their vicinity. Houses in the study area are constructed using wood and grass or maize stalks in some cases, corrugated galvanized iron sheets depending on the income level of individuals or the household. The wood for construction material is obtained mainly from the trees planted around the homesteads. Group discussions revealed that some farmers cut the wood for construction from the surrounding forests or buy it from those farmers who own trees. At times, the Shashemene wood industry enterprise provides the people around the forest with construction material upon request.

More than half of the supply of fuel wood is obtained from plantation (54%), followed by fuel wood obtained from the natural forest (29%). The latter group is landless, the most difficult to control and create a forum for discussion due to the moving nature of the individuals from one PA to the other. The remaining 17 % of the fuel wood comes from crop residues and animal dung. The wood quality preference of the local people is strictly concentrated on the products of existing meager natural forests rather than plantation products with less quality for various end uses (Eckholm *et al.* 1984).

### **Ownership and access rights to forest resources**

The Arsi Forest and Wildlife Enterprise, previously called Munesa Shashemene Wood Industry Enterprise, owns the adjacent forests of the study areas. Previously, the community has planted exotic trees like *Cupressus lusitanica* and *Eucalyptus* species for the purpose of community forest development to be used as a source of fuel wood and construction material. After the removal of the military regime, the Enterprise was established and the forest, once owned by the community, was given the responsibility to manage and administer the forest in the form of concession. The local people were deprived of the right to use the forest resources. In fact, people were pushed away from the forest by force. Then, people started to fell trees illegally and use them for their domestic consumption and selling wood for income generation purposes. Consequently, there was strong

animosity developed between the local pole and the Enterprise that lasted for more than 15 years.

Recently, there were a series of discussions involving the Enterprise managers, the community, the district administration and other stakeholders including Wondo Genet College of Forestry and Natural Resources. Therefore, agreement was reached to involve the community, specifically the youth, in the protection and development of forests of the surrounding areas (Wily and Dewees, 2001). The youth in the study areas was suffering from absence of employment after finishing school and graduation from colleges and universities. Protection and appropriate utilization of the resources of forests was seen as a job creation opportunity. It was agreed that the youth groups would get 15 ha of the forest area to plant trees and use the same as income generation scheme for a period of 15 years as of 2008. Accordingly, the community started planting trees where grazing was prohibited until the planted trees grow to the size of sapling (small trees) by which time they could be out of danger of being trampled by cattle. During the planting period, all community members including children, youth, elderly women and men participated joyously feeling a sense of ownership, indicating also the importance of stakeholder participation in decision making (Sithole, 1986; IUCN, 1996 and 1997; Scoones and Thompson, 1994).

When asked whether forest resources should be owned and/or managed by individuals, user groups or the state, the majority (89%) of respondents believe that ownership should shift to the state. The main reason given was that the power and capacity to properly manage the resource and control illegal cutting remains within the state. However, for resources that are managed on a comparatively long-term basis, the ownership rights should not be limited to the Government (Bojang and Reeb, 1998). It is argued that these types of resources can be properly managed by the community if and only if their ownership status is clearly established and understood (Tefera *et al.*, 2005).

63% of the respondents live within one kilometer distance from the forest area and the majority of them regard the forest as a source of their livelihood. Therefore, access to and ownership of the forest remained their prime concern because they fully understand the importance of preserving the forest to meet their own needs and to secure their future without interference from outsiders (focus group discussion during the start of the project). But only 12.6% of the respondents consider the environmental role of the forest while 24.2% appreciated the forest as source of construction material. Close to 36% of the respondents feel that the communities do not have any access to the forest resources on the pretext of conservation; whereas 56.8% of the respondents report that they could access these resources with restrictions.

### **Resource driven conflicts**

The majority (85 %) of respondents admit the existence of conflicts around the issue of use right between different ethnic groups which resulted in further deforestation and persistent disputes in the area. For the communities in the area, it means reduced livelihoods; and for the private sector it increases costs and risks. Conflicts occur between individuals or groups and forest guards; between different ethnic groups surrounding the forest as well as between people residing close to the forests and those relatively far away from it. Ethnic conflicts triggered by use rights of the forest often tend to be bloody and at times lead to irresponsible act against the forest, to the extent of setting it afire. Most of these disputes are resolved through traditional or customary conflict resolution mechanisms though some of the conflicts may continue to surface as time goes on.

