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SCHOOL OF GRADUATE STUDIES

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THE CASE OF ZEGHE PENINSULA

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Demographic and Socio-economic Factors Influencing Rural Women's Perception of Deforestation: A Case Study of Zeghe Peninsula, Bahir Dar Zuria Woreda

By

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To my father, Ato Achamyeleh Adal,

Who brought me as a full fledged person with his support and care.

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Abbreviations and Acronyms

AREPLUAA	Amhara Regional State Environmental Protection and Land Use Administration Authority
BoPED	Bureau of Planning and Economic Development
CARE	Cooperative for Assistance Relief Everywhere
CREW	Centre for Research on European Women
CSE	Center for Science and Environment
DAWN	Development Alternatives with Women for a New Era
DFID	Department for International Development
EARO	Ethiopian Agricultural Research Organization
EFAP	Ethiopian Forestry Action Plan
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
GO	Governmental Organization
IBRD	International Bank for Reconstruction and Development
IDP	Integrated Development Project
II	In-depth Interview
IUCN	International Union for Conservation of Nature and Natural Resources
NGO	Non Governmental Organization
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIFEM	United Nations Development Fund for Women
USAID	United States Aid for International Development
WBISPP	Woody Biomass Inventory and Strategic Planning Project
WSSD	World Summit on Sustainable Development

Abstract

In most developing countries, women play a major role as farmers, animal tenders, and water and fuel collectors. Yet, despite their roles, women are not adequately represented in the decision-making processes related to the issues of environment and development at local, national or international levels. Women have continued to speak out for policies and practices that do not threaten the health and well-being of future generations. The skill, knowledge, attitude and perception of women have been ignored for years and women are now demanding that their voices be heard. They continue to fight for improved living standards and protection of the environment. In almost all countries, women are disproportionately represented among the poor.

This study was conducted in Zeghe Peninsula, one of the tourist sites in Western Gojjam, Amhara Regional State, with the objectives of identifying the demographic and socio-economic factors influencing rural women's perception of deforestation, and examining their perception of deforestation with a sample of 426 female headed households. Statistical techniques like frequency, percentages, cross-tabulation, bivariate and multivariate analysis were used.

The study found out that, among demographic factors: age and household size; and the socio-economic factors: literacy status, farmland size and contact with conservation agents have an association with the dependent variable. The results of the multivariate analysis have shown that literacy status and farmland size of a woman significantly influence her perception of deforestation.

From the study it can be concluded that women living in Zeghe Peninsula have perception of deforestation, which is an important input for development plans, strategies and actions; as well as conservation movements to be carried out on the peninsula. Therefore, there is a lot to be done on women's empowerment, conservation initiatives with adequate participation of women to conserve the forest coverage, improve the lives of people and overall ecosystem of the peninsula including Lake Tana through investigating and using their indigenous knowledge.

CHAPTER ONE

1.1 Introduction

People are centre of concern for sustainable development; they are entitled to a healthy and productive life in harmony with nature (UN, 1995). However, many advances in human life tended to insulate them from the environment that shaped them and up on which they depend. And coming to the reality, for every action taken there is a reaction, an impact. The impacts of human activities on the environment often have both negative and positive sides.

Research in perceptions of environmental issues of rural Africa is needed, not only to reveal the rightness and diversity of the perceived environmental images, and to indicate the values on which they are based, but also to increase sensitivity with which planned change is carried out, there by increasing its effectiveness on both the national and local level (Larimore, 1969). Evidences show that poverty can only be sustainably reduced by managing natural resources for both the income they generate and the environmental services they provide.

> *...addressing environmental issues that matter to the low is critical to sustained poverty reduction and achieving the Millennium Development Goals.... but this requires a more "pro-low" and integrated approach linking action at local, national, and global levels* (DFID et al, 1992).

Environmental resources in many developing countries are acutely threatened, yet the desire for economic growth is also manifested. Controversy surrounding the recent World Summit for Sustainable Development provides further evidence of the importance of understanding perceptions of these issues (Michael and Lori, 2005). But in many developing countries, environmental problems are thrown away to the periphery because they do not appear to be as urgent as other issues. However, a clearer understanding of environmental issues shows that they are a matter of life and death and should be a priority. Of all community groups, rural women tend to have the responsibility for managing household resources, but they typically do not have managerial control. Given

the variety of women's daily interactions with the environment, they are the most highly affected by its degradation.

> *...Probably no other group is more affected by environmental destruction than low village women. Every dawn brings with it a long march in search of fuel, fodder and water. It does not matter if the women are old, young or pregnant: crucial household needs have to be met day after weary day, every time longer and more tiresome....* (CSE, 1985)

The skill, knowledge and perception of women have been ignored for years and women are now demanding that their voices be heard. They recognize that an integrated approach to sustainable development is necessary since political, economic, social and environmental issues are closely interlinked. According to UN Fourth World Conference on women 1995, women have an essential role to play in the development of sustainable and ecologically sound consumption and production patterns and approaches to natural resource management.

> *....women have been active in promoting an environmental ethic, reducing resource use, and reusing and recycling resources to minimize waste and excessive consumption* (Ibid).

1.2 Background

The economic and environmental problems facing the developing world are overwhelming in their magnitude and their complexity. Specially, Africans rely on primary resources, especially agrarian land, rivers and forests. When rivers dry up, soil erosion takes place and the land loses its fertility. As a result, Africans, more than any other people, will be hit very hard by the impact of climate change.

Not all groups in society have the same adaptive capacity, since all do not present the same vulnerabilities. Any group lacking in the financial, social, and political means of securing alternative livelihoods is less exposed to risk than others is therefore more vulnerable to environmental degradation (World Bank, 2003).

> *...vulnerability is determined by the type of resources on which individuals depend, the availability of these resources, and, crucially, by the entitlement of individuals and groups to mobilize these resources* (Ibid).

Vulnerability is therefore "a socially constructed phenomenon influenced by institutional and economic dynamics"(Adger et al. 2003), and in this sense, rural women, in comparison with men, show higher levels of vulnerability, since their participation in these institutional and economic dynamics is characterized by gender-based limitations in access to resources when performing their productive, reproductive and community roles.

Awareness of resource depletion, the degradation of natural systems and the dangers of polluting substances has increased markedly in the past decade. These worsening conditions are destroying fragile ecosystems and displacing communities, especially women, from productive activities and are an increasing threat to a safe and healthy environment (UN, 1995).

> *...gender issues should be given due consideration throughout the process and specific actions should be identified to facilitate the participation of women as fully integrated partners in all phases (planning, implementation, monitoring and evaluation) of the process.* (FAO, 1996)

Ibid revealed that, because the impact of forest depletion is felt so severely by women, they are usually anxious to participate in any decisions that are made about what new tree species are to be planted, and where. Women can thus provide an important input to planning (FAO, 1989).

According to World Bank (2001), forest resources directly contribute to the livelihoods of 90 percent of the 1.2 billion people living in extreme poverty and indirectly support the natural environment that nourishes agriculture and supplies of nearly half the population of the developing world. In Ethiopia, where more than 85 percent of the people living in rural areas, traditional fuels contributed a high percentage of the energy consumption, with Firewood being the most important source, followed by dung, crop residues and of charcoal (WBISPP, 1995). The same document revealed that within the households, traditional fuels contribute 99.6 percent of the total household energy consumed, with

firewood 81 percent, dung 9 percent, crop residues 8 percent and the remaining supplied by modern fuels.

> *...if the present trend of deforestation continues, there will be no sizeable areas of the natural high forest left in the first decades of the new millennium. Similar to the situation in northern Ethiopia, only a few small patches of forest might remain around holy sites such as churches and monasteries as well as in inaccessible areas* (Azene, 2001).

Following the hit by hailstorm of the whole peninsula (around 1972),drought (around 1986) and then the absence of "belg" rain (around 1999), coffee productivity has shown low average yield and decline trend over the years (AREPLUAA, 2004). As a result of these situations, coffee production, the only means of livelihood for people of the peninsula become very low and insufficient for subsistence. According to IDP (1993, sited in CARE Ethiopia 2001), the mean coffee productivity from 1988-92 was 108 kg/ha. This low coffee productivity is associated with deteriorating situation of rainfall amount and distribution and with declining tree shade necessary for coffee plant. Since then, as the way out of worsening living condition, people started to supplement their income by diversifying their income sources through felling of trees to sell as firewood. CARE Ethiopia (2001) indicated that, the peninsula supplied over 90 percent of the fire wood demand of Bahir Dar town. Firewood selling is the second most important income source for the people of the peninsula, next to coffee production. From household survey, it was found out that 67.5 percent of the total households (of which, 42.7 percent are female headed) in the peninsula participate in the activity (Maru, 2004). As a result, Ibid revealed that there are indications of environmental degradation in the peninsula and Lake Tana ecology. This poverty situation highly affects women in the peninsula since they totally depend on the coffee production for their family subsistence.

Different studies suggested that the understanding of socio-cultural acceptability or feasibility of conservation measures should be encouraged before implementation (Markos, 1997). Most rural women have a special relationship with natural resources; their cultures and practices promote a balanced use and preservation of natural resources so that future generations can meet their needs. Yet most development schemes today ignore the needs and practices of indigenous people.

1.3 Statement of the problem

Zeghe peninsula possesses one of the very few remnants of tropical forests in Ethiopia. It significantly contrasts with the surrounding mainland in its forest coverage. However, due to the poverty situation, people of the peninsula have been engaged in firewood selling. According to Zeghe peninsula baseline survey (CARE Ethiopia 2001), cutting Firewood for the purpose of income earning is a very recent practice on the peninsula. In the absence of viable alternative economic activities, many residents of the peninsula have resorted to cutting down trees to sell as firewood. The problem may get severe to the extent that the peninsula may be devoid of forests and remain with bushes if this rate continues. This in turn will affect the peninsula's appearance of being one of the tourist attraction sites of the country, and the income from the tourism will be highly decreasing. Wood cutting now ranks with equal prominence to coffee production as a source of income for most people living in the peninsula (CARE Ethiopia, 2001). So one can easily imagine how women living in the peninsula will be vulnerable as a result of the existing poverty-environmental degradation link, since for these poor women, the natural capital is their only alternative to survive. Various studies have shown how women are closely related with environment, and accordingly how their perceptions and indigenous knowledge be useful in conserving the environment for sustainable use.

> *...the environment matters greatly to people living in poverty. Because poor people perceive well being strongly related to the environment, in terms of their livelihoods, health, vulnerability and empowerment to control their own lives.* (DFID et al, 2002)

Poverty in Ethiopia highly victimizes women who are more vulnerable than men for all hazards. The reality of their daily life is the long walk required to fetch fuel and water. As scrub land becomes depleted and the environment deteriorates, and as increasing numbers of people compete for diminishing resources, women find it more and more difficult to collect enough Firewood in the time available to them (FAO, 1989).

> *...in non-industrial regions, trees are inextricably woven into the rural land household economies. They are used to provide fuel, fodder and food. They supply medicines and shade, increased soil fertility, shelter from the wind and protection from the rain. From them women fashion many of the products used in the house-and, often enough, the house itself. Perhaps the most importantly of all, trees and forests provide many rural women with their only source of personal income* (Ibid).

Though important natural resource users and managers, producers of food and other products, and indeed major contributors to the family wellbeing, women have been normally "invisible" to development policy-makers, programme planners and researchers. But the reality behind is women, being so close and highly dependent to and on nature are more interested to conserve the environment for sustainable use.

> *...women, particularly those living in the rural areas of the third world countries, play a major role in managing natural resources- soil, water, forests and energy (Dankelman and Davidson, 1988).*

In addition, given the intimate relationship between deforestation and poverty, a local-level gender-sensitive understanding of livelihood roles is all the more relevant for devising solutions.

1.4 Objectives of the study

The general objective of this study is to examine the demographic and socio-economic factors that influencing rural women's perception of deforestation.

The specific objectives include:

i. Identify the demographic factors (age, household size) that influence perception of rural women on deforestation.

ii. Explore the socio-economic factors (literacy status, size of farmland and contact with conservation agents) that influence perception of rural women on deforestation.

iii. Examine rural women's perception of deforestation.

1.5 The Study Hypotheses

The study attempted to test the following hypotheses:

1. Older women have high perception of deforestation than the younger ones.
2. Literate women have high perception than the illiterate ones.
3. Women with lower farmland size have high perception than those with higher farmland size.

