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**ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

**DEMOGRAPHIC AND SOCIO-ECONOMIC
DETERMINANTS OF KNOWLEDGE, ATTITUDE
AND PRACTICE TOWARDS FOREST
CONSERVATION: *A case of Wondogent, Sidama
Zone SNNPR***

**By
Temesgen Workayehu**

**Population Studies and Research Center
Institute of Development Research**

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**A Thesis Submitted to The School of Graduate Studies of
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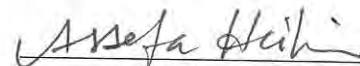
***Demographic and Socio-economic Determinants of Knowledge,
Attitude and Practice Towards Forest Conservation: A Case of
Wondogenet, Sidama Zone SNNPR***

By
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July, 2007

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List of Acronyms

BoFED	Bureau of Finance and Economic Development
BoPED	Bureau of Planning and Economic Development
CSA	Central Statistical Agency
EPA	Environmental Protection Authority
FAO	Food and Agriculture Organization
FGD	Focal Group discussion
FSCS	Forestry Sector Co-ordination Secretariat
KAP	Knowledge , Attitude and Practice
MASL	Meter Above Sea Level
PAs	Peasant Association
RCS	Regional Conservation Strategy
SNNPR	Southern Nation Nationalities People's Region.
UNEP	United Nations Environment Program

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Abstract

Forest coverage is the main indicator of the level of resource degradation. This is very apparent in the highlands of Ethiopia, which are identified among the critically endangered eco-regions of the world. As part of these highlands, Wondogent forest, which is located in Wondogent woreda, for instance, is one of the disturbed resources we have in the country. Assessing and explaining determinants of people's knowledge, attitude and practice towards forest conservation is the key objective of the study. An interview was conducted to collect the data. Literatures and Internet sources were also assessed during the study. The analysis is made at the individual level where the household listing served as the sampling frame. Random sampling was used to identify the 415 interviewees and Bi-variate and Multivariate logistic regression was used to examine the relationship between the set of independent variables and the dependent variable. The findings of the study show that considerable proportions of the target population have no knowledge of the resource. Even among those who have the knowledge of the resource, the majority do not know the status of the forest currently. People's perception of the long term impact of the current forest destruction is also found to be so weak. There are also much higher percentage of respondents (across all the demographic and socioeconomic characteristics) with no knowledge of conservation, negative attitude and poor practice of conservation. According to the result of the model, place of residence, sex and household size are identified as significantly important factors to affect knowledge of conservation. In terms of attitude place of residence, age and literacy status are found to be important factors to affect attitude of the people towards conservation measures. Based on such findings of the study, among others, provision of an extensive environmental awareness education, development of alternative energy and income source are forwarded as recommendations.

1. INTRODUCTION

1.1 Background

Forest coverage is one of the main indicators of the level of environmental degradation. The higher the percentage of land under forest cover the lower is the degree of resource degradation (Ayele Kuris, 2003). An extensive deforestation of forest cover, therefore, leads to wide scale soil erosion and declining of crop yields (Campbell, 1991.).

The term deforestation implies a decrease in the size of forest area over time. Regardless of this, there is inconsistency in the definition of forest area. Due to this inconsistency, country wise comparison on the extent, and cause of deforestation has faced difficulties, so that, studies are forced to mainly focus on the specific problems of the countries (Allen et.al:1985).

What ever the fact is, the developing world, especially Africa, has been experiencing high rate of deforestation to the extent of which forests are loosing their regeneration capacity. According to the 1981 Forest Resources Division of the FAO, the world forest coverage declines by 3-6 percent annually, of which, the lion's share goes to the developing countries.

1.2 Statement of the Problem

Ethiopia is one of those African countries where their environment is severely degraded (Campbell; 1991). Deforestation has reduced its tree cover to 2.7 percent from 40 percent at beginning of the century (Ayele Kuris, 2003). Because of such an extensive deforestation experience, the land has been exposed for wide scale soil erosion and declining of crop yields. For instance, the highlands of Ethiopia are grouped among the 200 critically endangered priority eco-regions of the world. (Dinerstein: 2002).

Out of the country's 2.7 percent remaining high forest areas, 45 percent is found under pressure from the expanding agriculture, increasing demand of energy and settlement. The national energy consumption from biomass fuels accounts for 94.8 percent of which fuel wood covers for 81.8 percent (Shibru Tedlla and Kifle Lemma, 1998).

In the SNNPR the average fuel wood consumption around the high forest areas is about 1200 kg per annum per household. It was also projected that by the year 2015 about 89,293 hectares of forest coverage will be cleared for agricultural expansion purpose (RCS of SNNPR 2003).

“.....Further more the loss of vegetative cover has in turn lead to the destruction of wild animals and the loss of organic chemicals” (SNNPR, RCS, 2003).

Wondogent forest is one of the disturbed forest areas in the region. Of its total 98,200 hectare of coverage, 17,200 hectare has been disturbed at various levels (Gedion Asfaw, 1995). As compared to other regions, in SNNPR there is high pressure imposed on the natural resource base. The region's people dependency on fuel wood as a major source of energy is one of the highest in the country which is about 95.5 percent in urban and 96 percent in rural areas.. About 80 percent of the region's population is also found settled very close (less than four kilometers) to the fuel wood source (CSA: 2004).

The extent of biodiversity loss in the country has also been proved by different studies to be irreversible if the present trend continues and no intervention is made. The projections made by FAO, concerning the wood demand at the national level, could be taken as an example. Accordingly, by the year 2014 the demand for industrial and construction wood will reach over 1.6 million m³ and 4.3 million m³ respectively. The demand for fuel wood is estimated to increase by 14.4 million m³ annually (FAO, 1992).

The SNNPR gross regional production estimate also indicates an increasing trend of the share of forestry products to the regional gross domestic product (BoPED, 2002). *Source;*

By considering this fact, an effort is being made by the government and non governmental organizations in order to change the situation. As part of this effort, the country had become the owner of the national environmental and population policies where it is tried to address environmental problems of the country in general and those remnant forests in particular. In the same manner, regions have come up with their own respective policy and strategy document. The policies identified the above problems as critical threats to the physical environment of the country. So that, educating people searching for alternative sources of income and energy,

among others, were thought to be key strategies to effectively implement and achieve the intended targets of the policies. For instance, in the SNNPR RCS document, people's empowerment is believed to be key task to proper utilization of natural resources (RCS: 2003).

Despite all these efforts, environmental degradation has continued to be one of the development challenges of this country in general and of the region in particular. This implies that dependency on forest and forest products continues increasing as the population increases and the consumption behavior changes. Therefore, the pressure on the remnant forests gets serious overtime and the biodiversity loss will be irreversible unless measure is taken to curb the situation.

In general, the underlying biodiversity loss are accounted for increasing demand of biological resource due to increasing population, lack of knowledge to consider long term consequences ,shifting cultural attitudes and policy failer to address the real problem (R.T Watson .et.al, 1995).

This study, therefore, looks into people's knowledge of conservation, attitude and practice towards conservation.

1.3 Objectives of the Study

The general objective of this study is to examine the major determinants of knowledge, attitude and practice towards forest conservation. In line with this general objective, the study attempts to achieve the following specific objectives.

- To examine the knowledge of the people about the environment
- To look into variation in the degree of forest conservation knowledge, attitude and practice across different demographic and socio economic characteristics of the study area population:
- To scrutinize weather there is any indigenous or introduced knowledge or practice that promotes the conservation of the forest resource of the area.

1.4 Significance of the Study

Through accomplishing the above objectives, the findings of the research will help policy makers, planners, program and project interventions to address the real problem, so that, the biodiversity resource of the country will be utilized in a sustainable manner to the development of the country. It could also be used as a spring board for further studies.

1.5 Scope of the Study

The study area is found in Wondoget woreda of Sidama Zone, SNNPR, encompassing five kebeles (one urban and four rural kebeles). The kebeles were Weshu soyama, Wetra kechema, kela 01 Abaye and Gutu anoma. It assesses people's knowledge, attitude and practice toward forest conservation. It also tries to explain the knowledge status of the people concerning the forest resource and their perception of the impact of the current forest destruction.

1.6 Research Questions

The study addressed the following questions.

1. In what status are the people in terms of their knowledge of the environment?
2. What differences in knowledge, attitude and practice of conservation exist across the different demographic and socio economic characteristics of the community in the study area?
3. What type of relation does exist between people's knowledge of the environment and their knowledge of conservation, attitude and practice towards conservation
4. Is there any indigenous or introduced practice of forest conservation the area?

2. REVIEW OF RELATED LITERATURE

2.1 Theoretical Framework

In his “limit of growth” principle, Malthus argued that “with growing population, resource depletion is accelerated resulting in wide spread deforestation, overgrazing, biodiversity loss etc. the ultimate destination of which is poverty and starvation” (Marquette, 1997). For him, an environmental crisis is one way of natural mechanism to limit the population growth. So that the environment reaction to the population pressure, which he later calls positive check, indicates an important environment population relationship. Among the solutions he proposed (Positive and preventative checks) to curb the situation (prevailing poverty), preventative checks like decreasing fertility, delaying marriage are preferred to be among the demographic responses of a rational man to the resource pressure (Bielli et.al,2001 , Donald 2004, Marquette, 1997).

On the other hand for Bosurepean cornucopian perspective, the growing population is not a problem because it allows division of labor which in turn brings possibility of increasing productivity. In other words, the growing population will lead to long term increases in output. Besides this, in both urban and rural areas, it might increase the opportunities for economies of the scale which further stimulates the intensification of agriculture, greater surplus, urbanization and industrialization (Marquette, 1997). In explaining the relationship between population and environment Boserup considers environment as a factor to be influenced by population and technology (Bielli et.al 2001).

There is also another thought that have tried to look at the population environment nexus. Among others, the multiplicative, and the mediating and development dependency -perspectives are the major ones. According to the view of the multiplicative perspectives, the population characteristics form a multiplicative interaction with other factors like levels of technology and consumption in order to influence the environment. Such an interaction is explained mathematically as $I=PAT$ where I = impact on environment, P =population Size, A = per capita consumption and T = level of technology. In general, this line of thought looks at the combined effect of population size, consumption and technology on environment. This interaction had been further specified as ultimate and aggravating causes of environmental degradation where

technology and consumption are considered as ultimate and population size as aggravating causes of environmental degradation. (Shaw, 1989 c, Hogan, 1992 as cited by Panda, Bielli et.al 2001)

Moreover, the “Mediating Perspective” approach tries to look at the environment population interaction from the social, cultural and institutional point of view. Therefore, according to this school of thought the population- environment interaction is mediated by socio-cultural and institutional factors (Bielli et.al 2001).

The development –dependency perspectives, on the other hand, look how the process of development mediates the population environment interaction. Here political and economic forces are important agents to manipulate the demographic characteristics of a country including its environmental outcomes. According to this line of argument major environmental problems are accounted for such difference in economic and political power of countries of the world (Martine 1992 as cited by Panda).

2.2 Review of Related Literatures

2.2.1 Forest Resource and Livelihood

By livelihood we mean the capabilities, assets and activities required for a means of living. And a livelihood is said to be sustainable when it can cope with and recover from stresses and shocks and maintain its capabilities and assets both now and in the future, without undermining the natural resource base (FSCS, 2001). Forests serve as an important means of rural livelihood through providing inputs like fuel, medicinal and food products. Besides these they diversify the farm household economy for they are characterized by easy access and require low skill and capital to be exploited (Campbell: 2002). The fact in the developing countries rural households shows that there is a high level of dependency on forest resources for their subsistence (Arnold, 2001). This situation in the case of SNNPR shows an increasing trend as it is indicated in the regional gross production estimates (BoFED: 2002).

2.2.2 The Concept and Methods of Conservation

Concept of Conservation

The concept of conservation implies the maintaining of viable species populations, to sustain ecological process, and be responsive to short and long term environmental changes (Oslon et.al:2002). The concept varies with the type of the resource whether it is renewable or non renewable. Therefore, for renewable resources, conservation does mean reducing the exploitation of the resources below the resources rate of replacement. On the other hand, for nonrenewable resources, conservation is an activity of maintaining an adequate supply of these resources well into the future. The purposes of natural resources conservation is therefore multi dimensional out of which humanity secure biological, economic, ecological benefits and insure his survival (H. Baldwin:2005).

Therefore, measuring the conservation status of a country helps to identify priority areas which need urgent conservation activity involvement. If so, identification of the conservation activity depending on the type and cause of the problem and the level of the effort needed will be an easy task (Oslon et.al:2002).

However, in the developing countries awareness on the problems caused by deforestation started to emerge since the early 1970s and therefore, the concept of conservation, is not well understood in these countries (Keely and Scoons:2000).

Methods of Conservation

There are a variety of conservation methods, but in the broader terms we can generalize all in to two methods of conservation identified as In-situ and ex-situe methods. The in-situe methods include legal protection of endangered species, preparation of recovery plans, and establishment of protected areas. The ex-situ method includes, botanic gardens, seed banks, clonal collections, museums, zoological gardens etc (Watson, 1995)

2.2.3 Global and Regional Initiative to Sustain the Environment

The global concern of the environment started to emerge since the early 1970s and in 1972, the first conference on environmental issues was held in Stockholm. The conference created an opportunity for the formation of United Nations Environmental Program (UNEP) as a responsible organ for environmental issues. Among others, encouraging sustainable development and increasing standards of living without destroying the environment was one of the most important achievements of the conference. The Rio de Janeiro Earth Summit, in 1992, was also another important summit that has created an opportunity to raise wide environmental issues. Among the many outcomes of the summit, an agreement like protecting endangered species and habitats has an important place. (Michael Zimmerman:2004)

Following this, in 2002 the World Summit on Sustainable Development was held in Johannesburg, with the aim of establishing new sustainable development goals for the 21st century. Among others, reducing the number of endangered species by 2010 is the most important agreements reached upon. (Barbault et.al 2002)

At the regional level the fifth African Ministerial Conference on the Environment was held in 1995. Here proper management and utilization of resources through human capacity building, environmental awareness, public information and management of demographic change and population pressure were the major outcomes of the conference (Shibru Tedlla and Kifle Lemma, 1998).

Regardless of all these efforts, the conservation experiences of Africa, including the community based ones, have been predominantly dominated by men. As the pressure for more equitable conservation and development process increases world wide, initiative was taken to make women and other marginalized groups part of the activity. However, there is still inexperience and lack of knowledge concerning how to mobilize all segment of the community (Flinatan, 2003)

2.2.4 An over view of Conservation History in Ethiopia

The history of conservation in Ethiopia dates back to the early 1960s, along with the green revolution movement which was aimed at ensuring the country with food security. Activities like hill side closure, wood lots terracing, etc. were among the solutions suggested by the then conservation oriented projects. However, the measures taken during that time were not successful for the following reasons (Keely and Scoons:2000).

