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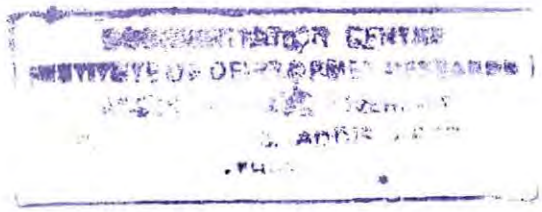
THE LIVELIHOOD OF THE FOREST DEPENDENT POPULATIONS: A CASE STUDY OF THE WOMEN FUELWOOD CARRIERS IN WOREDA 1 OF THE GULELE SUBCITY IN NORTHERN ADDIS ABABA

BY

ARLINDO P. DOMINGOS



MAY, 2011
ADDIS ABABA

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PREPARED BY

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To

ADVISOR: FEYERA SENBETA (Ph.D.)

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Title

The Livelihood of the Forest Dependent Populations: A Case Study of the Women FuelWood Carriers in Woreda 1 of the Gulele Sub City in Northern Addis Ababa.

By

Arlindo Pedro Domingos

DEVELOPMENT STUDIES

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Author
April, 2011

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Abstract

The present study is aimed at assessing the living conditions and the socioeconomic situation of Women Fuelwood Carriers and their interaction with the forest resources, and the effect on the forest as well, due to fuelwood harvesting, as a result of the great demand for energy supply. The cumulative effect of the illegal activity carried out by the WFCs on the reserved forest, as the major or sole means of their livelihood, has further repercussions. It contributes to increase depletion of the plantations, destroys the sustainable supply of fuelwood and ultimately puts at stake, not only the very survival of WFCs themselves, but also the household energy needs of end-users at large. Without education or training, or other way of supporting themselves and their families, these women subsist on fuelwood carrying and trading, as their primary source of income, at a considerable cost both to their own health and personal safety, and to the sound management of the forest resources. The general objective of the research is to assess the livelihood conditions of the women fuelwood carriers in northern Addis Ababa as well as their activities within the forest, in order to determine ways and means to make it sustainable and environmentally friendly. To do so, the researcher had to employ both quantitative and qualitative research methods to gather the necessary data for conducting the study. These included descriptive surveys using structured questionnaires, semi-structured interviews and FGDs with informants by employing interview guidelines and/or checklists, observations and documentary analyses to generate pertinent primary and secondary data from primary and secondary sources, with a view to ensuring the quality of data. To this end, a total of 92 sample respondents were selected out of 2000 target population, using systematic sampling techniques. This study found out that the socio-demographic and economic characteristics of the surveyed population depict exactly the state of poverty these WFCs are living in. They are essentially young adults and married migrants from different parts of the country and they are illiterate; having no significant assets to make a positive impact in their lives, although some of them claim to have assets of some sort back home. Their perception about the forests and its importance is, therefore, limited. Living in groups in tiny housing units and filthy environment, without any meaningful alternative income-generating activities, these Orthodox people, by religion, take all risks to gain a loft of bread out of the forests. The existing forests protection enforcement mechanisms and policies are inefficient to keep then at bay and inadequate to ensure good forest conservation practices in the study area. This is very often due to inadequate number of personnel to patrol the forest, lack of smooth communication, lack of clear guidelines and of co-ordination among the Government local authorities responsible for making it happen. Consequently, awareness creation is needed at all levels on the importance of a sound forest conservation system; and provision should be made of an adequate number of forest security guards in the study area with encouraging incentives in order to guaranty an effective forest protection. Local authorities and relevant stakeholders should commit themselves not only to provide WFCs with access to schools to acquire new life skills and alternative generating income, but also with decent housing units to allow them fit in the society in dignifying manner. Given the fact that effective management of forests is of paramount importance, there is a need for all parties concerned to pursue collective participatory forest management initiatives in such a way as to safeguard the interest of all, the environment and, particularly of the poor, who are the most reliant on the continued access to resources for fuelwood supplies.

Acronyms and Abbreviations

ABE Alternative Basic Education

BBS Basic Business Skills

Df Degree of freedom

FGD Focus Group Discussion

FGUs Forest Group Users

FGs Forest Groups

FWFC Former Women Fuelwood Carriers' Association

HH Household

HHH Household Head

ILO International Labor Organization

MOA Ministry of Agriculture

MOLSA Ministry of Labor and Social Affairs

NTFPs Non-Timber Forest Products

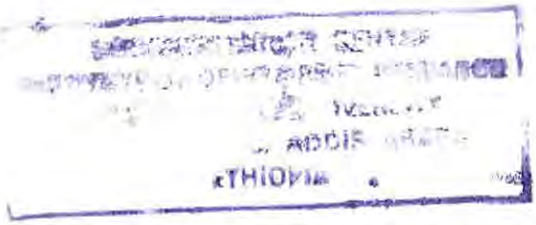
P Probability of Type 1 Error one is willing to Tolerate

SPSS Statistical Package for Social Science

$\chi 2$ Chi-square

WFCs Women Fuelwood Carriers

CHAPTER ONE



1. INTRODUCTION

1.1 Background of the Study

The recent supply disruptions in the international crude oil market followed by the escalating prices of crude oil have prompted policy makers in oil- importing countries to face the challenge of coping with higher oil prices (IEA, 2005). The degree to which oil price influences such economies depends mainly on the energy policies adopted, pricing mechanism implemented, the structure of the energy markets and the degree to which the international price changes are transmitted (ibid). Ethiopia is not an exception. Being a non-energy-fossil oil producing country, Ethiopia is also a victim of the higher oil prices in the international market due to its high dependence on petroleum imports (WFP, 2009; Heimann, 2009; Yared Haile-Meskel, 2008). The increasing demand for petroleum products for electricity generation, transportation, industrial production and domestic needs has made the Ethiopian economy more vulnerable to oil price shocks (Heimann, 2009).

The prospects of harnessing other renewable sources of energy in Ethiopia, as a measure to reduce the rate of consumption of fuelwood are a subject of discussion in different pieces of literature on this matter (Heimann, 2009; New Business Ethiopia, 2010). But, in this context of using forest resources, there is a dilemma. One of the controversies of development is between economic development and environmental conservation. Here, one may pose the following question: should a government give priority to conservation of forest over the livelihoods of the local population?

The rising demand for energy, due to widespread consumption of biomass fuels as sources of energy in Addis Ababa, and in Ethiopia in general, is one of the causes of deforestation (Heimann, 2009). It also perils the health conditions of the populations by the smoke it releases

into the surrounding environment, as the local users burn firewood for domestic purposes, polluting the air (Smith *et al.*, 2000; Vinod *et al.*, 2005).

However, the nature of the relationship between population and biomass, particularly fuelwood, is a subject of debate and controversy in the literature. Some scholars (Anderson 1986, 1987; World Bank, 1987) argue that there is a direct relationship between changes in fuelwood consumption and changes in rates of population growth and urbanization. Others (Cline-Cole *et al.* 1990) believe that this direct link is likely to be distorted by changes in the size of consuming units. One argument frequently encountered in the literature is that population concentration in urban areas leads to an increase in the demand for fuelwood, and that urban demand has a great potential for depletion of tree stock (O'Keefe and Raskin, 1985; Anderson, 1987), which triggers environmental concerns. To mitigate these demands, improved stoves and other measures of energy-saving were suggested as necessary to increase the efficiency of biomass fuel uses. Also, since the use of wood for fuel contributes to deforestation, they found that resorting to alternative sources of energy for cooking would be environmentally desirable. They thought that planning for suitable alternative fuels should, therefore, reduce dependence on wood. As biomass fuels were increasingly becoming scarce because of unsustainable wood cut, better management of biomass resources was found to be necessary.

A hundred years ago, around 1895, in order to minimize the massive deforestation around the Addis Ababa city and to reduce the possibility of an energy crisis, Emperor Menelik introduced *Eucalyptus* to Ethiopia. In fact, the main purpose was to redress the situation of severe shortage of fuelwood and construction materials in Addis Ababa and other regions in the country. Many foreign and local studies have already revealed the tremendous socioeconomic benefits that the eucalyptus trees offer to households (Davidson, 1995; Turnbull, 1999; Demel Teketay, 2000; Dechasa Jiru, 2001; Tsegaye Bekele, 2001) to mention but a few.

A segment of the population living by the Entoto Foothills, northern Addis Ababa, is basically dependent on the forest of eucalyptus as their source of energy (Fekerte Haile, 1991) and as source of income as well. The city of Addis Ababa requires large amounts of firewood to satisfy its energy needs. Women and children backloading mostly branch-wood and leaves into town

supply a significant part of the requirements, (ibid). Despite of the extremely arduous work in collecting and selling firewood, most of the WFCs have very low income and belong to the most disadvantaged sections of society. For lack of adequate education and skills and alternative livelihoods, as well as the rising demand for biomass energy, the women fuelwood carriers (WFCs) contribute to the depletion of the peri-urban forests of Addis Ababa. This negative interaction with the forest may lead to the WFCs' livelihood insecurity, by disrupting the sustainable supply of fuelwood and ultimately put at stake, not only the very survival of WFCs themselves, but also the household energy needs of end-users at large. Despite harassments, the forest security guards have not been able to discourage them from pursuing the illegal activities in the forest reserve.

The environment is the variable of ultimate concern, as events taking place somewhere; they influence the state of the environment. In the present case study, the environment is made up of woodlands from which the harvesting of wood for the provision of fuelwood in urban areas takes place. Woodlands are renewable resources, resilient to certain levels of harvest/disturbance. The sustainability objective is to at least maintain the ecological functions of the resources. Ecosystems, hydrological and socio-economic functions of woodlands are compromised when harvesting levels go beyond certain thresholds (Chambwera, n.d.).

The difference between the present research and most of the studies done on the livelihood conditions of women firewood carriers in Ethiopia is that the latter are based purely on economic perspective without considering the environmental aspects of development (e.g. Tadesse Tafesse., 2002; World Bank, 2004; Shanko, 2004), while the former focused more on the women's livelihoods in the light of environment sensitive development.

1.2 Statement of the Problem

The women fuelwood carriers, who make a living out of the forest resources, in Woreda 1 of the Gulele Sub City of the northern Addis Ababa, face the problem of livelihood insecurity. Without education or training, these women find it extremely difficult to get a decent job other than tapping into the forest.

The women who make their living by collecting fuelwood from forest plantations to sell in urban market places are strikingly visible as they stream in their hundreds, each day, labouring under their heavy loads. But, as with so much of women's productive work, this activity has been largely invisible to planners and policy makers. In this case, their invisibility is particularly astonishing: The Women Fuelwood Carriers (WFCs), as they have come to be known, daily provide an essential service, without which most urban dwellers could not cook their meals or heat their houses.