1.6 Significance of the Study

Since it is the perception that the local people have about the environmental problem they are facing that matters in every plan and action that should be taken, women as part of the society and main users and managers of the environment are concern of the study. As a result, this study attempts to identify and examine the demographic and socio-economic factors influencing their perception of deforestation, so that planners, program implementers and policy makers will be aware of the perceptions that women have and make the women part of every plan and implementation of any development strategy. It also provides information on the level to which demographic and socio-economic factors influence the perception of rural women to deforestation, which will play a vital role in creating awareness on the problem, shaping their attitudes and practices towards reducing the deforestation rate.

It will also contribute a lot in filling the research gap, help different governmental and non-governmental organizations in planning and implementing strategies to reduce poverty, empower women and above all conserve the environment for sustainable use.

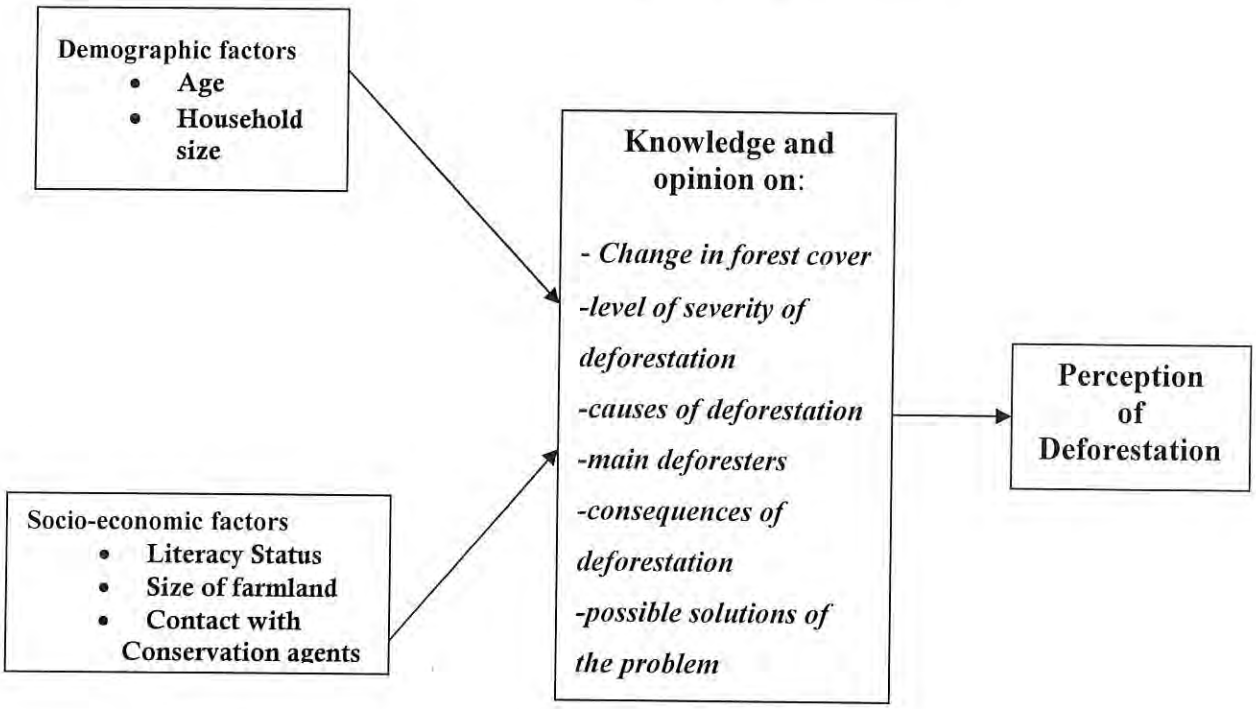
1.7 Analytical Framework

In this study, the demographic factors that influence the perception of rural women to deforestation, age and household size are considered. And the socio-economic factors

such as, literacy status, size of farm land, contact with conservation agents are expected to influence the perception of rural women as indicated in figure1.1 below.

As shown in the analytical framework, rural women's perception of deforestation is treated as a dependent variable in the study. The demographic factors (age and household size) and the socio-economic factors (literacy status, size of farmland and contact with conservation agents) affect the knowledge and opinion that women have on the change in forest cover, level of severity of deforestation, causes of deforestation, main deforesters, consequences of deforestation and the possible solutions of the problem that they suggest that in turn will determine the level of their perception on deforestation.

Figure1.1Analytical framework to study the Demographic and Socio-economic factors Influencing Rural Women's Perception of Deforestation.



Source: Author

1.8 Operational definition of concepts and variables

- *Deforestation*: refers to the removal of trees without sufficient forestation.
- *Perception*: refers to the individual's knowledge and opinion to the process of deforestation.

- *Age:* refers to the number of completed years the woman lived since her birth date.
- *Household size*: refers to the total number of persons living in the same household.
- *Literacy Status*: refers to the number of completed grades in her school attendance; categorized as illiterate, primary, secondary.
- *Size of the farmland*: refers to the area of agricultural farm land that belongs to the household.
- *Contact with Conservation agents*: refers to the contact that the woman has with kebele workers, conservation agents or environmental protection workers.

1.9 Limitations of the Study

The study has undergone some limitations. As the location of the study is far away from towns and getting female headed households and getting the required information was not easy, resources such as time and money were constraints to conduct the study. In addition even if it was anticipated from the start, the response of the subjects about their income had two problems, lack of willingness among the subjects to provide information about it and subjects could not even guess their income the researcher decided not to include income as an explanatory variable for the perception variation among women on deforestation.

1.10 Organization of the Thesis

This thesis has six major parts, The first part which includes introduction, background of the study, statement of the problem, objectives of the study, the study hypothesis, , significance of the study, analytical frame work, operational definition of concepts and variables, limitations of the study and organization of the paper. The second part deals with the review of related literature; the third part on data sources and methodology of the research; the fourth and fifth parts discuss the findings of the study, specifically, the fourth one discusses the background characterstics of the respondents and the fifth one presents results on the factors influencing the perception of rural women on deforestation. Conclusions and some recommendations are forwarded in the last part of the thesis.

CHAPTER TWO

Review of Related Literature

2.1 The Women-Environment Nexus

The women-Environment nexus has interesting implications for policy and research. It is evident that environmental policies have been gaining ground at the expense of the rural development policies that prevailed during the 1980s, in which the gender approach had been far better integrated (Leach, 1992). Thus environmental policy is a key area for gender based research and analysis that will have an impact on policy.

More recently the preparatory documentation for Earth Summit II has reaffirmed particular commitment to the empowerment and participation of women, to reflect the critical role of women in the achievement of sustainable development (Monica, 1997). On the other hand, a growing debate about gender and the environment highlights women's roles in the use and management of natural resources, opening up important opportunities for development analysis and action (Leach, 1992).

> *...but there are traps in conceiving of women's roles in relation to the environment in a partial, narrow, or static way; of isolating them from men's roles; and of assuming a close link between women and 'nature'* (Ibid)..

Charlotte Bretherton (1998) has identified three main categories of women-environment nexus, these conceptualizations are important in considering the construction of women's identity in relationship to the environment, and their experiences. In her interpretation, these links fall broadly into three categories: *Women as saviors*, *Women as victims* and *Women as the problem.*

While explanations for this 'critical role' vary in emphasis, they tend to focus upon the special significance for women of environmental issues. Perceptions of women and environment links fall into the above three broad categories: each of which has differing policy implications.

The notion of *women as saviors* accords with the principles of ecological feminism, which emphasize the positive nature of women/environment links and posit a close relationship,

even an equivalence, between women generally and the natural world. Ecofeminists also maintain that women bear special responsibility towards the environment. As a consequence of their reproductive and nurturing roles and the experience of oppression and exploitation which they share with the natural world, it is argued; women enjoy unique insights which, in turn, generate responsibilities (Warren, 1994; Jackson, 1995). In several regions of the Third World, in particular, there is a need to acknowledge, and utilize, women's special knowledge: of the medicinal properties of plants, of cheap and effective water purification measures, and of management/ conservation techniques appropriate to local ecosystems (Shiva, 1988; Sontheimer, 1991; Mies and Shiva, 1993; Sachs, 1996). Whatever the merits of such arguments, and their implications for women who are already somewhat burdened with responsibilities, Mies and Shiva (1993) claim, from their conversations with women's groups in many parts of the world, that 'women, worldwide, felt the same anger and anxiety, and the same sense of responsibility to preserve the bases of life, and to end its destruction'. In practice, however, policy initiatives seeking to utilize the commitment and expertise of women have typically placed them in subordinate and unpaid roles. 'Women as saviours' tend to be voluntary labourers, not project managers (Thomas, 1992; DAWN, 1992).

The notion of *women as victims* of environmental change or degradation can be illustrated through the close relationship between poverty and exposure to environmental hazard. In the context of rural areas in the South, the relationship between women, poverty and environmental degradation has been most fully documented. This applies, in particular, to those regions where women bear principal responsibility for subsistence agriculture and for collection of diminishing supplies of water, fuel and other forest resources; that is, they must provide for the survival needs of themselves and their families in the context of increasing environmental degradation, deforestation and/or desertification. In circumstances where women's economic security and social status have depended upon their relationship with the natural world, the effects of environmental change have been devastating. Moreover, in some regions, notably the Sahel and parts of sub-Saharan Africa, male migration has effectively created a majority of woman-headed households (DAWN, 1985; Shiva, 1988; Sontheimer, 1991; Sachs, 1996). In these circumstances,

policy initiatives emphasizing women/environment links have focused upon the welfare of women and their children. 'Women as victims' are objects rather than subjects of policy (Moser, 1991).

Emphasis upon *women as a problem* in environmental terms is commonly reflected in environmental policies and noted in reports by intergovernmental and non-governmental organizations (IUCN, 1991; IBRD, 1992; UNDP, 1996). Every aspect of women's activity, it seems, has environmental implications: in production and reproduction, as primary carers, as subsistence farmers or as consumers, women are targeted as the objects of policy. Women, we learn, are 'at the centre of the food crisis' (Dankelman and Davison, 1991) central to 'the fight against desertification' (Monimart, 1991) and 'central to population control' (CREW, 1994).

It is in this last area, of course, that women have most frequently been targeted as objects of policy; women's reproductive capacity is very evidently on the agenda of global environmental politics. Despite the more significant impacts of over consumption in the 'developed' world, population growth in the South has tended to be identified by Northern commentators as the major problem; and control of Third World women's fertility as the solution. Thus, in the context of 1970s neo-Malthusianism, the proposal by the Director of USAID that 25 per cent of women in the Third World should be sterilized was by no means untypical (Johnson and Nurrick, 1995; Mies, 1994). Subsequently, however, women's interventions have influenced discussion of this issue in international fora, ensuring that, at this level, the contemporary focus of debate is upon the broader issue of reproductive health (UNEP, 1994). Despite this, population control remains at the centre of the global-change agenda, as does the overwhelming stress upon women's fertility (Seager, 1997). However, policy proposals by intergovernmental organizations and non-governmental organizations increasingly stress the importance of addressing illiteracy among women as the most cost-effective means of reducing fertility rates, relieving pressure on diminishing environmental resources and encouraging women into waged work (IBRD, 1992; UNDP, 1995; UNEP, 1995). This is a welcome shift in the formulation of population/environment issues on global agendas; however, it owes more

to arguments about efficiency (as defined by neo-liberal economists) than to concerns for the empowerment of women.

> *. . . the return on getting girls into school is over 20 percent, and probably much greater. In fact, it may well be the single most influential investment that can be made in the developing world* (Summers, 1993).

In these debates *'women as the problem'* are evidently the objects of policy-oriented primarily towards environmental and/or economic concerns. The extent to which such policies are successful, however, will be determined by the differing socio-cultural norms and religious practices which shape the specificities of gender relationships, and hence contextualize reproductive choice. Thus in Jordan, for example, eradication of the gender gap in primary and secondary education has had little impact upon fertility rates or women's participation in waged work (Taylor, 1993).

Women-environment links have undoubtedly achieved some prominence on global environmental agendas. Moreover, focus is upon women not only as the targets of population control programmes, but also as a resource to be mobilized in defence of the environment. Achievement of 'sustainable development', we are told, will owe much to 'the special relationship between the position of women and the state of the natural environment' as quoted in Bretherton (1998). This statement by UNCED Secretary-General Maurice Strong clearly resonates with the ecological feminist perspective of women as saviors and, similarly, assigns disproportionate responsibility to women.

