FACTORS INFLUENCING THE PERCEPTION OF DEFORESTATION OF RURAL WOMEN;
A case study of Omonada woreda of Jimma zone, Oromia Region

M.A. Dissertation

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INDIRA GANDHI NATIONAL OPEN UNIVERSITY

FACTORS INFLUENCING THE PERCEPTION OF DEFORESTATION OF RURAL WOMEN;
A case study of Omonada woreda of Jimma zone, Oromia Region

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In Partial Fulfillment of the Requirements for the Degree of

MASTER OF ARTS IN RURAL DEVELOPMENT

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Indira Gandhi National Open University

You have turned my sorrow into joyful dancing.
No longer am I sad and wearing sackcloth.
I thank you from my heart, and I will never stop
singing your praises, my Lord and my God.

DECLARATION

I hereby declare that the Dissertation entitled **FACTORS INFLUENCING THE PERCEPTION OF DEFORESTATION OF RURAL WOMEN; A case study of Omonada woreda of Jimma zone, Oromia Region** submitted by me for the partial fulfillment of the M.A. in Rural Development to Indira Gandhi National Open University, (IGNOU) New Delhi is my own original work and has not been submitted earlier either to IGNOU or to any other Institution for the fulfillment of the requirement for any course of study. I also declare that no chapter of this manuscript in whole or in part is lifted & incorporated in this report from any earlier work done by me or others.

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CERTIFICATE

This is to certify that Mr. **_Belay Tesfa__** student of M.A. (RD) from Indira Gandhi National Open University, New Delhi was working under my supervision and guidance for his project work for the course **MRDP-001**.

His project work entitled

FACTORS INFLUENCING THE PERCEPTION OF DEFORESTATION OF RURAL WOMEN; A case study of Omonada woreda of Jimma zone, Oromia Region

Which he is submitting, is his genuine & original work.

Place: Signature:

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BIOGRAPHY

The author was born in Nekemte town of the then Wellega Province, Ethiopia on July the 15th, 1986. He attended his Elementary and Junior Secondary Schools at Burka jato Elementary and Nekemte comprehensive high School for his Senior Secondary School.

After successful completion of his high school, he has earned a BA degree in Sociology (August 2007) from Addis Abeba University. He joined the Indira Gandhi National Open University in June 2008 to pursue his postgraduate study in Rural Development.

The author has more than four years of progressive working experience working as coordinator in family planning and reproductive health and development facilitator in Non-Government Organizations operational in almost all the four corners of the country.

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Many thanks again go to my project supervisor, Dr. Mengistu Huluka whose committed supervision and guidance turned this manuscript a real dissertation. Without his professional assistance and encouragement, it might not be that easy for me to finalize this project work in due time.

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ACRONYMS

CBO	Community Based Organization
CSA	Central Statistics Agency
DAs	Development Agents
FAO	Food and Agricultural Organization
FDRE	Federal Democratic Republic of Ethiopia
FHH	Female Headed Household
GAD	Gender and Development
GDP	Gross Domestic Product
GoE	Government of Ethiopia
GOs	Government organizations
MoA	Ministry of Agriculture
NGOs	Non governmental organizations
ONRS	Oromia National Regional State
SPSS	Statistical Package for Social Science
UNDP	United Nations Development Program
WAO	Woreda Agricultural Office

FACTORS INFLUENCING THE PERCEPTION OF DEFORESTATION OF RURAL WOMEN; A case study of Omonada woreda of Jimma zone, Oromia Region

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ABSTRACT

In most developing countries, women play a major role as farmers, animal tenders, and water and fuel collectors. Yet despite their roles as, women are not adequately represented in decision making process 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 wellbeing of future generation. The skill, knowledge, attitude and perception of women have been ignored for years and women are now demanding that their voice be heard. They continue to fight for improved living standard and protection of the environment. In almost all countries women are disproportionably represented among the poor.

This study was conducted in one of Orimia region which is known for its forest cover in south west Ethiopia, in Jimma Zone in Omonada woreda, with the objective of identifying the demographic and socio-economic factors influencing rural women with sample of 426 female household. Statistical techniques like

frequency, percentage, cross-tabulation, bivariate and multivariate analysis were used.

The study found out that, among demographic factors; age and household size, and the agents have an association with the dependent variable. The results of multivariate analysis have shown that literacy status and family size of women significantly influence her perception of deforestation.

INTRODUCTION

1.1. Background

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

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 the perceptions on 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 household resources, they typically do not have managerial control. Given the variety of women's daily interaction 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 to have to be met day after weary day every time longer and more tiresome… (CSE, 1985)*

The economic and environmental problems facing the developing world are overwhelming in their magnitude and their complexity. Specially, Africans rely on natural 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 place, will be hit very hard by the impact of climate change.

Research in perception 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 changes is carried out, thereby increasing its effectiveness on both the national and local levels (Larimore,1969). Evidences show 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).*

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 women1995, women have an essential role to play in the development of sustainable and ecologically sound consumption of 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).*

Awareness of resource depletion, the degradation of natural system and the dangers of polluting substances has increased markedly in the past decade. These worsening condition are destroying fragile ecosystems and displacing communities, especially women, from productive activities and are an increasing threat to 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, monitoring and evaluation) of the process.*

The conference revealed that, because of the impact of forest depilation women are severely affected. They are anxious to participate in any decision making process,

including the type of tree species are to be planted, and where, as they can provide important inputs 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 which supplies for nearly half of 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 household energy consumed, fire wood 81 percent, dung 9 percent, crop residues 8 percent and the remaining supplied by modern fuels.

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

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.

Statement of the problem

Jimma zone is one of the zones in Oromia National Regional State (ONRS) which itself is one of the nine regional states of the Federal Government of Ethiopia. It has a total surface area of 359,620 square kilometers, which makes up almost a third of the total landmass of the country. Jimma zone is well endowed with natural resources contributing significantly to the national economy of the country. However, due to poverty some people in the area have been engaged in collection and selling firewood, a practice recently began. In the absence of viable alternative economic activities, many residents of the area have resorted to cutting down trees to sell as firewood.

The problem may get worse to the extent that the area may be devoid of forests in a few years if the deforestation continues at this rate. So one can easily imagine how women residing in the area became vulnerable as a result of the existing poverty-environmental degradation link. For these poor women, the natural capital is their only alternative means to survive. The contribution of other sources (natural, communal or own plantation) is minimal which indicates that deforestation to satisfy the fuel need in the area is a serious problem and needs immediate intervention for forest sustainability.