In the capital city of Addis Ababa, with a population of 2,738,248 (CSA, 2007) - reported in 2008, the majority of households use fuelwood for cooking, brewing and heating, most of which is supplied by thousands of women (WFCs) each day. The work the women do to earn their living is illegal, and ultimately destructive. They collect fuelwood from plantations own by the government and by gathering leaves and branches from the forest floor and from living trees; they hamper the trees' growth, rob the soil of fertilizer and contribute to soil erosion.

The cumulative effect of the WFCs' work in the forest reserve, as the only means of their livelihood, has further repercussions. It contributes to increase depletion of the plantations, disrupts the sustainable supply of fuelwood and ultimately puts at stake, not only the very survival of WFCs themselves, but also the household energy needs of end-users at large.

Managers have struggled to protect the plantations from illegal forest users, rural and urban ones, particularly as the state enterprise with the monopoly for fuelwood has only been able to provide about a third of urban need, according to local authorities. This huge gap has been filled by farmers who bring in fuelwood on donkeys – and by WFCs loaded on their back (direct observation). Forest protection has been very traditional: it has depended on the vigilance of armed guards (inadequate in number and poorly paid).So far, there was no attempt to encourage the participation of forest users or others stakeholders in the plantations' protection scheme or management plan.

The WFCs subsist on fuelwood carrying and trading, as their primary source of income, at a considerable cost both to their own health and personal safety, and to the sound management of the forest resources. The income that the WFCs earn from the selling a bundle of fuelwood barely permits survival – when they collect it themselves they end up selling it in the local market to the tune of ETB 15.00 - 20.00. Such a meager income entails, apart from the harassment by and bribes to the forest security guards, the back-breaking work of walking up to 30km round trip; and back-loading an average weight of 30kg on the return journey.

Deforestation related issues are a real national concern in the study area, according to some local authorities. But, equally important is the issue of the livelihood of a large number of people who depend on supply of traditional fuels to make a living. In fact, balancing these two concerns of maintaining the WFCs' sustainable livelihood and protecting the forest are the central theme of this research.

1.3 Objectives of the Study

The general objective of the research is to assess the livelihood conditions of the women fuelwood carriers in northern Addis Ababa as well as their interaction with the forest. The specific objectives are:

- To assess the women fuelwood carriers socioeconomic situation;
- To identify the role of fuelwood sell in their livelihood;
- To study the interaction between WFCs and the forest;
- To recommend measures to assist in promoting the livelihoods of the WFCs and mitigating the negative effects of their activities in the forest.

1.4 Research Questions

The research questions to be dealt with are:

- What is the current livelihood (social, natural, physical and financial) situation of the women fuelwood carriers?
- What is the role of fuelwood sell in their livelihood?
- Is there any kind of interaction between the WFCs and the forest?
- What are the factors likely to improve women fuelwood carrier's livelihood conditions?

1.5 Significance of the Study

This paper aims at providing the policy makers and planners (development practitioners/environmentalists) with tangible and concrete evidences on how to improve the livelihood situation of the vulnerable and poor women firewood carriers. For this purpose, the study identifies training needs for WFCs development. On the other hand, the research explains the implications of the eucalyptus trees to the local people livelihood and the peril on the environment of the cutting off of those trees. Finally, this study may be considered as a basis for further in-depth empirical investigation/research on areas of forest-environment interaction and it may serve as a material source.

1.6 Limitations to the Study

The most salient limitation is the language barrier. To minimize this issue, several translators were employed not only to ensure the flow of communication, but also to guaranty data accuracy (by using a kind of triangulation system). These helped to administer the questionnaires and moderate focus group discussions as well. Apart from these, there are other factors that may challenge some of the findings of the studies, such as the cultural background of the researcher and that of the WFCs; the sex difference between the researcher and the women; even though other ladies were recruited as enumerators to carry out the job of data collection. Another difficulty faced by the researcher was the WFCs' busy working schedules; all these factors combined encroached upon the respondents understanding, attitudes and perceptions towards their overall conditions, which might have influenced the validity and reliability of some of the data generated from sensitive questions in the study.

1.7 Organization of the Thesis

This Thesis is organized into five chapters. Chapter one deals with the general introduction of the study including research objectives. Chapters two deals with review of literature on research topics. The literature review focuses on livelihood of the forest dependent populations, forest resources and management, and so on. Chapter three contains the methodology applied to accomplish the research objectives and description of the study area. Chapter four deals with presentation and analysis and interpretation of the data collected. Chapter five presents the conclusion drawn from the study and the recommendations.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Definition of Terms and Concept

Forest

FAO (1998) defines forest as follows:

> *A "land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 hectares (ha). The trees should be able to reach a minimum height of 5 meters (m) at maturity in situ. It may consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground; or open forest formations with a continuous vegetation cover in which tree crown cover exceeds 10 percent".*

Livelihood: "A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living" (DFID, 1999).

Forest fringe community: Refers to the people who live in or near the forest and have access to forest areas and who depend to a large extent on the forest for their livelihoods.

Sustainability in these contexts refers to the ability to maintain or enhance resource productivity on a long-term basis.

Sustainable livelihood: "A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base" (DFID, 1999).

Food Security: The ability to adequately satisfy these stocks and flows of food and cash for a sustained source of meeting basic needs is what is expressed as security. A livelihood quality will improve when its security and sustainability are improved. Security in this context refers to secure ownership of, or access to resources and income-earning activities, including reserves and

assets to offset risk, ease shocks and meet contingencies (WCED, 1987; Chambers and Conway, 1992).

Vulnerability: it refers to the external environment in which people pursue their livelihoods and their exposure to the negative effects of external environments, as well as their resilience in resisting and recovering from external shocks and trends (Chambers, 1989).

2.2 Livelihoods in Forest Dependent Communities

Many forest dependent people employ a diversity of means to help meet basic needs: food and cash crop production, forest and tree product gathering and income-earning enterprises both on and off the farm. Often, the poorer the household, the more diverse the sources of their livelihood, as the needs for the year must be made up from various off-farm as well as on-farm natural resources, and often from migrant labouring as well (Shepherd *et al.*, 1999 in: Tropenbos International, 2005).

The dependence of local populations on forest resources can be derived from a number of sources, two of these are: their close contact with the forest and its products; their vulnerability with Non-Timber Forest Products (NTFPs) providing an important safety net in times of stress in their economic activities (Shackleton and Shackleton, 2004). Poor rural and 'peri-urban' people are very much dependent on land and other natural resources for their livelihood (Chambers and Conway, 1992) as well as for income (Tropenbos International, 2005).

Contribution of Forestry to Livelihoods Improvement

Forests contribute to all aspects of rural and peri-urban lives of fringe communities: providing food, medicines, fuelwood, fodder, canes, building materials, wrapping leaves, pestles, chewing sticks, and materials for all sorts of household items.

However, these contributions vary in terms of income to households. Cavandish (1998) estimated a 35 % contribution of forest income to the total income in rural areas of Zimbabwe. While Levang *et al.*, (2003) estimated 30.4 % contribution to the income of 72 percent of the households in Indonesia; Adhikare (2003) states that forest contributes 14-20% to total income

of mountain dwellers in Nepal rural areas. A study carried out by Bawayla (2004) in Zambia indicated that the average income derived from forest product is approximately to the tune of US$900 per household per year among residents of Nyampande and US$450 by Chibwe residents.

Obviously, as several studies indicate, forest income is more important for poor households than non-poor ones. For example, a study in Uganda (Johnson, 1991) reveals that the importance of forest income decreases as the degree of poverty decreases. It concludes that the forest income is more important for poor households because the major part of their income comes from forest. But for non-poor households, the forest income contributes only a little, if at all, in the overall income. Vedeld *et al.,* (2004) also indicated that poor households generate income from forests, which is one of diversifying source of income.

However, forestry to be genuinely successful in sustainable poverty reduction, women as well as minorities needs to be involved and empowered. Rogers. A. (1992; 1997) is conversant and associated with low levels of education and lack of skills. Training and extension program organized through Forest Group Users (FGUs) increase the skill and knowledge of the users and thus helps to select, design and implement the appropriate livelihood strategy for them (LFP, 2003). Improvement in income opportunities and human capital of the poor would naturally reduce their vulnerability to adverse shocks and would promote their livelihoods. Forest policies, forest acts, and FGUs rules, the FGUs organization, social relations and networks, inclusion through the active participation of women and disadvantaged groups and the practice of democratic processes in decision making increases the social capital of FGUs.

The FGUs funds (Financial capital) and the FGUs institution (Social capital) can be used to develop physical capital such as roads, drinking water supply, school and irrigation canal at local level, which improve the well being of the people. These have important impact on poverty reduction and livelihood diversification by improving the markets, speeding the flow of information and resources and integrating the local economy into national economy. It is expected that mobilization of local people in the whole process of planning, implementation and benefit sharing of Forest Groups ensure lower unit costs, better quality of work, and greater

transparency in fund utilization, greater local ownership and more long-term sustainability (World Bank, 2003, cited in Kanel *et al.,* 2004).

Household's Dependence on Fuelwood

According to Sokona (n.d.), the literature on the fuelwood question increasingly suggests that there are a host of complex sociological, economic and ecological factors, which actively mould and reshape the nature and magnitude of the energy crisis confronting poor households in Africa. Reference has been made to scarcity of labour force, transport difficulties, competing demands for wood products, land tenure systems and patterns of population settlements and movement. It has been stressed that there is a close link between energy, water and food, and that fuel scarcities, while serious, are only one of the numerous difficulties which threaten survival (ibid). Fuelwood shortages are a symptom of widespread rural and peri-urban poverty and are linked to the more fundamental dimensions of survival, production and land management.

Historically, wood has been the most important source of bioenergy (http://www.greenfacts.org/glossary/abc/bioenergy.htm). Wood has been used for cooking and heating since the discovery of fire. In developing countries, it is also used in commercial applications such as fish drying, tobacco curing and brick baking (ibid). In developed countries, it is predominantly used for energy generation in the forest industry.