It is evident that much commitment, and even more rhetoric, attaches to debates around women/environment links. However, the insistent reference to women's 'special' position serves both to obscure the many significant differences among women and to separate all women from the social contexts within which they operate. 'Special' implies peculiar, exceptional; to be considered as a separate category. What transpires is policy about women; what is missing is systematic analysis of the gender relations which mediate women's relationships with their social and natural environments.

2.2 Dependency on Forest Resources and Its Effect

Rural populations in poor countries pay the highest price for environmental degradation, as their livelihoods depend on the goods and services ecosystems provide. Generation of water, wood and non-wood forest products, fuel, cycling of nutrients, replenishment of soil fertility, prevention of erosion, breaking down of wastes and pollutants, carbon sink and storage, recreation, etc. (Koziell and McNeil, 2002).

Forests are an integral part of resources required for global sustainable development. Forest-related economic activities affect livelihoods of poor people. They provide socio-cultural benefits and are the foundation for indigenous knowledge; and as ecosystems, forests play a critical role in mitigating the effects of climate change and protecting biodiversity.

> *Forests provide not only environmental protection, but also significant income and livelihood options globally for more than one billion forest-dependent people.*[1]

Forests provide a wide range of products (timber, fruit, medicine, beverages, fodder) and services (shade, beautification, erosion control, and soil fertility). Without trees human life would be unsustainable. Forests also play an important cultural, spiritual and recreational role in many societies. In some cases, they are essential to the very definition and survival of indigenous and traditional cultures. Forest and tree products can make direct contributions to household food security and health, mainly for the lowest families and in times of natural disaster. Furthermore, the income obtained through the sale of certain products (Firewood, medicines) can then be used to purchase food.

> ...firewood *has become increasingly difficult to obtain in both rural and urban areas in many Sub-Saharan African countries with rapidly growing populations using much more Firewood than in the past* (World Bank, 1990).

[1] http://www.unep.org

Deforestation is primarily confined to developing countries, and mainly in the tropics (Myers 1994).The global rate of net forest loss has slowed to 9 million hectares per year, according to the latest global forest assessment by the UN Food and Agriculture Organization (FAO, 2000)[2]. Africa, however, continues on its fast track of deforestation, with no signs of a slowing down. Forests are disappearing most rapidly in Africa and Latin America, whereas in Asia, the reduction of natural forests is largely compensated by new plantation forests. There is growing concern over shrinking areas of tropical forests (Barraclough and Ghimire 2000).

The livelihoods of over two hundred million forest dwellers and low settlers depend directly on food, fiber, fodder, fuel and other resources taken from the forest or produced on recently cleared forest soils. Furthermore, tropical deforestation has become an issue of global environmental concern, in particular because of the value of tropical forests in biodiversity conservation and in limiting the greenhouse effect (Angelsen et al 1999).

According to Global Forest Resources Assessment (2005), between 1990 and 2000, Ethiopia has lost an average of 140,900 hectares of forest per year. This amounts to an average annual deforestation rate of 0.93 percent. Between 2000 and 2005, the rate of forest change increased by 10.4 percent to 1.03 percent per annum. In total, between 1990 and 2005, Ethiopia lost 14 percent of its forest cover, or around 2,114,000 hectares.

Measuring the total rate of habitat conversion (defined as change in forest area plus change in woodland area minus net plantation expansion) for the 1990-2005 interval, Ethiopia lost 3.6 percent of its forest and woodland habitat due to firewood collection, conversion to farmland, overgrazing, and use of forest wood for building materials (FAO, 2005). As a result, Ethiopia will face a difficult future, because the agricultural sector, which forms the backbone of the economy, is totally dependent on forest resources (Ibid).

[2] http://www.afrol.com/Categories/Environment/env055_fao_deforestation.htm

The forest cover of Ethiopia has suffered severe deforestation and degradation through heavy exploitation resulting from an escalating demand for Firewood and land for cropping and grazing (Lisanework and Mesfin, 1989). According to them, ecological degradation, including deforestation and erosion, is widespread, particularly in the northern and central highlands.

Historical sources indicate that in the early twentieth century about 42 million hectares, or the equivalent of some 35 percent of Ethiopia's land area, might have been covered with forest (EFAP, 1994). At the current rate of deforestation of over 150,000-200,000 hectares per year, it will be completely deforested in less than 20 years unless drastic measures are taken to reverse the trend (Demel, Masresha and Asferachew, 2003).

According to EFAP (1992), in spite of the intimate linkage of women with the issues of food security and household energy, their rights and representation have been very limited; they have not therefore been well placed to deal with the problem of deforestation. The same source provided detailed confirmation of the importance of women's role in rural and forestry related affairs.

> *...in Gojam for example, women are reported as working over 15 hours per day: collecting water and fuel, marketing, preparing food, and caring for children. Of significance is the 18percent of this time spent in gathering wood and dung* fuel (Ibid).

Another study in Addis Ababa area, Fekerte (1991), put this figure at 38 percent of the working day. According to EFAP (1994), studies on pastoral women in southern Ethiopia revealed a comparable work regime, although some tasks were different, and included herding animals, and building temporary huts. It is thus clear that actions to deal with the forestry problems of rural communities, must take account of this central role of women if they are to succeed.

2.3 Women and Forest Resources

Since the start of human history, women have contributed essentially to the conservation, use and management of natural resources. Around the world they play distinct roles from men: in managing agricultural lands, plants, animals and forests, in collecting and managing water for domestic use and income generation, in the collection and use of (bio-)fuels. By so doing, they contribute time, energy, skills and personal visions to family and community development. Their extensive experiences make them an invaluable source of knowledge and expertise on environmental management.

In almost all communities world wide, men and women have different gender based roles and responsibilities, needs and priorities as well as knowledge of access to and control over the local environment, in this case, the forests. In most developing countries, men often view forests in terms of commercial possibilities, whereas women usually see them as a source for meeting their domestic needs.

> *...women's relationship with the environment revolves around their central concern with household food security and family welfare, and with the provision of water and fuel. Women are also custodians of biodiversity and caretakers of agricultural and livestock genetic resources: wildlife is a major component in household food security for low women, as is the identification, preservation and use of a wide diversity of domestic plant and animal species which women have carefully selected, bred and exchanged throughout human history* (FAO, 1995).

According to Sontheimer (1991), there is a commonly held belief that women are responsible for much of the environmental destruction taking place in rural areas. They are seen carrying the heavy loads of wood on their heads and foraging for the last twig or bit of green in areas of which have been stripped bare of vegetation. But laying the blame on women is to ignore the globally linked causes of environmental destruction which have created and continue to create a situation of scarcity that often forces women to ecologically destructive actions.

> *...because women are well aware of the utility of trees on the homestead, they take good care to plant and maintain them. In many if not most rural societies, it is only the women who have accumulated the traditional knowledge about the foods and other household products that trees can supply.* (FAO, 1989)

Different studies have shown the interaction that women have with forests in their day to day lives. The main forestry related preoccupation of Ethiopian women is the availability of, and distance to Firewood supplies (EFAP, 1994). Other forestry related interests include browse supplies for their sheep and goats, which are often kept in the family compound; the availability of traditional medicines, handicrafts, gums, resins which they gather for sale.

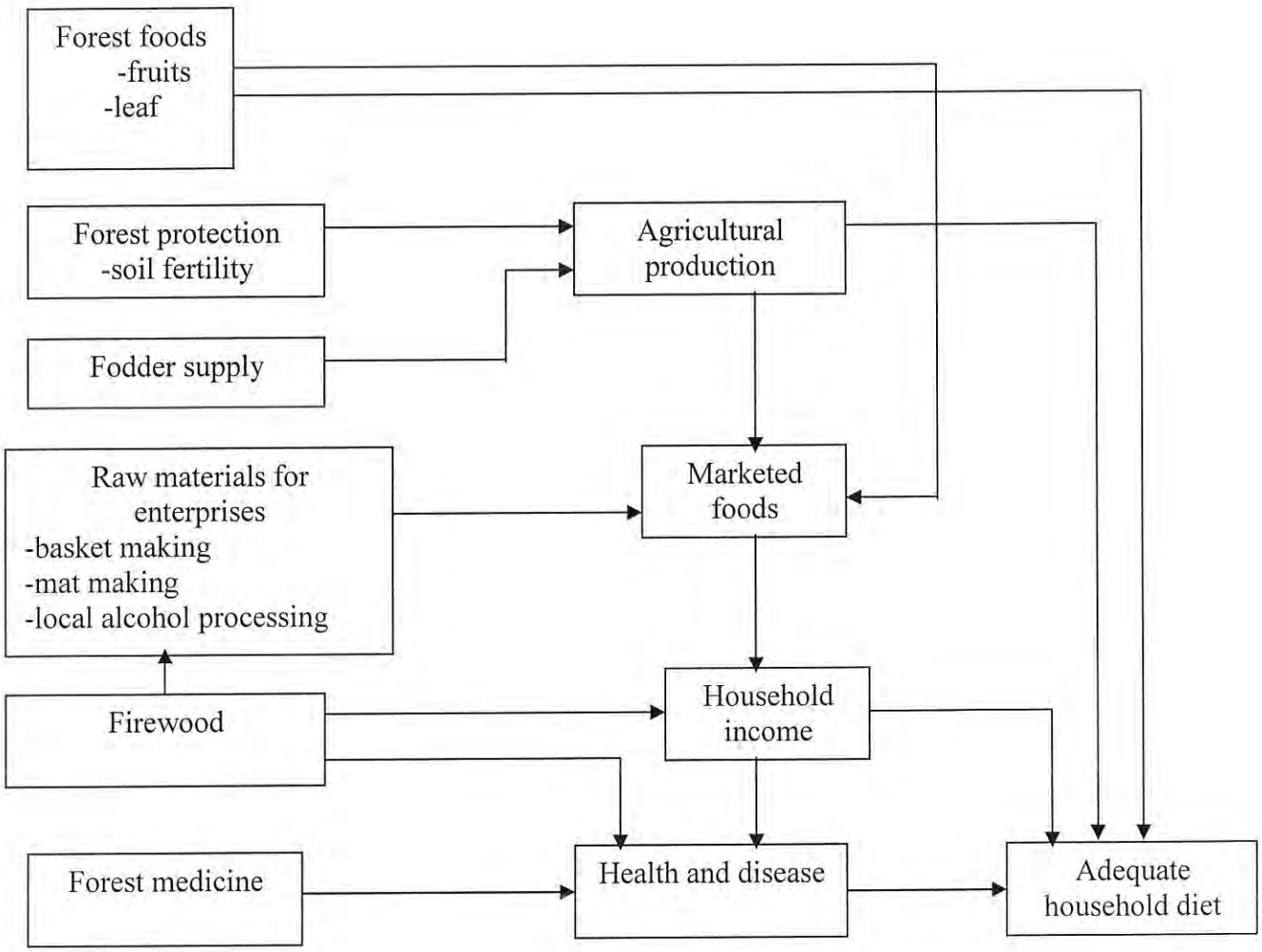
Tasks distributed to women on the basis of their gender roles, such as wood and water collecting, are time and energy consuming, and as desertification causes these resources to rarefy, an ever-increasing work burden is associated to these tasks. Win-win solutions which are environmentally sustainable, time/energy-saving and socially relevant have been devised, such as improved cooking stoves and local-level agro forestry activities (FAO 2003).

Trees, directly or indirectly, thus provide rural women with a substantial portion of their families' diets. In Tanzania, two or three species are enough to provide some food for every month of the year (FAO, 1989). This study also has shown that these trees are used more intensively during famines or droughts, illustrating their important role in providing food security. Women rely on the presence of trees to maintain many parts of their households, they gather, build, and repair fences around their household compounds. They use trees for dyes, by extracting the barks. Trees also provide medicines, which in many traditional societies is practiced by women.

In the developing world, women are the main harvesters of many wood and nonwood forest products. For example, they are the primary collectors of Firewood, which serves as the principal domestic energy source in most developing countries. This Firewood collection does not generally contribute to deforestation as much as is often claimed: "as women mostly collect dead wood, which is easier to cut, their work does not damage the trees" (Rodda,

1993). Women generally use only a few simple tools or no tools and carry the wood home themselves. Fuelling and tending the household fire has always been women's work. According to FAO, 1989, Nepal women and girls together collect 84 percent of the fuel. Another study, Rodda, 1993 indicates that millions of women in India sell Firewood to ensure the survival of their households. Many rural women rely on the sale of forest products as an important component, and often the sole source, of income. They sell Firewood as well as other forest products. This income is used to improve household food security and the welfare of the women's families. Limiting their access to forest resources by, for example, changing property or user rights, can thus deal rural women a double blow: directly, by depriving them of a means of fulfilling household needs through consumption of forest products, and indirectly, by taking away an important source of income to meet those needs.