The below study have shown 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 a long walk to fetch fuel and water. As the land becomes depleted with vegetation and the environment deteriorates, and as increasing number of people compete for diminishing resources, women find it more difficult to collect enough firewood within limited time allocated (FAO, 1989).

Though being important natural resource users and managers, producers of food and other products, and indeed major contributors to the family's wellbeing, women have been normally "invisible" to development policy makers, programme planners and researchers. But the reality behind is, women, being so close to and highly dependent 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, forest and energy (Dankelman and Davidson, 1998)*

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.

Objective of the study

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

The specific objectives of this study 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 on deforestation.

1.4 The Study Hypothesis

The study attempted to test the following hypotheses:

1. Older women have high perception of deforestation than younger ones.

2. Literate women have high perception than illiterate ones.

3. Women with lower farm size have higher perception than those with larger farmland.

1.5. Coverage (universe)

This research is limited to addressing the objectives mentioned in this proposal which is to assess demographic and socio-economic factors influencing rural women's perception of deforestation. The study is also limited to Omonada woreda located in Burka Assendabo and Waktola kebele administration in Jimma district of the Oromia Region.

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 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.

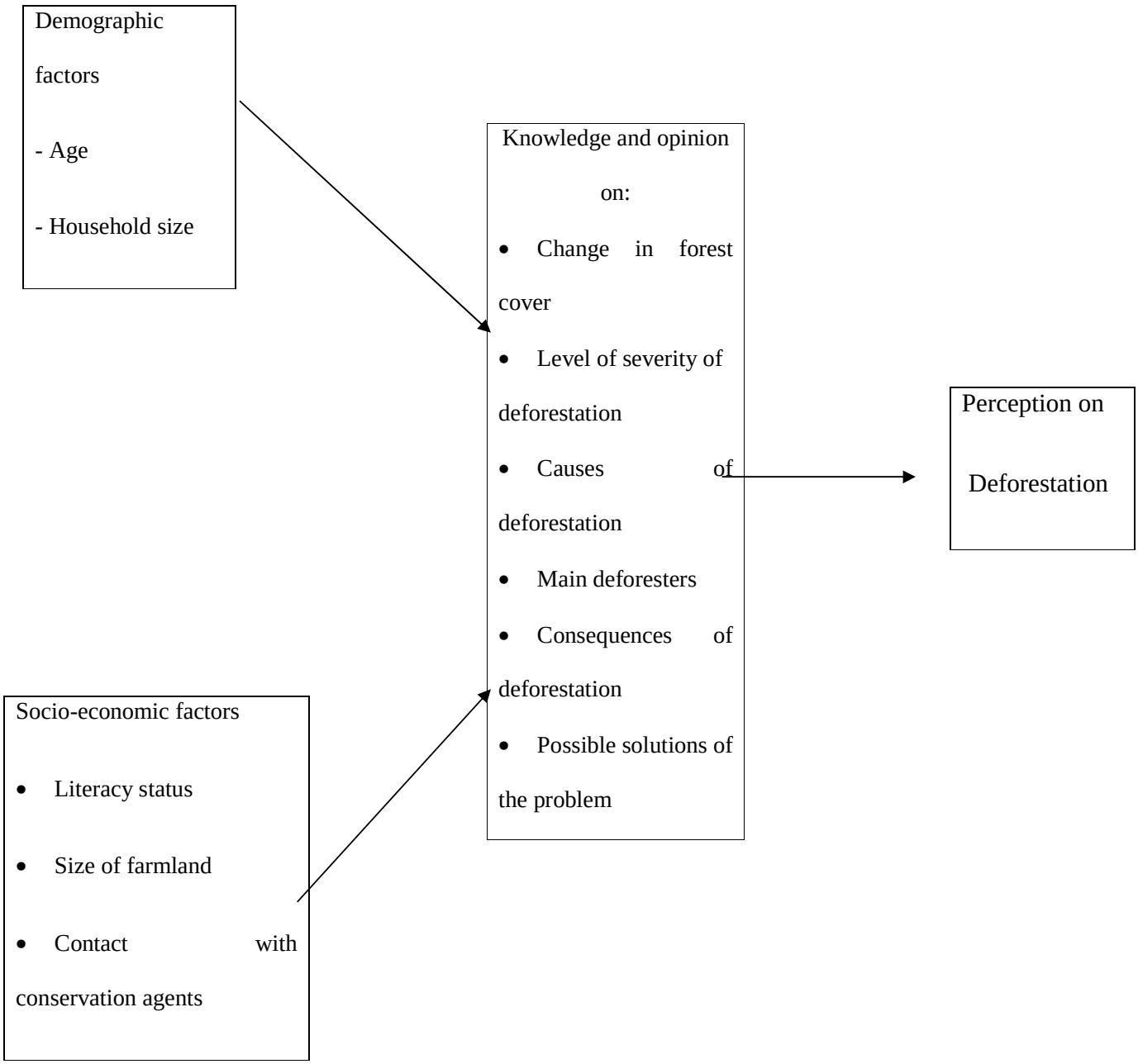
It will also contribute a lot in filling the research gap, help different governmental and non-governmental organizations in planning and implementing strategies to reduce poverty, empower women and above all conserve the environment for sustainable use.

1.7 Analytical Frame work

In this study, the analytical 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, contract with conservation agents are expected to influence the perception of rural women as indicated in figure 1.1 below.

As shown in analytical frame work, 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) affects 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.

Figure 1.1 Analytical frameworks to study the demographic and socio-economic factors influencing rural women's perception of deforestation



1.8 Operational definition of concepts and variables

- **Deforestation:** refers to the removal of trees without sufficient forestation. It is the permanent destruction of indigenous forests and woodlands. Deforestation in Ethiopia is due to locals clearing forests for their personal needs, such as for fuel, hunting, agriculture, housing development, and at times for religious reasons. The main causes of deforestation in Ethiopia are shifting agriculture, livestock production and fuel in drier areas. Deforestation is the process of removing the forest ecosystem by cutting the trees and changing the shape of the land to suit different uses.

- **Perception**: refers to the individual's knowledge and opinion to the process of deforestation. It is the process of using the senses to acquire information about the surrounding environment.