In Ethiopia, as in so many other developing countries, fuelwood is still produced, consumed and also sold in the local markets to generate household income (http://www.greenfacts.org/glossary/wxyz/wood-energy.htm). Since fuelwood is mainly used in private households for cooking and heating and it is very often traded informally, it is difficult to collect reliable empirical data at household level. But, one thing is for sure, the fuelwood is a major source of energy for households. Those who engage in the collection and selling of firewood on a regular basis are invariably the poorest of the poor. They are particularly women (WFCs) and children, who depend on fuelwood collection and marketing for their livelihood (Dessalegn Rahmato, 2001). On the other hand, poor women in rural and urban areas may resort to firewood collection and selling as one of their coping mechanisms in times of crisis, as well. As in the case of Arssi, for instance, during famine period, besides livestock and household assets, people also sold trees, firewood and charcoal. Especially the women became involved in

carrying the firewood to the nearest cities for sale. They became the backbone of their families (Dodota, Arssi, 2007), which is equivalent to say that fuelwood plays an empowering role in poor households in Ethiopia.

Citing Dessalegn Rahmato, a study undertaken by ILO/MOLSA, for example, revealed that over 80 percent of households in Addis Ababa obtain their domestic energy from biomass fuel (wood, and tree residue) and dung, and the annual inflow of fuelwood into the city is estimated at close to 21,000 metric tons. It goes on to say that between 15 to 20 thousand of women and children in the capital provide about 35% of the city's domestic energy supply, while another third is supplied by peasants from surrounding areas. Fuelwood selling is the main non-farm income source for female-headed households. This is due to its 'openness' for anyone who is capable of collecting and transporting (Degefa Tolossa, 2005).

Biomass and Energy Substitution

About 2.3 billion people worldwide - every two in five rely on biomass fuel, mostly fuelwood, as their main or soul sources of domestic energy requirements (Sands, 2005; FAO, 1995). About 3 billion people of the planet depend on biomass energy for cooking (Dessalegn Rahman, 1998).

The use of biomass has a number of repercussions for poor people. The fuel quality is low, and when burnt it gives off quantities of smoke and particulates that are recognized as having negative effects on health. The several hours a day spent in collecting fuel means that this time cannot be used for other livelihood activities. Although nearly every household in rural areas will use some biomass as an energy carrier, poor households will spend more time searching than those in higher income groups (Reddy, 2000).

Although economic development in many developing countries has been rapidly progressed alternatives to biomass, fuels are still scarce in many rural areas (Koopmans, 1993; Soussan, 1991). In fact, forests are still among the vital sources and are providing majority of the biomass fuel required in most developing countries.

The construction of the traditional cooking stove leads to combustion processes inside stoves to be non-ideal, thus, favoring incomplete combustion. Due to the incomplete and inefficient combustion, such stoves produce significant quantities of 'products of incomplete combustion' (PIC) importantly fine and ultra fine particles, which have more global warming potential (GWP) than CO_2 (Smith *et al.*, 2000). Bhattacharya *et al.*, (2000) report that incomplete combustion of biomass in the traditional cooking stove release carbon monoxide (CO), nitrous oxide (N_2O), methane (CH_4), polycyclic aromatic hydrocarbons (PAHs), particles composed of elemental carbon or black carbon, and other organic compounds.

As local people of forest areas are heavily dependent on forests for their energy needs, improving cooking stove would reduce indoor air pollution and increase energy efficiency.

Wood fuel burning on traditional stoves causes emissions of pollutants such as carbon monoxide, methane, nitrogen oxides, benzene, formaldehyde, benzo (a) pyrene, aro-matics and respirable particulate matter (Shukla, 1996). These emissions have significant implications for climate change due to their considerably high global warming potential compared to CO_2 (IPCC, 1990).

The effects of the biomass burning in the traditional cooking stoves on human health have been reported by many scientists in the world. Among them blindness (Mishra *et al.*, 1999a); asthma (Schei *et al.*, 2004); acute respiratory infections (Smith *et al.*, 2000; Vinod *et al.*, 2005); cancer (Bhargava *et al.*, 2004); chronic obstructive pulmonary disease (Ekici *et al.*, 2005); eye discomfort, headache, back pain (Diaz *et al.*, 2007); reduced birth weight (Mishra *et al.*, 2004); stillbirth (Mishra *et al.*, 2005); and tuberculosis (Mishra *et al.*, 1999b), among others.

Historical background of Forest Management in Ethiopia

Ethiopia has an old age history of management of natural resources. Perhaps, this is due to immense wealth in natural resources of Ethiopia.

Towards the turn of the 19th century, that is during the reign of Menelik II, 1890-19 14, urbanization began in Ethiopia in several areas (Willis, 1966). This was the beginning of a major

forest destruction period. According to Fekerte Haile, citing Willis, after Menelik settled at Ankober, the forest resources in the area were completely used up for construction and fuelwood and he was forced to relocate the capital to Inewari. This movement from place to place in search of fuelwood and construction material continued until Menelik settled at Entoto near Addis Ababa. The third major deforestation, however, occurred when the Derg was overthrown and the new regime came to power (Dessalegn Rahmato, 2001).

Peri-urban Forest Resources Management of Addis Ababa

Menelik introduced the range of eucalyptus forest in the periphery of Addis Ababa to meet the increasing demand for wood due to population growth. The seedlings were supposed to be for each residence to plant, tend and utilize, as Rases and Mekuanint were given land in and around Addis Ababa. These landlords intensified the management control of the then privately owned eucalyptus forest. As the landlords employed local tenants to guard and strictly control the resources, the forests were reportedly properly managed (World Bank, 1987). Nevertheless, there are no figures indicating the productivity of the Addis Ababa peri-urban forest during this period (Aklog, 1990).

Rural-urban Migration

The negative effects of environmental deterioration on the productive capacity of the land, threatens food production and the livelihoods of both rural and urban populations. Because the poor in developing countries live primarily in rural areas and are dependent on agriculture, rural poverty and environmental degradation are obviously closely related (Todaro, 1989).

Migration is often a direct response to environmental degradation and rural poverty. In his study of the demographic responses to drought and food crisis in the Sahel in the mid-1980s, Hill (1989) asserts that the main individual, household, and community strategy for coping with drought was out-migration. Migration may be viewed as part of a household survival strategy even during non-drought years, whereby a family allocates part of its labor for nonfarm work (including seasonal out-migration).

A migrant move to wherever the expected net objective and subjective returns to migration are greatest. Microeconomic models lead to several important generalizations about the impact of

migration on individuals (Massey *et al.,* 1993). Individual characteristics (education, experience, and occupational skills) increase both the likelihood of migration and the probability of employment in the destination area relative to the area of origin. In short, the microeconomic theory suggests that people make decisions about where to live depending on where they can expect to maximize their future earnings.

Livelihood Strategies

A livelihood comprises the capabilities, assets and activities required for means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, and maintain or enhance its capabilities and assets both row and in the future, while not undermining the natural resource base (Carney, 1999).

Sustainability is important if programs in poverty reduction are to be lasting. Sustainability of livelihoods rests on several dimensions, environmental, economic, social and resilient in the face of external shocks and stresses; are not dependent on external support (Ashby and Carney, 1999).

Conceptual and Theoretical Framework

The focus of the framework is on the livelihoods of the women fuelwood carriers in Woreda 1, Gulele Sub City in the northern Addis Ababa region. Livelihoods of community members are influenced by external and internal forces and factors, such as economic trends, conflicts, resource management, seasonality and health. People's objectives (or livelihood outcomes) are normally shaped by their livelihood assets and strategies. Following the Sustainable Livelihoods Framework by DFID (1999), a livelihood consists of different capitals; physical, human, financial, social and natural. Within this study these capitals are mostly considered in relation to the forest. Natural capital is particularly salient in the studied community because various livelihood strategies such as NTFP gathering, chainsaw operations or basket weaving can help inhabitants in achieving their livelihood outcomes. Desired outcomes can reduce vulnerability, increase income, and improve food security or a more sustainable use of the resource base.

The feedback process shows the link between the livelihood outcomes and assets. For example, proper use of forest resources warrants the sustainability of the natural asset and therefore has a positive effect on the livelihoods of community members.

CONCEPTUAL FRAMEWORK

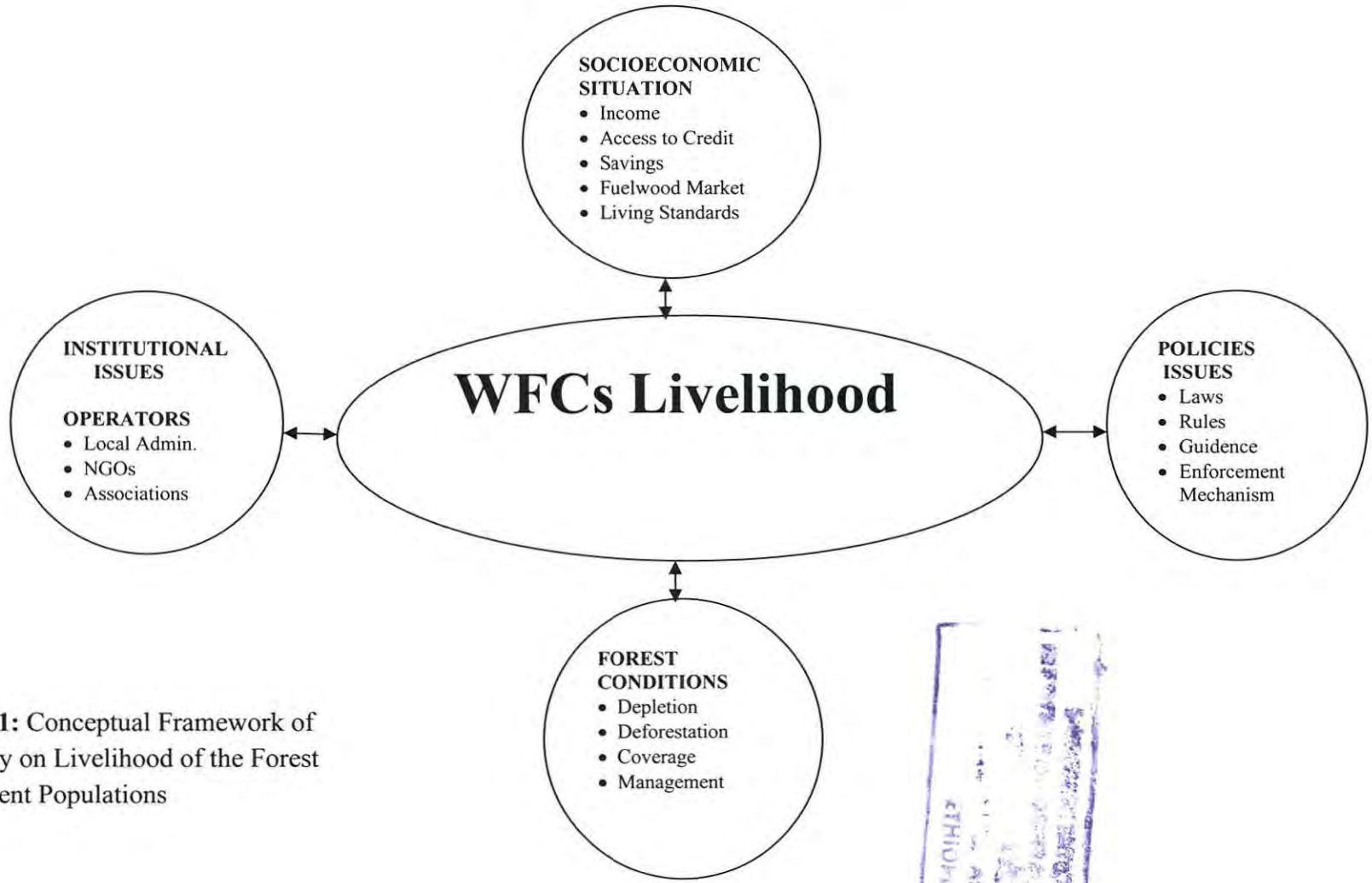


Figure 1: Conceptual Framework of the study on Livelihood of the Forest Dependent Populations