Figure2.1. Link between women and Forest Resources. Source: Adopted from FAO/UN, 1989.



The forest is a valuable source of food. Women gather a wide variety of plants, insects and plant products to supplement the basic diet, whereas men hunt forest animals. These include leaves, seeds, nuts, fruits, bark, fungi, leafy vegetables, caterpillars, beetle larvae, and honey. In a case study in Sierra Leone, for example, women were found to rely much more heavily on plant resources than men. They used wild foods as ingredients for making a sauce which was central to the daily diet, as snacks for children, and as buffers during food shortages. In fact, several famines of the last century were recalled by the name of the forest product which had been most important for survival (Leach, 1993).

Collecting animal fodder is generally performed by women. They gather grass, leaves, fruit and branches to feed small domestic animals (such as rabbits, pigs and poultry) and also sometimes to feed the large animals. For example, in India and Nepal, women and girls collect the food for the buffaloes (Rodda, 1993). Women must also find the leaf litter which is used for the bedding of domestic animals. In addition, forests provide the materials for many household products, including baskets, bowls, brushes, etc.

To conclude, for centuries, women have gathered forest resources, and this remains an important activity for tribal societies and for many other rural households in Africa, Asia and Latin America. For women, forests are multifunctional, whereas men tend to concentrate on their commercial potential.

2.4 Women and Environmental Change

Today, women struggle against alarming global trends, and are working together to affect the change. By establishing domestic and international non-governmental organizations, many women have recognized themselves and acknowledge to the world that they not only have the right to participate in environmental issues but they have different relationship with environment including different needs, responsibilities, and knowledge about natural resources (Jiggins, 1994). That is why women are affected differently than men by environmental degradation, deforestation, pollution and overpopulation, and become more concerned about environmental problems.

Some of Ecological Movements initiated by Women

The Chipko Movement:

According to Breton 1998, one of the first environmentalist movements which was inspired by women was the Chipko movement (Women tree-huggers in India). It began when Maharajah of Jodhpur wanted to build a new palace in Rajasthan which is India's Himalayan foot hills. While the axemen were cutting the trees, a willing victim Amrita Devi hugged one of the trees. This is because in Jodhpur each child had a tree that could talk to it. The axmen ignored Devi and after taking her off, the tree cut down. Her daughters who followed her and her mom all were killed. People from forty-nine villages around Jodhpur responded to this act and hugged the trees the axemen were trying to cut. This act by Himalayan village women was a nonviolent resistance movement to save the forest. Chipko movement doesn't have any formal structure, board of director or any specific leaders. Women who participated in this movement were largely rural women, who are connected to each other horizontally rather than vertically via a hierarchy (Ibid). Chipko activists haven't focused on one area and they shift their hub into any region which faces the risk of deforestation. Chipko's idea and philosophy spread through word of mouth mostly by women who talked about them on village paths or markets. According to *ibid*, , this conflict started because men wanted to cut the trees to use them for industrial purposes while women wanted to keep them since it was their food resource and deforestation was a survival matter for local people.

The Green Belt Movement:

Another movement, which is one of the biggest in women and environmental history, is the Green Belt movement. Nobel Prize winner Wangari Maathai founded this movement on the World Environment Day in June 1977. The starting ceremony was very simple, with a few women participating, who planted seven trees in Maathai's backyard. By 2005, 30 million trees had been planted by participants in the Green Belt movement on public and private lands. The Green Belt movement aims in bring environmental restoration along with society's economic growth. This movement leaded by Maathai focused on restoration of Kenya's rapidly diminishing forests as well as empowering the

rural women through environmental preservation, with a special emphasis on planting indigenous trees[3].

The above movement initiatives by the indigenous women indicate that both men and women in the communities play an important role in the destruction or protection of cultural and natural heritage. However, approaches to cultural and natural conservation have not adequately incorporated the views and interests of the communities where these are located. In particular, consultation with women has been limited resulting in their knowledge, interests and perceptions being largely excluded in the planning and decision-making process. Development and conservation planners often overlook important aspects related to women's activities and roles in society, hence perpetuating the subordinate position and low image of women.

2.5 Perceptions of Environmental Issues

Key conclusion of the Johannesburg Summit was recognition of the importance of broad public participation in decision-making with regard to sustainable development. In the face of many social and environmental challenges expected within development, priorities must be set. Engaging the local voice within this agenda setting may improve policymakers' ability to respond to issues of most salience (Micheal and Lori, 2005), since public controversies raise interesting issues.

> *...first is the issue of the opportunity for the sociological approach to contribute given the field's expertise in investigating and understanding attitudes and opinions. Second is the issue of the role of attitudes and values in environmental change in developing settings* (Ibid).

Local attitudes and perceptions, whether narrow or broad in scope, shape the atmosphere on which environmental struggles are resolved. Therefore understanding how people consider and perceive environmental issues may be of particular value in policy formulations with regard to development issues.

[3] http://www.wangarimaathai.or.ke/

> *...public understanding of the general environment-population related issues is critical for focus of successful conservation efforts* (Karen et al, 1995).

2.5.1 Environmental Perceptions in Developing Countries

It is obvious that environmental resources in many developing countries are acutely threatened. A revolution in Third World attitudes toward environmental issues has occurred since the 1972 United Nations Conference on the Human Environment held in Stockholm (Bassow, 1979).

> *...controversy surrounding the recent World Summit for Sustainable Development provides further evidence of the importance of understanding perceptions of these issues especially in poor countries* (Micheal and Lori, 2005).

Research on environmental perception; however has practical claims to priority as well, because it is relevant to the implementation of economic development projects and programmes of planned change (Larimore, 1969). According to a recent study Michael and Lori (2005), there are multitudes of ways in which individuals perceive environmental conditions and environmental change, with such diversity of perceptions likely related to the complexity inherent in the environmental issues themselves.

> *...individual expressions of environmental concern may relate to countless physical qualities associated with the air, water, and land upon which humans and all other species depend. Further, concern with the factors shaping human environmental impacts may encompass issues related to, for example, human culture, politics, and/or technology* (Ibid).

The past two decades have seen increasing scholarly attention to the human dimensions of environmental change (Curran et al. 2002) as well as public concern with environmental issues (Dunlap and Riley 1992; Mertig, Dunlap, and Morrison 2002). Although the majority of work on public environmental perception has explored these issues within the context of developed economies (Dunlap and Mertig 1995), high levels of international concern with environmental change and environmental quality suggest the possibility of the emergence of "global environmentalism" (Brechin and Kempton 1994).

Although less prevalent, research on environmental perception in less developed regions is particularly significant, given continuing dependence on proximate natural resources in many areas (High and Shackleton 2000). In fact, in resource-dependent regions, perceptions of environmental decline, particularly with regard to changes in local resource conditions, may shed light on the environmental issues most salient to local residents. Insight into potential policy support can also be derived from critical consideration of the ways in which individuals come to be concerned with environmental issues. With regard to this, a compelling and intriguing theoretical debate has been taking place over the past several years around the issue of environmental concern in lower-income contexts. Some scholars have argued that concern with environmental quality is a post materialist value associated with a greater emphasis placed on quality of life issues typically correlated with increasing wealth (Inglehart 1995). From this perspective, although lower-income individuals may express general concern with environmental issues, when positioned as involving costs such as an economic tradeoff, environmental issues receive less support relative to other social and economic concerns.

> ... *the crunch comes when a difficult choice is needed between roads or trees, dams or endangered species, to burn fossil fuels that may lead to global warming or to remain non industrialized* (Ibid).

Brechin and Kempton, (1994) suggest that high levels of environmental concern also characterize residents of less developed nations, as evidenced by the proliferation of grassroots environmental organizations in these regions. They further provide empirical evidence that, while less likely to be willing to make economic tradeoffs, individuals in less wealthy nations expressed relatively more willingness than their wealthier counterparts to volunteer time to improve the environment.

As such, they argue that observed reluctance to pay for environmental protection by socio-economically disadvantaged individuals is due not to a lack of environmental values, but to the pecuniary bias inherent in the tradeoff measures (Brechin and Kempton 1994). Other work, at the national level, suggests that overall national affluence is more often negatively related to citizen concern for environmental quality (Dunlap and Mertig 1995).

> *...the outcome is dependent upon the particular measure used, with measurements of environmental concern positioned as environment-economic tradeoffs yielding less support from residents of lower nations* (Ibid).

2.5.2 Gender and Perception of the Environment

Local-level biodiversity is maintained through knowledge and know-how of both women and men. In effect, because of gender-based roles in rural livelihoods, women and men acquire and transmit different and complementary knowledge: they have knowledge about different things, and different knowledge about the same things; they organize knowledge in different ways, and transmit it by different means (Bassow, 1979). People's approaches to environmental issues may depend on their relationship with nature.

> *...both women and nature have been considered as subordinates entities by men throughout history, which conveys a close affiliation between them* (Wenz, 2001).

Throughout history men have looked at natural resources as commercial entities or income generating tools, while women have tended to see the environment as a resource supporting their basic needs. As an example, rural Indian women collect the dead branches which are cut by storm for Firewood to use rather than cutting the live trees (Rodda, 1993).

Since African, Asian, and Latin American women use the land to produce food for their family, they acquire the knowledge of the land/soil conditions, water, and other environmental features (Abzug, 1995). She also revealed that any changes in the environment on these areas, like deforestation, have the most effect on women of that area, and cause them to suffer until they can cope with these changes. One of the good examples would be the Nepali women whose grandmothers had to climb to the mountain to be able to bring in wood and fodder.

While cutting a forest for the income generated is something men would do, women are more likely to keep and protect a forest. On the other hand, men generally engage in firewood collection only on a larger scale and when it becomes profitable to do so (Zein-Elabdin, 1997). Their access to both more effective tools, such as axes and chain saws, as

well as to means of transport increases the number of trips possible as well as the harvest per trip. Moreover, higher firewood prices have been associated with men taking over this activity from women (*Ibid*).

Another study (CARE, 2001) conducted in the study area also reveals similar fact that

> *...firewood selling involves two categories of people. The first group sells firewood on a small scale mainly on a daily and weekly basis. They mainly sell the wood within Zeghe peninsula. This group is characterized by female-headed household, disabled, old aged, and with insufficient family labour. The second group involves full time Firewood traders who mainly export the wood to Bahir Dar on a daily and a weekly basis. Young men who have fairly active family labour characterize this group. Most of these people are school dropouts from high school with no other means of employment. This is the most destructive group in the wood cutting process.*

Gender-based commitments and movements such as feminism have reached to a new approach through the combination of feminism and environmentalism called Ecofeminism. Ecofeminists believe on the interconnection between the domination of women and nature. According to ecofeminism the superior power treats all subordinates the same. So, ecofeminism takes into account women subordination and nature degradation (Mellor, 1997). Remarking all these different reactions, one can see that however, most policy decision makers are men, but women have responded more sensitively and actively to environmental dilemmas and debates.

The deep connection between women and nature comes from the daily interaction between them. However, in the recent decades, environmental movements have increased as the movements for the women's rights have also increased (Mellor, 1997).Today's union of nature preservation with women's rights and liberation has stemmed from invasion of their rights in the past (Merchant, 1996).

In developing areas of the world, women are considered the primary users of natural resources (Land, forest, and water), because they are the ones who are responsible for gathering food, fuel, and fodder (Abzug, 1995). Although in these countries, women mostly can't have the land and farms ownership outright, they are the ones who spend most of their time working on the farms to feed the household. Shouldering this responsibility leads them to learn more about soil, plants, and trees and not misuse them.

Although, technological inputs increase male involvement with land, many of them leave the farm to go to cities to find jobs; so women will be responsible for an increasing portion of farm tasks (Jiggins, 1994).The same document revealed that besides considering how to achieve appropriate agricultural production and human nutrition, women want to secure access to the land; as a result, women's perspectives and values for the environment are somewhat different than men's. Women give greater priority to protection of and improving the capacity of nature, maintaining farming lands, and caring for nature and environment's future. Repeated studies have shown that women have a stake in environment, and this stake is reflected in the degree to which they care about natural resources. As consumers and producers, caretakers of their families and educators, women play an important role in promoting sustainable development through their concern for the quality and sustainability of life for present and future generations. However, due to discrimination, many women are unable to exercise their full potential in natural resource and environmental management, given their lack of training, status, land and property rights and capital.