- **Age**: refers to the number of completed years the woman lived since her birth date. Rural households mostly devote their time or base their livelihoods on agriculture. The older the household head, the more experience he has in farming. Moreover, older persons are more risk averters, and mostly they intensify and diversify their production activities

- **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. Literacy status of rural women is expected to be related positively since education is important to gage the level of awareness of household. Educated farmers are able to acquire and process information easily which may lead to high perception of deforestation. It represents the level of formal schooling completed by the household head at the time of the survey. Education enhances farmers' ability to perceive, interpret and respond to the new events.

- **Size of the farmland**: refers to the area of agricultural farm land that belongs to household. Land is used for production of crop for consumption and fore sale. Therefore, the size of cultivated land and food security status of households are hypothesised to hove positive relationship.

- **Contact with conservation agents**: refers to the contact that the women has with kebele workers, conservation agents or environmental protection workers. Extension service play important role for rural farmers in terms of providing advice and information through extension agents on how to use different improved agricultural technologies which in turn increase production and productivity of agriculture.

1.9 Limitation 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 decide not to include income as an explanatory variable for the perception variation among on deforestation.

2. 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 gaining ground at the expense of the rural development policies that prevailed during 1980s, in which gender approach had been far better integrated (Leach, 1992). Thus the environmental policy is the 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 development9 Monica, 1997). On the other hand, a growing debate about gender and the environment highlights women's role 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 role; and of assuming a close link between women and 'nature'(Ibid).*

Charlotte Bretheton (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 in three categories; women as *saviors*, women as *victime* and women as the *problem*.

While explanation for this 'critical role' varies in emphasis, they tend to focus up on the special significance for women of environmental issues. Perception of women and environment links fall in to 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 ecosystem (Shiva,1988).

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 basis 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 saviors' tend to be voluntary laborers, not project managers (Thomas,1992;DAWN,1992).

In these debate '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 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 up on women not only as the targets of population control programmes, but also as a resource to be mobilized in defense 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 natural

environment' as quoted in Bretherton(1998). This statement by UNCED Secretary-General Maurice Strong clearly resonates with the ecological feminism 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 insistence to women's 'special' position serves both to obscures 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 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 population in poor countries pays 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 Mc Neil,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, forest play a critical role in mitigating the effects of climate change and protecting biodiversity.

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

Forest provides a wide range of products (timber, fruits, medicine, beverages, and fodder) and service (shade, beautification, erosion control, and soil fertility).without trees human life would be unsustainable. Forest also plays 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, medicine) can then be used to purchase food.

> *…firewood has became 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.undp.org*

Deforestation is primarily confined to developing countries, 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 (FA0, 2000)[2]. Africa, however, continues on its fast track of deforestation, with no signs of slowing down. Forests are disappearing most rapidly in Africa, Latin America, whereas in Asia, the reduction of natural forest 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 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 2000and 2005, the rate of forest change increased by 10.4 percent of its forest cover, or around 2,114,000 hectares.

[2]*http:/www.afrol.com/categories/environment/env055 faodeforestation.htm*

Measuring the total rate of habitat conversion (defined as change in forest area plus change in woodland areas minus net plantation expansion) for the 1990-2005 interval, Ethiopia lost 3.6 percent of its forest and woodland habitat due to firewood collection, conversation 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).

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 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 reserve the trend (Demel, Masresha and Asferachew, 2003)

According to EFPA (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 forest related affairs. 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. Another study in Addis Ababa area, Fikerte(1991), put the figure of the women work at 38 percent of the working day. 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 Resource**

Since the start of human history women have contributed essentially to the conservation, use and management of natural resources. Around the world they play district roles from men: in managing agricultural lands, plants, animals and forest, 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, skill 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 worldwide, 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 resolves 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 twing 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 create and continue to create a situation of scarcity that often firces 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.(FOA,1989).*

Different studies have shown the interaction that women have with forests in their day to day lives. The main forestry related preoccupation of Ethiopia 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 developing world, women are the main harvesters of many wood and non wood 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. Fueling 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 rely on the sale of forest products as an important component, and often the sole source, of income. This income is used to improve household food security and the welfare of the women’s facilities. 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