Factors Likely to Improve Livelihoods

There are several factors that influence one's livelihood. These factors defer from one community to the other depending on the location and cultural background. The dependence of local people on forest resources can be derived from a number of sources, two of these are: their close contact with the forest and its products; their vulnerability with NTFPs providing an important safety net in times of stress in their economic activities (Shackleton and Shackleton, 2004). Poor rural and 'peri-urban' people are very much dependent on land and other natural resources for their livelihood (Chambers and Conway, 1992) as well as for income (Tropenbos International, 2005).

Generally speaking, the most important factors are those such as economic status, age and gender, which play a critical part in shaping opportunities to sustain or improve livelihoods. These factors also influence the outcomes of managed processes of social change such as decentralization, and the ways in which different people may be represented in, or excluded from, natural resource management processes.

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Description of the Study Area

The City of Addis Ababa, officially known as the City Government Administration of Addis Ababa, is one of the city administrations in the country which is located in the central highlands of Ethiopia that stretches from 1800 to 3200 meters above sea level. The City Administration of Addis Ababa, in geographic terms, is located between 9 02 N, 38 42 E (Ethiopian Government, 2011). The total area of Addis Ababa is 526.99 square kilometers. Its topography is constituted by hills, valleys, rivers and streams. The mean month rainfall based on records of weather station at Bole is minimum 16.8 mm and maximum 278 mm, in the months of January and August respectively (N.M.A., 2011). The average rainy days are 20, 27, 26 and 18 in the months of June, July, August and September, respectively. The mean monthly temperature ranges from 20 ^{0}C to 25^{0}C during the day time.

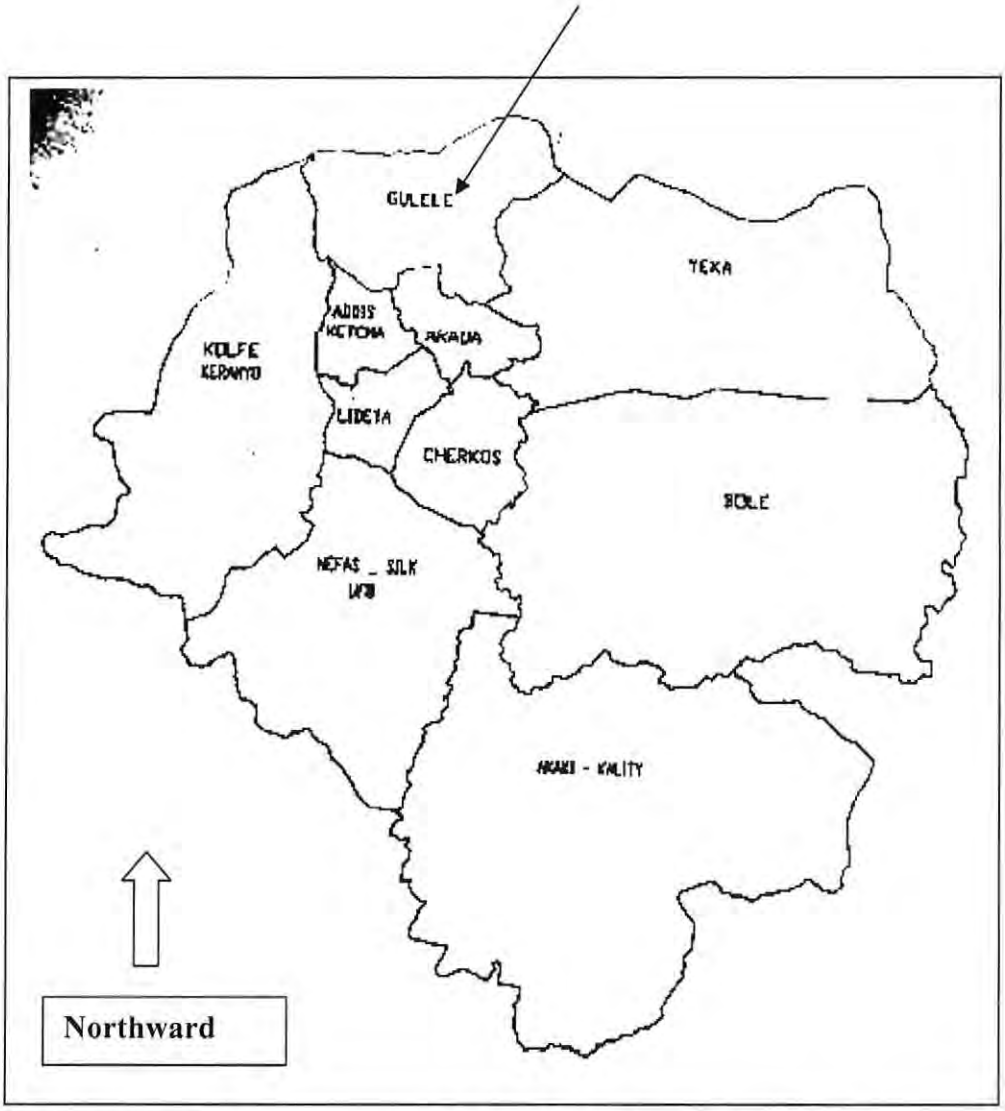
According to the official document of the City Administration of Addis Ababa (2010), the total projected population of the City Administration of Addis Ababa for July 2010 was estimated to be 2, 739, 551 persons; disaggregated by sex, 47.65% males and 52.35% females (CSA, 2010).

The capital city, according to the Annual Book of the City Administration of Addis Ababa, was divided into 10 sub-cities and a total of one hundred sixteen woredas/districts for administrative purpose beginning July 2009 (see Maps 1- 3). Gulele Sub-city Administration is one of the sub-cities.

The total area of the Gulele Sub-city is 30.18 square kilometers, which makes it the fourth Sub-city in terms of its geographic dimension. In the Sub-city, a total of 267,624 persons were living in 2007. The population density of the Gulele Sub-city was 9438.9 persons per a square

kilometer, which ranked it the fourth densely populated section of the City. In 49,661 households, 23,315 individuals, and 31,320 households had access to either radio, telephone and/or TV set, respectively.

In Gulele Sub-city there are currently a total of 10 woredas/districts. District/Woreda 1 Administration (previously known as Kebeles 19/20/21 Administration) is one of the districts under the auspices of the Gulele Sub-city Administration. This District is the study area. District/Woreda 1 Administration had a total population of 29,235 persons in July 2007. Disaggregated by sex, there were 48.04% males and 51.96% females. In addition, the total number of households in the study area was 7,833 householders who had been resided in 6,843 housing units of different types in terms of the materials used for their construction such as walls, floors, ceilings, and other parts made of mud, bamboo/reed, wood planks, parquet/polished wood, cement screed, plastic tiles, cement tiles, brick tiles, ceramic/marble tiles and/or others.



Source: City Administration of Addis Ababa, September 18, 2010

Figure 1: Map of the City Government of Addis Ababa – The Study Area (Gulele Sub City)

3.1 Methods

Criteria for Selecting the Study Area

In order to draw representative sample from the target population, the study followed multistage sampling procedures. The study purposefully selected Woreda 1 of the Gulele Sub City, in which the target population is located. Then, it employed systematic sampling techniques because the list of the women fuelwood carriers (the target population), which is the sampling frame, was available, part of it in Woreda's Office and another part in the Former Women Fuelwood Carriers' Association, and totally it was 2000 WFCs.

This is followed by the sampling interval exercise, which was determined based on the formula $K=N/n$, where N is the size of the target population, n the size of the sample and K is the sample interval, e.g. 2000/92=22 (Sample Size Calculator by Raosoft, Inc., 2004).

To arrive at the sample size of 92, the researcher resorted to the website-based formula called Raosoft Sample size calculator, admitted a margin error of 10%, which is common to tolerate the above-stated sample size. The researcher also used 95% as the confidence level, which is the amount of uncertainty possible to tolerate, given the sample size. After entering the number 2000 as the size of target population, the response distribution was fixed at 50% (since the researcher did not initially know the skewness of the distribution of the target population, and the sample size recommended was 92.

To draw the stated representative sample size 92, the study used Random starting by choosing a number (7) between 1and K (22), after that the consecutive sampler of respondents was drawn following sampling interval calculated above, e.g. 7, 29, 51, 73,...92.

3.2 Methods of Data Collection

Household Survey

Quantitatively, the study employed the descriptive survey method to collect quantitative data and describe the general and specific characteristics of the target population –Women Fuelwood Carriers (WFCs). Further, structured questionnaires were used to generate general socio-demographic profile of the respondents.

The quantitative data were triangulated by qualitative data. Qualitatively, the study used semi-structured interviews with a total of ten (10) persons (7 female and 3 male) to collect data on their attitude towards the forest in light of environmental protection and development in a sustainable manner.

3.3 Focus Group Discussion

This was undertaken along with community leaders and *Woreda's* Officials. Two different focus group discussions were conducted separately for collecting different information regarding Women Fuelwood Carries. Each focus group discussion was comprised of 6 individuals. To guide the discussion, (Fuelwood Carries & Non Fuelwood Carries) semi-structured checklists were developed on a number of issues such as the interaction between the WFCs and the forest, the environmental protection, livelihood sustainability, the factors likely to improve WFCs livelihood situation; the WFCs' attitude about the resources (perceptions towards the forest in the future, the livelihood impacts, concern about sustainable use of natural resources; community attributes (community-based organization, type and functions, institutions on resource use, decision making processes). This method of data collection was very important as it helped to cover a wide range of issues that would require a lot of time and huge amount of financial resources, if carried out through household surveys.