In general, the conservation history in Ethiopia could be seen from three perspectives. Accordingly, we have the first conservation experience of the country that had been practiced between the periods 1957 to 1974 (the period of monarchial régime). Then follows the second period of experience during Marxist regime, extending from 1975 to 1991. Currently (since 1991) the country is in its third period of conservation experience (Shibru Tedlla and Kifle Lemma,1998).

The first phase of the experience starts from extends between 1957 and 1974. During this time the primary target of the then government was to bring about economic development through over exploiting the natural resources with no limit. Therefore, there had been no space to the concept of sustainable use of natural resources. But as time goes, in the second five year plan (1963-1967), little awareness on the consequences of deforestation and soil erosion on human well-being were created and the concept of sustainability started to become an agenda. During this time the need for policy and legislation emerged and, legislation was drafted for the first time concerning ownership and utilization of forest resources. As the concept of conservations grows, the third five year plan, in its document incorporated participatory, coordinated and decentralized administration approach were developed centering deforestation as major problem of the country (Shibru Tedlla and Kifle Lemma,1998). Because of the existing land tenure system and limited integration of peasants to the national economy all the conservation activities of the time remained unsuccessful (Campbell: 1991).

The second Phase extends from 1974-1991. During this time, in 1974, the National forestry program for Ethiopia was established. The ten year perspective plan (1984-94) and Ethiopian highland reclamation study forestry conservation plans were drafted. Based on these documents, significant actions of reforestations were made practical. For instance, during this time 600,000 km bund was constructed, 470,000 km hill side traces were build, 80,000 hectares of land was closed for regeneration .(Campbell: 1991).

Nevertheless, factors like limited land holding size of each PAs versus the growing population pressure, ownership of land by the state, denial of farmer's access to forest resource, the ambitious nature of this plan, the 1976 draught together with the civil war had made it not fully achieve its target. (Campbell: 1991: Shibru Tedlla and Kifle Lemma, 1998)

During the third phase, post 1991, the National Conservation Strategy is designed and approved in 1997 as strategic frame work for the management of the environment and having broad objective of improving the quality of life of all Ethiopians through sustainable utilization of the countries forest resource. Decentralized administration, participatory, sectoral and cross sectoral approach was also appreciated in the strategy. The country become owner of an environmental policy that identifies issues like integration of gender, social and cultural issues and public awareness and promoting understanding of the essential linkage between environment and development as important agents of promoting conservation of resources (EPA, 1997).

In general all the conservation efforts that have been made in Ethiopia have basically one common characteristic that they all have been drafted based on particular events like famine, particular scientific studies and the interest of supporting groups. So that the environmental problems in the country continued to be an issue (Keely and Scoons:2000) .

2.2.5 Demographic and Socioeconomic Factors and KAP towards Forest Conservation

Demographic Factors

Sex is one factor that substantially affects people's knowledge of conservation, attitude and practice towards conservation.

"Women possessed less knowledge than men concerning conservation Less aware of the conservation benefit and were ignorant of long term benefit." (Flintan 2003).

Concerning gender differences in knowledge and attitude towards environment, there are basically three types of arguments. The first line of argument (Knowledgeable Support Hypothesis) bases itself on the view that western society considers the environment to be developed by science and technology. So that for men have got the opportunity to command techno scientific component of the society that enabled them acquire scientific and technological knowledge to dominate nature and socialized un-ecological attitude towards environment. On the contrary women, according to the same line of argument, are denied of acquiring this knowledge because they have no access to the techno scientific knowledge. Despite this fact, they are socialized to ecological caring roles of mother and nurture, as it is observed in their reproductive and child rearing activity in the community. So, for those who promote this view, men have more exploitive and negative view to the environment than women. (Hayes: 2001)

On the second line of argument the eco-feminist theorists like Merchant support the above line of argument and describe environmental problems as the result of men domination. For these eco feminists, female inequality and environmental problems are the result of male domination. It is thus this similarity between female and nature that made women have positive attitude towards nature than men. Therefore, for eco-feminists had been females equal to men dominant over men environmental problem would not have been an issue (Tiondi: 2000).

In the third line of argument, (the Safety corner Hypothesis) women are more likely to express concern about the environment only when environmental issues directly threat the health of their families. For them such disparity in environmental attitude have strong correlation with selected phenomena when in one or the other way the phenomena is an environmental issue that could

threat their life. But under the normal condition men and women do not differ in their level of concern about the environment (Hayes: 2001).

Age is one of the demographic factor that affects the knowledge and attitude of individuals towards environmental management (Torgler et.al:2005). As theorists hypostasized it, the age-environment relationship is either the cohort effect which is generational differences in socialization and experience or aging process. People in the same cohort would have similar attitudes towards certain issue as compared to those in different cohort. In the case of aging, older people are taught to be more interested in protecting their social stand and wealth therefore they are less likely interested to invest in the prevailing social system for good of the future. Unlike the older people the younger ones are more willing to attach to the new social system from which they taught is beneficiary in the future (Vlosky et.al :1999).

In some studies negative correlation between age and attitude towards the environment is observed. For instance, according to the study conducted by, older people are found to be more risk averters than the younger ones (Torgler and Graciaetin : 2005). On the other hand, international Institute for Environment and Development indicated that, in Tanzania there are positive attitudes towards the environmental conservation at the younger and older age (Flintan 2003).

The impact of age could also be seen from the people's consumption behavior perspective. As per capita consumption increases through time, distinct expenditures will follow distinct age pattern. Accordingly, studies show higher consumption behavior at middle age and lower consumption at younger and older ages. As people become more consumers, they are more likely to negatively affect the environment (Pebly; 1998). Therefore their knowledge and attitude would be under the domain of their consumption behavior.

There is also variation between those ever married and unmarried in knowledge and attitude towards the conservation of the environment. When people get married people, they establish strong social network with in the community, therefore, they are expected to involve in community activities than the single people. Their parental effect also makes theme wish have

conducive environment so that the future of their children is secured. Therefore, they are more concerned with environmental problems than the unmarried (Torgler et.al:2005). So that, according to Torgler study married people are expected to have better knowledge of the environment and better attitude than the single ones.

On the contrary, the findings of Flintan study in the year 2003 show that married women as compared to the unmarried ones are busy of activities like house keeping, raising families, cooking and other activities as a result of which they are less involved in the community based activities. This therefore has limited their knowledge of environmental conservation activities.

For instance, according to the same source, in Ethiopia women on average spend six hours a day in coffee making activity. In Mali also they spend 10-14 hours a day in preparing meal for husbands. This has made them little time to participate in conservation activities than men so that they tend to compromise long-term environmental conservation activities to short term needs.

It is also tried to look the impact of marital status in knowledge, attitude and practice of environmental conservation from the household formation and consumption behavior perspective. As household formation occurs, the consumption behavior of the household will automatically be changed. Therefore with increasing number of households, there is always growth in the volume of consumption (Pebly; 1998). Therefore, with the change in consumption behavior like growth in the energy consumption and increasing volume of waste disposal, people tend to be more destructive to the physical environment.

Socio Economic Factors

People's Knowledge and attitude towards environmental conservation is also affected by socio economic factors like education, type of activity or industry and income. The researcher will try to look into the correlation between these variables and the dependent variables

Education could be taken as an optimal measure of the socio economic status the woman, for it is has strong correlation with economic status, access to information, resource and many other benefits (Chrisenson & Johnson 1995; Elo & Preston 1996).

Educating women, raises women level of awareness on environmental issues and increases their role in the conservation activities. For instance, universal primary education is given due emphasis in the millennium development goals of United Nations implying that it is one of the development challenges of the developing countries. Once women are educated, because of their role in the household and the community, they could serve as conservation knowledge conveying agents to the rest of the communities.

The Integrated Conservation and development Project (ICPD) in Africa, for instance, educating women was given top priority and the advantage of the program was explained by a young a Kenyan women who had participated in the program in the following manner.

“In our area people were eating turtles. Now I know the importance conserving turtles. I have educated the whole community by telling them it is not good to eat turtles ...”
(Flintan 2003. pp 22).

Studies indicate that women in the developing countries, as compared to men, have less access to education and resources. This fact has been confirmed in the EDHS 2005 that there is large disparity between the educational attainment level of men and women in Ethiopia. According to the survey, at the national level out of the total women population 24 percent in the urban and 74 percent in the rural areas have no education. The percentage for men in the respective areas is about 7.9 percent and 49.2 percent respectively. In SNNPR the same source shows that 65.7 percent women and 32.6 percent of men have no education

Education therefore will have a remarkable impact on women’s relation with the physical environment through affecting their social; and economical status. So that uneducated women are highly likely to lack knowledge and resource to be invested on environmental conservation as compared to men. In the study of Flintan, 2003, uneducated women failed to understand the link

between conservation and development as compared to men and have also little understanding about linkages between rights to resources and conservation responsibilities.

The type of activity or industry that an individual engaged has also impact on his/her knowledge and attitude towards the environment. There are occupations identified and assigned to men and women. Such division of labor is very common phenomena in Africa. Men are mostly assigned to field activities and women to house hold activities. As a result of this there is an important difference in knowledge concerning the environment and attitude towards it between men and women depending on their industry (Moor 1996a as cited by Flintan 2003).

For instance in Ethiopia, according to the 2005 national labor force survey, 75percent of women and 84.3 percent of men are engaged in Agriculture, Hunting and Forestry related activities. Therefore, based on the type of individual's economic activity, it is expected that men who deal with the environment in larger proportion than women have better knowledge of the environment and attitude towards it.

Place of residence is also another factor to determine the level of individuals knowledge and attitude towards the environment. Urban areas have better infrastructural development like education, health, media (radio, television, newspaper etc.), etc than rural areas. Therefore, people in urban areas have better access to make use of these opportunities. Therefore, they could easily access different environmental research findings and become aware of issues concerning the environment. The Study conducted in Costa Rica shows that urban lower class feels more strongly the effect of environmental degradation than the rural groups (Holl et.al 1995). There is also variation between the lower and upper classes in Costa Rica where lower lasses have better knowledge than the upper classes (Holl et.al 1995).

Despite this fact the Ethiopian forestry Action Programm identified Large section of the urban population in Ethiopia is un aware of environmental issues while the reverse is true for the rural people., According to the action program, rural people are against their environment not because they have no knowledge of the environment but it is their poverty that leaves the to over utilize the resource (Minstry of Natural resource Development and Environmental Protection, 1994).

The type of activity at the two places of residences also differs. In urban areas, non agricultural activities are dominant while the reverse is true in the rural areas. So that it is obvious that their perception of the environment vary accordingly. Out of the total population of the country, 80.2 percent are engaged Agriculture related and, forestry activities. Of these, only 13.0 percent are living in urban while 88.5 percent are living in rural areas. The employment to population ratio is also high in rural areas, which is about 82.0 percent and 50 percent in urban areas (CSA, Labor Force Survey: 2005). As described earlier, the largest proportion the ratio in rural areas is engaged in agriculture and related activities and the reverse is true in urban areas. Therefore, rural people as compared to their urban counterpart, have close day to day interaction with their environment in order to sustain their life. Moreover, they are expected to develop positive attitude towards the environment and acquire better knowledge of the environment.

The environmental policy of Ethiopia, in its document, has recognized and identified Environmental education and awareness as a key strategy to transform knowledge of environmental issues to the people. For instance, among the many strategies of the policy, the articles stated below could tell us how access to media is crucial in changing knowledge and attitude of people towards the environment.

Strategy 1

- *To formulate environmental awareness programmes in such a way as to make them address specific environmental problems of particular localities in view of the extreme variability of environmental conditions and problems in Ethiopia; (Environmental policy of Ethiopia,1997)*

Strategy2

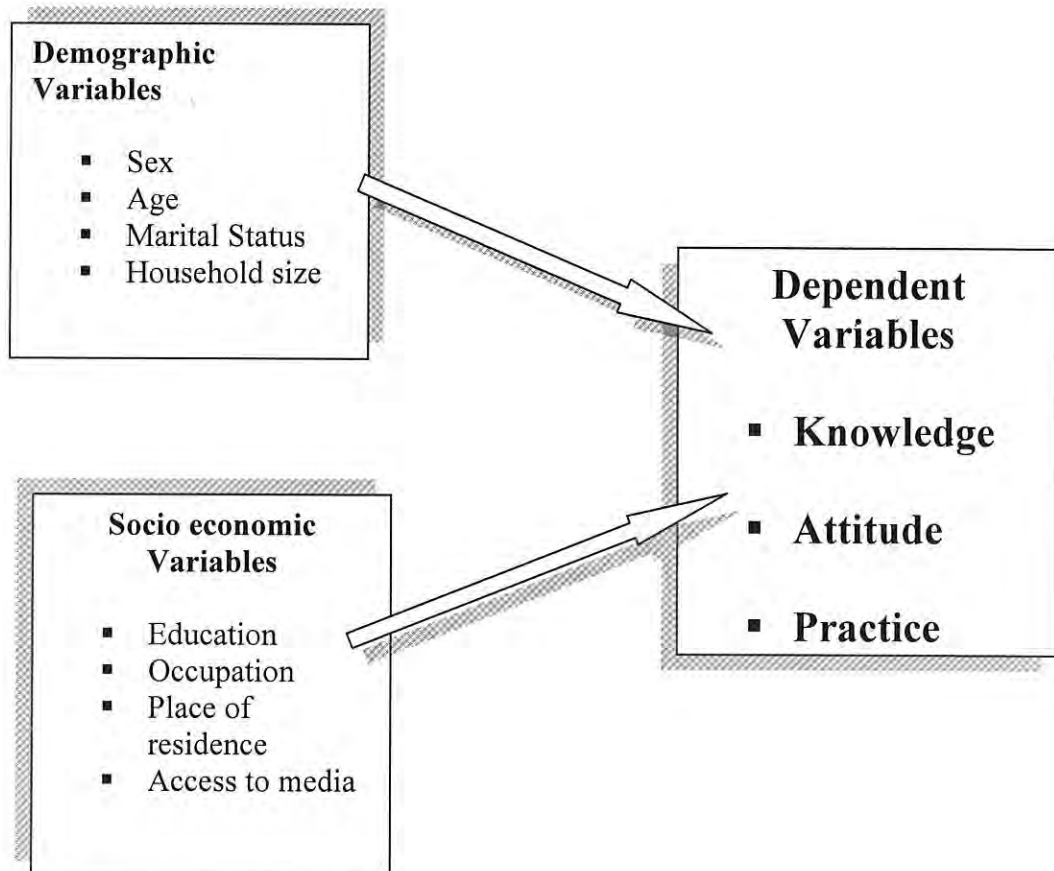
- *To recognize the important role the mass media play and to effectively use them in creating and promoting environmental awareness in view of the physical problems of access and communications in Ethiopia; (Environmental policy of Ethiopia,1997)*

Despite this fact, the percentage of people who have access to radio and television at the national level is 26.3 percent and 3.75 percent respectively. The situation in the study area is even much

worse as compared to the national average, which is about 21.8 percent for radio and 1.3 percent for television. (CSA, Welfare Monitoring Survey: 2004)

The statement in the stated strategy implies that to have or have not access to media matters the opportunity of being informed and uninformed about the environmental issues.