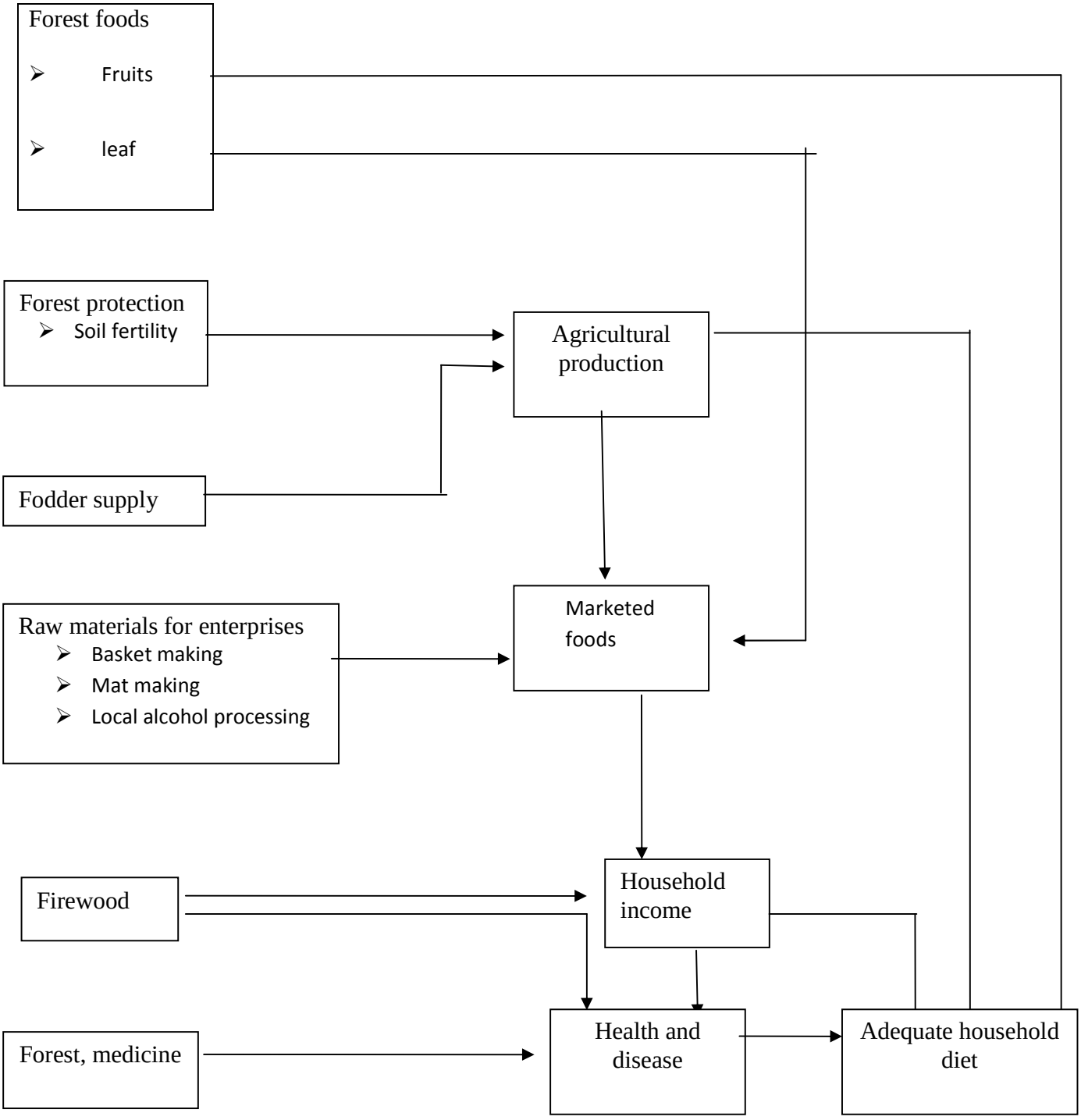


Figure 2.1 Link between women and Forest Resources. Source: Adapted from FAO/UN,1989

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 became more concerned about environmental problems.

Some of Ecological Movement initiated by Women

The Chipko Movement:

According to Breton 1998, one of the first environmentalist movements which were 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 Rajathan which is India's Himalayan foot hills. While the axe men were cutting the trees, a willing victim Amrita Deve hugged one of the trees. This is because in Jodhpur each child had a tree cut down. Her daughter who followed her and her mom all was killed.

People from forty-nine villages around Jodhupur responded to this act and hugged the trees the axe men were trying to cut. This act by Himalayan village women was a non

violent 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 in to 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 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.

The above movement initiates 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, interest and perceptions being largely excluded in the planning and decision-making process. Development and conservation planners often overlook important roles in society, hence perpetuating the subordinate position and low image of women.

2.5 Perception 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, priority must be set. Engaging the local voice within this agenda setting may improve policy makers' ability to respond to issues of most salience (Michael 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 attitude 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.

2.5.1. Environmental Perception in Developing Countries

It is obvious that environment resources in 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 Environmental 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 (Michael 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 programs of planned change (Larimore, 1969). According to 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 expression of environmental concern may relate to countless 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). Although the majority of work on public environmental perception has explored these issues within the context of developed economies (Dunlap and Relay;1992). 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 in to potential policy support can also be derived from critical consideration of the way 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 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 level of environmental concern also characterizes residents of less developed nations, as evidence 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 reluctant 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 (Brech andKempton,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, 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 be depending on their relationship with nature.

> *…both women and nature have 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 Fire wood 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 Nepal women whose grandmothers had to climb to mountain too 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 engaged 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 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).

Gender based commitments and movements such as feminism have reached to a new approach through the combination of feminism and environmentalism called Eco-feminism. Eco-feminism believes on the interconnection between the domination of women and nature. According to eco-feminism the superior power treats all subordinates the same. So, eco-feminism takes in to 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 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 right and liberation has stemmed from invasion of their right's in the past (Merchant, 1996).

In the 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 of ownership outright, they ate the ones who spend most of their time working on the farms too 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 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, 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 consumer 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 right and capital.

2.5.3 Factor Influencing Perception of Environmental Issues

Certainly stakeholder perceptions should be major concern to policymakers since decision 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(Dunlop and Riley,1992).

> *…it also involves the broader social, political, and economic processes and institution 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 researcher point out that socio-economic and demographic variable alone is insufficient in their explanatory capabilities (Samdahl and Robertson, 1989). Yet, it is important to identify every factor that result in variations among individual perceptions of environmental issues, since it play 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 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 result 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 (Guangno and Markee, 1995; Howell and Laska, 1992; Raudsepp, 2001) are significant drivers of environmental attitudes and concern.

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 consistent attention by environmental psychology researchers. Raudsepp (2001) found that women were significantly more likely than men to be considered with environmental problems. Most research finds slight evidence that women are more environmentally concerned (Jones and Dunlap, 1992) or process stronger environmental attitudes than men (Foster and Ms Beth, 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 perpetual processes beyond the explaining influences of socio-economic and demographic factors may drive perceptions of the environment.