2.5.3 Factors Influencing Perception of Environmental Issues

Certainly stakeholder perceptions should be of major concern to policymakers since decisions must be made with regard to policy priorities (Hunter 2004), where the local voice can shed light on the environmental implications of urbanization and development with most social impact. Studies of the people's dimensions of global environmental change encompasses investigation of the human causes of global environmental transformations, the consequences of such changes for societies and economies, and the ways in which people and institutions respond to the changes (Dunlap and Riley, 1992).

> *...it also involves the broader social, political, and economic processes and institutions that frame human interactions with the environment and influence human behavior and decisions* (Ibid).

Research using socio-economic and demographic variables to explain environmental perceptions have advanced our understanding of how people view, think about, and are aware of the natural environment (Samdahl and Robertson, 1989). However, some researchers point out that socio-economic and demographic variables alone are

insufficient in their explanatory capabilities (Samdahl and Robertson, 1989).Yet, it is important to identify every possible factor that result in variations among individual perceptions of environmental issues, since it plays vital role in proposing various conservation and development projects.

> *...development projects have been undertaken to address the complex issues of deforestation, environmental degradation and rural poverty*[4].

In the past, researchers in the field of environmental psychology have explained environmental perceptions primarily through socio-economic and demographic factors.

> *...traditionally, researchers in environmental perception have relied on socio-economic and demographic variables, such as age, education, income, political orientation, and occupation, to explain broad scale environmental perceptions such as attitudes, views, awareness, and concerns* (Buttell, 1987).

For example, in their summary of more than a decade of previous research, Van Liere and Dunlap (1980) found that age, education and political ideology are consistently associated with environmental concern. According to them, it is possible to conclude that younger, well-educated, and politically liberal persons tend to be more concerned about environmental quality than their older, less educated and politically conservative counterparts. Jones and Dunlap (1992) and Scott and Willets (1994) found the same results that young, highly educated, liberal-minded individuals demonstrate greater recognition of and concern for environmental problems. Other studies focusing on the role of socio-economic factors find evidence that younger age (Fransson and Garling, 1999; Honnold, 1981; Nord, Luloff, and Bridger, 1998) and higher levels of education (Guagano and Markee, 1995; Howell and Laska, 1992; Raudsepp, 2001) are significant drivers of environmental attitudes and concern.

[4] http://www.fao.org/docrep/005/y9882e/y9882e04.htm

Although not as pronounced as other socio-economic factors, income is another variable shown to explain environmental perceptions and attitudes (Fransson and Garling, 1999; Van Liere and Dunlap, 1980). For example, Scott and Willets (1994) found that respondents with higher income levels were more likely to demonstrate environmental concerns.

Gender is also a variable that receives consistent attention by environmental psychology researchers. Raudsepp (2001) found that women were significantly more likely than men to be concerned with environmental problems. Most research finds slight evidence that women are more environmentally concerned (Jones and Dunlap, 1992) or possess stronger environmental attitudes than men (Foster and McBeth, 1994). However, as acknowledged by Van Liere and Dunlap (1980), gender does not appear to be as significant a predictor of environmental concerns or attitudes as other socio-economic and demographic variables.

As stated by Van Liere and Dunlap (1980) in reference to years of research on the topic, the foregoing review indicates that researchers have had limited success in explaining the social bases of environmental concern. In a review of the socio-economic and demographic correlates of environmentalism, Cantrill and Senecah (2001) concluded, contradictory findings such as these indicate that perceptual processes beyond the explaining influences of socio-economic and demographic factors may drive perceptions of the environment.

CHAPTER THREE

Research Design and Methodology

3.1 Brief Description of the study area

Zeghe peninsula is located in Amhara Regional State, Western Gojam Zone, Bahir Dar Zuria Woreda (See Annex I). The peninsula comprises two kebele administrations; ***Ura*** and ***Mehal Zeghe Yiganda***. The peninsula extends into the southwest corner of Lake Tana of which three-fourth of the peninsula is surrounded by the lake and one-third of the peninsula is extended in land, 32 km away from Bahir Dar by land or 15km away when navigating on the Lake (BoPED, 2001).Out of the total area of 1304.31 hectares, 1241.91 hectare is believed to be covered by agro forest (Coffee and Forest) and 62.4 hectares is covered by planted trees (AREPLUAA, 2004).

A homogeneous population in terms of religion (Orthodox) and ethnicity (Amhara) occupies Zeghe peninsula. The peninsula has a high concentration of religious people. The six monasteries that date back to thirteenth-century with their great wealth of antiquities attract many tourists to Zeghe peninsula (CARE Ethiopia, 2001). The Orthodox Church of Ethiopia is the custodian and the leader of the community values and traditions. The same document revealed that the church has played a very prominent role in preserving the forests in Zeghie peninsula for many years. The major objective has been to retain the wholesomeness of the environment within the peninsula. This has been achieved by means of promoting coffee production and restricting livestock rearing (thereby reducing the need to clear forests for pasture development). Indeed, the forests in Zeghie peninsula have been managed by natural regeneration for many centuries.

According to CARE Ethiopia baseline survey report (2001), the natural vegetation on Zeghie peninsula is a savannah forest, made up of more than 40 different species of indigenous trees, like Cordia africana (*Wanza*), Olea capensis (*Woyra*), Podocarpus gracillior (*Zigba*), etc.

3.2 Sources of Data

This study used primary data (both quantitative and qualitative) that are obtained from survey questionnaires, focus group discussions, key informants and observations. It also used secondary data sources obtained from the situation analysis on the forest cover of the peninsula, conducted by the Amhara Regional state Environmental Protection and Land Use Administration Authority (AREPLUAA, 2004); and CARE Ethiopia baseline survey (2001) in order to understand and describe socio-economic and demographic characteristics of the population of the study area in addition to various books, journals and research reports used to get related literature.

3.3 Sampling Techniques

The peninsula is composed of two Kebele administrations mentioned above and fifteen villages. A multi stage stratified purposive sampling was employed to get the respondents. According to the situation analysis of the peninsula conducted by AREPLUAA by the year 2004, the number of female headed households in both Kebele administratives is 655 (*See Annex II*). A sample of 189 (44 percent) out of a total of 290 female headed households and 237 (56 percent) out of a total of 365 female headed households were taken from Ura, and Mehal Zeghe Yiganda Kebele administratives respectively.

According to Dixon and Leach (1978),

$n = (Z\alpha/_2)^2 (p*q)*1/e^2 + C$, Where C is the contingency, taken as 11percent for this study.

$n = 1/e^2*(Z\alpha/_2)^2 *p (1-p) + C$, $q=1-p$

Where n is the sample size, p is an estimate of the rural women proportion who perceive deforestation, and $q=1-p$

The proportion P is taken as 0.5, meaning that 50 percent of the female headed households are assumed to perceive deforestation, Z is the standard normal value corresponding to the desired level of confidence and e is the maximum acceptable error margin.

And statistically, if the proportion of target population with a certain characteristics is 0.5, the corresponding Z-statistic is 1.96 and we desire at 0.05 error margin.

$n= 1/ (0.05)^2 * (1.96)^2 * (0.5) *(0.5) + 11$percent contingency

n = 426

3.4 Data processing and Analysis

3.4.1 Variable Identification

The independent variables (demographic and socio-economic) that influence the dependent variable (perception of deforestation) include age, household size, literacy status, size of farmland and contact with conservation agents. Data on the independent variables was collected using the survey questionnaire from individual illegible woman.

The dependent variable; perception of deforestation was measured using the responses given by the individual respondent in part IV of the survey questionnaire. These questions were used to measure individual respondent's knowledge and attitude on: change in forest cover, level of severity of deforestation, causes of deforestation, main deforesters, consequences of deforestation, and possible solutions of the problem that they think. These questions were ranked out of 32, the mean mark was found to be 18 and standard deviation to be 6. For this study, the cut point of level of perception is set to be 24 (X (mean) + 1D (standard deviation)) i.e. 75 percent of the responses given are correct. Based on this, if a woman answers 75 percent and above of the questions which indicate their perception of deforestation, then she is regarded as having 'high' perception of deforestation and if she scores below 75 percent, she will be regarded as having 'low' perception of deforestation.

3.4.2 Data Entry, Cleaning and Editing

After getting the collected data, it has undergone through manual editing and then cleaned using Statistical package for social scientists software in order to check the proper entrance and logical consistency of all the data collected.

3.4.3 Method of Data Analysis

In order to test the stated study hypotheses and attain its objectives, selected methods of data analysis were employed accordingly. First, brief description of the background characteristics of the respondents was presented using descriptive statistics, among which, their demographic characterstics: age, family size; and socio-economic characterstics: literacy status, size of farmland and Contact with conservation agents are presented in number and percentages.

The presence or absence of relation/ association between each independent variable mentioned above with the dependent variable is shown using the bivariate analysis. In addition, the percentage variations among perception of rural women on deforestation were displayed using the cross tabulation. Finally, the strength and direction of the relative influence of each of the independent variables on the dependent variable are shown using the multivariate analysis.

CHAPTER FOUR

Background Characterstics of the Respondents

Under this chapter the demographic and socio-economic characterstics of the respondents that one way or another influence perception of rural women on deforestation will be presented. The study considers only female headed households from both kebeles: Ura and Mehal Zeghe Yiganda. Therefore, the background characterstics of the respondents: age, household size, literacy status, size of farmland, contact with conservation agents are described below.

4.1 Demographic Characterstics of the Respondents

Age

Age is one of the factors that influence perception of rural women on deforestation. Table 4.1 below presents age group distribution of the respondents in broader age groups. As it is indicated in the table, a considerable number of the respondents (45.5 percent) belong to the 24-33 age groups. Secondly, 20.7 percent of them are found in the age category of 34-43. And the remaining respondents are found to be older than 44. From Table 4.1, one can infer that most of the respondents are women younger than 44 years.

Table 4.1 Age distribution of the respondents in broader age groups

Age	Number	Percent
24-33	194	45.5
34-43	88	20.7
44-53	48	11.3
54-63	59	13.8
64+	37	8.7
Total	**426**	**100.0**

Source: Own Survey, 2007

Household size

The number of persons living in a household is another demographic variable considered in this study to influence rural women's perception on deforestation. As indicated in Table 4.2, most of the respondents (57.0 percent) have a household size of 1-4 persons. Respondents with household size of 5-8 persons account for the remaining 43.0 percent of the total respondents.

Table 4.2 Household size of the respondents

Household Size	Number	Percent
1-4	243	57.0
5-8	183	43.0
Total	**426**	**100.0**

Source: Own Survey, 2007

4.2 Socio-economic Characterstics of the Respondents

Literacy Status

Literacy Status is one of the socio-economic factors that influence the perception that women could have on deforestation. Table 4.3 illustrates that almost half of the respondents were found to be illiterate. And the remaining 50 percent of the respondents can at least read and write. Women who have attained their primary education account for 23.5 percent of the sample population.

The least percentage is observed to be of those who have attained secondary education. This may be the result of different socio-economic and cultural constraints, like early marriage and poverty for a girl not to join secondary education, since they have to go to the nearby town (Bahir Dar) for secondary education.

Table 4.3 Literacy Status of the respondents

Literacy Status	Number	Percent
illiterate	213	50.0
can read and write	57	13.4
primary	100	23.5
secondary	56	13.1
Total	**426**	**100.0**

Source: Own Survey, 2007

Size of Farmland

The farmland they own is mostly used for Coffee production. Table 4.4 describes that relatively higher percentage of the respondents (41.5 percent) own 2.04-4 timad of farmland. It can also be seen that only 10.3 percent of the respondents own relatively higher timad of land (above 4).

Table 4.4 Farmland Size of the respondent's household

Farmland Size (in timad[1])	Number	Percent
<0.4	74	17.4
0.4-2	131	30.8
2.04-4	177	41.5
>4	44	10.3
Total	**426**	**100.0**

Source: Own Survey, 2007

[1] **1 timad is equal to 0.25 hectares**

Contact with Conservation Agents

As Table 4.5 indicates, among the surveyed female headed households, only 35percent of them have contact with conservation agents. On the other hand, majority of the households have no contact with conservation agents.