2.2.6 Conceptual Framework



Source: Organized from different literatures.

2.2.7 Description of the variables

Variables	Category
<p>► Dependent variables</p> <ul style="list-style-type: none"> ▪ Knowledge ▪ Attitude ▪ Practice 	<p>Have / Have not any</p> <p>Have Positive / Negative attitude</p> <p>Don't have any/ Have at least one</p>
<p>Independent variables</p>	
<p>Demographic Variables</p> <ul style="list-style-type: none"> ▪ Sex is defined as ▪ Age ▪ Marital Status ▪ Household size 	<p>Male / Female</p> <p>15-30, 31-50, =>5</p> <p>Ever married/ Never Married</p> <p><=5 and >5</p>
<p>Socio economic Variables</p> <ul style="list-style-type: none"> ▪ Literacy ▪ Major Occupation ▪ Type of crop cultivated ▪ Place of residence ▪ Access to media 	<p>Literate / illiterate</p> <p>Farmer, Non farmer unemployed, housewife</p> <p>Coffee & chat, Sugarcane, Food crop</p> <p>Urban /Rural</p> <p>have no access, have access to one, two, three media</p>

2.2.8 Definition of Terms

- Biodiversity or biological diversity denotes the totality of life forms including genes, species and ecosystems and variety of different organisms in a certain area or as the sum of all the different species of animals, plants, fungi, and microbial organisms living on Earth and the variety of habitats in which they live (Niles Eldredge: 2004). But for this study biodiversity is the totality of all types of tree species in the study area.
- Conservation is sustainable use and protection of natural resources including plants, animals, mineral deposits, soils, clean water, clean air, and fossil fuels such as coal, petroleum, and natural gas. (Olson,et.al, 2002, Baldwin, Encarta 2004) . In this study conservation implies the sustainable use and protection of forests.
- Knowledge is defined as the people's knowledge of forest conservation in terms of protecting and the sustainable use the forest resource.
- Conservation practice throughout the paper is defined as the practice that people in the study area have acquired from their ancestors that is to mean any traditional method of conserving forest resources and / or a knowledge that they have acquired through modern environmental education that could be from any form of media, agricultural experts etc.
- Attitude is defined as people's feeling towards overexploitation of the resource for fuel wood, lodging, construction, settlement, agricultural expansion and any other purpose.

3. METHOD AND MATERIALS OF ANALYSIS

3.1 Background of the Study Area

Southern Nation Nationality People's Region is one of the nine regional states in the country located between 4°43"-8° 58" north latitudes and 34° 88" -39°14" east longitude. It constitutes 10 percent of the total area of the country and 20 percent of the country's population of which 8 percent and 92 percent are living in urban and rural areas respectively. It has a population growth rate of 2.9 percent. The region is divided among 13 zones, 125 woredas and 8 special woredas and has an average population density of 131 persons per sq km. In the region altitude varies between 376 MASL around lake Rudolf to 4207 MASL in Gamo Gofa . (BOFED, 2006).

If we have a look at the demographic profile of SNNPR, one can observe very poor status in all its aspects. For instance, the 2006 population projection made for the region indicates that with annual growth rate of 2.72 percent (It is above the national growth rate which is 2.6 percent), the urban and rural population reaches 1,219,000 and 13,625,000 respectively. The population growth for urban and rural areas of the region is also above the national average which is 4.6 and 2.5 percent respectively. The average family size in the region is about 4.7 in rural and 4 in urban areas. (CSA, 1987)

Thus, population pressure and over grazing are identified as the main actors of environmental degradation we presently observe in the region. In other words, the mismatch between carrying capacity of the environment and the rapidly changing demographic history of the country that has been growing from 1 percent at the beginning of the century to 3 percent in the 1990s, have become serious challenges to the region's resource base (RCS, 2003). The increasing urban population, while the urban areas are not capable of providing the people with all the opportunities like alternative source of energy, job, etc. is another dimension through which burden on the environmental resource is created. Commercial logging and annual burning are all the results of this demographic chaos and have been contributing a lot for the over exploitation of the resources (RCS, 2003).

The socio economic characteristics of the population have also vital role to play in the resource depletion of the region. In all the developing countries like ours, it is common to have a population with poor household economy, large agricultural population, low access to media and education, poor infrastructure, gender inequality etc.

The 2005 Ethiopian demographic and health survey indicates that In SNNPR 69.6 percent of females between ages 15-49 and 47.3 percent males have no education. According to the same survey only 24.5 percent of women and 86.4 percent of men are employed. The study also shows the fact that, because of various socio economic and cultural influences, 86.6 percent women and 72.3 percent men in the region have no access to any source of media. (EDHS; 2005)

The region is endowed with large volume of (0.8 million hectares) remnant forests (EPA, 2003). But different studies show that these precious resources of the country are in rapid truck of depletion for which the factors mentioned above are taken as major agents. Being very much concerned of this environmental crisis, the regional government has come up recently with its Regional Conservation Strategy with the purpose of protecting the flora and fauna resources of the country. (RCS, 2003)

Wondogent is one of remnant forest resource of the country which is located in Wondogent Woreda of Sidama zone. Geographically it is situated nearly at 7^o 13' North latitude and 38^o 37' East longitudes. It is bordered with the escarpment and associated plateau lying between the rift valley lakes and the eastern edge of the rift valley. It has an altitude that ranges from 2100 to 2700 meter MASL(BoFED,2004). This forest patch contains about 51 types of plant species and has a total coverage of 98,200 hectares (Gedion Asfaw,1996). Wondogenet Forestry College is also located here making use of the forest as an instrument of teaching students.

3.2 Data Source

Primary data was collected through household survey. Secondary sources like statistical abstracts, internet sources, related literatures, research reports, journals etc were used.

All people in the study area, who are 15 years old and above, were included in the study,.

3.3 Sampling Procedure

Multi (seven) stages purposive sampling procedure was used in order to select the study area. But in order to identify the household and the target group random systematic sampling procedure was employed. The unit of analysis was at individual level. It was only four illegible individuals (when we find more than four illegible individuals) who were interviewed in a household. This was because, in a condition where the household size is too large, the number of households to be covered by the study will be minimal. Therefore, it is expected to conduct an interview with two male and two female illegible (above the age of 15) interviewees in a household.

3.4 Sample Size Determination

To decide the sample size of the interviewees, P value of 50 percent for both men and women was employed. Thus, using the formula

$$n = \frac{(P*(100-P)* Z^2)}{e^2}$$

Where n= Sample size

P= the P-value which is assumed to be 50percent for both sexes

Z= the number of standard error corresponding to 95 percent Confidence interval and is given as 1.96

e= The margin of error that the researcher tolerates.

Accordingly,

- The total number of samples to be included in the study (n)

$$= \frac{50*(100-50)*1.96^2}{5^2}$$

$$= 384$$

- With eight percent of contingency the total number of interviewees were

$$= 384 + 31$$

$$= 415$$

A total of 415 interviewees were needed to conduct the research.

The sample distribution among the Kebeles / Peasant associations goes using Proportion to population size (PPS) method. The target populations, as described earlier are those who are

above the age of 15. Accordingly, five kebeles, which are found around Wondogent forest, were identified purposefully. In all the selected kebeles, household listing with filtering variable age was conducted by the enumerators which was later served as a sampling frame for the study. After conducting the listing, random sampling technique was employed to identify the interviewees.

3.5 Data Collection Procedures and Verification.

The researcher employed five data collectors (four for rural and one for urban) and two supervisors for each. They were provided with two days training before listing and data collection (One day for listing and one day for data collection). Data cleaning work was also done at office.

3.6 Method of Analysis

Bi-variate linear regression, in order to look in to the degree of association of each independent variable to the dependent variable was used. This takes the form of

$$Y = a + bx + e.$$

Where:

- Y= is the dependent variable
- b= is the coefficient that shows weather the relation of the independent variable “x” is positive or negative or no relation when it takes the value of “0”
- a =is the constant
- e = is the error term

Logistic regression was also employed to examine the relationship between the set of independent variables and each dependent variable separately (knowledge, attitude and practice) because all are dichotomous (as 0, 1)

So that Probability of (Y (dependent variable) = 1) = F (X) and the probability of Y=0 = 1-(F (X)). Where, “X” is the impact of the independent variables on each of the dependent variables. Thus the logistic function of the form $(P = 1/1+e^{-Z})$. “Z” is a linear function of set of predictor

variables and tells us that as the value of “Z” becomes infinitely negative “e^{-z}” becomes larger and larger the value of “P” then approaches to zero. The reverse will happen when “Z” takes infinitely positive values. But when “Z” takes the value of “0” the value of “e^{-z}” will be one and “P” holds the value of 0.5.

Accordingly, $Z = b_0 + b_1x_1 + b_2x_2 + \dots + b_k x_k$

Therefore to look into the effect of (x_i) the dependent variables on “p” the response variable when transforming it in to the multivariate logistic function

$P = 1 / (1 + e^{-(b_0 + b_1x_1 + b_2x_2 + \dots + b_kx_k)})$ and when transforming this to logit model it will take the form

$$\text{Logit}(P_i) = \ln(P(i) / (1 - P_i)) = b_0 + B_1x_1 + B_2x_2 + \dots + B_kx_k$$

Where b₀ refers to the intercept in the model.

B_i=refers to the effect of “x_i” on the logs odd that Y_i=1 for other X_i values

“X_i” independent variables where (i= 1, 2, 3....K)

4. RESULTS AND DISCUSSION

4.1 Characteristics of the Study Population

Totally, 415 individuals were selected and studied to investigate the linkage between their demographic and socio economic characteristics and their knowledge, attitude and practice towards forest conservation. Structured questions were developed to capture these characteristics of the respondents along with their KAP towards conservation. The questions, using age as a filtering variable, were forwarded to all those who are aged 15 and over.

The kebeles selected for the survey were those found adjacent the forest area. This was with the assumption that residents of the nearby kebeles to have potentially closer interaction with the resource than others. Accordingly, five kebeles were identified for the survey. These are; Gutu Anoma, Wessa Soyama, Kela 01, Wetera kechema and Abaye kebeles. All the kebeles are located in Wondogenet woreda. Their population size was obtained from the woreda administrative records. Accordingly using proportion to population size method the questioners were distributed among the kebeles.

This section is, therefore, devoted to look at the distribution of eligible respondents based on their demographics and social characteristics collected at the time of the survey.

4.1.1 Demographic Characteristics

Knowledge, attitude and practice differentials towards conservation across sex were one of the areas investigated. of the total 460 individuals, 54 percent of the respondents were found to be males and 46 percent female. So that all the three response variables; Knowledge, Attitude and Practice, towards conservation are seen across both sexes. Table 2 shows the frequency distribution of the respondents by sex.

Table 1: Frequency distribution of the respondents by Sex

Sex of the respondent	Frequency	Percent	Valid Percent	Cumulative Percent
Male	224	54.0	54.0	54.0
Female	191	46.0	46.0	100.0
Total	415	100.0	100.0	

Age, as described earlier, in this research is used as a filtering variable at the time of listing, so as to identify the eligible individuals to be interviewed. At the beginning when data was collected, information concerning age (in completed years) was gathered by an open ended question. For data analysis purpose it was categorized in to three major groups as indicated in table 3 below. The three age categories were 15-30 (the young population), 31-50 (an adult population) and the last age group, "above 51 years of age"(old population).

Table 2: Respondents distribution by three age groups

Age group	Frequency	Percent	Valid Percent	Cumulative Percent
15-30	239	57.6	57.6	57.6
31-50	133	32.0	32.0	89.6
>=51	43	10.4	10.4	100.0
Total	415	100.0	100.0	

Accordingly, out of 415 eligible individuals, the largest proportions (57.6 percent) of the respondents were concentrated in the age category of 15-30 age groups while 32 percent of the respondents were found in the age category of (31-50 years). Respondents in the age category of >=51 years had lowest proportion which is about 10.4 percent.

Concerning the marital status, data was collected on the bases of four marital status as married, divorced, widowed and never married. However, the proportions of those who are widowed and

divorced became low. For the convenience of the analysis therefore, this variable was regrouped and recoded as "ever married" and "never married".

Table 3: Frequency distribution for respondent's marital status

Marital Status	Frequency	Percent	Valid Percent	Cumulative Percent
Ever married	260	62.7	62.7	62.7
Never married	155	37.3	37.3	100.0
Total	415	100.0	100.0	

Therefore, those who are divorced and widowed are categorized under "ever married" category while the "never married remains untouched. Based on this grouping, it was found out that from 415 interviewees there were 62.7 percent "ever married" and 37.3 percent "never married".

Household size is the other variable that was assumed to have association with people's knowledge, attitude and practice towards conservation. Thus, respondents were made to tell the number of their household size. For those whose household size is five and less than five, their actual size was recorded. But those households with more than five household members were made to be included in an open category of "greater than five". The question of house hold size is forwarded only for those who have been ever married at the time of the survey. Like marital status, the household responses were recoded in to two categories as "five & less than five" and "greater than five". Table 5 below shows the frequency distribution of the house hold size.

Table 4: Frequency distribution of respondents by household size

Household Size	Frequency	Percent	Valid Percent	Cumulative Percent
5 & less than 5 people	138	54.1	54.1	54.1
More than 5 people	117	45.9	45.9	100.0
Total	255	100.0	100.0	

Accordingly the households with more than five and less than five household members account for about 33.3 percent while the percentage for those with more than five household members were 66.7 percent.

4.1.2 Socio economic Characteristics

By social characteristics we mean people's literacy status, occupation, place of residence, land ownership, access to media and type of crop cultivated. It was also attempted respondents KAP towards forest conservation across these characteristics.

Based on this, it was first attempted to see how knowledge, attitude and practice of forest conservation vary across places of residence. Out of the 415 respondents, 76.9 percent were rural residents and the rest 23.1 percent were urban residents. Table 6 sows the rural urban distribution of the respondents.