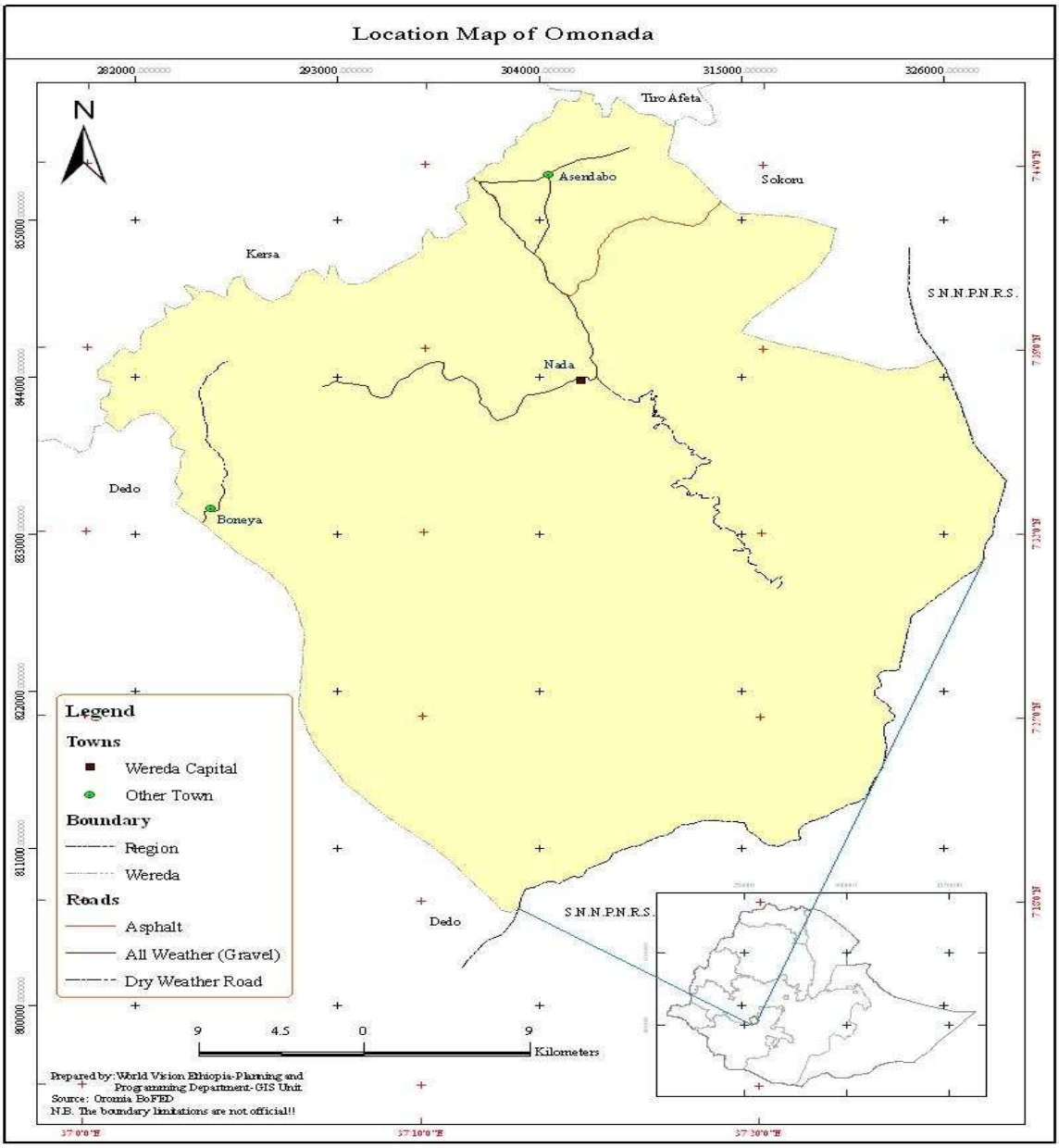
RESEARCH METHODOLOGY

3.1 Description of study site

Jimma Zone, found in South Western Ethiopia, lies between 360 10´ E longitude and 70 40´ N latitude at an elevation ranging from 880 m to 3360 meters above sea level (Dechassa, 2000). Very currently Jimma Zone is divided in to 16 Weredas/districts (hosting a total population of over 2.4 million; CSA, 2004) with an agro-ecological setting of highlands (15%), midlands (67%) and lowlands (18%) (Dechassa 2000). Farmers in the area practices mixed crop-livestock agriculture. The zone is one of the major coffee growing areas of southwest Ethiopia; cultivated and wild coffee is a main cash crop of the area.

Jimma zone is well endowed with natural resources contributing significantly to the national economy of the country. Major crops grown, other than coffee, are maize, teff, sorghum, barley, pulses (beans and peas), root crops (enset-false banana and potato) and fruits. Tef and honey production are another sources of cash after coffee. Enset is a strategic crop substantially contributing to the food security of the zone and is especially important in Setema and Sigimo weredas (highlands) (CSA 2004). According to JZMSR (2004), the climate is humid tropical with bimodal heavy annual rain fall, ranging from 1200 to 2800 mm. In normal years, the rainy season extends from February to early October. The thirteen years mean annual minimum and maximum temperature of the area was 11.3 oC and 26.2 oC, respectively. The soil type of the study area is characterized with black to red soils.

Major agro-ecological zones of the woreda are categorized as Dega, Woinadega and Kolla that makes up 23.9%, 62.7% and 13.58% respectively. According to a census conducted in year 2008 current population of the Omonada woreda is estimated to be 256,280 of which 134,301 are females with crude population density of 154.6 P/$km^{2.}$ There are about 45,375 household heads with average family size of 5.6 in the operational woreda. Ethnic wise majority of the resident population are Oromo and almost 98.5% of the population is Muslim.


Location Map of Omonada
282000
293000
304000
315000
326000
N
Tiro Afeta
Asendabo
Sokoru
Kersa
S.N.N.P.N.R.S.
Nada
Dedo
Boneya
Legend
Towns
Wereda Capital
Other Town
Boundary
Region
Wereda
Roads
Asphalt
All Weather (Gravel)
Dry Weather Road
9
4.5
0
9
Kilometers
Prepared by: World Vision Ethiopia-Planning and Programming Department- GIS Unit.
Source: Oromia BoFED
N.B. The boundary limitations are not official!!
37°0'0"E
37°10'0"E
37°20'0"E

3.2. Method of data collection

Data will be collected both from primary and secondary sources:

3.3.1 Primary data

***Household survey*:** Household level information is generated through household level survey using semi-structured interviews. Pre-test of the interview schedule will be undertaken prior to conducting the interview so that relevant comments are incorporated for finale use. Enumerators (no more than four) will be recruited based on their proficiency in communicating using local language, educational background and prior experience in similar assignments. Training will be given to enumerators on the content of the schedule and procedures to follow while conducting the interview.

Focus group discussion: This will be held with and officials of Kebele Administrations, conservation agents/environmental protection workers, female headed households in the study area.

3.3.2 Secondary data

Relevant secondary data to the research will be collected from development agents; and the district Office of Agriculture and Rural Development (Desks of the rural water supplies, cooperatives & important others) & World vision Ethiopia omonada ADP. If the need arises, information will also be gathered from zonal & regional offices.

3.3. Sampling techniques

Out of the woreda with two kebele administrations (Burka Assendabo and Waktola) were selected. Multi-stage stratified sampling was employed to get the respondents. The number of female headed household in both kebeles is 655. A sample of 189 (44%) out of total 290 female headed households and 237 (56%) out of 365 female headed households were taken from Burka Aassendabo and Waktola kebeles administrative, respectively. The total number of female headed households will be used as the sampling frame. Then from each category, sample households will be drawn randomly.