Table 4.5 Respondent's Contact with Conservation Agents

Contact with Conservation Agents	Number	Percent
Has no contact	277	65.0
Has contact	149	35.0
Total	**426**	**100.0**

Source: Own Survey, 2007

CHAPTER FIVE

Factors Influencing Rural Women's Perception of Deforestation

Under this section of the study, the results of the bivariate and multivariate analyses will be presented. These methods of analyzing data are employed because: the bivariate analysis indicates whether there exists a relationship between the dependent, perception and a set of explanatory variables or not. For this reason, chi-square test is employed to indicate whether there exists an association between the dependent variable and each of the independent variables.

The independent variables both demographic and socio-economic include age, household size, literacy status, size of farmland and contact with conservation agents. Data on the independent variables was collected using the survey questionnaire from individual illegible households. The dependent variable; perception was measured using the responses given by the individual respondent in part IV of the survey questionnaire as explained in the methodology part of the study.

5.1 Bivariate Analysis Results of factors influencing Rural Women's Perception of Deforestation

Table 5.1 below summarizes the result of chi-square test of the demographic and Socio-economic Characteristics of the respondents, Zeghe Peninsula, 2007. As can be seen from this table, of the total 426 women, 132 (31 percent) are found to have high perception of deforestation while the rest 294 (69 percent) have low perceptions of deforestation.

Table.5.1. Results of Bivariate Analysis for Demographic and Socio-Economic Factors Influencing Rural Women's Perception of Deforestation.

Background Characterstics	Level of perception				N (percent)	x^2	df
	Low		High				
	Number	Percent	Number	Percent			
Age							
<34	98	50.5	96	49.5	194(*45.5*)	57.0***	1
≥34	196	84.5	36	15.5	232(*54.5*)		
Total	*294*	*69.0*	*132*	*31.0*	426		
Household Size							
≤4	150	61.7	93	38.3	243(*57*)	14.0***	1
>4	144	78.7	39	21.3	183(*43*)		
Total	*294*	*69.0*	*132*	*31.0*	426		
Literacy Status							
illiterate	211	99.1	2	0.9	213(*50*)	179.8***	1
literate	83	39.0	130	61.0	213(*50*)		
Total	*294*	*69.0*	*132*	*31.0*	426		
Size of farmland (in timad)							
<0.4	45	60.8	29	39.2	74(*17.4*)	91.4***	1
0.4-2	54	41.2	77	58.8	131(*30.8*)		
2.04-4	151	85.3	26	14.7	177(*41.5*)		
>4	44	100.0	0	0.0	44(*10.3*)		
Total	*294*	*69.0*	*132*	*31.0*	426		
Contact with conservation agents							
has no contact	277	100.0	0	0.0	277(*65*)	355.6***	1
has contact	17	11.4	132	88.6	149(*35*)		
Total	*294*	*69.0*	*132*	*31.0*	426		

Source: own survey, 2007

*-P value<0.05, **-P value <0.01, ***-P value <0.001

As it can easily be inferred from the above table, the results of the bivariate analysis indicate that the explanatory variables: ages, household size, Literacy status, size of farmland and contact with conservation agents have an association or relation with the dependent variable; perception.

5.1.1 Demographic Factors Influencing Rural Women's Perception of Deforestation

Age

Among respondents who are younger than 34, 50.5 percent of them have low and the remaining 45.5 percent have high perception of deforestation. And for those older than age of 34, 84.5 percent of them have low perception while 15.5 percent of them have high perception. This indicates that age of a woman and her perception of deforestation have an association (x^2=57.0, P<0.001 and df=1).

Household Size

Regarding household size, 61.7 percent of women with household size of 4 and below have low perception while 38.3 percent of women with the same household size have high perception of deforestation. For respondents who have household size above 4, 78.7 percent of them have low perception and 21.3 percent have high perception, showing that there exists a relation ship between household size and perception of deforestation of women (x^2=14.0, P<0.001 and df=1).

5.1.2 Socio-Economic Factors Influencing Rural Women's Perception of Deforestation

Literacy Status

With regard to literacy status illiterate women with low perception of deforestation constitute 99.1 percent and the remaining 0.9 percent have high perception. Literate women with low perception constitute 39.0 percent and the remaining 61.0 percent have

high perception. The existence of an association between literacy status of a woman and her perception of deforestation is indicated by the result of the bivariate analysis (x^2=179.8, P<0.001 and df=1).

Farmland Size

60.8 percent and 39.2 percent of women who own a size of farmland which is less than 0.4 timad have low and high perception of deforestation respectively. Among women who own 0.4-2 timad of size of farmland, 41.2percent have low perception and 58.8 percent of them high perception. 85.3 percent and 14.7 percent of women have low and high perceptions respectively; among women who own a farmland size of 2.04-4 timads. In the category of women with ownership of 4.04 timad and above, all of them (100 percent) of them have low perception. This association between size of farmland and perception of women on deforestation is indicated in the result of the chi-square test (x^2=91.4, P<0.001 and df=1).

Contact with Conservation Agents

With regard to the last explanatory variable that is contact with conservation agents, all women who have no contact with the conservation agents, have low perception of deforestation, while among those who have contact with conservation agents, 11.4 percent of them have low perception and 88.6 percent have high perception. This association is well explained by the bivariate analysis result (x^2=355.6, P<0.001 and df=1).

5.2 Multivariate Analysis Results of factors influencing Rural Women's Perception of Deforestation

Table5.2. below describes results of multivariate analysis for demographic and socio-economic factors influencing perception of rural women on deforestation. The result of multivariate analysis is used to indicate the strength, relative influence and nature of association of the explanatory variables with the dependent variable.

Table.5.2. Results of Multivariate Analysis for Demographic and Socioeconomic Factors Influencing Rural Women's Perception of Deforestation.

Background Characterstics	B	S.E.	df	Sig.	Exp(B)
Age					
<34(RC)	0.000	.392	1	.211	1.000
>=34	0.491				1.634
Household Size					
<=4(RC)	0.000	.330	1	.819	1.000
>4	-0.076				0.927
Literacy Status					
Illiterate	-5.183	.788	1	.000	0.006***
Literate(RC)	0.000				1.000
Size of farm land (in timad)					
<=2	1.561	.310	1	.000	4.764***
>2(RC)	0.000				1.000

Source: own survey, 2007

*-significant at p<0.05, **-significant at P<0.01, ***-significant at P<0.001

B-regression coefficient **RC**-reference category

S.E- standard error **df**-degree of freedom

Among the independent variables, contact with conservation agents is not entered in to the model due to its multicollinearity effect with the rest of the independent variables (See Annex III). It is easy to understand how significant contact with conservation agents can influence the level of perception of deforestation that a woman could have from the results of the bivariate analysis indicated in Table5.1. The reason behind is straight forward those who have contact with conservation agents perceive deforestation higher than those who don't.

5.2.1 Demographic Factors Influencing Rural Women's Perception of Deforestation

Age

As Table 5.2 above shows that age of a woman doesn't significantly influence her perception of deforestation (df=1, Exp (B) =1.634 and p= 0.211, which is greater than 0.005). That is for this particular study, the association between age of a woman and her perception of deforestation is not statistically pronounced.

This may be due to the fact that younger women are more likely to be educated, and as it could easily be anticipated, educated women perceive deforestation. In addition, a woman being educated and young may motivate her to have access as well as initiative of contacting conservation workers, and get knowledge and concern of environmental problems like deforestation.

But this doesn't mean that older women do not perceive deforestation. Since as time goes; they can recognize the change in forest coverage and the effects that are exhibited as a result of it. As mentioned by most participants of the FGD held with a group older of women, they said:

> *"... even when we go to the market places some seven years ago, we hardly see the sky, and feel the sun, since the forest was very dense. But now a days, people, especially young men cut trees to get income for their family and the forest becomes scarce".*

They also said that the weather of the peninsula was not like the current one, which they mentioned is 'sunny'. And some of them concluded that this is the curse of God, since the community was ordered not to rear live stocks and harvest the land; but due to the poverty situation, they said, some people started to break those orders given by religious leaders.

Other participants also mentioned the result of technological advancements, like electricity supply for one of the monasteries, Ura Kidanemihret which of course has large number of foreign and local tourist visitors, has a negative effect on the forest coverage; because trees were cut in order to protect the electric wires from tree branches, which will cut them during wind and open a road to the monastery.

Older women also complain on the disappearance of some types of trees, which specially were used for medicine, when leaves and barks are smoked. They also mentioned the decrement in coffee production which resulted them to lead miserable life, which, they said 'is the result of loss of trees that were sheds for the coffee plant.'
But on the FGD held with older men, they were defending the tree cutters by saying:

> *"...men cut trees that inhibit the coffee productivity; and they select those trees that have natural regeneration power. They do not cut trees under risk of disappearing...."*

A study conducted by Maru, 2004, having majority of male headed household respondents revealed that only 3 percent of the respondents forwarded cutting of shed trees as the reason for low coffee productivity.

This shows that, even though men couldn't deny the decrement in forest coverage, they don't agree on the severity of the problems resulted by deforestation. The explanation given for the decrement in coffee production by them was that, 'it is the curse of God.' And they strongly argue that cutting trees is the only way out of poverty, unless and other wise governmental or non governmental organizations could do something, like monetary aids. Studies focusing on the role of socio-economic factors find evidence that younger age (Fransson and Garling, 1999; Honnold, 1981; Nord, Luloff, and Bridger, 1998) are significant drivers of environmental attitudes and concern.

Therefore in general, it is hardly possible to conclude respondents of different age groups should have a significant variation in perception of deforestation. The explanations given by different age group of women may vary due to their sociocultural attachments, like education, religiosity e.t.c. Younger women are more likely to explain their perception of deforestation than the older ones, keeping in mind that older women are more close to nature and have indigenous knowledge. As the result of the above multivariate analysis therefore, hypothesis number 1 shall be rejected.

Household Size

Similarly, size of the household of woman is found not to significantly influence the woman's perception of deforestation, as Table5.2 indicates; this insignificance is expressed by the results presented in Table5.2 (df=1, Exp (B) =0.927 and p= 0.819 which is greater than 0.005).

The first possible explanations for this could be, the subjects of this study, being female headed households, who are responsible for household decision making, might lead not to follow and agree with attitudes and perceptions of deforestation of the rest of their family members, who are under them.

The second reason may be, nearly half of them younger than 34 (45.5 percent) and only few of them married (9.6 percent) during the time of the survey, are more likely to have smaller household size. And the possible age composition of the household members to be in the childhood, who may not properly perceive deforestation, they won't have the power to influence perception of the household head.

The third possible explanation may be even if women have younger or educated household members, they most likely migrate to the near by town to work for a living and if the family can afford, to attend their secondary and higher education. As a result, the demographic and socio-economic factors of individual household members may affect the perception that a woman would have on deforestation.

5.2.2 Socio-Economic Factors Influencing Rural Women's Perception of Deforestation

Literacy Status

The result of multivariate analysis as indicated in Table 5.2 above shows, education significantly influences perception of a woman on deforestation (df=1, Exp(B)=0.006 and p=0.000) at p value less than 0.001. The result implies, illiterate women are 94 percent less likely to perceive deforestation than the literate ones.

Different studies also have shown the same result, for example, in their summary of more than a decade of previous research, Van Liere and Dunlap (1980) education is consistently associated with environmental concern. According to them, it is possible to conclude that well-educated persons tend to be more concerned about environmental quality than less educated counterparts. Jones and Dunlap (1992) and Scott and Willets (1994) found the same results that highly educated individuals demonstrate greater recognition of and concern for environmental problems. Other studies focusing on the role of socio-economic factors find evidence that higher levels of education (Guagano and Markee, 1995; Howell and Laska, 1992; Raudsepp, 2001) are significant drivers of environmental attitudes and concern. There fore, Hypothesis number 2 is accepted.

Farmland Size

The result of the multivariate analysis also asserts that women's perception of deforestation is significantly influenced by the size of farmland that they own (df=1, Exp(B)=4.76 and p=0.000) at p value less than 0.001. The analysis reveals that, Women with farmland size 2 timads and below are nearly five times more likely to perceive deforestation than those who own above 2 timads.

This is because it is the poor have closer relation with nature, since they heavily depend on the natural capital for their subsistence. Different studies also have shown that rural

populations in poor countries pay the highest price for environmental degradation, as their livelihoods depend on the goods and services ecosystems (Koziell and McNeil, 2002).

The poor often depend directly on a wide range of natural resources and ecosystem services for their livelihoods (DFID, 2002). Women with smaller farmland size highly perceive environmental problems like deforestation because the work burden and the time they spent will get worse as they face the scarcity of the natural resources. Probably no other group is more affected by environmental destruction than low village women (CSE 1985). Every dawn brings with it a long march in search of fuel, fodder and water. It does not matter if the women are old, young or pregnant: crucial household needs have to be met day after weary day, every time longer and more tiresome (Ibid).