Table 5: Distribution of respondents by place of residence.

Place of Residence.	Frequency	Percent	Valid Percent	Cumulative Percent
Rural	319	76.9	76.9	76.9
Urban	96	23.1	23.1	100.0
Total	415	100.0	100.0	

Data regarding literacy status were collected by asking each respondent whether they could read and write with understanding. Therefore, out of the 415 respondents 68.4 percent could read and write. The rest 31.6 percent of the respondents never read and write. The table below shows the frequency distribution of the literacy status of the respondents.

Table 6: Frequency distribution of respondents by literacy status.

Literacy Status	Frequency	Percent	Valid Percent	Cumulative Percent
literate	284	68.4	68.4	68.4
Illiterate	131	31.6	31.6	100.0
Total	415	100.0	100.0	

It was also attempted to capture occupation from two perspectives. First five major occupation options were listed in the questionnaire and later regrouped into four groups as farming and non farming, unemployed and housewife.

Table 7: Frequency distribution of respondents by major occupational group

Occupational Group	Frequency	Percent	Valid Percent	Cumulative Percent
Farmer	153	36.9	36.9	36.9
Non farmer	64	15.4	15.4	52.3
Unemployed	113	27.2	27.2	79.5
House wife	85	20.5	20.5	100.0
Total	415	100.0	100.0	

Accordingly, the percentage distribution of farmers was 36.9 percent while the non farmers were about 15.4 percent. Unemployed and housewives accounted for 27.2 and 20.5 percent respectively. Besides this, the farmers were further regrouped into three categories as "Coffee & Chat producers", "Sugarcane growers" and "food crop & other growers". This was done with the intention of investigating the KAP differentials with in the farmers. Among these three groups, "coffee & chat" growers take the highest percentage of the respondents (52.3 percent) followed by Sugarcane and food crop growers (32.7 and 15.0 percent) respectively.

Table 8: Frequency distribution of farmer respondents by the type of crop they grow..

Farming by Type of Crop	Frequency	Percent	Valid Percent	Cumulative Percent
Coffee & Chat	80	52.3	52.3	52.3
Sugarcane	50	32.7	32.7	85.0
Food crops and others	23	15.0	15.0	100.0
Total	153	100.0	100.0	

Access to media is one and probably an important factor in enhancing people's knowledge even in the remotest areas. Three types of media were identified as major instruments of educating the people. These were access to news papers/magazines, access to radio and access to television. The respondents, who have education, were asked whether they usually read news paper or magazines. But concerning radio and television, all respondents were asked separately whether they usually listen and watch radio and television respectively. Their frequency was organized in table 10.0

Table 9: Frequency distribution of respondents by access to media

Media Exposure	Frequency	Percent	Valid Percent	Cumulative Percent
No media	126	30.4	30.4	30.4
At least one media	51	12.3	12.3	42.7
At least two media	76	18.3	18.3	61.0
At least three media	162	39.0	39.0	100.0
Total	415	100.0	100.0	

Among all the respondents, 30.4 percent have no access to any form of media. The percentages of those who have access to at least three media are about 39 percent. Accordingly, the distribution of the respondents based on their access to media, is indicated in the above table.

4.2 Respondents Knowledge Status of the Forest Resource and the Perceived Changes on the Environment.

Data on knowledge of the forest resource biodiversity was gathered and analyzed¹. Along with their knowledge of the resource, the respondent's observation of any environmental change in terms of climate, soil erosion, productivity and availability of water etc was asked².

Respondent's capacity of understanding the impact of the current destruction across generation was considered as another important measure of their knowledge level of the resource. Therefore, question that examines this knowledge of the respondents were included in the questionnaire. They were also asked to answer how they relate impoverishment of the people with the depletion of forest resource. This chapter, therefore, deals with respondent's knowledge status of the forest resource.

4.2.1 Respondent's Knowledge Status of the Resource

It is found important to have complete picture regarding the respondent's knowledge of the resource the source of knowledge and their perception of the current status of the forest. Table 10 below shows respondents response to the questions that asked the above issues.

¹ For this purpose, the respondents were asked about the biodiversity of the forest resource and its status over time.

² The objective of which is to look at the respondent's capacity to understand the cause and effect relationship of the environment and overexploitation of the forest resource.

Table 10: Respondents over all knowledge of the resource, its current status, and their capacity of relating forest destruction with poverty in percent.

Response	Is the forest rich in its biodiversity?	Are the species still available in large quantity?	Does forest depletion leads to poverty?	Have you heard of the world environmental day?
yes	53.7	49.8	83.6 ³	6.7
No	7.5	48.4	3.9	93.3
I don't know	38.8	1.8	12.5	-
Total	100.0	100.0	100.0	100.0

As indicated the table indicates, 53.7 percent of all the respondents know that the forest resource is rich in diversity while 46.3 percent of respondents do not know. When the respondents, who have knowledge of the resource, were asked where they obtained their knowledge of the resource, only 9.6 percent mentioned agricultural experts as their source of knowledge. For the majority of the respondent's (90.4 percent) the sources of knowledge of the resource were found to be ancestors and their own experience. It was also found that 51.6 percent of respondents with knowledge of the resource do not know whether there is change in the status of species or not.

It is only 48.4 percent of the respondents that have perceived the status of the resource in terms of variety of species has currently decreased. These groups of respondents were able to make comparison between the present status with the status of the forest ten years ago and said it has significantly decreased.

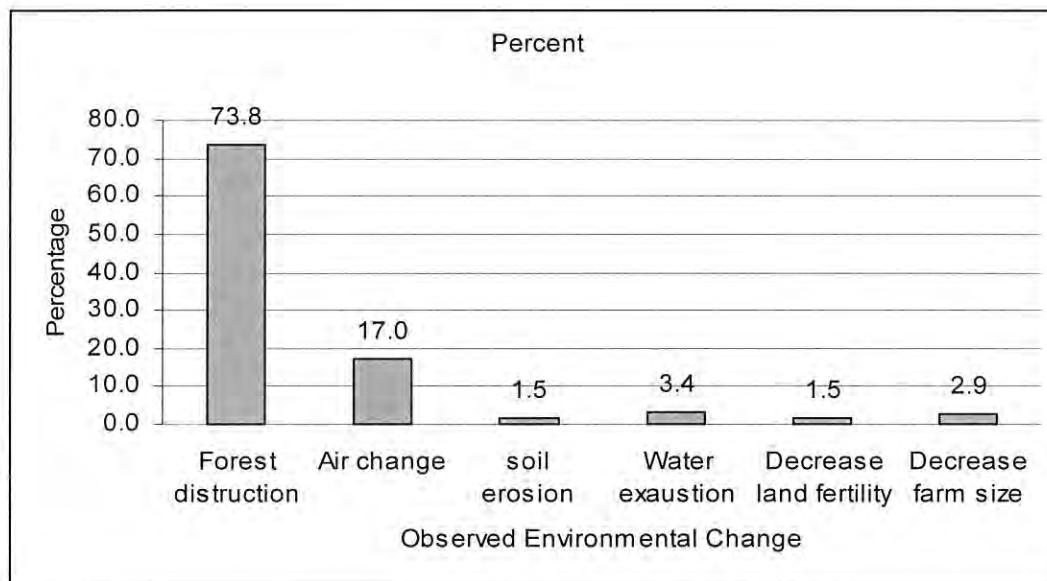
³ The majority (more than 80 percent) of the respondents here are sugarcane producers. For them, their entire irrigation farm is based on the water that comes down from the forest area. According to the woreda agricultural office, currently about 7 springs are dried up in the area.

4.2.2 Respondents Perception of Environmental Change

People's perception capacity of what is happening in their environment in terms of change in climate, land productivity, water resource and forest coverage could be taken as one measure of their knowledge of the environment.

Base on this concept, those who were age 25 and older were asked to tell if there is any environmental change that they have observed in their lifetime⁴. Therefore, 206 respondents were found eligible to answer this question. Chart 3 shows the percentage distribution of respondents based on their perceived environmental change.

Figure 1: Percentage Distribution of Respondents by Observed Environmental Change.

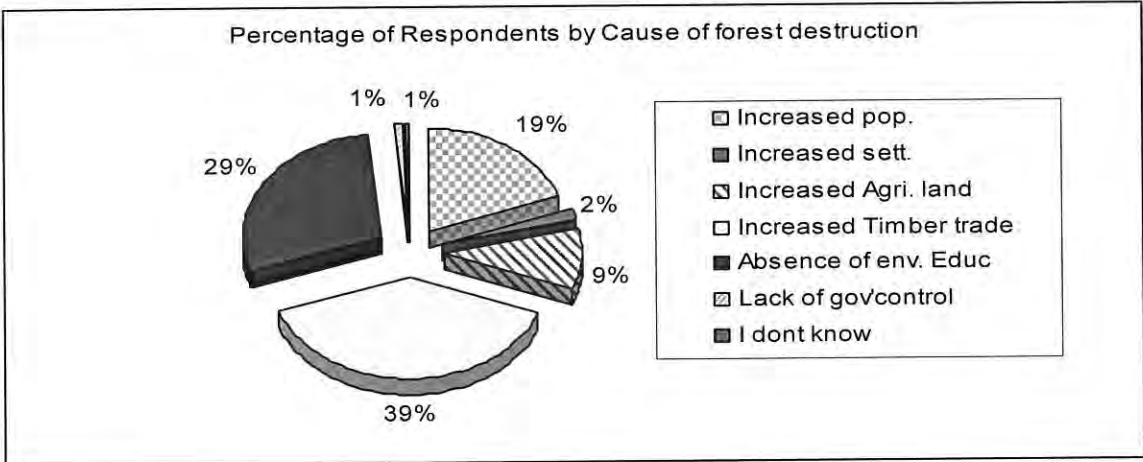


Accordingly, the majority of the respondents (73.8 percent) have observed only the change in forest cover. The percentage of those who are capable of perceiving other environmental changes, like change in climate, land productivity, and the volume of ground water, accounted for about 26.2 percent.

⁴ This age group was selected to filter the interviewees for this specific question. This was with the intention that those who were younger than 25 were younger than age 15 ten years ago and it could be difficult for them to make comparison, and it would also be a violation of the view that knowledge about the environment starts at adulthood.

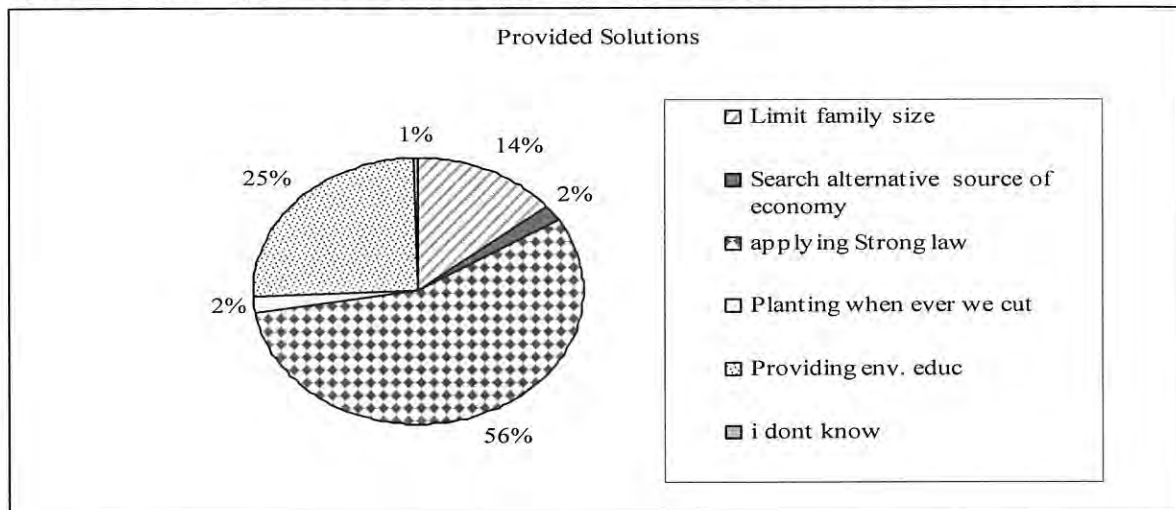
Out of the 73.8 percent respondents, who said forest resource depletion is the major environmental change they observed, the largest proportion (38.9 percent) attached the cause with increased timber production. For 28.9 percent of the respondents, absence of environmental education is the cause of the forest destruction. Only 19 percent of the respondents attach the cause of over exploitation with increasing population. Chart 4 indicates people’s response to the causes of the current forest depletion in the study area.

Figure 2: Percentage distribution of respondents by mentioned causes of forest destruction



In forwarding solutions to the increasing forest destruction, the majority of the respondents (56.4 percent) said endorsing strong law as the solution to control the over exploitation of the resource. Providing environmental education as a solution was forwarded by 24.8 percent of the respondents. Those who said limiting family size accounted only for about 14.1 percent of the respondents.

Figure 3: Percentage distribution of respondents by mentioned solutions to stop forest destruction



In general, one can conclude that the majority of the target population has failed to perceive the cause and effect relation between forest destruction and some other environmental changes. For instance, increasing population size was the least perceived cause of forest destruction. In the same manner, climate change, land productivity and water volume decrease are the least perceived environmental problems observed in association with the forest destruction.

4.2.3 Impact Perception & Association of Forest Destruction With Poverty.

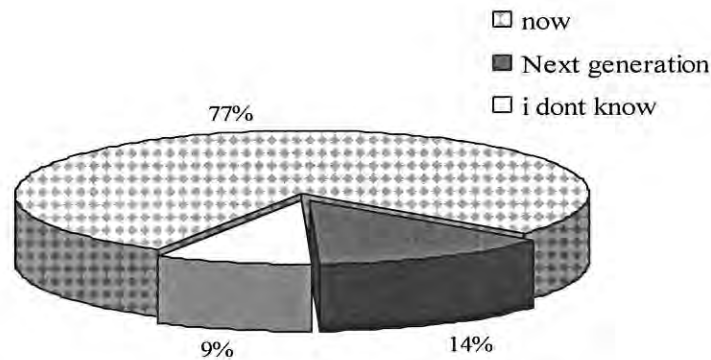
It was also tried to understand the perception of the public about the nexus between forest depletion, poverty and its cross generational impact. The majority of the respondents (83.6 percent the majority of which are sugarcane producers) perceived that the depletion of the forest may lead them into impoverishment⁵. The rest 16.4 percent of the respondents did not know whether there is link between forest destruction and poverty or not.