3.4 Data Processing and Analyzing

3.4.1. Variable Identification

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

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 and possible solutions to the problem. These questions will be ranked out of 32, the mean mark was found to be 188

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)) that is 75 percent of the responses given are correct. Based on this, if woman answers 75 percent and above of the questions which indicates 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. Methods of data Analysis

In order to test the 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 characteristics: age, family size; and socio-economic characteristics: literacy status, size of farmland and contact with conversation 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 or 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.

After getting the collected data, the next step will be manual editing and then it will be cleaned using statistical package for social scientists (SPSS) software in order to check the proper entrance and logical consistency of all the data collected.

CHAPTER FOUR

4. Results and Discussions

4.1 Demographic Characteristics of the Respondents

Age

Age is one of the factors that influence perception of rural women on deforestation. A considerable number of the respondents (45.5percent) 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 this result, one can infer that most of the respondents are women younger than 44 years (Table 4.1).

Table 4.1 Age distribution of the respondents in broader age groups

Age	Number	Percent
24-33	194	45.5
43-43	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 which tend to influence rural women's perception on deforestation. Most of the respondents (57.0%) have a household size of 1-4 persons. Respondents with household size of 5-8 persons account for the remaining 43.0% of the total respondents (Table 4.2).

Table 4.2.Household size of the respondents

Household size	Number	Percent
1-4	243	57.0
5-8	5-8	43.0
Total	426	100.0

Source: Own survey, 2011

4.2 Socio-economic Characteristics of the Respondents

Literacy Status

Literacy status is one of the socio-economic factors that influence the perception that women could have on deforestation. Almost half of the respondents were 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 same population (Table 4.3).

Most girls cannot continue beyond primary education level as a result of different socio-economic and cultural constraints, like early marriage, poverty and unavailability of secondary schools nearly (Table4.3).

Table 4.3 Literacy Status of the respondents

Literacy Status	Number	Percentage
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, 2011

Size of farmland

The farm land they own is mostly used for coffee production. Relatively higher percentages of the respondents (41.5 percent) own 2.04-4 *timad* of farmland. Only 10.3 percent of the respondents own relatively large hectare of land (Table 4.4).

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, 2011

[1]1timad is equal to 0.25 hectares

Contact with Forest Conservation Agents

Among the surveyed female headed households, only 35 percent had contact with forest conservation agents. The majority of the households had no contact whatsoevers with conservation agents (Table 4.5).

Table 4.5 Respondent's Contact with forest conservation Agents

Contact with conservation Agents	Number	Percent
Has no contact	277	65.0
Has contact	149	35.5
Total	426	100.0

Source: Own survey, 2011

5. 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. Thee methods of analyzing the data were employed ; the bivariate analysis indicates whether there exists a relationship between the dependent and the independent variables. For this analysis, chi-square test was 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 sample households. The dependent variables- perception was measured using the responses given by individual respondent.

According to the result of chi-square tests of the demographic and socio-economic characteristics of the respondents at Omo nada woreda, of the total 426 women, 132(31percent) had high perception of deforestation while the rest 294(69 percent) have low perception of deforestation (Table 5.1).

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

Background Characteristics	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)		
≥34	196	84.5	36	15.5	232(54.5)	57.0***	1
Total	294	69.0	132	31.0	426		
Household size							
≤ 4	150	61.7	93	38.3	243(57)		
> 4	144	78.7	39	21.3	183(43)	14***	1
Total	294	69.0	132	31.0	426		
Literacy status							
Illiterate	211	99.1	2	0.9	213(50)		
Literate	83	39.0	130	61.0	213(50)	179.8***	1
Total	294	69.0	132	31.0	426		
Size of farmland							
< 0.4	45	60.8	29	39.2	74(17.40		
0.4 – 2	54	41.2	77	58.8	131(30.8)	91.4***	1
2.04 – 4	151	85.3	26	14.7	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)		
Has contact	17	11.4	132	88.6	149(35)	355***	1
Total	294	69.0	132	31.0	426		

Source: own survey, 2011

*-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: age, household size, literacy status, size of farmland and contact with conservation agents had an association or relation with the dependent variable: perception (Table 5.1).

5.1 Demographic Factors Influencing Rural Women's Perception of Deforestation

Age

Those respondents who are younger than 34, had low perception and the remaining half had high perception of deforestation. But those older than age 34, large percentage (84.5) of them had low perception of deforestation (x^2 =57.0, P<0.001 and df=1). (Table 5.1)

Household size

Regarding household size, 61.7 percent of women with household size of 4 and below have low perception. For respondents who have household size above 4, large majority (78.7 %) had low perception and showing that there exists a relationship between household size and perception in deforestation (x^2 =14.0, P<0.001 and df=1). (Table 5.1)

5.2 Socio-economic Factors Influencing Rural Women Perception of Deforestation

Literacy status

With regard to literacy status, illiterate women had low perception of deforestation constituting 99.1 percent. Literate women with low perception, however, constitute 39.0

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

Farm size

A large number of women farmer who own a size of farmland with is 0.4 *timad* have low perception of deforestation. However, those who own 0.4-2 *timads* of farmland only, 41.2 percent have low perception while the rest had high perception of deforestation. Surprisingly, 85.3 percent with farm size between 2-4 *timads* of women had low perceptions of deforestation. The existence of an association between size of farmland owned and perception of deforestation is indicated by the result of bivariate analysis (x^2 =91.4, P<0.001 and df=1)

Contact with conservation agents

With regard to contact with forest conservation agents, women who had no contact with forest conservation agents, have low perception of deforestation, while among those who had good contact with conservation agents, 88.6 % had high perception. The association between the variable is significant, as shown by the bivariate result (x^2 =355.6, P<0.001,df=1)

5.2 Multivariate Analysis of Factors Influencing Rural Women's Perception of Deforestation

The multivariate analysis is used to indicate the strength, relative influence and nature of association of the explanatory variables with dependent variable (Table 5.2).

Among the independent variables, contact with conservation agents is not entered in to the model due to its multi co linearity effect with the rest of the independent variables (See Annex III). It is to understand how significant contact with conservation agents can influence the level of perception of deforestation that a women could have from the result of the bivariate analysis indicated in Table 5.1. The reason behind is straight forward those who have contact with conservation agents the perception on deforestation was higher than those who did not have contact.

Table 5.2 Results of multivariate analysis for demographic and socio-economic factors influencing rural women's perception of deforestation.