3.4 Key Informant Interview

Selected people from the Woreda study area and zonal concerned government offices, private investors, NGOs Staffs and other stakeholders were interviewed using a guide.

3.5 Direct Observation

Direct observation was conducted in the selected areas of the study, where there is a severe effect of deforestation on the livelihoods of the WFCs. In this regard, the WFCs were followed to and from the forest to know how they actually do the harvest the bundles of firewood, and other forest resources. The physical settings of the area, condition of the forest, and management practices were subjected to physical observation as well. Direct observation was also made on the respondents' households, housing conditions their access to different facilities such as water, toilets, and so on. All of these were undertaken with the help of checklists to complete the reliability of data collected through the above-mentioned techniques.

3.6 Secondary Data

Having due regard for the validity and quality of information, secondary data were collected through reviewing the available studies, books, plans and reports at different relevant institutions, including the local authorities.

3.7 Data Analysis

Immediately after the successful completion of data collection, the quantitative data were edited, coded and entered into the latest version of Statistical Package for Social Sciences software (SPSS version 19.0) to be cleaned and made ready for analysis. The data generated were of quantitative and qualitative nature. Therefore, for data collected through focus group discussion, and key informant interview, qualitative assessment were employed and used in triangulation of evidences. Besides, qualitative information (response of the FGD & the interview) was analyzed, verified and applied to draw inference and conclusions. Each qualitative analysis was integrated with quantitative analysis for purpose of inference.

Meanwhile, quantitative data were analyzed using descriptive statistics with the help of the above-stated statistical software (SPSS). Based on surveyed data, socioeconomic characteristics of sampled households were described with respect to livelihood diversification status by employing descriptive statistics. In addition, some open-ended questions, which were incorporated in the structured questionnaires, were also analyzed quantitatively in the same way.

In order to quantify qualitative data with the study, the researcher first coded the open-ended questions. In so doing, the researcher classified major responses which were not given frequently. The classification of responses was primarily based on similarities or differences among the responses, after the researcher had looked for major characteristics of the responses and put them accordingly.

CHAPTER FOUR

4. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

Sampled Household

The respondents who were sampled to participate in the present study were ninety-two (92), selected from the following areas: kebele 19 (57. 60%); kebele 20 (35.90%); and kebele 21 (6 %).

The women fuelwood carriers (WFCs), who were the respondents in this study, were from different villages. Although they were more or less evenly distributed, its concentration was more skewed towards Kuskuam where 16.30% of the respondents came from; followed by Bilatie Gibi with 15.20 % and then Dejazmach Metaferiya with an equal percentage of the WFCs; next, Adarashe with 14.10%, and other ones in less significant numbers.

Sex

Concerning the sex of respondents, all of them were female. This is not a coincidence. It happened that way because the sample respondents were all women fuelwood carriers and therefore there is no single man involved in the survey. According to local people, traditionally speaking, the above-mentioned activity is a women's business.

Age

The age of fuelwood carriers ranged from 18 to 68. A significant proportion of the respondents' age (34.80 %) were found to be within the range of 18-27; about 33 percent of them were within the range of 28-37; while 22.80% fell within the age category of 38-47. The age average is about 33.4 years and there were no younger girls registered undertaking these activities as shown in previous similar studies (Fekerte Haile, 1991). The fact is that the sampling frame got from the Former Women Fuelwood Carriers' Association (FWFCs) did not register ladies younger than 18 years old. However, the data gathered showed that there are younger girls fuelwood carriers, who were even younger than the minimum above-stated age, including younger boys. Relatively

speaking, these younger boys and girls who were children of the FWCs follow the footsteps of their mothers in collecting firewood on weekends. Generally, the WFCs' age distribution shows that they fall not only within the economically active age category (15-60), but they are also elderly and economically inactive ones.

Educational level

In this context, it was discovered that 51.1 percent the of respondents were illiterate; 15.20 percent of the studied respondents were those who completed primary education (grade 1-4) and other 15.20 percent achieved primary education (grade 5-8). Only 1.10 percent of the respondents have alternative basic education and another 1.10 percent completed the secondary education (grade 11-12). By all means, this is a very low level of educational achievement by the households. This suggests that any kind of program designed to improve their livelihood would require further training and outreach activities by stakeholders.

The study also found out that the relationship between the educational level of the respondents and their age was statistically significant at the calculated value of $\chi 2 = 31.162$, df = 35 and critical or table value of $\chi 2 = 49.8018$ and $p = .05$. The results further indicate that age is an important indicator of educational achievement. The older you are the lesser probability you have to achieve higher educational level. Thus, younger WFCs have achieved higher educational level.

Marital Status and Religion

Most of the sampled respondents (78.3%) were married. Little more than 16 percent were single or never married and 4. 3% were divorced. 1.10 percent of the firewood carriers were widowed and none of them were separated. One positive aspect in this context might be the possibility of supporting each other – husband and wife – in terms of generating household income. The other aspect, perhaps less favorable, is that the women, being married and as a fuelwood carrier, may not have time to support other household members back home and, at the same time, carry out other household chores in a traditional way.

As far as religious affiliation or devotion is concerned, out of ninety-two sampled respondents, 75 percent are Orthodox Christian. About 23 percent Protestants and Catholics were just two percent.

Family Size

About 35 percent of the sampled respondents had a family size of two, followed by 25 percent single family sized households. The minimum percentage (1.10%) of WFCs reported a family size of 6. Generally, on average, the household in the study area have about 5 household members, which is a bit higher than that of the Gulele Sub city (4.2 % per household) and that of Addis Ababa (4.1 % persons per household), in accordance with the Central Statistical Agency (2008). Apart from this fact, data generated through observation of some selected households showed that the family size of the WFCs was found to be much bigger than that statistically reported. This happens because the respondents simply reported members of the respective households composed by the core dependents (i.e. wife, husband and children). But, in reality and what is interesting is that there are two different sets of family living in the same house, supporting each other. The implication is that their livelihoods are expressions of styles of survival strategies, cohabitation, tolerance, and transparency.

There is association between yearly household income and the total number of household members. The results of bivariate analysis show that family size of WFCs is dependent upon their yearly amount of income at $\chi 2_{\text{calculated}} = 20.782$, df = 24 and p = .652, which is bigger than .05 (i.e., 95% confidence level). This means that there is a significant difference between those WFCs who earn higher amount of income yearly and those of lower earners in terms of total family size. Thus, one can conclude that WFCs who earn higher annual household income seem to have bigger family size than those women who have low yearly income.

4.1 Social-economic Situation

Job Opportunities

All of the sampled respondents (100 percent) were firewood collectors. They predominantly depend on firewood for their livelihood. Forest provides the basis for their livelihood: money,

child education, learning trade and starting a petty trade, if they can. By implication, it is not difficult for one to presume that the forest resources, being the major source of income, are very much endangered of depletion and consequently of deforestation in the long run, due to the pressure this section of the populations exert on it for their survival.

Occupation diversity in the household should be one of the coping strategies used by WFCs. Nevertheless, about 100 percent of the respondents reported that they are not engaged in petty trading. 2.20 % alone seek to do this kind of business, which include *enjera* baking, selling vegetables, brewing *tela* (local beer), spinning cotton and carpeting. From the total number (92) of the respondent only 1.10% were engaged in petty trading for a period of seven months. The implication is that the majority of the respondents had no other significant source of income but from fire wood collection and selling.

Only 37 percent of the respondents out of the total of 92 were self-employed. About 4.3% of the respondents engaged in backstreet market, washing clothes on house to house basis, spinning cotton and the like for the period of 10 years. The rest of them (i.e., from 1.10 to 3.3%) were engage in some sort of activities for a period between 1 to 37 years. These women could not do more in term of self-employment for lack of finances.

The majority of the respondents (71 percent) in Woreda 1, Administration of Gulele Sub City have been engaged in the firewood collection. The minimum percent of the respondents who have been involved in the activity of collecting firewood was 1.10%, which reflects different years of services like from 1 to 33 years. These statistics reveal the great importance the forest resources have in the livelihood of the concerned WFCs. In other words, this is due to the lack of alternative generating income and the need to continue to support the household income. In the same framework, chi-square analysis supports that these WFCs are found to be dependent on firewood harvesting and selling to be able to generate adequate income for the respective households at $\chi 2_{\text{calculated}} = 6.584$, $df = 5$, $\chi 2_{\text{critical/table value}} = 11.0705$ and $p = .253$. With this analysis in mind, one may conclude that the WFCs are really dependent on the forest.

Table 1: Number of years of the Respondents' Firewood Collection in the Study Area

Duration of FW Collection in Years	Frequency	Percent
1-5	32	34.80
6-10	33	35.90
11-15	9	9.80
16-20	11	12.00
21-25	4	4.40
26-30	2	2.20
33+	1	1.10
Total	**92**	**100.00**

Source own survey 2010-11

4.2 Daily Amount of the Respondents' Income in ETB

The majority of the WFCs are living in a poverty condition (75 percent), in which they earn less than one Dollar a day, as stated by the World Bank (2002) regarding the poverty line (1 USD threshold for poverty line). On the other hand, an insignificant percentage of the respondents were found to earn more than a Dollar daily (1.10% to 2.20%). The finding of the present study implies that these women live in poor conditions. In contrast, qualitative findings indicate that there are some people in the Household helping generating income from the business activities in backstreet market, and other informal sectors.

As far as yearly household income is concern, there is a great variability among WFCs in the study. Twelve percent of the sampled respondents were found to earn ETB 2,501.00-3,500.00 per year, whereas only between 2.20% to 3.30% earned an amount about ETB 7,501.00-8,501.00. An individual requires a total amount of ETB 5976.00 to live and work in health condition annually. The study found out that about 30 percent of the respondents earned less than the above-mentioned amount annually. The remaining proportion was found to be in relatively good living condition as they were found to earn an amount which ranges from ETB 7,501.00-8,501.00. The minimum amount of annual household (HH) income was found to be about ETB 500.00 whereas the maximum amount was ETB 8,501.00. This happened like that, because some HHs had been engaged in other income generating activities such as spinning, weaving, daily laborer, petty

trading, washing clothes on house to house basis, baking *ingera,* and brewing, and when it was summed up on annual basis it appeared to be like the above estimations.