To know the ability of the respondent's long term impact perception of the forest destruction, all the 415 respondents were asked when the impact of the current destruction of the resource will be manifested. Accordingly, the large majority of the respondents (77.6 percent) perceived the

⁵ The majority of these respondents attach the possibility of their impoverishment with the drying up of their irrigation farms upon which their entire life depends.

impact from short term perspective. It is only 13.5 percent of the respondents that have perceived the impact from the coming generation perspective. The rest 8.9 percent do not know when the impact of the current destruction will appear. Chart 6 shows respondents impact perception in terms of long and short term perception.

Figure 4: Respondents perception of the current forest destruction impact.



In general, in linking forest destruction and poverty, the sugarcane producers are the one who perceived it better. In perceiving the impact of the current destruction of the forest, the majority (86.5 percent) of the respondents failed to look it from cross generational point of view.

4.3 Knowledge, Attitude & Practice (KAP) towards Forest

Conservation

Data on the conservation knowledge of the respondents were collected based on the multiple answer question, that lists six possible conservation practices. By computing knowledge out of these six responses, respondents are categorized as having and not having knowledge of conservation.

Concerning the respondent's attitude towards the conservation measures to be taken, their attitude is captured by asking four consecutive questions. The questions are basically derived from the area's major activities that are assumed to be important problems by imposing big pressure on the resource. Accordingly, destruction of forests for fuel-wood and charcoal, agricultural and settlement expansion and exploitation of the forest for timber and other construction materials are taken as measures of attitude. Based on these questions, the respondents were asked their agreement or disagreement if all the listed activities above are made to stop.

For the simplicity of the analysis, answers were recoded as positive or negative attitude. Accordingly, one has to agree at least to two out of the four conservation measures (50 percent) to be categorized as having positive attitude.

To understand about conservation practice experience of the respondents, two questions were asked. The first question was about the past conservation experience of the respondents and while the second question was about whether they were practicing conservation activities at the moment or not. By combining the conservation experience of the respondents at the two points in time, respondents who "have" and "have not" conservation experience were identified.

The aim of this section is to understand the relationship between the demographic and socio economic characteristics of the respondents and their knowledge, attitude and practice towards forest conservation. For this purpose, descriptive statistics such as frequency distributions and cross tabulation were employed. Furthermore, the pattern and variation of knowledge, attitude and practice towards conservation by various types of demographic and socio economic backgrounds of the eligible respondents were assessed.

4.3.1 Demographic Factors and KAP towards Conservation

Conservation knowledge of the respondents varied across various age groups. Higher proportions of respondents (57.7 percent) in the younger age group (15-30 age group) had better knowledge of forest conservation as compared to others. Of the 239 respondents who were in 31-50 age groups, 59.4 percent have no knowledge of forest conservation. The percentage for those who had no knowledge of conservation increases from 42.3 percent to 60.5 percent as one goes from the younger to the older age group. Nevertheless other studies indicated that people at older age have better knowledge of conservation and this was stated in the following manner.

"In the case of aging, older people are taught to be more interested in protecting their social stand and wealth therefore they are less likely interested to invest in the prevailing social system for good of the future. Unlike the older people the younger ones are more willing to attach to the new social system from which they taught is beneficiary in the future (Vlosky et.al :1999)."

The respondent's attitude towards any conservation measures also varied across the age groups. As table 11 below shows, out of the 239 respondents who are between 15-30 age groups, 57.3 percent have positive attitude to any measure that has to be taken to conserve the forest while 42.7 percent were against the conservation measures. The majority of the respondents (65.4 percent) in the age group 31-50 responded positively to the conservation measure that has to be taken concerning the forest.

The findings show that, at the younger and older age groups, there is relatively high percentage of negative attitude to the conservation measures than the middle age group. Nevertheless, different studies show that people in the middle age group, as compared to others, have negative attitude towards the environment. This was justified from consumption behavior perspective. As per capita consumption increases through time, distinct expenditures will follow distinct age pattern and therefore there will be higher consumption behavior at middle age and lower consumption at younger and older ages. As people become more consumers, therefore, they are more likely to negatively affect the environment (Pebly; 1998).

When we look at the conservation practice of the respondents across the three age groups, only small percentage of the respondents are currently practicing conservation activities. However, the percentage concerning conservation practice increased from younger (4.6 percent) to older age (25.6 percent).

When we compare the previous and the current conservation experience of the respondents, there had been better conservation practice earlier. For instance for those who were in the age group 31-50, 12.8 percent were practicing conservation activities in the past while this has decreased to 8.3 percent currently. The same is true for those who are above the age of 51. For this age group 25.6 percent were practicing conservation earlier and currently it has decreased to 11.6 percent. In general, the majority of the respondents (more than 90 percent) had no conservation practice in their life time.

Table 11: The respondent's KAP status towards forest conservation, across age (in Percent).

Socioeconomic characteristics	Knowledge		Attitude		Practice	
	Have	Have not	Positive	Negative	Have	Have not
Age						
➤ 15-30	57.7	42.3	57.3	42.7	4.6	95.4
➤ 31-50	40.6	59.4	65.4	34.6	14.3	85.7
➤ 51-and Over	39.5	60.5	51.2	48.8	25.6	74.4

Out of 224 male and 191 female respondents 53.1 percent of males were found to have knowledge of forest conservation while the percentage is a bit lower for female (47.1 percent). The study conducted in Tanzania also showed that women possessed less knowledge than men concerning conservation less aware of the conservation benefit and were ignorant of long term benefit. (Flintan 2003).

Concerning attitude, about 66.5 percent of the male respondents had positive attitude to conservation measures while the percentage for females was about 50.8 percent. Therefore, males than females have better positive attitude towards the conservation practice.

On the contrary, according to the knowledgeable support hypothesis, men have got the opportunity to command techno scientific component of the society that enabled them acquire scientific and technological knowledge to dominate nature and socialized un-ecological attitude towards environment. But women, though they have no access to the techno scientific knowledge, they are socialized to ecological caring roles of mother and nurture, as it is observed in their reproductive and child rearing activity in the community (Hayes 2001).

Currently 12.5 percent of male respondents and 6.8 percent of female respondents are practicing conservation activities. For both sexes, there had been better conservation practice earlier which

was 10.7 percent for male and 5.8 percent for female respondents. In general male had better conservation practice than females at both times.

Table 12: The respondent's KAP status towards forest conservation, sex (in Percent).

Socioeconomic characteristics	Knowledge		Attitude		Practice	
	Have	Have not	Positive	Negative	Have	Have not
Sex						
➤ Male	53.1	46.9	66.5	33.5	12.5	87.5
➤ Female	47.1	52.9	50.8	49.2	6.8	93.2

Out of the 260 respondents, who were categorized as ever married, 55.4 percent had no knowledge of forest conservation. With respect to the never married category, 40 percent of the 155 respondents had no knowledge of forest conservation. Therefore, the study indicated that never married people had better conservation knowledge than the ever married ones. The study of Flintan also shows that married women as compared to the unmarried ones are busy of activities like house keeping, raising families, cooking and other activities as a result of which they are less involved in the community based activities. They have, therefore, limited their knowledge of environmental conservation activities.

Attitude towards the conservation measures did not vary significantly with marital status. For instance, among the ever married, 60 percent responded positively to the listed conservation measures. In the same manner the percentage of positive attitude for the never married ones was about 58.1 percent.

Nevertheless, as to Torgler, married people have better knowledge of the environment and better attitude than the single ones. This is because as people get married, they establish strong social network within the community, therefore, they are expected to involve in community activities than the single people. Their parental effect also makes theme wish to have conducive

environment, so that, the future of their children is secured. Therefore, they are more concerned with environmental problems than the unmarried (Torgler et.al:2005).

Comparing the conservation practice of the respondents across ever married and never married; ever married ones had far better (13.5percent) conservation practice than the never married ones (3.9 percent).

Table 13: The respondent's KAP status towards forest conservation, across marital status (in Percent).

Socioeconomic characteristics	Knowledge		Attitude		Practice	
	Have	Have not	Positive	Negative	Have	Have not
Marital status						
➤ Ever married	44.6	55.4	60	40	13.5	86.5
➤ Never Married	60	40	58.1	41.9	3.9	96.1

In general, table 12 below indicates that across every demographic characteristic, there are significant numbers in the target population (nearly half) with no knowledge of conservation. However, among all the demographic characteristics, better knowledge of conservation was observed in the never married category where 60 percent of the respondents have the knowledge. On the contrary, the least percentage (39.5 percent) of respondents with knowledge of conservation was observed in the age category older than 51.

Similarly, better positive attitude was observed among male respondents (66.5 percent). Female respondents accounted the least percentage with positive attitude(50.8 percent). Respondents in the 51 and over age category had also better conservation practice (25.6 percent) while the practice is lest (3.9 percent) among the never married ones.

4.3.2 Socio-economic Factors and KAP towards Forest Conservation

Among the 181 illiterate respondents 80.9 percent did not have the knowledge of forest conservation while the percentage is much less for those who had education (about 35.2 percent). The study of Flintan, revealed the fact that uneducated women failed to understand the link between conservation and development and have also little understanding about linkages between rights to resources and conservation responsibilities (Flintan 2003).

Concerning attitude towards conservation measures, there is no variation across literate and illiterate respondents. Nearly equal proportion of both (59.5 and 59.2 percent respectively) had shown positive attitude towards the conservation measures.

Coming to the conservation practice of the respondents, 97 percent of the illiterates are not currently practicing any conservation activity. The percentage for those who have some education was 92.8 percent. Currently there is much less conservation practice in both educational categories.

Table 14: The respondent's KAP status towards conservation across education (in Percent).

Socioeconomic characteristics		Knowledge		Attitude		Practice	
		Have	Have not	Positive	Negative	Have	Have not
Education	literate	64.8	35.2	59.2	40.8	12.3	87.7
	illiterate	19.1	80.9	59.5	40.5	4.6	95.4

Knowledge of forest conservation across places of residence has also significant variation. Out of the 319 rural respondents 56.4 percent had no knowledge of forest conservation. In urban areas, among the 96 urban respondents only 27.1 percent were found to have no knowledge of forest

conservation while the majority had some kind of conservation knowledge. This indicates that there is much better conservation knowledge in urban areas than the rural areas. The Study conducted in Costa Rica also confirmed that urban lower class feels more strongly the effect of environmental degradation than the rural groups. Therefore, there is variation between the lower and upper classes in Costa Rica where lower classes have better knowledge than the upper classes (Holl et.al 1995).

However, despite their low level conservation knowledge, the majority of rural respondents (67.4 percent) showed positive attitude to the conservation measures to be taken. On the contrary, among the urban respondents, despite their better knowledge of conservation, the largest proportion, (80.2 percent), responded negatively to the measurers to be taken to conserve the forest. Despite this fact, the Ethiopian Forestry Action Program study indicated that, rural people have negative attitude to their environment as compared to the urban people. Such negative attitude was accounted for the extreme poverty that leaves them to over utilize the resource (Ministry of Natural Resource Development and Environmental Protection, 1994).

The current conservation experience of the rural and urban population also varies significantly. Among the 319 rural respondents 96.6 percent were not currently engaged in any conservation activities. Besides, only 5.6 percent of the respondents from rural population had some past conservation experience. Among the 96 urban respondents 12.7 percent are currently practicing some kind of conservation activities while about 17.7 percent had some conservation experience in the past. This shows that urban respondents have better conservation experience than their rural counter parts.

Table 15: The respondent's KAP status towards conservation place of residence (in Percent).

Socioeconomic characteristics		Knowledge		Attitude		Practice	
		Have	Have not	Positive	Negative	Have	Have not
Place of Residence	Urban	72.9	27.1	19.8	80.2	6.3	93.7
	Rural	43.6	56.4	71.2	28.8	21.9	78.1

Knowledge, attitude and practice of forest conservation also varied with occupation. There are occupations identified and assigned to men and women. Such division of labor is very common phenomena in Africa. Men are mostly assigned to field activities and women to house hold activities. As a result, an important difference in knowledge and attitude towards the environment (depending on their industry) exists among people (Moor 1996a as cited by Flintan 2003). Accordingly, of the farmers, 54.2 percent were found to have no knowledge of conservation. Similarly among the housewives 67.1 percent had no knowledge of conservation.

When we look at the attitude variation among the major occupation groups, the highest proportion (68.6 percent) of those who were engaged in farming activities had positive attitude towards conservation of the forest resources. The least (48.4 percent) percentage of positive attitudes towards conservation measures is observed among the non farmers.

Table 16: The respondent's KAP status towards conservation across occupation (in Percent).

Socioeconomic characteristics		Knowledge		Attitude		Practice	
		Have	Have not	Positive	Negative	Have	Have not
Occupation	Farmer	45.8	54.2	68.6	31.4	8.5	91.5
	Non Farmer	70.3	29.7	48.4	51.6	28.1	71.9
	Unemployed	58.4	41.6	57.5	42.5	2.7	97.3
	House wife	32.9	67.1	52.9	47.1	8.2	91.8

Conservation knowledge with in farmers producing different crop system like coffee, chat, sugarcane, and food crops was investigated and fewer respondents (26 percent) from sugarcane producers and higher respondents (60 percent) from chat and coffee growers had knowledge of conservation.

When the attitude variation further investigated among the farmers, 51 and 69 percent of "coffee & chat" and "food crop growers", respectively, have positive attitude to the conservation actions

to be taken to conserve the resource. Regardless of their low level of conservation knowledge, the sugarcane growers, because their entire farming is highly dependant on the irrigation from water that comes down from the forest area, all (100 percent) have shown strong positive attitude to wards the conservation measures to be taken.

The conservation experience of both the farmers and non farmers did not show an important difference. Most of them, which are 91.5 and 89.3 percent of the farmers and the non farmers respectively, had no conservation practice in their life time. The unemployed respondents have the least (2.7 percent) conservation experience. Within the farmers, the food crop growers have better conservation experience than others.

It was also important to investigate knowledge, attitude and practice towards forest conservation in relation to access to media. For instance, the Environmental policy of Ethiopia recognizes the importance of media in creating and promoting environmental awareness (Environmental policy of Ethiopia, 1997). Accordingly, as table 13 sows, the respondents who had access to media had better conservation knowledge than otherwise. In this study it is proved that knowledge of conservation increased from 34.1 percent who have no access to any media to 65.4 percent who have accesses.

Their attitude to the measures of conservation also showed similar pattern. Accordingly, as the people are exposed for more media their attitude increasingly becomes positive. Positive attitudes, towards conservation measures, had increased from 52.4 percent 64.8 percent as people are accessed for more media. The practice of conservation had also shown increasing trend across media exposure. The practices, for the people who have no access for any media, were about 7.1 percent. This percentage showed an increase to 13.2 percent as people are accessed to more media.

Table 17: The respondent's KAP status towards conservation across accesses to media (in Percent).