Background Charateristics	B	S.E	Df	Sig.	Exp(B)
Age	0.000 0.491	0.392	1	0.211	1.000 1.634
Household size	0.000 -0.076	0.330	1	0.819	1.000 0.927
Literacy Status	-5.183 0.000	0.788	1	0.000	0.006*** 1.000
Size of farmland	1.561 0.000	0.310	1	0.000	4.764*** 1.000

Source

*-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

5.2.1. Demographic Factor Influencing Rural Women perception of Deforestation

Age

Age of a women 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 in 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, as it could easily be anticipated, educated women perceived most about deforestation. In addition, women 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 the effect of 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 of older women, they stated that:

> "*…even when we go to the market places some seven years ago, we hardly see the sky and enjoy the sun, since the forest was very dense. But now a days, people, especially young ones cut trees freely and sell for family income, as a result the forest coverage dwindles.*".

They had also stated that the climate of the area was not as the currently observed, which they mentioned was more 'sunny'. And some mentioned that this was due to the curse of God. Other participants claim that the changing was due to technological advancements, such as, expansion of electric power. Sometimes, trees were cut in order to protect the electric wires from the reach of tree branches.

During FGD Older women complain on the disappearance of some types of trees, which specially were used for medicine. They had also mentioned that the decrease in coffee production was mainly due to as a 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..."*

Even though men couldn't deny the decline in forest coverage, they didn't seem to agree on the severity of the problems of deforestation. The explanation given for the decrease in coffee productivity was that, 'it is the curse of God'. And they strongly argue that cutting trees is the only way to reduce poverty, unless and otherwise governmental or non governmental organizations intervene by providing, monetary aids or income generating scheme. Studies focusing on the role of socio-economic factors find evidence that

younger groups (Fransson and Garling, (1999); Hannold,(1981) are significant drivers of environmental attitudes and concern.

Therefore in general, it is hardly possible to conclude respondents of different age groups have significant variation in perception of deforestation. The explanations given by different age groups of women may vary due to their socio-cultural attachments, like education, religion etc. Younger women are more likely to state their perception of deforestation than the older ones, keeping in mind that older are more close to nature and have indigenous knowledge. As a result of the above multivariate analysis therefore, the hypothesis that "older women have high perception of deforestation than younger ones" shall be rejected.

Household size

Similarly, size of the household of woman is found not to be significantly influence the woman's perception of deforestation, (df=1, Exp (B) =0.927 and p=0.819 which is greater than 0.005) (Table5.2).

The first possible explanation for this could be that, 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, that among the younger than 34years of age (45.5 percent) and only few of them are married (9.6 percent) during the time of the survey and more likely to have smaller household size. And the possible age composition of the household members to be in the childhood stage who may not properly perceive deforestation and they won't have the power to influence perception of the household head.

The third possible explanation may be even that if women have younger or educated house hold members, they most likely migrate to the nearby town to work for a living and if the family can afford attend secondary and the higher level of 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 shows, education significantly influences perception of a women on deforestation (df=1, Exp(B)=0.006 and p=0.000) at p value less than 0.001, which implies that illiterate women are 94 percent less likely to perceive deforestation than the literate ones.

Different studies also have shown the similar 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 Scote and Willets (1994) also found the similar results that higher levels of education (Guagano and Markee, 1995; Raudsepp, 2001) are significant drivers of environmental attitudes and concern. Therefore, the hypothesis that" literate women have high perception than illiterate ones" 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 those who own above 2 *timads*.

This is because it is the poor who have closer relation with nature, since they heavily depend on the natural capital for their subsistence. Different studies also have shown that rural population in poor countries pay the highest price for environmental degradation, as their livelihoods depend on the goods and services of the ecosystem (Koziel and McNeil, 2002).

The poor often depend directly on a wide range of formal resources and ecosystem services for their livelihoods (DFID, 2002). Women with smaller farmland size would

perceive highly environmental problems like deforestation because the work burden and the time they spend would 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 day (ibid).

Participants of the FGD, women of different age groups and the environmental protection workers, stated that:

> *"…those who own smaller farmland sizes, have many tree sheds for 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 would have a double negative effect: losing the trees, that in turn affects coffee productivity. But if the worst comes they sell the tree to cutters. The tree cutters focus only on getting the trees out to an open area, and in so doing coffee plants get damaged, and considered as another loss.

An environment protection worker said:

> *"…even though cutting trees is prohibited by the government, some firewood sellers are still cutting trees and transporting to nearby town. These men, defend themselves by saying that,' the trees they cut have a natural regeneration power' which of course*

might be true but not considering the time the trees need to regenerate and became sheds…"

He also added: "…households which face extreme poverty situations, most of them female headed household ask for permissions to sell. After considering the different socio-economic background of that household, and the situation of the trees we sometimes give them permission…"

So, for this study, women with smaller farmland size were more likely to perceive deforestation and its effects than those who own larger farmland sizes. As such the hypothesis that, "women in the lower farm size have higher perception than those with larger farmland size" is accepted.

CHAPTER SIX

CONCLUSSION AND RECOMMENDATIONS

6.1 Conclusions

The forests in the Omonada woreda, Jimma Zone, have been managed by natural regeneration for many centuries. The major objectives have been to sustain of the environment with-in the area. This has been achieved by means of promoting coffee production. Due to deep rooted poverty in the zone, people living in the area over exploiting the existing forest resources, which had negative impact on both the fauna and flora of the area. Such practice aggravated the problem of poverty, especially on women headed household.

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 variable, literacy status and the size of farmland that she owns significantly influenced women's perception of deforestation, while the influence due to demographic variables; age and household size, is not as significant as the influence as that of the socio-economic ones. Therefore except the first, two of the hypotheses of the study are accepted.

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

they won't die while trees are their around, even if not for the long term. Women sell the woods for survival knowing that it will affect coffee production and the over all ecosystem and climate of the area.

Tackling environmental degradation is an integral part of effective and lasting poverty reduction, local attitude 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 to resolve conflicts as they arise, are ,therefore, a necessary basis for environmental interventions.

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 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 problem and constraints cannot be solved by women alone but by the coordinated efforts 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 outlook are identified, plan and strategies shall be developed based on full participation of the people concerned. On the basis of the study findings the following recommendations could be forwarded:

- The homogeneity of the society, especially in terms of religion is an indication of togetherness in society problems. Therefore, it is important to involve religious leaders and elders in forest conservation plans and actions to be taken with regard to forest resources of the area.