Table 2: Yearly Amount of the Respondents' Income in ETB

Birr	Frequency	Percent
<500	2	2.20
501-1500	20	21.80
1501-2500	17	17.7
2501-3500	11	12.00
3501-4500	20	21.9
4501-5500	9	9.7
5501-6500	2	2.2
6501-7500	6	6.5
7501-8500	2	2.2
8501+	3	3.3
Total	**92**	**100.0**

Source own survey 2010-11

Household Income

The sources of household income in the study were found to be composed of husband, wife, and parents of either household head, children and brothers-in-law. The males' household heads normally contribute to the household with income they would get from weaving staffs, while their wives would be away for firewood harvesting. These are highlanders from Gamo communities and skillful weavers who migrate to Addis Ababa looking for better markets and better pay for their products (Olmstead, 1974), cited in Getaneh Mehari (2006).

In answering the question whether a large number of dependents in the family would constitute a problem, 54.30 % out of a total of 92 sampled respondents said that no matter the size of their aggregate it would not make any difference, while 46 percent said yes it would.

4.3 Firewood Collection and Markets

A significant part of the women firewood collectors (43.50 %) woke up at 05: 00 am; while others (11 percent) at 04: 00 am to go to forest to collect firewood and other resources and in the process they (30.40 % and 26%) would spend in there, on average, 5 hours a day. There were still others (10 percent and 6.50 percent) who would spend even more like 6 and 8 hrs, respectively. These statistics really show how dependent these people were on the forest and the danger it represents to forest degradation and soil erosion, as well as to the environment as a whole.

The researcher's direct communication with the respondents and observation revealed that all of WFCs were collecting firewood from the reserve forest. The main purpose for harvesting fuelwood was basically to generate income to purchase other goods needed in the household. Those goods were food, soap, clothing and footwear, utensils, utilities, etc. The other purpose for harvesting firewood from the reserve forest was for consumption in order to provide household with the necessary cheaper energy for cooking and heating.

Concerning the marketing, the findings of the study document indicate that the prices of different sized bundles of firewood, including dried leaves and brunches, come up with mix varieties of figures that range from ETB 1.00 to 40.00. Simple survey revealed that there are over 13 market places in and around the study areas of the Woreda, where the WFCs were selling bundles of firewood.

The findings of these market places showed that four (4) scooped dried leaves with two hands was ETB 1.00; very small bundle of dried brunches with dried leaves was four (4) ETB. The minimum price of a bundle of firewood sold by a WFC in the market place was between ETB 18. 00 and ETB 20. 00. The price of the same size of the bundle of firewood could vary from one trader to another in the same market. If another trading woman, other than the firewood collectors, was to sell the same size of bundle of firewood the price would increase by ETB 5.00 (minimum) and ETB 8.00 (maximum). So, considering the above-mentioned circumstances, the average prices (minimum price) in the market ultimately range from ETB 25.00 to 28. 00. The

maximum price ranges from ETB 30. 00 to ETB 35.00, contrary to what the traders had previously said to be ETB 40. 00 the selling price for the bundle of firewood. After a number of observations of the market prices at different market places, it was found that the latter was the accurate price.

Observation showed that there were a number of well-organized full time women fuelwood traders who had been supplying different sized bundles of firewood into the local market places in those above-mentioned areas of the Sub City, in Addis Ababa. These women were found to have already established socioeconomic relations with the WFCs in the study area and its surroundings, and even with firewood traders from both sexes that brought the bundles by loading them on ISUZU trucks to the City Government Administration of Addis Ababa.

Despite these happenings, these women, whose perception by the society is belittled everyday because of what they do for a living, who walking long distances, often barefoot, back-loading bundles of firewood under the intense sun, faced the unfair prices of the local markets, most of the time practiced by wholesalers and retailers. The WFCs would return home silent and almost empty handed, experiencing physical, social and psychological impact. These women, who many times buy a bundle of firewood from the forest at ETB 15.00 to ETB 20.00, ended up selling it with a marginal profit of ETB 5.00. That is the fate these women have to face sometimes (personal communication).

The women found it to be very risky to collect firewood during the rainy season, because in that period of time there were many wild animals in the forest. Another inconvenient fact expressed by the respondents was that the wet leaves and small wood they harvested from the forest could not be sold immediately. It would require a special place to keep them until such a time they would be dried and ready for sale. Although in the end the products would cost more in the market and therefore it meant more money for the WFCs, they expressed fear of being attacked by animals like hyenas and monkeys. Another serious risk stated was the heavy rain. When they

were caught in by a sudden rainfall, the probability of becoming sick was very high; sicknesses like upper respiratory infections, cold, asthma and the like.

4.4 Place of Firewood Collection

The findings of the study show that WFCs did collect firewood from reserve forest/plantation. In accordance with the quantitative data reported, 100 percent of the WFCs harvested firewood from the above-stated area.

The respondents, when asked about the number of times they collect firewood from the forest, 30.4 % said they did it every day, 13 percent of them collected firewood five days a week and 12 percent went to the forest every two days and finally 3.3 % said six days a week.

The WFCs' main purpose for going to the forest was not only the collection of firewood. Sometimes, about 4 and 2 percent of them engage in wild fruit collection and other wood products.

4.5 Some Aspects of Forest Law and Enforcement

This study generated both quantitative and qualitative data on whether the efforts to reduce illegal firewood collection on and off reserved forest in Entoto Mountain were effective or not. Quantitatively, the study figured out that about seventy-one percent of the women respondents had stated that the efforts in Woreda 1 Administration were ineffective to prevent 'illegal' firewood collectors from entering into the reserve forest. Findings from qualitative research of this study also revealed that the existing forest laws that have been enacted and rectified by the national authorities were not being implemented properly, at least at local level. While conducting semi-structure interviews with three different government officials at Gulele Sub city Environmental Protection Sector Office, as they confirmed, 'the forest laws of Ethiopia are there, but how do you expect us to implement it? There are many compatriots out there who are poor and in need of forest resources to eke out their living, including women firewood collectors, peasants in and around the forest. It is impossible to implement and realize our existing forest laws on the ground as long as there are their bellies to be filled in!' In fact, this holds true in

many African countries. These arguments also reflect the findings of Yonas Yemshaw (2001) who, referring to the Proclamation 94/1994, which provisions stipulate that forests are to be utilized according to the management plans and that the local people may utilize natural forests in respect of these management plans and by paying the appropriate fees according to their extractions, said both provisions were never implemented as only a few of the forests had management plans and owing to extreme poverty, it was not possible to charge the local people for wood extraction. In fact, to the best of the researcher's knowledge, some legislators had prescribed laws in some developing countries that did not work (and they had to shelve them). And this is because they did not consult the local people before hand to find out whether those laws were appropriate against the reality on the ground. So, formulation of laws and policies is sometimes made without taking into account the actual circumstances the targeted populations live under, rendering the laws and policies inoperative. This situation is common in many African countries. In Ghana, for instance, concerning forest policies, institutions and policies, the study revealed that community members often resort to measures that tend to resist the enforcement of these policies, drawing on members' social power or capital to alter and or transform such enforcement (Abane, 2009).

The study further tried to find out the reasons why the Process Owner's Office was ineffective to reduce illegal firewood collection on and off forest reserve. The respondents responses to this question was reflected in a mixed way, as they (31.5 %) said 'while the forest laws restricted me from getting access to the forest, my capacity to pay the required amount of money (as bribe) paved the way for me to enter the forest'. 26.1 % said, 'our social contact and relationship developed with the guards positive attitude towards WFCs and they helped us to collect firewood'. Fifteen percent of them answered as follows: 'WFCs access to the forest mostly depended on the willingness of the forest security guards'. One percent reported that 'we have already got informal permission to enter the forest; while 26.1 % said that 'I have no idea about the forest laws and no problem regarding entry into the forest'.

A semi-structured interview with a guard was conducted in order to determine his job description as well as those of his colleagues and their socioeconomic status. At the end of the interview, it was found that the total number of guards assigned to the area which extend from Entoto Saint Mary Church to French Saint George Church, which is approximately 55 ha, are sixty five (65) (permanent and temporary employees). Their age ranged from 35 to 55 and they belong to different ethnic groups such as Gamo, Oromo, Gurage, Amhara and Tigrian. Each of these guards earned a monthly salary of ETB 400.00 out of which they pay house rent of about ETB 70.00, taxes and pension. These guards had an official mission of watching over and patrolling all the above-stated geographical extension of forest under the responsibility of Ethiopia Cultural Heritage, which had been given the mandate to protect and conserve the forest in that area. Only five (5) guards patrol all the area every day.

After the interview, the researcher was able to draw the conclusion that this guard and his colleagues were working under severe pressure. The number of patrolling agents was very small in comparison with the geographical extension of the area they were told to control. They were living very humble social lives with their families. In times like these, in which everything is found to be expensive, it is hard to realize that these guards, who are 45 years old and above, earning a salary of ETB 450.00, still have energy and strength to stand the cold very early in the morning and late evening. These guards need a huge supplement of staff to help them in patrolling and positive incentives, if they were to succeed in effectively protecting the forest. Otherwise, they will continue to accept bribes, to use violence against WFCs and be loose in their activities to protect the forest.

4.6 Standards of Living and Housing Conditions

Observation by the researcher revealed that the housing units and conditions in the study area where WFCs were living in were deplorable. The houses were made of wood, mud, stone, cement, plastered hollow blocks, bricks, and corrugated iron sheet; their ceiling construction materials were fabrics, bamboo/reed, chip wood/hardwood, and grass; but the environment was extremely filthy and would normally be considered unfit for human habitation. Fifty percent of them have no latrine, sharing common pit-latrines. The statistical data gathered shows that the

remaining 50 percent of the respondents whose houses have latrines, 28.3 % of those latrines are located outside the compound and are old requiring cleaning and maintenance. Only 7 percent declared to have them inside the house. These unsanitary conditions, coupled with high population densities, make the environment highly hazardous, particularly to children.

Little over 75 percent of the sample respondents share a single multi-purpose room with other household members and/or other families. The common room is used for cooking, dining, storing, sleeping and as a living room. Some even do not have such a room; they live with others as dependents or use a corner of a kitchen as a sleeping place against payment of a small amount of money every month. Only 6.50% had a house with two rooms. About three-quarters had wooden and metal beds.