Quite understandably, conflicts are caused by the desire to protect the forest resources, on the one hand, and the compelling need to use these resources for survival, on the other. In other words, destruction of forest resources is directly related to the presence or absence of alternative sources of livelihoods in the area. People must survive today before they conserve resources for tomorrow. The study suggests that the ultimate solution lies in creating alternative and viable employment opportunities for unemployed youth both within and outside the forest zone. Besides, conflicts and their devastating impact on forest and related natural resources can be minimized through the development of participatory forest and land use policies rather than through the protectionist and exclusionist approach currently in use.

### **External causes of deforestation**

About 40% of the respondents indicated that illegal cutting is one of the top most causes of deforestation followed by expansion of agricultural land. Accordingly, 72.6% of the respondents believe that the forest area is shrinking from what used to be before as far as their memory extends back. The major protagonists of illegal cutting and logging of trees are reported to come from outside the forest areas: lumber hunters, commercial wood processors and people in need wood for construction purposes. Only 3% of the respondents believe that local communities are direct beneficiaries of the resource itself the rest confirmed that either the resource is utilized by illegal users or exploited only by a few groups of people within the forest zone with possible links to outside actors. The recent mushrooming of illegal wood processing industries in the nearby towns such as Shashemene, Arsi-Negele, Wosha, Kela, Awassa, has initiated the local people to go for supplying lumber

woods-. Even some informants witnessed that the lumber from the area is sent to Zeway, Modjo and Addis Ababa.

### **Conclusion**

The existing condition of forest and natural resources within the Wondo Genet catchment is so much precarious. The rate of deforestation was very high due to lack of responsibility and ownership mechanisms put in place. Deforestation was the result of many causes; some natural, others mainly due to human actions owing to inappropriate land-use systems and incentives, expansion of agricultural areas, increasing demand for forest products and lack of information and understanding on the importance of forests to the livelihoods of the local people.

The research revealed that the area formerly covered by the forest is shrinking every year though the exact rate of conversion of forestland into cropland needs to be substantiated by successive studies. Respondents and forestry experts at the Wondo Genet College of Forestry and Natural Resources concurred with this observation and attributed the problem to lack of appropriate land and forest tenure system, illegal cutting, especially by external wood-hunters owing to the growing demand for lumber and construction wood. Decline in the forest resources can also be attributed to lack of water for both drinking and for irrigation. Especially the latter might have reduced the pressure from the forest by providing alternative food production opportunities.

However, one of the most important lessons learnt during this field study survey was that the majority of the communities is well aware of the ongoing changes on the forest resources and the economic and environmental consequences of deforestation, and therefore are prepared and willing to participate in forest management activities provided that the right policy environment for such participation is created.

Therefore, the major task ahead will be developing an appropriate resource management strategy based on a continuous assessment of the existing resources and how best to protect and revitalize these resources. To this effect, it is necessary to establish confidence in the community and, once this is done, it is very likely that a responsible and dynamic development process, geared toward a sustainable management of the forest resources, may take place within and among the participating communities. Therefore, livelihood diversification is critically useful.

The study also revealed that overpopulation has contributed to the problem of deforestation. Population growth leads to a rise in the number of landless and unemployed youth who do not have alternative means of livelihoods both in the rural and urban areas. Consequently, they often engage in illegal cutting of trees or

serve as spies for those wood hunters from outside the communities.

It was also learnt that members of the community are convinced of the need for conserving and managing the forest because they appreciate the value of the forest not only as a source of fuel wood and construction material but also as source of water for drinking and downstream irrigation. The communities have also perceived forests as means of stabilizing climatic conditions and a means of off/on-farm employment and income generation.

Another important lesson is the realization that both community leaders and local government agencies have expressed commitment to work very closely with the College; and this is a good gesture though implementation of these commitments would require favorable socioeconomic and political conditions which were put in place very recently. It is therefore recommended that the College should continue to carry out regular consultations with the communities in the three Woredas surrounding the forests.

## ACKNOWLEDGEMENTS

We would like to acknowledge the support of Sida through the project called 'Development Oriented Interdisciplinary Thematic Action Research (DOITAR)' for sponsoring this study. Our special thanks go to the communities in all peasant association for working together and Gebreyesus Tenagashaw and Solomon Shiferaw; colleagues at Wondo Genet College of Forestry and Natural Resources for their assistance during seedling acquisition and Kefyalew Sahle for his assistance in GIS techniques during demarcation of the area provided to youth group.