- Since education is a 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 posses 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, it is also possible to make women take part of such alternative means by training them on how to make income generating activities.

- In-depth studies will be needed to minimize the declining trend of wood resources with the increasing crop cultivation at different times. Therefore it needs an extension policy formulation of on-farm tree development in discussion with the local communities.

- The pressures of polygamies and weak family planning on forest resources in study area will need further studies;

- Because of the complex nature of the problem of deforestation, the Ethiopian government alone is not able to prevent deforestation. By now, we also knew that markets alone are unable to prevent this either. Eventually local stakeholder participation will be required.

- Public disengagement has detrimental effects on environmental education, awareness, advocacy and the building of engaged and empowered civil society assets must be built to conserve and use Ethiopia's forests in a sustainable way.

- Prohibiting people to cut trees without providing alternative means, especially those who live in rural parts of the country, will actually affect their livelihood as their daily needs became more difficult.

- Attention should be given to the creation of effective local management organizations to mobilize farmers in conservation, development and appropriate use of forests

Annex I: Number of female headed households in Burka Assendabo and Waktola

NAME OF KEBELES	NO	NAME OF THE VILLAGE	NUMBER OF FHH	SAMPLE TAKEN
BURKA ASSANDABO	1	Goro	36	23
	2	Warsoo	33	21
	3	Doroni	25	16
	4	Warabi	46	30
	5	Ossoo	60	39
	6	Turri	62	40
	7	Yebu	28	18
	Sub Total		290	189
WAKTOLA	8	Wodeyi	44	29
	9	Gumboo	37	24
	10	Worjii	43	28
	11	Kandii	47	31
	12	Chalte	61	40
	13	Harbuu	32	21
	14	Goroo	46	30
	15	Sayyo	55	36
	Sub Total		365	237
	Total		655	426

Annex II : 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

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6. APPENDICES

Appendix I: Survey Questionnaire for Household survey

Code No. _____

Purpose

The principal objective if this questionnaire is to identify the demographic and socio-economic factors that influence the perception of rural women on deforestation in omonada woreda, east Jimma zone. The study is conveyed for academic purpose. Hence the responses from respondents are confidential and cannot be traced to the persons who provide 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	

Reason for not completed/partially completed questionnaire

1. Not willing
2. Vacant
3. Other(specify)_____

Enumerator's Name_____ Supervisors Name_____

Signature_____ Signature_____

Date _____ Date _____

Part I Demographic and Socio-economic characteristics of household

101 Name (optional)	102 Relation with head	103 Sex	104 Age	105 Martial 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	1.farmer 2.herder 3. house wife 4.daily laborer 5.weaving 6.pottery 7.trader 8.selling firewood 9.grow vegetable 10.fishery 11.beehiving 12.other	1.farmer 2.herder 3.house wife 4.daily laborer 5.weaving 6.pottery 7.trader 8.selling firewood 9.grow vegetable 10.fishery 11.beehiving 12.other	1.illetrate 2.read &write 3.primary 4. secondary 5tertiary 6.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 laborer	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# 203 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 laborer	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 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. Follow land	1	2
208.5. Woodlot	1	2
208.6. Renting the land	1	2

208.7. Other (specify)_____

209. Do you have own livestock? (1. Yes 2. No)

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

	Yes	No
210.1. Ox	1	2
210.2. Cow	1	2
210.3. Donkey	1	2
210.4. House/Mule	1	2
210.5. Goat/Sheep	1	2
210.6. Chicken	1	2
210.7. Bee hive	1	2

210.8. Other (specify)_____

Part III. Information about Forest resource

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 the 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.daughers 5.other (specify)_____

305.2. Food ((1.Head 2.Spouse 3.Sons 4.daughers 5.other (specify)_____

305.3. Fodder (1.Head 2.Spouse 3.Sons 4.daughers 5.other (specify)_____

305.4. Source of income (1.Head 2.Spouse 3.Sons 4.daughers 5.other (specify)_____

305.5. Medicine (1.Head 2.Spouse 3.Sons 4.daughers 5.other (specify)_____

305.6. House construction (1.Head 2.Spouse 3.Sons 4.daughers 5.other (specify)_____

305.7. 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 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

308.5. 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#401is 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

404.1.1High	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. Schools	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)

	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. Owen 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 negative effects 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 in 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
410.1. 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. Governmental Organization	1	2
412.2. Nongovernmental organization	1	2
412.3. Community	1	2
412.4. Other (Specify)	1	2

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

	Yes	No
413.1. Loss of forest policies	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 erosion	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)

4. How old are you?

5. What is your household consumption?

6. What is your occupation?

7. How long did you stay in the current place?

8. How is the forest cover change over time?

9. What do you think is the major causes of deforestation?

10. What do you think are the consequences of deforestation?

11. Who do you think are the main deforester?

12. Is there gender variation?

13. Is there age variation?

14. Is there income variation? Among deforesters?

15. What is your source of information on deforestation?

16. What is the level of people's awareness on deforestation?

17. Is there gender variation?

18. Is there age variation?

19. Is there income variation? Among deforesters?

20. Mention the services provided by conservation agents to stop deforestation.

21. Do you think the services are adequate?

22. Do they cooperate with the community?

Conservation Agents/ Environmental Protection workers.

23. What is your duty?

24. How is the forest cover change through time?

25. What do you think are the major causes of deforestation?

26. What do you think are the major consequences of deforestation?

27. Who do you think are the main deforesters?

28. Is there gender variation?

29. Is there age variation?

30. Is there income variation? Among deforesters?

31. What is your source of information on deforestation?

32. What is the level of people's awareness on deforestation?

33. Is there gender variation?

34. Is there age variation?

35. Is there income variation? Among deforesters?

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

37. Were all the attempts practical? Were there problems faced?

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

38. How was the forest cover change over time?

39. What could be the reasons for the change in the forest cover?

40. How do you perceive deforestation?

41. Who do you think are the major deforesters?(why?)

42. Do you think it has negative effects on the present and future lives of the community?

43. What do you think is the level of perception of your community towards deforestation?

44. What do you think are the consequence of deforestation?

45. What do you think should be done in order to protect the forest resources from being over exploited?