Table 3: Number of Rooms per Respondents' Households

No. of rooms	Frequenc y	Percent
One room	70	76.10
Two rooms	16	17.40
Three rooms	6	6.50
Total	**92**	**100.00**

Source own survey 2010-11

Nowadays, due to land scarcity, it is extremely difficult, in Addis Ababa, particularly within the confines of the population surveyed, for individual households to build their own houses. Normally, in the urban centers people rent houses according to their ability to pay. So, among the respondents, 80.40 % rented the houses they are living in. Only 11 % of them have their own houses. Based on the results of cross-tabulation analysis, the study indicated that ownership of a house was not dependent upon the average of yearly household income at $\chi 2_{\text{calculated}} = 190.053$, df = 159 and p = .047. Therefore, those WFCs who had earned relatively higher average yearly income might not have owned the house they are currently living in.

Table 4: Ownership of the House in which the Respondents Live

Ownership Status	Frequency	Percent
One's own	10	10.90
Rental	74	80.40
One's parent(s)	7	7.60
Lives with one relative	1	1.10
Total	**92**	**100.00**

Source own survey 2010-11

Typical of big urban centers, house rent is a nightmare when it comes to its costs. Addis Ababa is not an exception. But, obviously, it all depends on one's pocket. In the study area, the monthly house rent for people of low income earnings like the sampled WFCs was found to be from ETB 3. 00 (from kebele owned houses) up to ETB 350.00 (privately owned houses). So, the average monthly payment (for rental houses) was ETB 89.00. But, of course, as it was stated earlier on, these are houses with no human conditions of habitability. And 76.10 % of the respondents said that they are the ones who pay their house rent, and they live in the area for a period between 1 to 54 years, which implies that they have spent a lot of money when compared to their meager savings. On the other hand, it also revealed that while some have settled there for a long time, others are recent migrants.

Although the vast majority of respondents do have access to electricity, nonetheless they use it only for lighting. For cooking, brewing and heating, 67 % of them use Kerosene dried leaves and/or firewood in order to save money for other purposes. But, the implication of this situation is the huge amount of pollution the city has in the atmosphere.

Water is scarce. Access to water is still very basic in certain areas. Despite the fact that water, when it runs at home it does intermittently, 71 percent of the respondents still managed to get it through the pipe system, while others get water either from wells (38%) located outside the

compound (shared) or freely from springs (11%), which is about 2 km away from their residences.

Women fuelwood carriers being studied here have a very narrow view of capital assets. They consider assets as being the capital observable immediately in their surrounding such as those described in the Table 19. Unlike others in similar situations in different countries, like Ghana, who consider their immediate natural environment as presenting natural assets. They perceive lands, forest areas (including forest reserves) as a major source of natural assets (Harrison, 2006: 27). Natural assets are perceived by them as something valuable and given by nature. In this regard, some of them claimed to own land resources and/or fruits and vegetables back home. Cross-tabulation result shows that there is an association between the period in which the WFC had been engaged in harvesting firewood and the ownership of natural assets at $\chi 2_{\text{calculated}} = 27.884$, df = 19, $\chi 2$ critical/table value = 30.1435 and p = .086, with 95% confidence level. According to their perception and understanding, 22.40 % realized that the assets they got here in Addis Ababa are just physical capital such as cooking gas stove/Buta gas in Addis Ababa. Further, significant part of them (22, 20 %) declared to have only a dining table. The study also found that there is a relationship between duration of firewood collection and ownership of physical assets at $\chi 2_{\text{calculated}} = 31.774$, df = 19, $\chi 2_{\text{critical/table value}} = 30.1435$ and p-value = .033. This is to say that, the longer the WFCs collect firewood, the more physical assets they are likely to get.

Table 5: Distribution of Physical Capital being owned by the Respondents

Assets Owned by the Respondents [a]	Responses	
	N	Percent
House of one's own	5	1.20
Telephone	5	1.20
Television	2	0.60
Dining set	91	22.20
Radio	73	17.80
Tape recorder	57	13.90
Bed room set	42	10.20
Cooking gas stove/ Buta gas	92	22.40
Others - household utensils, and related items	43	10.50
Total	**410**	**100.00**

Source own survey 2010-11

4.7 Savings

About 28 percent of the respondents used iddir banking system to save their money. Some 6.50 % used both Iqub and Iddir, while 4.30% used iqub, and 1.10 % said both iqud and bank. For instance, the amount of savings 11 respondents (3.30%), of the total 92 WFCs, had managed to deposit in the Iqub system was ETB 8.00 monthly. Another (3.30%) also deposited ETB 40.00, while 2 of them (2.20%) had saved ETB 5.00. So, it is reasonable to conclude that about a quarter of the WFCs in the study had shown the intention of building up some kind of financial capital through savings. The results of a cross-tabulation analysis indicate that there is a relationship between the period of firewood collection and ownership of financial asset at $\chi 2_{\text{calculated}} = 15.963$, df = 19 and $\chi 2_{\text{critical/table value}} = 30.1435$, p = .660, with 95% confidence level. Therefore, those WFCs who have been engaged in the business of firewood collection for longer period of time managed to build up their financial assets.

4.8 Medical Services

As far as medical services are concerned, the WFCs were asked whether they were able to pay for it if one of their household members fell ill. About 67 percent of the respondents said no, they did not have the capacity to pay. Only 32.60 % said yes. Among those who did not have the ability to pay a medical treatment, only 11 (12 percent) of the respondents had medical insurance and in some cases (6) it did not cover drugs and laboratory expenses. This situation explains clearly the extent to which these women are poor and behind the curtains. Therefore, the only way they had to survive was to tap into the forest resources. The bivariate analysis reveals that there is association between duration of firewood collection and the WFCs' capacity to pay for medical expenses at $\chi 2_{\text{calculated}} = 24.549$, $df = 19$, $\chi 2_{\text{critical/table value}} = 30.135$ and $p = .176$. thus, one can deduce that the WFCs who have been harvesting and selling firewood for longer period of time are capable of covering their medical expenses.

4.9 Awareness about Forests and Related Issues

The respondents' levels of awareness about forests and related issues are indicated in the table that follows. Eighteen percent of the sampled respondents said they were aware of the fact that the Entoto Mt. belongs to the Government. About 16 % of them reported that they know about the existence of Government's regulation concerning the forest. About 15 percent of the WFCs know that the fuelwood collection in the forest controlled by the Government is illegal. But, they forget this fact when the belly starts ringing, warning about the lack of food. About 14 percent of the respondents said that they had heard about deforestation. But, 'we have no choice', said one of them. 'How then were we supposed to make a living, and the forest is the only resource we got?'

Table 6: Awareness about Forests and Related Issues

Awareness Levels	Responses N	Responses Percent	Percent of Cases
Whether or not the respondent is aware of the forest on Entoto Mt. belongs to the Government;	64	18.30	82.10
Whether or not the respondent is aware of the existence of any Government's regulation concerning the forest;	55	15.80	70.50
Whether or not the respondent is aware of the reasons for established regulations by the Government (if any);	35	10.00	44.90
Whether or not the respondent is aware of the implication of indiscriminate cutting of trees to the environment;	47	13.50	60.30
Whether or not the respondent has heard about deforestation;	50	14.30	64.10
Whether or not the respondent understands the relationship between deforestation and soil erosion;	47	13.50	60.30
Whether or not the respondent knows that the fuel wood collection is an illegal activity.	51	14.60	65.40
Total	**349**	**100.00**	**447.40**

a. Dichotomy group tabulated at value 1.

Source own survey 2010-11

Although these women fuelwood carriers were basically illiterate, some of them were nonetheless found to be a little bit aware of the value of the forest. They recognized that forest is not only important for the extraction of food, fuelwood and timber, but that it also must be taken

care of and protected against soil erosion, in order to ensure both its sustainability and their sustainable livelihood. They perceive the forest as something good for the environment as a whole.

The study assumed that the perception of the WFCs towards the forest, in terms of the environment as a whole, is dependent on educational level. Similarly, the cross-tabulation analysis revealed that the women's perception regarding the forest was associated with their level of education at $\chi 2_{\text{calculated}} = 7.556$, df = 7 and $\chi 2$ critical/table value = 14.0671 at p = .375 with 95% confidence level. Thus, those women who have achieved higher educational level have a better level of understanding of the importance of the forest in terms of the environment as a whole.

4.10 Perception of Forest Cover and Deforestation

Respondents across the survey area reported an overall decline in forest cover as far as they remember. Eighty-eight percent of the respondents were of the opinion that the peri-urban forest in the study area is decreasing compared with the forest coverage that was there 10 to 15 years back. However, a minority (4.30%) reported that the period of decline was now over and in recent years the forests is becoming better, while another 4.30 % said that the forest did no change.

Table 7: Current status of Peri-urban forests

Forest Status	Frequency	Percent
1. Decreasing in high rate	81	88.00
2. Becoming better	4	4.30
3. Increasing	3	3.30
4. Unchanged	4	4.30
Total	**92**	**100.00**

Source own survey 2010-11

On the reasons why it is increasing, decreasing or becoming better, 65.20% of the respondents said that it is decreasing because the City Government Administration of Addis Ababa sells the

Eucalyptus trees. 28.30% were of the opinion that the reason why the peri-urban forest is decreasing is because the forest sector of the Woreda 1 or that of the Gulele Sub city cut and sell the trees in order to generate revenue, without bothering much about replanting of the seedling. Only 2.20 % of the respondents expressed optimism by stating that the concerned body is planting seeds and that there are new off-shots from the already cut logs.

4.11 Rural-Urban Migration

The study indicated that seventy eight percent of the respondents were found to be migrants from different parts of the country, whereas only 22% were born and brought up in the study area. The findings of the study were in agreement with others studies on the same subject, like that of Fekerte Haile (1991). There might be a number of contributing factors, among which perhaps population density may have a lion share. For example, some of the groups of migrants in the study area were from Gamo Gofa, whose population density is 145 persons per sq. Km (CSA, 2008). According to Getaneh Mehari (2006), citing Freeman (1999), Gamo people are highlanders with an economy predominantly based on agriculture. Freeman and Pankhurst (2001: 181), also cited in the same literature, considered the above community as a population with high density and quite small land holdings. They went on to say their land is less fertile and as a result the productivity is low. Getaneh Mehari, citing Olmstread (1974), said the life of Gamo people particularly that of Dorze, is highly associated with rural-urban migration which has to do with weaving economy. Weaving is associated with 'national market', because weaving products are most profitably sold in urban centers. That is why most of the weavers migrate to Addis Ababa (Olmstead, 1974). The research also found out that Gamo men (husbands), being the most skillful within the community of weavers, come first to Addis Ababa, followed by women (the wives) in order to contribute to the household income by collecting firewood (personal communication). This is followed by Tigray, whose regional state recorded 91.2 persons per sq. km. The Amhara come next in terms of numbers of migrants into Addis Ababa, particularly in the study area, whose regional state registered a population density of 108. 15 persons per sq. km. Oromya, with a population density of 76.93 persons per sq. km. Southern Nations, Nationalities, and Peoples Region (SNNP) with 142 person per sq. km. Finally, Gurage region, whose population density was 217.13 persons per sq. km. These are the Regions where the women fuelwood carriers (WFCs) come from due particularly to population pressure in those areas.