Socioeconomic characteristics		Knowledge		Attitude		Practice	
		Have	Have not	Positive	Negative	Have	Have not
Access to media	No media	34.1	65.9	52.4	47.6	7.1	92.9
	One media	41.2	58.8	58.8	41.2	9.8	90.2
	Two media	51.3	48.7	59.2	40.8	13.2	86.8
	Three media	65.4	34.6	64.8	35.2	10.5	89.5

In general, across every socio economic characteristic, significant knowledge of conservation differences could be observed. The figures between educated / non educated, urban / rural and between those who have access and have no access to media showed enormous difference in conservation knowledge. Across occupation, nearly half of the respondents have no knowledge of conservation.

4.3.3 Knowledge of the Resource and KAP towards Forest Conservation

Knowledge of the resource or the environment dose not necessarily provide us guarantee on knowledge of conservation, positive attitude towards conservation. This is because there are conditions where numbers of intermediate factors drive knowledge of the resource and knowledge of conservation and positive attitude towards conservation into opposite directions. Among others, owner ship of the resource, poverty, source of knowledge of the resource etc. could be taken as intermediate factors to impact both .For instance, the study of Ethiopian forestry Action Program indicated that rural people are against their environment not because they have no knowledge of the environment but it is their poverty that leaves them to over utilize the resource (Ministry of Natural resource Development and Environmental Protection, 1994).

Therefore it would be more important to look people's knowledge of the resource on the one hand and their knowledge of conservation, attitude and practice towards conservation on the other hand. Accordingly, the findings of the study showed that males had better knowledge of the biodiversity richness of the resource (57.6 percent) and better knowledge of conservation (53.1 percent) than females where the percentage was 49.2 and to 47.1 percent respectively. Higher proportion of males as compared to females had also positive attitude which is about 66.5 to 50.8 percent respectively. Concerning the impact of current forest destruction, female respondents (30.4 percent) have better perception of the long term impact of current forest destruction than males (15.6 percent).

The age groups 15-30 as compared to the two age groups had the least percentage (43.1 percent) of respondents with the biodiversity knowledge of the resource but were found to have better knowledge of conservation (57.7 percent). Respondents of this age group had also better perceived the impact of the forest destruction from long term perspective than the other two age groups.

In terms of attitude, large proportion of respondents (65.4 percent) with positive attitude towards the conservation measures, were found in the middle age groups (31-50) followed by the younger age group respondents (57.3 percent).

Ever married had better knowledge of the biodiversity of the resource (60 percent) than the never married ones (43.2 percent). On the contrary, in terms of conservation, the ever married have fewer respondents (44.6 percent) with knowledge of conservation than the never married (60 percent).

The ever married respondents (16.9 percent) again remained behind in perceiving the long term impact of the current forest destruction. The never married respondents (31.6 percent) had better perception of the long term impact of the current forest destruction. In terms of their attitude towards the conservation measures, no basic difference is observed in between.

By the place of residence, the urban respondents had less biodiversity knowledge (41.7 percent) but better knowledge conservation (72.9 percent) than the rural residents. Urban respondents (30.2 percent) had also perceived the long term impact of the resource's current depletion better than the rural respondents (20.1 percent).

In terms of attitude, despite their better knowledge of the resource and conservation, the large majority of the urban respondents (80.2 percent) had negative attitude towards the conservation measures. On the other hand, in rural areas only 28.8 percent of the respondents had negative attitude to wards the conservation measures.

Among illiterate respondents, 61.8 percent had better knowledge of the resource but much lower percentage of them (19.1 percent) had knowledge of conservation than the literate respondents for whom knowledge of the resource and conservation is about 50 percent and 64.8 percent respectively. Like marital status, no significant difference is observed across education in terms of attitude.

4.4 Predictions of Conservation Knowledge and Attitude towards Conservation

This chapter is allotted to explore the contribution of demographic and socio economic, characteristics of the respondents to the prediction of the occurrence of the outcome variables (Knowledge of forest conservation and Attitude towards conservation measures). In the previous chapters some of the specific research questions were discussed by using descriptive statistics such as cross-tabulation and percentage distribution. Moreover, the researcher tried to look at the relationship among the respondent's socioeconomic and demographic characteristics, their knowledge status of the forest resource and its conservation and their attitude towards forest conservation. However, this was not enough to make deduction and explore the predictive power of the independent variables in explaining the likelihood of the occurrence of the dependent variables. For this purpose, the logistic regression analysis is used. A number of variables indicating conservation knowledge status of respondents and their attitude towards conservation measures were used to fit the model. For both dependent variables (knowledge of conservation

and attitude towards conservation) the models were used independently. For the third dependent variable (Practice of conservation), because of the very insignificant number of respondents (less than 10 percent) who had been practicing conservation, the model was not used to explain it. Rather, it was extensively analyzed using cross tabulation.

Age, sex, marital status, household size, place of residence, literacy status, major occupation, access to media of the respondents are taken as predictors to fit the model. These predictors (independent variables) are believed to have the power to predict the probability of occurrence of outcome variables (knowledge and attitude). This is to mean that, the probability or likelihood to which a respondent has the knowledge of forest conservation and positive attitude towards forest conservation are explained by these independent variables. The enter subcommand is used for model selection, in which all the selected predictor or independent variables are entered into the model at once.

4.4.1 Variables Used and Parameter Coding

All the selected variables are given codes which are meaningful. Indicator variables for coding were used and hence the coefficients for the new variables represent the effect of each category as compared to the reference category. The coefficient of the reference category is zero which makes its $\exp(\beta)$ value or value of odd ratio one. Each independent variable had categories and of the categories the first category was taken as a reference category. The reference category is used to measure the extent to which the respondent had the possibility to possess the outcome variable as a change in the status occurs from the reference to the next category. For instance, the literacy status of the respondent is taken as an important predictor to the occurrence of the dependent variables (knowledge and attitude) (the likelihood of having knowledge and having positive attitude). This variable has two categories namely, literate and illiterate. The literate category is taken as a reference category and hence measurement is made from this reference category which means that to what extent the individual's knowledge of forest conservation and positive attitude towards conservation measures changes as one moves from literate to illiterate respondents.

The outcome (dependent) variables used to fit the model are knowledge of forest conservation and attitude towards forest conservation. Those who know at least one method of forest conservation are considered as having knowledge of conservation. For the second dependent variable (attitude), out of the four attitude measures one has at least to agree for two conservation measures to be considered as having positive attitude.

Table 18: - Predictors used to multivariate binary logistic regression analysis and categorical variable coding for knowledge.

Variables		Frequency	Parameter coding		
			(1)	(2)	(3)
Access to Media	No media	126	1.000	.000	.000
	at least one media	51	.000	1.000	.000
	at least 2 media	76	.000	.000	1.000
	at least 3 media	162	.000	.000	.000
Major occupation	Farmer	153	1.000	.000	
	Non farmer	149	.000	1.000	
	Unemployed	113	.000	.000	
Type of crop cultivation	Coffee & Chat	85	1.000	.000	
	Sugarcane	61	.000	1.000	
	Food crops and others	269	.000	.000	
Age	15-30	239	1.000	.000	
	31-50	133	.000	1.000	
	Above 51	43	.000	.000	
Sex	Male	224	1.000		
	Female	191	.000		
Household size	5 & Less than 5	138	1.000		
	>five	277	.000		
Marital status	Ever married	260	1.000		
	Never married	155	.000		
Literacy status	Yes	284	1.000		
	No	131	.000		
Place of residence	Rural	319	1.000		
	Urban	96	.000		

Table 19: - Predictors used to multivariate binary logistic regression analysis and categorical variable coding for attitude

Variables		Frequency	Parameter coding			
			(1)	(2)	(3)	(4)
Major occupation	Farmer	153	1.000	.000	.000	.000
	Merchant	34	.000	1.000	.000	.000
	Employed	30	.000	.000	1.000	.000
	Unemployed	113	.000	.000	.000	1.000
	Other	85	.000	.000	.000	.000
Access to Media	No media	126	1.000	.000	.000	
	At least 1 media	51	.000	1.000	.000	
	At least 2 media	76	.000	.000	1.000	
	At least 3 media	162	.000	.000	.000	
Age	15-30	239	1.000	.000		
	31-50	133	.000	1.000		
	Above 51	43	.000	.000		
Sex	Male	224	1.000			
	Female	191	.000			
Household size	5 & Less than 5	138	1.000			
	>five	277	.000			
Marital status	Ever married	260	1.000			
	Never married	155	.000			
Literacy status	Yes	284	1.000			
	No	131	.000			
Place of residence	Rural	319	1.000			
	Urban	96	.000			

4.4.2 Knowledge of Conservation

Table 18 contains predictors used to multivariate binary logistic regression analysis and categorical variable coding for knowledge. In table 20 the estimated coefficients and related statistics from the multivariate binary logistic regression model that predict the likelihood of an individual to possess knowledge of conservation from the constant, and the independent variables (Sex, Age, Marital Status, Household size, place of residence, occupation, literacy status, access to media) are presented. Given these coefficients the logistic regression equation for the likelihood of having knowledge of conservation can be written as;

$$\text{Likelihood of an event occurring} = \frac{1}{1 + e^{-Z}}$$

Z is the linear combination of the above stated independent variables or predictors. The same procedure could be applied for the likelihood of having positive attitude

When the equation is applied to an individual who has a marital status of married and the values of zero is given to the other independent variables, we find that the value of $Z = -1.65$ that is $Z = 1.30$ (β of the constant) + 0.34 (β of marital status). Using this value, and by assuming the value of zero for the other independent variable, the likelihood of the individual to have knowledge of conservation can be predicted. The event will occur if the value of probability is greater than 0.5. By considering the above equation, the probability of having knowledge of conservation for married individuals is found to be 0.16 which is less than 0.5 . And hence, we would predict that an individual who is ever married is less likely to have knowledge of conservation. By assuming the value of zero to the other predictors, the same procedure could be applied to an individual with different socio economic and demographic characteristics. For instance, the likelihood of having knowledge of conservation for an individual who have access to no media is less likely as compared with those who have access to media at different level. This is because the value of the probability of having knowledge of conservation(y) is calculated to be 0.21 for those who have no access to media which is less than 0.5.

Table 20: Parameter estimate for the binary logistic regression model of knowledge of conservation using the selected predictors.

Step 1(a)	B	S.E.	df	Sig.	Exp(B)	Z	Prob "y"
Place of residence(1)	-0.71	0.34	1.00	0.04	0.491	-2.01	0.12
Sex(1)	0.43	0.29	1.00	0.14	1.536	-0.87	0.29
Age			2.00	0.09		-1.30	0.21
Age(1)	0.78	0.47	1.00	0.10	2.179	-0.52	0.37
Age(2)	0.92	0.42	1.00	0.03	2.498	-0.39	0.40
Household size(1)	0.24	0.32	1.00	0.46	1.274	-1.06	0.26
Marital status(1)	-0.34	0.42	1.00	0.41	0.709	-1.65	0.16
Literacy status(1)	2.05	0.37	1.00	0.00	7.743	0.75	0.68
Type of crop cultivated			2.00	0.87		-1.30	0.21
Type of crop cultivated (1)	0.01	0.46	1.00	0.99	1.007	-1.29	0.22
Type of crop cultivated (2)	0.20	0.48	1.00	0.67	1.225	-1.10	0.25
Access to media			3.00	0.54		-1.30	0.21
Access to media (1)	0.56	0.44	1.00	0.20	1.756	-0.74	0.32
Access to media (2)	0.51	0.46	1.00	0.27	1.660	-0.79	0.31
Access to media (3)	0.38	0.36	1.00	0.28	1.465	-0.92	0.29
Occupation			2.00	0.98		-1.30	0.21
Occupation(1)	-0.11	0.54	1.00	0.83	0.892	-1.42	0.20
Occupation(2)	-0.04	0.43	1.00	0.92	0.960	-1.34	0.21
Constant	-1.30	0.75	1.00	0.08	0.272		

Occupation is another variable used to fit the model. By applying the same approach to the individuals engaged in different kinds of economic activity as farmers, non farmers, unemployed, the values of the probability of " y"(the dependent variable knowledge) are obtained to be 0.21,0.20 and 0.21 respectively. Since all the values are less than 0.5, the likelihood of the individuals for having knowledge of forest conservation is less likely to happen. Similar

prediction is built based on the age of the respondents. As shown on table 20 that the probability of having knowledge of conservation is less likely at all ages.

To make an interpretation of the binary logistic regression coefficient, rearrangement of the equation for the logistic model must be considered. The model can be rewritten in terms of odds of an event occurring. The odds of an event occurring are defined as the ratio of the likelihood of having the probability to not having. The value of the $\exp(\beta)$ or odds ratio are interpreted as the change in the odds associated with a unit change in the independent variable. The change is measured based on the reference category assigned for each independent variable.

The sign of β (logistic coefficient) tells the direction of the change. For instance, when sex of the respondent changes from male to female, the likelihood of the respondent to have knowledge of conservation increased by a factor of 1.53. This is because the value of β is positive showing that the odds are increased. Considering the case of marital status of the respondent, in conditions where a respondent is ever married, the value of $\exp(\beta)$ is computed to be 0.34 showing that as we go from ever married to never married respondents, the likelihood of having knowledge of forest conservation is increased by a factor of about 0.70. The same could be applied for place of residence. Here the value of $\exp(\beta)$ is computed to be 0.71 and the value of β is positive showing that as one moves from the urban to the rural areas the likelihood of having knowledge of conservation increases. This is also statistically significant (Significance value is less than 0.05).

The other important variable incorporated to build the model is access of the respondent to media. This variable is included because of the fact that as people have better access to media the better will be their knowledge of conservation. When we look at how well the model fits, two methods, Hosmer and Lemeshow test of goodness and the classification table, were applied. Thus, the Hosmer and Lemeshow goodness of test show the significance level of 0.673 which is above 0.5 indicating that it is a good model to predict the dependent variable knowledge. The classification table (table21) also shows that 74 percents of the 415 respondents are classified correctly. In the same manner 84.5 percent of the respondents are correctly predicted to have knowledge of forest conservation.

Table 21: Classification Table to look at the fitness of the model for knowledge of conservation.

Observed		Predicted		
		Knowledge of conservation		Percentage Correct
		Have no knowledge conservation	Knows at least one method of conservation	
Knowledge of Conservation	Have no knowledge conservation	84	67	55.6
	Knows at least one method of conservation	41	223	84.5
Overall Percentage				74.0

4.4.3 Attitude towards Conservation Measures.

Table 19 Predictors used to multivariate binary logistic regression analysis and categorical variable coding for attitude. In table 22 contains the estimated coefficients and related statistics from the multivariate binary logistic regression model that predict the likelihood of an individual attitude towards conservation measures from the constant, and the independent variables are presented. Given these coefficients the logistic regression equation for the likelihood of having positive attitude can be written as;

$$\text{Likelihood of an event occurring} = \frac{1}{1 + e^{-Z}}$$

Z is the linear combination of the independent variables or predictors.