Participants of the FGD, women of different ages and an II made with one of the environmental protection workers, also goes in line with the above literatures that: some of the participants said that:

> *"...those who own larger size of farmlands, have many tree sheds for the coffee plant so they sell trees which are not serving as sheds and which inhibit the growth and productivity of the coffee plant..."*

But those who own smaller farmland size are less likely to sell the trees since it will have a double effect: losing the trees, that in turn affects the coffee productivity. But if the worst comes they will sell the trees for tree cutters. These tree cutters only focus on getting the tree parts and when they do so, as a result, the coffee plants get damaged, which is another loss.

An environment protection worker said:

> *"...even though cutting trees is prohibited by the government, some Firewood sellers are still cutting the trees and transporting to Bahir Dar town by papyrus boats. These men, defend themselves by saying that, 'the trees they cut have natural regeneration power' which of course might be true but not considering the time the trees need to regenerate and become sheds..."*

He also added:

> *"...households which face extreme poverty situations, most of them female headed ones ask us for permissions to sell. After considering the different socio-economic back ground of that household, and the situation of the trees that they want to sell, we sometimes give them permissions..."*

So, for this study, women with smaller farmland size are found to more likely to perceive deforestation and its effects than those who own larger farmland sizes. As a result, Hypothesis number 3 is accepted.

CHAPTER SIX

Conclusions and Recommendations

6.1 Conclusions

Zeghe peninsula being unique in physical environment, with natural vegetation which is savannah forest and has a homogeneous composition of religion and ethnicity is one of the tourist attracting places in Ethiopia. The Orthodox Church of Ethiopia has played a very prominent role in preserving the forests in Zeghie peninsula for many years. The major objective has been to retain the respectability of the environment within the peninsula. This has been achieved by means of promoting coffee production and restricting livestock rearing and harvesting (thereby reducing the need to clear forests). Indeed, the forests in the peninsula have been managed by natural regeneration for many centuries.

Due to the deep rooted poverty situation, people living on the peninsula are over exploiting the existing forest resources, which has a negative impact on both the fauna and flora of the area, including Lake Tana ecology. As a result of this, especially women of the peninsula are becoming victims of the existing abject poverty.

Findings of this study revealed that women do perceive deforestation, its consequences and the possible solutions to get rid of the existing problems, since they are the one who are suffering a lot as a result of deforestation. Among the anticipated socio-economic variables, literacy status and size of farmland that she owns significantly influenced women's perception of deforestation, while the influence due to the demographic variables; age and household size, is not as significant as that of the socio-economic ones. Therefore except the first, two of the hypotheses of the study are accepted.

As participants of the FGD and II mentioned, poverty is the main driving force of deforestation. They said that they cut trees and sell for survival. And they said they need support from GOs and NGOs in order to stop deforestation. They strongly claimed that

they won't die as long as trees are their way out, even if not for the long term. Women of the peninsula sell the tree for survival knowing that it will affect the coffee production and the over all ecosystem and climate of the peninsula. Whereas men cut trees, transport it to Bahir Dar and sell it.

Tackling environmental degradation is an integral part of effective and lasting poverty reduction, local attitudes and perceptions, whether narrow or broad in scope, play a significant role in shaping the atmosphere on which environmental struggles are resolved. Therefore understanding how people consider environmental issues and applying the solutions originated from the base of their indigenous knowledge may be of particular value in policy formulations with regard to development issues. Such participatory planning procedures which allow different social groups to speak out their concerns, and which can work through conflicts as they arise, are therefore a necessary basis for environmental innervations.

In recognition of the important role women play in all spheres of society, the Ethiopian government has formulated a policy to ensure women's full integration in the development processes. The policy document emphasizes this in the statement:

> *"Women constitute a larger group of the labour force in various economic sectors; therefore economic development is unthinkable without the participation of women".*

The policy is also a recognition that gender issues do not only concern women but society as a whole and that women's problems and constraints cannot be solved by women alone but by the coordinated effort of the society, the government and women. The national policy on women is intended to be implemented by all development agencies, government departments, NGOs, Community based organizations as well as private organizations. Therefore, Development and conservation planners must not overlook important aspects related to women's activities and roles in society.

6.2 Recommendations

Once local people's perception and the factors that influence their perception are identified, plans and strategies shall be developed based on the full participation of the people. On the basis of the findings, the following recommendations can be forwarded:

- The homogeneity of the society especially in terms of religion is an indication of their respect for the religious people. Therefore it is important to involve religious leaders and elders in conservation plans and actions of the forest resources of the peninsula.

- Since education in this study is found to be the major influencing factor, it is a must to include environmental education in the curriculum, so that young people will be well aware of the problem and its solutions, and transfer their knowledge to their family members. Here the girl's enrollment should also be given due consideration, since teaching a girl is teaching the family and the community at large.

- In the existing situation, women are largely excluded from training and extension programmes, ignoring that they possess a wide range of knowledge about the use and conservation of natural resources. Therefore it should be noted that a lot has to be done to provide women with equal opportunities in development activities with men.

- Since poverty is the reason the respondents gave as the driving force for deforestation, it is important to provide the society with an alternative means of livelihood. For instance, providing the society with modern fishing materials, since Lake Tana has a huge fish potential, giving trainings on how to fish with out hurting the Lake's ecosystem, and some marketing ideas in order to provide fish in large scales. It is also possible to make women part of such alternatives by training them how to make fishing materials like net and provide for fishermen.

- Firewood selling, being the major activity performed specially by young men, has negative impacts on physical damage of coffee plants, loss in the overall biodiversity of the peninsula and its beauty that has a vital role in the ecotourism sector. These men should therefore be provided with alternative means of survival, trainings on the forest managements so that they could at least be selective while cutting trees and replace at least two or more trees whenever they cut one, and identify the indigenous ones and gradually stop cutting trees.

- Expertise should also work towards the improvement of coffee production through different ways like irrigation, by solving the problems that could be faced due to the location of the peninsula than waiting for the rain water.

- Another problem of the community, mentioned by the FGD and II participants was the monkey population, which is increasing from time to time and lowering the vegetables and fruit productions of the peninsula that was a recent practice to support their means of survival. Effective and long lasting solutions in minimizing this monkey population should be part of plans in improving the lives of the community.

- Zeghe peninsula, having a variety of tree species, and Lake Tana in the nearby, also suitable for beekeeping. Therefore training interested people in modern beekeeping may also be one means of livelihood, than cutting and selling trees.

- Last but not least, although it is certain that socio-economic and demographic variables play an important role in shaping attitudes toward the environment, it is also clear that other factors such as the influences due to location, and other sociocultural activities must also be studied in order to more fully understand what shapes environmental perceptions, attitudes, and concerns.

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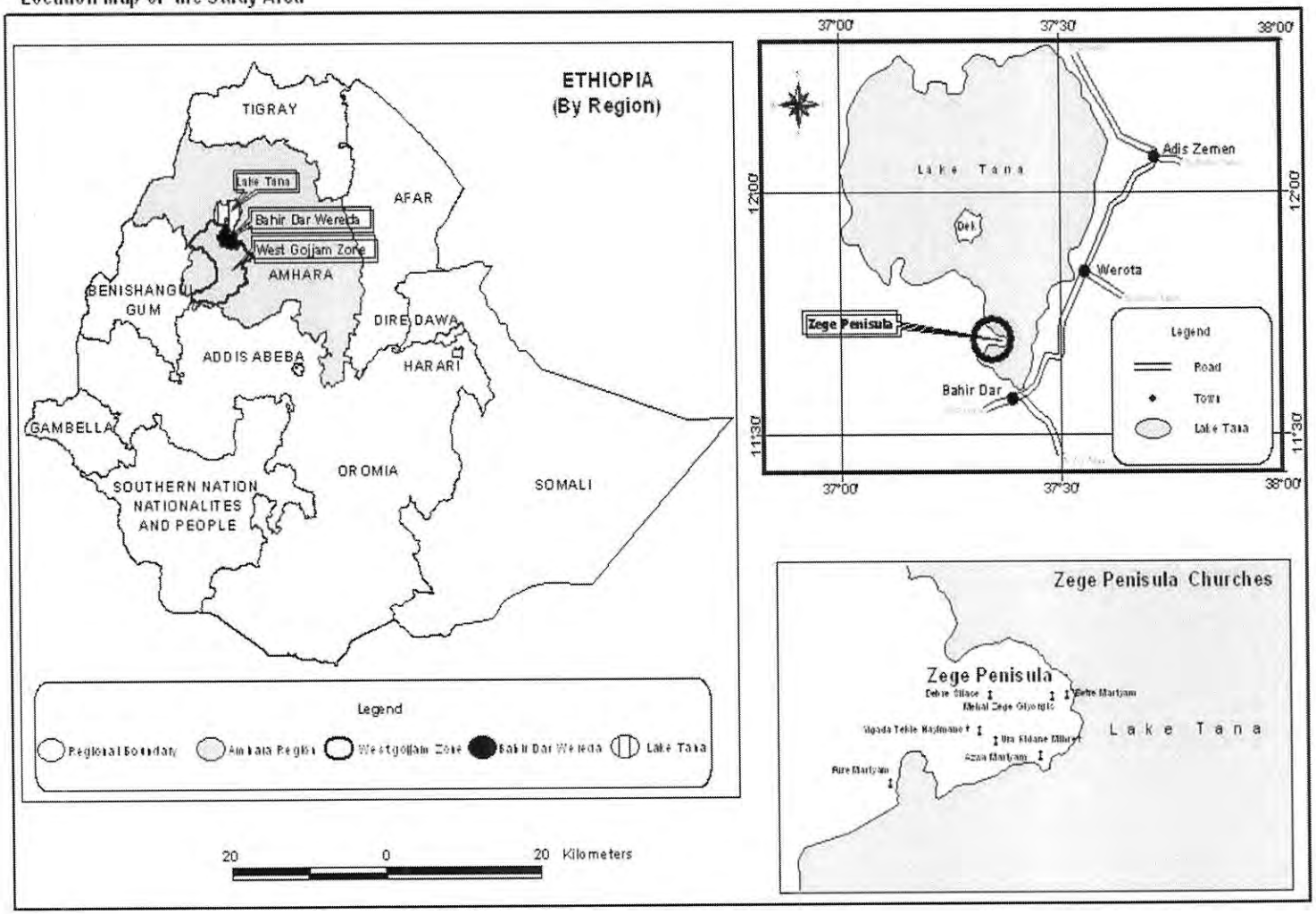
Location Map of the Study Area



Annex II: Number of Female Headed Households in Ura and Mehal Zeghe Yiganda Kebeles.

Name of Kebele	No.	Name of the Village	Number of female headed households	Samples Taken
URA	1	Broramie	36	23
	2	Mekelamie	33	21
	3	Sar Wodeb	25	16
	4	Washa	46	30
	5	Ura	60	39
	6	Gami	62	40
	7	Gubi/ Attati	28	18
	Sub Total		***290***	***189***
MEHAL ZEGHE YIGANDA	8	Sar Wodeb	44	29
	9	Debirdesh	37	24
	10	Agerbet	43	28
	11	Mehal Zeghie	47	31
	12	Yiganda 1	61	40
	13	Yiganda 2	32	21
	14	Kamgedel	46	30
	15	Kokel	55	36
	Sub Total		***365***	***237***
	Total		**655**	**426**

Source: AREPLUAA.2004

Annex III: Correlation Matrix

The cut point is taken to be 0.64

Correlation Matrix

	Constant	Age	Household size	Literacy Status	Size of farmland	Contact with conservation agents
Constant	1.000	0.000	0.000	0.000	0.000	-0.514
Age	0.000	1.000	-0.175	0.000	0.053	0.000
Household size	0.000	-0.175	1.000	0.000	0.054	0.000
Literacy Status	0.000	0.000	0.000	1.000	0.000	-0.858
Size of farmland	0.000	0.053	0.054	0.000	1.000	0.000
Contact with conservation agents	-0.514	0.000	0.000	-0.858	0.000	1.000

Appendix I: Survey Questionnaire for Household Survey

Code No. _____

Purpose

The principal objective of this questionnaire is to identify the demographic and socio-economic factors that influence the perception of rural women on deforestation in Zeghe Peninsula, West Gojam Zone. The study is conveyed for academic purpose. Hence the responses from respondents are confidential and cannot be traced to the persons who provided them.