## REFERENCES

- Addisalem, A. (2003). Forest Fragmentation and its impact on Genetics Variation of *Cordia Africana* Population around Wondo Genet, MSc., Ethiopia.
- Alemtsehay, T. (2011). Seasonal availability of common bee flora in relation to land use and colony performance in gergera watershed Atsbi Wembwrta district, eastern zone of Tigray, Ethiopia. MSc.Thesis. Hawassa University, Wondo Genet College of Forestry and Natural Resources, pp76
- Belaynesh, Z. (2002). Forest Resource Changes in and around Wondo Genet catchment and its near future impacts, Wondo Genet College of Forestry and Natural Resources, MSc Thesis.
- Barraclough, L.S., Ghimire, B.K. (1995). Forests and Livelihoods, The Social Dynamics of Deforestation in Developing Countries, UNRISD.
- Dale D.W., James L. (1989). Fire as a forest management tool: Prescribed burning in the southern United States Eckholm, Erik, Gerald Foley, G.B., Lloyd, T. (1984). Fuel wood: the energy crisis that won't go away, Earthscan, UK.
- FAO (1998). Community Forest Case Study Series 13. Developing Participatory and Integrated Watershed Management, Rome.
- IFFN, (2000). Ethiopian Fire Special. The Ethiopia Fire Emergency between February and April 2000. International Forest Fire News (IFFN) No. 22- April 2000, p. 2-8
- IUCN (1996). Collaborative Management of Protected Areas: Tailoring the Approach to the Context, Issues in Social Policy, September 1996, Switzerland.
- IUCN (1997). Beyond Fences: Seeking Social Sustainability in Conservation, Vol.1, 2000 (Reprinted)
- Today, B., Dominique, R (1998). Community Forest Ownership: Key to Sustainable Forest Resource Management. The Gambian Experience, Washington DC.
- Menassie G., Tefera M., Mahdere, M. (2003). Forest Fire Impact Assessment in Selected Fire-Prone Ecosystems of Ethiopia, Report. August 2003
- Ricardo, V. (1986). Mediterranean forest fires: A regional perspective, 1987, preventing forest fires through silviculture, September. 1989, Mediterráneas forest fires: A regional Perspective.
- Saigal, R. (1988). Modern forest fire control: The Indian experience,
- Scoones, I., Thomson,J. (1994). Reprinted 2000, Beyond Farmer First, Rural People's Knowledge, Agricultural Research and Extension Practice, IIED.
- Sithole, B. (1986). Where the Power Lies: Multiple Stakeholder Politics over Natural Resources, A participatory methods guide, ISBN: 979-8764-99-4.
- Tefera, M., Demel, T., Hakan, H., Yonas, Y. (2005). Role of Communities in Closed area Management, *Mountain Research and development*.
- Troensegaard, J. (1989). FAO's role in forest fire protection: An overview of activities 1970-89. A Senior Forestry Officer (Plantations and Protection) in the Forest Resources Division of the FAO Forestry Department.
- UNCED, (1992). A Guide to Agenda 21, A Global Partnership, Geneva, March1992.
- USDA, (2000). Wildland fire in ecosystems effects of fire on flora. General Technical Report RMR-GTR-42- Volume 2
- USDA, (2005). Wild land fire in ecosystems effects of fire on soil and water. General Technical Report RMR-GTR-42-Volume 4
- UNFCCC (2007). Climate change: impacts, vulnerabilities and adaptation in developing countries pp 68.
- UNRISD, (1994). Environmental degradation and social integration, Briefing Paper No. 3 World Summit For Social Development pp23

Wily, L.A., Dewees, P.A. (2001). From users to custodians: changing relations between people and the state in forest management in Tanzania. Environment and Social Development Unit, Africa Region, World Bank. Washington DC.  
World Conservation Union (IUCN-): People in Charge, the Emerging phase of Conservation, World Conservation-Bulletin, and August 1996.

Zerihun Mohamed, A. (1999). Natural Resource Competition and interethnic relations in Wondo Genet, South-Central Ethiopians. School of Graduate Studies, Addis Abeba University, MSc Thesis.