Table 22: Parameter estimate for the binary logistic regression model of attitude towards conservation using the selected predictors.

Step 1(a)		B	S.E.	df	Sig.	Exp(B)	Z	Prob"y"
Place of residence(1)		2.96	0.39	1.00	0.00	19.21	0.05	0.51
Sex(1)		0.80	0.30	1.00	0.01	2.23	-2.11	0.11
Age				2.00	0.18		-2.91	0.05
Age(1)		-0.12	0.47	1.00	0.80	0.89	-3.03	0.05
Age (2)		0.45	0.42	1.00	0.28	1.58	-2.46	0.08
Household size(1)		0.93	0.34	1.00	0.01	2.53	-1.98	0.12
Marital status(1)		-0.26	0.41	1.00	0.53	0.77	-3.17	0.04
Literacy status(1)		0.22	0.37	1.00	0.56	1.24	-2.69	0.06
Access to media				3.00	0.68		-2.91	0.05
Access to media (1)		0.25	0.42	1.00	0.55	1.28	-2.66	0.07
Access to media (2)		0.52	0.44	1.00	0.23	1.69	-2.39	0.08
Access to media (3)		0.22	0.35	1.00	0.53	1.25	-2.69	0.06
Occupation				4.00	0.62		-2.91	0.05
Occupation (1)		-0.24	0.42	1.00	0.58	0.79	-3.15	0.04
Occupation (2)		0.34	0.58	1.00	0.56	1.40	-2.57	0.07
Occupation (3)		0.44	0.60	1.00	0.46	1.56	-2.47	0.08
Occupation (4)		0.23	0.48	1.00	0.63	1.26	-2.68	0.06
Constant		-2.91	0.89	1.00	0.00	0.05		

When the equation is applied to an individual who has a marital status of ever married and the values of zero is given to the other independent variables, we find that the value of $Z = -1.97$ that is $Z = -2.41 (\beta \text{ of the constant}) + 0.44(\beta \text{ of marital status})$. Using this value, and by assuming the value of zero for the other independent variable, the likelihood of the individual to have positive attitude towards conservation measures can be predicted. By considering the above equation, the probability of having positive attitude towards conservation measures for ever married is found to be 0.12 which is less than 0.5. And hence, we would predict that ever married are less likely to

have positive attitude than never married. By assuming the value of zero to the other predictors, the same procedure is applied to an individual with different socio economic and demographic characteristics. For instance, the likelihood of having positive attitude for an individual who have and have not access to any media is less likely.

Another variable used to fit the model for attitude is occupation. By applying the same approach to the individuals engaged in different kinds of economic activity as farmers, merchants, employees, unemployed and housewives, the values of the probability of "y" (the dependent variable attitude) are obtained to range between 0.05 to 0.08. Since all the values are less than 0.5, the likelihood of the individuals (on the bases of their occupation) for having positive attitude is less likely to happen. Similar prediction is built based on the age of the respondents. With respect to age, the probability of having positive attitude towards the conservation measures, is less than 0.5 at all age groups implying the less likelihood of having positive attitude.

As one goes from male to female respondents, the likelihood of the respondent to have positive attitude towards conservation measures increased by a factor of 2.23. This is because the value of β is positive showing that the odds are increased. Considering the case of marital status of the respondent, in conditions where a respondent is ever married, the value of $\exp(\beta)$ is computed to be 0.26 showing that as one moves from ever married to never married respondents, the likelihood of having positive attitude towards forest conservation increases by a factor of about 0.77. The same could be applied for place of residence. Here the value of $\exp(\beta)$ is computed to be 2.96 and the value of β is positive showing that as one moves from the urban to the rural areas the likelihood of having positive attitude increases. This is also statistically significant (Significance value is less than 0.05).

The other important variable incorporated to build the model is access of the respondent to media. As the value of the odds ratio or $\exp(\beta)$ in table 16 suggests, as an individual is being exposed to one form of media, the likelihood of having positive attitude increases by a factor of 0.68. Likewise, when people are exposed to more forms of media the likelihood of having positive attitude increases. As it is applied for knowledge, the goodness of the model was tried to

be seen from Hosmer and Lemeshow and the classification table perspectives. Accordingly, the results of both methods indicated that the model is capable of predicting dependent variable well. The Hosmer and Lemeshow test of goodness show the significance level of 0.756 which is above 0.5 indicating that it is a good model. In the same manner the classification table (table 23) also indicates that out of the total respondents 73.3 percent is correctly classified. In the same manner of the 89.9 percent of the respondents are correctly predicted to have positive attitude towards forest conservation.

Table 23: Classification table to look at the fitness of the model for attitude towards conservation.

Observed			Predicted		
			Attitude		Percentage Correct
			Negative	Positive	
Attitude	Negative	85	84	50.3	
	Positive	25	221	89.8	
Overall Percentage					73.7

5. SUMMARY, CONCLUSION & RECOMMENDATIONS

5.1 Summary

Investigating people's knowledge of conservation, their attitude and practice towards conservation, would be more meaningful when it is treated along with the environmental knowledge of the people. Based on this concept the researcher had tried to look at the respondent's knowledge of the resource or the environment. Accordingly, 53.3 percent of the respondents had knowledge of the resource and for the majority of them (90 percent) their own experience and the forefathers were the sources of their knowledge. Nevertheless, out of those who have knowledge of the resource 51.6 percent did not know the current status of the forest.

In perceiving the environmental change, the majority (73.8 percent) have observed only the change in forest cover. Out of them, 38.9 percent mentioned increased timber production as the major cause. Only for 19 percent of the respondents, the cause was increasing population. In forwarding solution, the majority of the respondents (56.4 percent) said endorsing strong law controls the over exploitation of the resource. Those who mentioned limiting family size as a solution accounted only for about 14.1 percent. Those who are capable of perceiving other environmental changes, like change in climate, land productivity and the volume of ground water and associated the change with forest depletion accounted for about 26.2 percent. Of all the respondents, 83.6 percent perceived the nexus between forest depletion and poverty. In perceiving impact of the current forest destruction, 77.6 percent and 13.5 percent perceived it from short and long term perspective respectively.

When we come to the respondent's knowledge of conservation, across the three age categories, the percentage of those who had no knowledge of conservation increased from 42.3 percent to 60.5 percent as one goes from the younger to the older age category. This prevails the fact that there were higher proportions of respondents with knowledge of conservation in the younger age category (15-30 age groups) than the other age categories. In terms of attitude, the younger and older age groups had relatively high percentage of respondents with negative attitude to the

conservation measures than the middle age group. Only small percentages of the respondents in all age groups were currently practicing conservation.

More males than females were found to have better knowledge of forest conservation and positive attitude to conservation measures as compared to females. With regard to their conservation experience, again males had better experienced it than females.

Across ever married and never married respondents, the findings of the study indicated that never married people (60 percent) had better knowledge of conservation than the ever married ones (44.6 percent). Their attitude towards the conservation measures did not vary significantly between them. The ever married ones, as compared to the never married ones, had better conservation practice.

The large percentage (80.9 percent) of illiterate respondents had no knowledge of forest conservation while the percentage is much less for literate ones (35.2 percent). Concerning their attitude towards conservation measures, no variation is observed in between. However, large proportion (nearly 40 percent) of respondents in both categories had negative attitude towards the conservation measures. More than 90 percent of illiterates and literates had no conservation experience in the past.

Knowledge of forest conservation varies significantly across places of residence where 56.4 percent of the rural and 27.1 percent had no knowledge of forest conservation. The majority (67.4 percent) of rural respondents, despite their low level conservation knowledge, showed positive attitude to the conservation measures. In the mean time the urban majority (80.2 percent) responded negatively to the conservation measures. In both place of residents, the large majority (more than 85 percent) had no conservation experience.

When we look at the attitude variation among the major occupation groups, the higher proportion (68.6 percent) of those who were engaged in farming activities had positive attitude towards conservation of the forest resources than others. The conservation experience of both the farmers and non farmers did not show an important difference where for both with no conservation

experience is above 85 percent. The finding on conservation knowledge with in farmers showed that higher number of sugarcane producers than coffee and chat producers had no conservation knowledge. Meanwhile, the sugarcane growers had shown strong (100 percent) positive attitude towards the conservation measures than others.

In relation to accesses to media, knowledge of conservation had increased from 34.1 percent who have no access to any media to 65.4 percent who have accesses. Attitude to the measures of conservation also showed similar pattern where positive attitudes had increased from 52.4 percent 64.8 percent as people are accessed for more media. The practice of conservation had also increased from 7.1 percent with no media to 13.2 percent as people are accessed to more media

The findings of the study also showed that males had better knowledge of the resource and better knowledge of conservation than females. Higher proportion of males as compared to females had also positive attitude towards the conservation measures. However, in perceiving the impact of current forest destruction, female respondents had better perception of the long term impact than males. Respondents in the younger age category (15-30) were least in their knowledge of the resource but were found to have better knowledge conservation and long term impact perception of the current forest destruction. In terms of attitude, the largest proportion of respondents with positive attitude towards the conservation measures were found in the middle age groups (31-50).

Ever married than never married had better knowledge of the resource. On the contrary, in terms of conservation, the ever married had fewer respondents with knowledge of conservation than the never married. The ever married respondents again lag behind the never married in perceiving the long term impact of the current forest destruction. In terms of their attitude towards the conservation measures no basic difference is observed in between.

The urban respondents had less knowledge of the resource but better knowledge conservation than the rural residents. They had also better perceived the long term impact of the resource's

current depletion than the rural respondents but had large number of respondents with negative attitude towards the conservation measures as compared to the rural respondents.

Among illiterate respondents, large number of respondents had better knowledge of the resource but much lower percentage of knowledge of conservation than the literate respondents.

5.2 Conclusion

Extensive environmental education seems little practiced in the study area. The agricultural office had also little effort in growing and distributing the seedlings of the indigenous trees in the area. Besides this, one could say that there are no awareness creation activities in the area concerning the environment when the disaster that is currently taking place on the resource is noticed. Efforts like diversification of income sources; energy sources etc. are also important activities that have to be considered to minimize the pressure on the resource. Family planning works are also another effort to be made to minimize the pressure on the resource. The people also should be made feel sense of ownership of the resource and made participate at every activity done around the resource. But what is observed during the study time was a feeling of marginalization by the government concerning the forest.

The world environmental day should also be colorfully celebrated in areas where environmental degradation is serious. Otherwise it will have less impact in creating environmental awareness among the public if it remains at halls. For instance, during the study time more than 90 percent of the respondents haven't heard of the word "world environmental day."

In general all the poor efforts made by the concerning bodies (government organizations, environmental activists and others) had been extensively proved during the study time when 90 percent of those who had the knowledge of the resource acquired the knowledge not from agricultural experts but from their own experience and forefathers. The respondents were also less capable of relating the extensive forest destruction with poverty and long term or generational impact.

Generally, the over all finding of the research showed that considerable proportion of the target population had no knowledge of the resource. Even among those who had the knowledge of the resource the majority do not know the status of the forest currently. Their cause and effect observational capacity of the environmental change was also found to be poor. This had been again manifested when the large majority of the respondents mentioned forest destruction as the major change they had observed in their environment and attached it with the increased timber production. As it had been stated earlier, population pressure was the list perceived cause of forest depletion in the area.

There had been also much higher percentage of respondents with no knowledge of conservation, negative attitude and poor practice of conservation. This situation had been observed across all the demographic and socioeconomic characteristics of the respondents.

According to the result of the model, place of residence, sex and household size are identified as significantly important factors to affect knowledge of conservation. In terms of attitude place of residence, age and literacy status are found to be important factors to affect attitude of the people towards conservation measures. Based on such findings of the study, among others, provision of an extensive environmental awareness education,

5.3 Recommendations

A scheme that could bring about alternative sources of income should be developed by the government and other concerning bodies. As it has been observed in the study, the livelihood of many people is highly dependant on the forest resources. They consider the forests as a hard time security of the household. Because they require no skill and no capital, in other words because they are easily accessible they serve as alternative probably an important source of income.

It is also important to narrow the knowledge gap between the environmentally concerned bodies and the public at the grass root level. Therefore, there could be good ground to have smooth relation ship in between. For such important activities, an extensive environmental education

through local institutions, religious institutions, schools, public gatherings should be provided to the public at large.

Environmental clubs, at schools at village levels etc should be organized. Rewards for their activities must also be arranged so that it could be able to create mass mobilization towards sustaining the environment.

Fuel wood is the major component of household energy in Ethiopia in general and in SSNNPR in particular. This large percentage of the population (more than 90 percent) will continue to depend on the forest resources as a source of fuel wood unless measure is taken to change the situation. Therefore, the concerned governmental organizations, like the energy sector, and non governmental organization should work much in ensuring the community with sustainable alternative rural energy supply.

As it had been observed during the study time, practice of planting trees on the farm lands and compounds has been least practiced. Therefore, the community must be made to practice planting trees on the farm boundaries, compounds and wastelands that could actually provide him with multiple purposes. So that the community makes use of these trees as a source of construction, fuel wood, source of food etc. Thus the government and non governmental organizations should work on such activities extensively.

The majority of the community should be made to develop a sense of ownership concerning the forest. Therefore, at every activity of the government concerning the forest the community must be made informed or aware. This is to mean that the community must not be asked his contribution only when there is a need of afforesting but also the community is equally important when the government wants to clear the forest for some purposes.

There is also little activity of growing and distributing the seedlings of indigenous trees on the side of government and other concerning bodies. This has been done for two reasons: one for they consume much time to grow, and they are costly. Though the fact is true, the concerning

bodies should give top priority in rehabilitating these indigenous and endangered types of tree species because their entire disappearance is highly disastrous.

It has also to be made that the World Environmental Day should always be colorfully celebrated with in the community so that it would be possible to refresh people's view of the environment

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Annex 2

Questionnaire Developed to Look the determinants of Knowledge, Attitude and Practice Towards Forest Conservation. (the case of Wondogent .)