Thank you for your cooperation in advance

Name: _____
Enumerator's Code _____
Kebele No. / Name _____
Name of the village _____
Time of interview_____

Controlling table

Interview Result

No	Situation	
1	Completed	
2	Partially completed	
3	Not completed	
4	Date of appointment	

Reasons for not completed/ partially completed questionnaire

a) Not willing
b) Vacant
c) Other (specify) _____

Enumerator's Name _____
Signature _____
Date _____

Supervisor's Name_____
Signature _____
Date _____

Part I. Demographic and Socio-economic Characteristics of the Household.

NO	101 Name (optional)	102 Relation with head	103 Sex	104 Age	105 Marital Status	106 Two main means of livelihood		107 Educational Status	108 Economically Active	109 Have Special Skill training
						106.1 First	106.2 Second			
		1.spouse 2. child 3. relative 4.dependent, hired	1. MALE 2. FEMALE		1.Single 2.married 3.divorced 4.widowed 5.separated	1.farmer 2.herder 3.housewife 4.daily labourer 5.weaving 6.pottery 7.student 8.carpenter 9.trader 10.selling firewood 11.grow vegetable and fruit 12. fishery 13. bee hiving 14.other _____	1.farmer 2.herder 3.housewife 4.daily labourer 5.weaving 6.pottery 7.student 8.carpenter 9.trader 10.selling firewood 11.grow vegetable and fruit 12. fishery 13. bee hiving 14.other _____	1.illitrate 2.read andwrite 3.primary Secondary 4.tertiary 5.special training	1.yes 2.no	1.yes 2.no

Part II. Household Resources and Means of Livelihood.

201. What is the major means of livelihood of the household? (Multiple responses are possible)

	Yes	No
201.1. Farming	1	2
201.2. Herding	1	2
201.3. Daily labourer	1	2
201.4. Weaving	1	2
201.5. Pottery	1	2
201.6. Carpenter	1	2
201.7. Trading	1	2
201.8. Selling firewood	1	2
201.9. Grow vegetable and fruit	1	2
201.10. Fishery	1	2
201.11. Bee Hiving	1	2
201.12. other (specify) _____)		

202. Who is involved in agricultural activities in your household? (Multiple responses are possible)

	Yes	No
202.1. Head	1	2
202.2. Spouse	1	2
202.3. Sons	1	2
202.4. Daughters	1	2
202.5. All	1	2
202.6. other (specify) _____)		

203. Does your household have supplementary income? (1. Yes 2. no)

204. If the answer for Q#303 is yes, what is the major source? (Multiple responses are possible)

	Yes	No
204.1. Farming	1	2
204.2. Herding	1	2
204.3. Daily labourer	1	2
204.4. Weaving	1	2
204.5. Pottery	1	2
204.6. Carpenter	1	2
204.7. Trading	1	2
204.8. Selling firewood	1	2
204.9. Grow vegetable and fruit	1	2
204.10. Fishery	1	2
204.11. Bee Hiving	1	2
204.12. other (specify) _____)		

205. Who is more involved in supplementary income activities? (Multiple responses are possible)

	Yes	No
205.1. Head	1	2
205.2. Spouse	1	2
205.3. Sons	1	2
205.4. Daughters	1	2
205.5. All	1	2
205.6. other (specify) _____)		

206. Do you have your own land? (1. Yes 2. no)

207. If the answer for Q#206 is yes, what is the total size of your land?
(In timad)_____

208. If the answer for Q#206 is yes, for what purpose have you used your land? (Multiple responses are possible)

	Yes	No
208. 1. Growing Vegetable and fruits	1	2
208. 2. Cropland	1	2
208. 3. Grazing land	1	2
208. 4. Fallow land	1	2
208. 5. Woodlot	1	2
208. 6. Renting the land	1	2
208. 7.Other (specify) _____		

209. Do you have your own livestock? (1.yes 2.no)

210. If the answer for Q#209 is yes, (Multiple responses are possible)

	Yes	No	How many?
210. 1. Ox	1	2	210.1.1 _____
210. 2. Cow	1	2	210.2.2_____
210. 3. Donkey	1	2	210.3.3_____
210. 4. Horse/Mule	1	2	210.4.4_____
210. 5. Goat/Sheep	1	2	210.5.5_____
210.6. Chicken	1	2	210.6.6 _____
210.7. Bee Hive	1	2	210.7.7 _____
210. 8. Other (specify) _____			210.8.8_____

Part III. Information about Forest resources

301. Are there forest resources around your village? (1. Yes 2. No)

302. Do you have easy access to forest resources? (1. Yes 2. no)

303. If the answer for Q#302 is no, why not? *(Multiple responses are possible)*

	Yes	No
303.1. Reserved Forest	1	2
303.2. Distance	1	2
303.3. Land form	1	2
303.4. Wild beasts	1	2

303.5. Other (specify) _____

304. For what purpose do you mainly use the forest resource? *(Multiple responses are possible)*

	Yes	No
304. 1. Fuel wood (local use)	1	2
304. 2. Food	1	2
304. 3. Fodder	1	2
304. 4. Source of income	1	2
304. 5. Medicine	1	2
304. 6.House construction	1	2

304. 7. Other (specify) _____

305. If the answer for Q# 302 is yes, who is responsible for collecting forest resources for each of the mentioned purposes? *(Multiple responses are possible)*

305.1. Firewood (1. head 2. spouse 3. sons 4. daughters 5. other (specify) _____)

305.2. Food (1. head 2. spouse 3. sons 4. daughters 5. other (specify) _____)

305.3. Fodder (1. head 2. spouse 3. sons 4. daughters 5. other (specify) _____)

305.4. Source of income (1. head 2. spouse 3. sons 4. daughters 5. other (specify) _____)

305.5. Medicine (1. head 2. spouse 3. sons 4. daughters 5. other (specify) _____)

305.6. House construction (1. head 2. spouse 3. sons 4. daughters 5. other (specify) _____)

305.7. Other (specify) _____ (1. head 2. spouse 3. sons 4. daughters 5. other (specify) _____)

306. Does your household plant trees? (1. Yes 2. No)

307. If the answer for Q# 306 is yes, who does often do the planting? *(Multiple responses are possible)*

	Yes	No
307.1. Head	1	2
307.2. Spouse	1	2
307.3. Sons	1	2
307.4. Daughters	1	2
307.5. All	1	2

307.6. Other (specify) _____

308. If the answer for Q#306 is yes, for what purpose do you plant trees? *(Multiple responses are possible)*

	Yes	No
308.1. Sale	1	2
308.2. Firewood	1	2
308.3. House construction and fencing	1	2
308.4. production of household furniture	1	2

308.4. Other (specify) _____

309. If the answer for Q#306 is yes, Who makes the decision in cutting the trees? *(Multiple responses are possible)*

	Yes	No
309.1. Head	1	2
309.2. Spouse	1	2
309.3. Sons	1	2
309.4. Daughters	1	2
309.5. All	1	2

309.6. Other (specify) _____

Part IV. Women's Perception towards deforestation

401. Do you think there is a change in the forest cover through time? (1. Yes 2. no)

402. If the answer for Q#401 is yes, what type of change is it?
(1. Increment 2. Decrement)

403. If the answer for Q#402 is Decrement, What do you think is the cause? *(Multiple responses are possible)*

	Yes	No
403.1. Fire wood	1	2
403.2. Expansion of Agricultural land	1	2
403.3. Settlement	1	2
403.4. Climatic change	1	2

403.5. Other Specify _____

404. What do you think is the level of Deforestation in your area?

	Yes	No
404.1. High	1	2
404.2. Medium	1	2
404.3. Low	1	2

405. From where do you get information on deforestation? *(Multiple responses are possible)*

	Yes	No
405. 1. TV	1	2
405.2. Radio	1	2
405.3. Written materials	1	2
405.4. School	1	2
405.5. Conservation Agents	1	2

405.6. Other (specify) _____

406. Who do you think are major agents for deforestation? *(Multiple responses are possible)*. Those who:

	Yes	**No**
406.1. Cut trees for fuel wood	1	2
406.2. Expand agricultural expansion	1	2
406.3. Settled from another place	1	2
406.4. Own livestock ranching	1	2
406.5. Sell Fire wood	1	2
406.6. Perform commercial logging	1	2
406.7. Perform slash and burn cultivation	1	2

406.8. Other (specify) _____

407. Why do you think the above agents deforest the area? *(Multiple responses are possible)*

	Yes	No
407. 1. Fuel wood (local use)	1	2
407. 2. Food	1	2
407. 3. Fodder	1	2
407. 4. Source of income	1	2
407. 5. Medicine	1	2
407. 6.House construction	1	2

407. 7. Other (specify) _____

408. Do you think Deforestation has a negative effect on the environment?
(1. Yes 2. no)

409. If the answer for Q#408 is yes, in what way? *(Multiple responses are possible)*

	Yes	**No**
409.1. Loss in biodiversity	1	2

409.2. Loss of nutrients in the soil.	1	2
409.3. Decrement in the depth of the lake	1	2
409.4. Accelerated soil erosion	1	2
409.5. Natural disasters due to climatic change	1	2

409.6. Other (specify) _____

410. If the answer for Q#408 is yes, how sever is the problem?

	Yes	No
410.1. High	1	2
410.2. Medium	1	2
410.3. Low	1	2

411. What do you think should be done in order to protect the forest resource from being deforested? *(Multiple responses are possible)*

	Yes	**No**
411.1. The community should be provided With other means of income	1	2
411.2. There should be activities to raise the awareness Of the community on deforestation	1	2
411.3. There should be community based Participatory forest management	1	2

411.4. Other (specify) _____

412. Who do you think is responsible to protect the forest resources? *(Multiple responses are possible)*

	Yes	**No**
412.1. Governmenntal Organizations	1	2
412.2. Non- Governmenntal Organizations	1	2
412.3. Community	1	2

412.4. Other (specify) _____

413. What do you think are consequences of deforestation? *(Multiple responses are possible)*

	Yes	**No**
413.1. Loss of forest species	1	2
413.2. Loss of wild animal species	1	2
413.3. Shortage of fuel wood	1	2
413.4. Aggravated soil erosion	1	2
413.5. Accelerated Soil infertility	1	2
413.6. Deteriorated quality of water	1	2
413.7. Decrement in water sheds	1	2

413.8. Other (specify) _____

Appendix II: Checklist for In-Depth Interview (II)

- **Key Informants –Community Elders** [Male, Female]

1. How old are you?
2. What is your household composition?
3. What is your occupation?
4. How long did you stay in the current place?
5. How is the forest cover change through time?
6. What do you think are the major causes of deforestation?
7. What do you think are the consequences of deforestation?
8. Who do you think are the main deforesters?
   - Is there gender variation?
   - Is there age variation?
   - Is there income variation?

   Among the deforesters?
9. What is your source of information on deforestation?
10. What is the level of people's awareness on deforestation?
    - Is there gender variation?
    - Is there age variation?
    - Is there income variation?
11. Mention the services provided by conservation agents to stop deforestation.

    -Do you think the services are adequate?

    -Do they cooperate with the community?

- **Conservation Agents/ Environmental Protection workers.**

1. What is your duty?
2. How is the forest cover change through time?
1. What do you think are the major causes of deforestation?
2. What do you think are the consequences of deforestation?

3. Who do you think are the main deforesters?
    a. Is there gender variation?
    b. Is there age variation?
    c. Is there income variation?

    Among the deforesters?
4. What is your source of information on deforestation?
5. What is the level of people's awareness on deforestation?
    a. Is there gender variation?
    b. Is there age variation?
    c. Is there income variation?

8. What attempts have been made by your institution in creating awareness on the problem? Like the consequences that would be resulted by deforestation…

    -Were all the attempts practical? Were there problems faced?

Appendix III: Guide Line for Focus Group Discussion (FGD)

1. How was the forest cover change over time?
2. What could be the reasons for the change in the forest cover?
3. How do you perceive deforestation?
4. Who do you think are the major deforesters? (Why?)
5. Do you think it has a negative effect on the present and future lives of the community?
6. What do you think is the level of perception of your community towards deforestation?
7. What do you think are the consequences of deforestation?
8. What do you think should be done in order to protect the forest resources from being over exploited?

DECLARATION

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

Name: Tegbar Achamyeleh

Signature _____

Place: Addis Ababa University

Date: July, 2007

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

.....	.....
TEREFE DEGEFA (PH. D)	**CHALACHEW AREGA (ATO)**

July, 2007