SECTION 1 : AREA IDENTIFICATION

Region Zone Woreda

Name of the PA Name of the Town
 Kebele

Interviewer's Name and Signature Name Signatuer
 Supervisors name and Signature

No	QUESTIONS AND FILITERS	CODING	CATAGORIES
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SECTION 2 : BACKGROUND INFORMATION

101	Sex of the respondent	Male	<input type="text"/>	1
		Female	<input type="text"/>	2
102	Age of the respondent? (In full years)	<input type="text"/>	<input type="text"/>	1
103	How long have you been continuously living in the area? (If it is less than one year write "00")	Years	<input type="text"/>	1
			<input type="text"/>	
104	What is your marital status?	Never married	<input type="text"/>	1
		Married	<input type="text"/>	2
		Divorced	<input type="text"/>	3
		Widowed	<input type="text"/>	4
105	What is the size of your family? (if the respondent is different from single)	1	<input type="text"/>	1
		2	<input type="text"/>	2
		3	<input type="text"/>	3
		4	<input type="text"/>	4
		5	<input type="text"/>	5
		>5	<input type="text"/>	6
106	Can you read and write?	Yes	<input type="text"/>	1
		No	<input type="text"/>	2
107	What is the highest grade you have completed?	Grade	<input type="text"/>	1
		Certificate	<input type="text"/>	2
		University/College diploma	<input type="text"/>	3
		University / College Degree	<input type="text"/>	4
108	What is the current occupation you have engaged in? <i>(An occupation that you earn more than 3/4 of your household income)</i>	Farmer	<input type="text"/>	1
		Merchant	<input type="text"/>	2
		Government employee	<input type="text"/>	3
		Others Specify	<input type="text"/>	4
109	Do you have land for agricultuer?	Yes	<input type="text"/>	1
		No	<input type="text"/>	2
110	How much of land do you own?	Less than one hectare	<input type="text"/>	1
		1-2 Hectares	<input type="text"/>	2
		> 2 Hectares	<input type="text"/>	3

111	What do you cultivate most (>3/4) on your farm land?	Coffee		1
		Sugarcane		2
		Chat		3
		Food crop		4
		Other		5
112	Do you read news papers, magazines?	Yes		1
		No		2
113	If the answer is no , why?	I am not interested		1
		Not easily avilabel		2
		I don't know		3
114	Do you listen to the radio?	Yes		1
		No		2
115	If the answer is no , why?	I am not interested		1
		Not easily avilabel		2
		I don't know		3
116	Do you watch Television?	Yes		1
		No		2
117	If the answer is no , why?	I am not interested		1
		Not easily avilabel		2
		I don't know		3

118	What type of fuel does your household mainly use for cooking?	Electricity		1
		Biogas		2
		Kerosene		3
		Charcoal		4
		Firewood		5
		Dung		6
		Others Specify		7

119	If your answer is firewood, where do you collect /get it from	From the forest		1
		From some other place		2
		From farm residuall		3

120	How long do you travel to collect the firewood on average?	<1km		1
		1 km		2
		2km		3
		3km		4
		4km		5
		>5km		6

SECTION 3: KNOWLEDGE

201	Do you make use of the forest resource?	Yes		1
		No		2

202	If yes, for what purpose do you make use of it?	Fuel wood		1
		Logging		2
		Othe, specify		3

203	Do you think Wondogent forest is rich in terms of biodiversity?	Yes		1
		No		2
		I don't know		3

204	If yes, how do you know it?	Heard from radio, television	<input type="checkbox"/>	1
		News papers, magazines	<input type="checkbox"/>	2
		experts.	<input type="checkbox"/>	3
		learned from forefathers	<input type="checkbox"/>	4
		From own experience	<input type="checkbox"/>	5
205	Can you name me the types of flora you know available		<input type="checkbox"/>	1
206	Are all the types of plant you mentioned currently available in large quantity?	Yes	<input type="checkbox"/>	1
		No	<input type="checkbox"/>	2
		Don't Know	<input type="checkbox"/>	3
207	Which type of plant has reduced in quantity?		<input type="checkbox"/>	1
208	Can you tell me the degree by comparing its present quantity with the past quantity?	Before ten years	<input type="checkbox"/>	1
		Before five years	<input type="checkbox"/>	2
209	What do you think is the cause?	Logging	<input type="checkbox"/>	1
		Charcoal	<input type="checkbox"/>	2
		Construction	<input type="checkbox"/>	3
		Fuel wood	<input type="checkbox"/>	4
		Other	<input type="checkbox"/>	5
210	What is the series environmental problem you observed around your environment ?	Deforestation	<input type="checkbox"/>	1
		Soil erosion	<input type="checkbox"/>	2
		Decreasing of water sources	<input type="checkbox"/>	3
		Decreasing of land productivity	<input type="checkbox"/>	4
		Decreasing of farm land size	<input type="checkbox"/>	5
		I don't know	<input type="checkbox"/>	6
211	If your answer is deforestation, what do you think is the cause?	Over population	<input type="checkbox"/>	1
		settlement	<input type="checkbox"/>	2
		Increasing expansion of farm land	<input type="checkbox"/>	3
		Increasing business of logging	<input type="checkbox"/>	4
		lack of environmental Education	<input type="checkbox"/>	5
		Expansion of investment	<input type="checkbox"/>	6
		Lack of gov'control	<input type="checkbox"/>	7
		Idont know	<input type="checkbox"/>	8
212	If your answer is deforestation, what do you think is the solution?	Limiting family size	<input type="checkbox"/>	1
		Searching for another source of income	<input type="checkbox"/>	2
		Drafting strict law that protects trees from cutting	<input type="checkbox"/>	3
		Planting Trees	<input type="checkbox"/>	4
		Education	<input type="checkbox"/>	5
		Idont Know	<input type="checkbox"/>	6
213	If your answer is soil erosion ,what do you think is the cause?		<input type="checkbox"/>	1
			<input type="checkbox"/>	2

214	If your answer is soil erosion ,what do you think is the solution?	Afforestation	<input type="checkbox"/>	1
		Contour plowing	<input type="checkbox"/>	2
		developing traces	<input type="checkbox"/>	3
215	If your answer is decreasing water resources ,what do you think is the cause?	<input type="checkbox"/>	<input type="checkbox"/>	1
		<input type="checkbox"/>	<input type="checkbox"/>	2
216	If your answer is decreasing water resources ,what do you think is the solution?	<input type="checkbox"/>	<input type="checkbox"/>	1
		<input type="checkbox"/>	<input type="checkbox"/>	2
217	Can people cause the forest resource to deplete?	Yes	<input type="checkbox"/>	1
		No	<input type="checkbox"/>	2
		Don't Know	<input type="checkbox"/>	3
218	If yes, how could they cause deplete the resource?	By using it for logging	<input type="checkbox"/>	1
		By using it for fuel purpose	<input type="checkbox"/>	2
		By using it for medicinal	<input type="checkbox"/>	3
		By using it for settlement	<input type="checkbox"/>	4
		Other	<input type="checkbox"/>	5
		<input type="checkbox"/>	<input type="checkbox"/>	6
219	Can people protect the resource from depleting?	Yes	<input type="checkbox"/>	1
		No	<input type="checkbox"/>	2
220	If yes, how could they protect the resource? (Multiple answer.)	By planting trees on their farmland/compound etc.	<input type="checkbox"/>	1
		By stopping Logging	<input type="checkbox"/>	2
		By stopping agricultural land expansion	<input type="checkbox"/>	3
		By stopping cutting for settlement	<input type="checkbox"/>	4
		By protecting indigenous trees	<input type="checkbox"/>	5
		I don't know	<input type="checkbox"/>	6
221	If no, why? Describe it.	<input type="checkbox"/>	<input type="checkbox"/>	
222	Can people in the area get impoverished if the forests are destroyed?	Yes	<input type="checkbox"/>	1
		No	<input type="checkbox"/>	2
		I don't know	<input type="checkbox"/>	3
223	If yes, how could they get impoverished?	<input type="checkbox"/>	<input type="checkbox"/>	

224	When do you think the effect of the current deforestation impact will be serious?	Currently
		On the coming generation
		I don't know

	1
	2
	3

225	Have you heard of the world environment day?	Yes
		No

	1
	2

226	Have you heard of any environmental program in radio?	Yes
		No

	1
	2

227	Have you watched any environmental program in a television?	Yes
		No

	1
	2

228	Have you read of any environmental issues in news paper?	Yes
		No

	1
	2

Section 4 : ATTITUDE

301	Do you think the presence of the forest is beneficiary to you?	Yes
		No
		I don't know

	1
	2
	3

302	Who should own the forests?	Individuals
		Community
		Government/stat
		State and community
		No body
		I don't know

	1
	2
	3
	4
	5
	6

303	If your answer is "individuals", why?	
-----	---------------------------------------	--

	1
--	---

304	If your answer is "Community", why?	
-----	-------------------------------------	--

	1
--	---

305	If your answer is "State", why?	
-----	---------------------------------	--

	1
--	---

306	If your answer is "community and State", why?	
-----	---	--

307	If your answer is no body , why?	
-----	----------------------------------	--

	1
--	---

308	People who cut tree for logging must be punished.	I agree
		I don't agree
		I don't know

	1
	2
	3

309	If you agree or disagree , Why ?	
-----	----------------------------------	--

	1
--	---

310	People who cut tree for agricultural expansion must be punished.	I agree
		I don't agree
		I don't know

	1
	2
	3

311	If you agree or disagree , Why ?	
-----	----------------------------------	--

	1
--	---

312	People who cut tree for purpose of settlement must be	I agree
		I don't agree
		I don't know

	1
	2
	3

313	If you agree or disagree , Why ?	
-----	----------------------------------	--

	1
--	---

314	People who cut tree for charcoal must be punished?	I agree
		I don't agree
		I don't know

	1
	2
	3

315	If you agree or disagree , Why ?	
-----	----------------------------------	--

	1
--	---

Section 5: PRACTICE

401	Have you ever had any environmental protection practice?	Yes
		No

	1
	2

402	If yes,what type of practice do you know?	

	1
	2
	3
	4

403	Are you currently practicing environment protection activity?	Yes
		No

	1
	2

404	If yes, what type of practice are you making currently?	
-----	---	--

	1
--	---

405	If no, why?	
-----	-------------	--

	1
--	---

406	If yes, where did you learn it?	Inherited from the ancestors
		From Agricultural office
		From media

	1
	2
	3

407	Do you usually plant trees on your farm or around your home?	Yes
		No

	1
	2

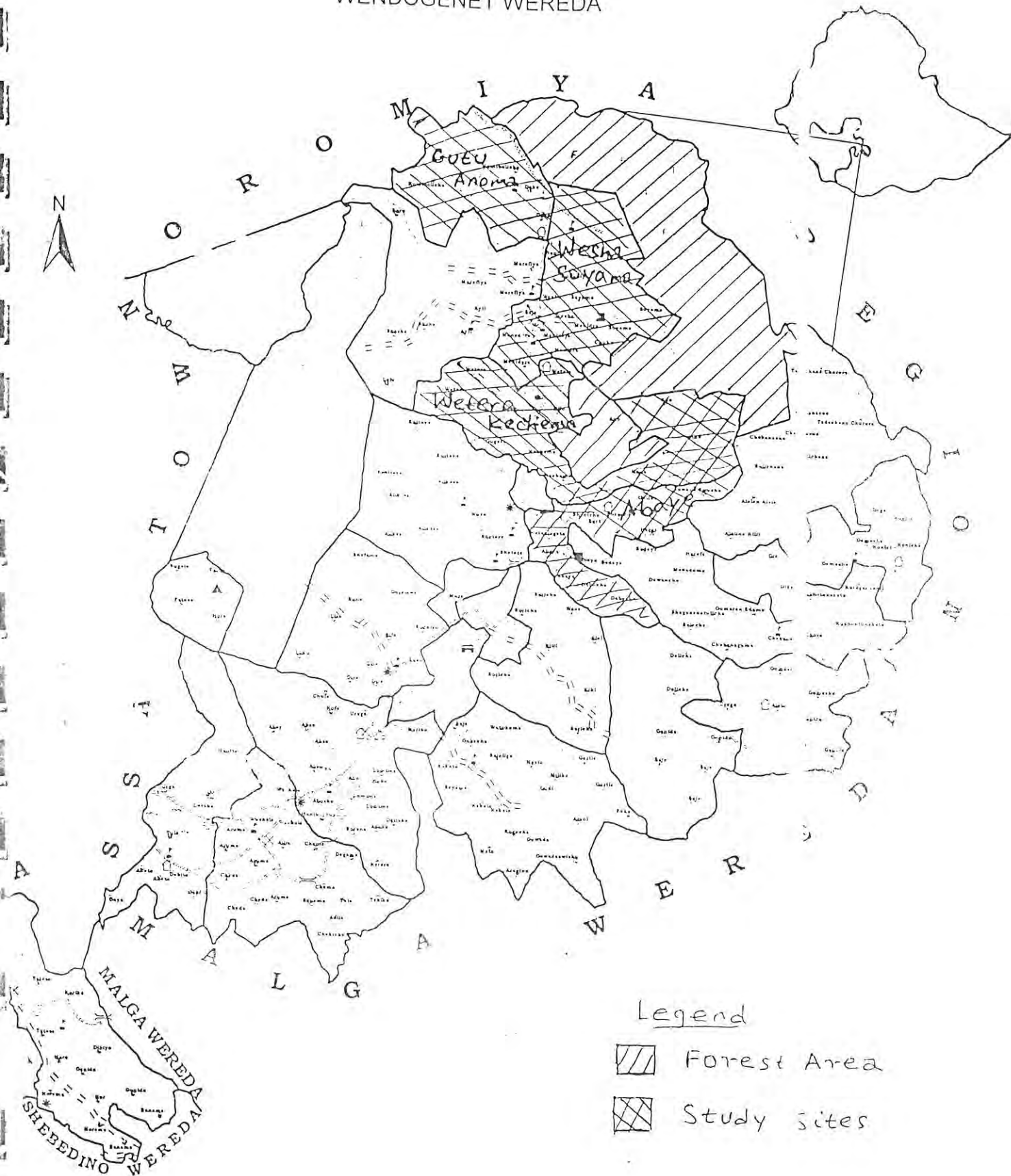
408	If yes, wher do you get the seedkings?	From own nursery
		From Agricultural office
		Other

	1
	2
	3


409	What type of trees do you usually plant?	Which are used for food
		Which are used for construction
		Which are used for beauty
		Other,specify


	1
	2
	3
	4

WENDOGENET WEREDA



Legend

 Forest Area

 Study sites

Scale 1:115,000

Source: modified from CSA census map

Declaration

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in other university and that all sources of the materials used in this thesis have been duly acknowledged.

Name: - Temesgen Workayehu

Signature _____

Date: July, 2007

This thesis has been submitted for examination with my approval as a university advisor.

Name of Advisor: Tadesse Woldemariam (Ph.D)

Signature  _____

Date of Approval: 13/08/07