However, migration is not a recent phenomenon and it continues to be one of the biggest sources of the fuelwood carriers. Fekerte Haile, in a study on FWCs (1991), found out that a high influx of women to Addis Ababa was reported during the Italian invasion (around 1940) (21). More recently, a report in 1973 indicated 11 per cent more female migrants into urban Ethiopia. The main objectives of the then women migrating to urban areas were to seek for better educational and employment opportunities and to escape from famine (22). Today, the migrants' purposes of coming to Addis Ababa remain the same, including population pressure in the face of shortage of land, both for farming and building, which was already referred to above, looking for ways and means to maximize their potentials and the value of their lives.

4.12 Alternative Livelihoods

The matrix produced by the SPSS data analysis clearly indicates that the majority of the forest-dependent populations have shown positive attitude to change the different activities they had been doing in the forest reserve surveyed. A total of 87 (94.60%) of the respondents stated that they would like to change their activity of firewood collection, while only 5 (5.40%) of them had refused to do so. The same study documented that 61 percent of those women who had already shown positive deviance to change their livelihoods in relation to the forest reserve were further asked about whether or not they had the necessary skills to make the necessary change. In response, they said that they had different types of skills for engaging in alternative livelihoods' activities. The skills found to be at the disposal of the respondents show that most of them had been equipped with relatively unsophisticated or unspecialized types of skills, which could be categorized as household chores and income-generating activities (IGAs) in the study area. The kinds of skills found to be available among the respondents who had already shown interest in changing their present business in the forest reserve (i.e. firewood collection) were the following in their decreasing magnitude: skills for starting and running businesses at back-street markets effectively (9.80%), baking *injera* (meaning the Ethiopian bread) on electric stove (7.60%), washing and ironing clothes (7.60%), spinning a bundle of thread for making Ethiopian traditional or cultural clothes (7.60%), preparing local brewery (4.30%), baking bread or cake (4.30%), spinning cotton (4.30%), food processing (2.20%), making soaps (2.20%), hair dressing

(2.20%), embroidery (2.20%), only 1.10% of them had the skills for running eco-tourism recreational centers. Among those respondents who claimed that they had no skills of any sort, all of them, that is, 34 respondents or about 39 percent of them, out of the total sample in the study, were unanimously found to be interested in attending training on development of skills for household income- generation. Those respondents also showed keen interest in getting trained in food processing (29.41%), followed by basic business skills (BBS) for starting and running any type of income- generating activity (20.70%). However, the women's interest in attending training on bakery, weaving clothes using modern weaving technologies, and making and producing candles as well as waxy candles, accounted for about 12 percent. In general, the majority of those WFCs (about 87 percent) confirmed that they would like to participate in the skills training program and be engaged in non-forest based economic activities such as bakery of *injera,* using electric stove (38.23%) any type of income-generating activities (23.53%), and food processing using alternative household energy sources (about 24 percent).

The contribution of the non-forest economic activities in the livelihood of the WFCs, which had been carried out to some extent by the respondents studied, documented positive results. About 9 percent of the respondents argued that the contribution of those livelihood activities to their household income has been very helpful, and 23 percent claimed that they are supporting their household income. Despite the fact that another 9 percent of the respondents had argued that those non-forest economic activities they had been engaged in for years did not help much, due to the soaring living expenses they have to cope with in the City of Addis Ababa.

Surprisingly, almost all of the respondents (94 percent) had never participated in any alternative livelihood training programs to augment the already available income in the households. Only 6.50% of those women firewood carriers had participated in some sort of alternative livelihood training programs, but with different types of IGAs (4.30%), like artifacts made of different materials (2.20%). Therefore, based on the findings of the study, one can deduce that the WFCs do show affirmative attitude towards changing their present livelihoods, which is firewood harvesting. The survey also reveals that the few skills they possess are unspecialized ones and

they do not help them much to generate enough income to contribute to a better life of the members of their households. Unfortunately, the WFCs do not have experience of participating in and generating incomes from different components of alternative livelihood programs like hairdressing, artifacts and so on.

In this study, different types of alternative livelihood programs both at the level of the WFCs and the level of household were considered. The respondents gave more than one response. The study revealed that 100 percent of the women would be interested in participating in backstreet market business, and 98.9 % of them were keen in, first, getting organized into an association and then they would engage in trading business. Meanwhile, about 48 percent of the women expressed their desire of modernizing their traditional weaving work, as they stated they would, together with their husbands, engage in weaving traditional clothes, using modern technologies. About 14 percent of the women showed interest in establishing a modern dairy farm business, while 8 percent would like to sell fruits and vegetables. These results indicate that the WFCs are more interested in individual marketing businesses of small-scale than group-based marketing businesses of medium-scale.

In the same perspective, each household of the WFCs was asked about the choice of participating in an alternative livelihood program. The findings of the study showed that all of the respondents would like to be involved in spinning cotton to make thread (i.e. a business they have already been practicing for years). They also expressed the desire to become later on members of the already established Association of WFCs in the study area. But, given the current circumstances, the women firewood carriers are relatively comfortable with the existing living process and context, because they are already tired of asking for support for various types of alternative livelihood programs, but to no avail.

Based on the results of Pearson chi-square analysis, the duration of the WFCs' engagement in firewood collection is associated with their willingness to change the current business in the forest into alternative livelihood options at $\chi 2_{\text{calculated}} = 3.6747$, $df = 5$, $\chi 2_{\text{critical/table value}} = 11.0705$

and p-value = .601. This shows that the longer the WFCs remain in the current business the more they develop a positive attitude to change. This is because they want to realize a better living condition.

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The importance of this study is to address the dichotomy of poverty, on the one hand, and deforestation and degradation, on the other, thereby striking a balance between sustainable livelihoods for women fuelwood carriers and a sound and sustainable forest. To do so, the researcher embarked on a survey on the ways the women fuelwood carriers live, their socioeconomic situation and attitudes and perceptions about the forest, in order to be able to determine the extent to which their interactions with the forest can bring about deforestation and degradation, and more poverty. By so doing, this study has shown that a socio-economic perspective must take into account an ecological perspective in considering future approaches to forest management. The livelihoods of the population in the study area generally depend on forest resources. The data presented here suggest that the production and sale of fuelwood and other NTFPs provide important sources of cash income for the surveyed WFCs. The study also found that the WFCs live almost in absolute poverty and have no other alternative source of income, and, worse still, most of them are illiterate. Despite of this fact, they can reasonably understand the importance of the forest resources. They are aware of the fact that if they continue to overexploit the forest resources in the form of fuelwood harvesting and timber felling, in the long run, the end result will be deforestation and degradation, and thereby probably the extinction of the only means of survival. But, unfortunately, these are not the only factors causing deforestation. There are other concurrent elements that must be taken into account such as population growth, the rising demand for land for farming, grazing and human settlement. All these problems sooner or later will affect very much their livelihoods.

To minimize and ultimately avoid these inconveniences, the environmental authorities should, in their reforestation program of the Entoto Mountain, consider the integration of eucalyptus. In doing this, they should also create a buffer zone for firewood consumption.

Reserved or "Protected" Forest is known to threaten the livelihoods of forest dependent populations. It proves a challenge for management authorities to reconcile the need for the protection with the recognition of the livelihood dependencies of local communities.

There are legislations to regulate the use of forest resources, such as the Proclamation 94/1994 which, among other things, introduces the principle of benefit sharing with local people in forest management and public participation. But this principle has no effect, because emphasis was put on sectoral coordination with the Ministry of Agriculture and other related sectors.

The same law regulates the utilization of forest resources by the local people, which requires them to obey pre-determined management plans and to pay appropriate fees in accordance with the volume of their extractions. However, the enforcement of these provisions lives much to be desired, due to lack of adequate management plans and owing to the extreme poverty in which the local people live, rendering it impossible to anyone to charge them.

Community-based forest management (CBFM) or community forest (CF) is now becoming a global phenomenon. Engagement of the people dependent on forest in some sort of negotiation of institutional arrangements, outlining of roles and responsibilities, and once a legal framework is in place, the preparation of management plans for simple and easy implementation by them, provision for forest product harvesting, sharing of these and other benefits, and so on, could be a step in the right direction.

National governments all over the world have either revised, or are revising, their national forest policy and legislation with a provision for involving local communities in the management of their country's forest resources. Many bilateral and multilateral development agencies and private organizations have supported, and some are still supporting, field implementation of new policies.

5.2 Recommendations

Given the importance that the forest has for so many people in economic and ecological terms, particularly for WFCs and the rest of the local population dependent on its resources, as well as the need for the local authorities to address the enormous socio-demographic and economic challenges the WFCs are facing, the following recommendations might perhaps help decision-makers and planners to solve the above-mentioned problems:

1. The local authorities, local population and other relevant stakeholders at the different levels should consider ways and means to improve the WFC socio-demographic and economic situations in an integrated and comprehensive approach. This approach should be based on interventions tailored to women, such as the provision of Alternative Basic Education, life skills, reproductive health, modern technology-based weaving and spinning, artifacts, hairdressing, basic business skills, and other vocational trainings, designed to equip WFCs with fast income-generating jobs and to gradually reduce their interaction with the reserved forest, while mitigating the levels of poverty. This approach should also help the WFCs to maximize these opportunities to create assets.

2. An effective management of forests is of paramount importance. Therefore, there is a need for all parties concerned to pursue collective participatory forest management initiatives in such a way as to safeguard the interest of all, the environment and, particularly the poor, who are the most reliant on the continued access to resources for fuelwood supplies.

3. With this in mind, there should also be plans for awareness creation on the importance of forests and for massive tree plantation, both at local and national level, because it is evident that the forest cover is reducing at an alarming rate, in order to replenish it and make it sustainable.

4. Taking into account the fact that biomass is still by far the most affordable source of energy and therefore it is largely used not only in the study area but across the population living in Addis Ababa as well, any policies designed at tightening control of the use of the forest resources should also consider a provision in the forest resources context for the remaining WFCs to collect and sell firewood in appropriate market places.

5. Given the enormous amount of people utilizing fuelwood not only in the study area but all over Addis Ababa, governmental authorities should consider and devise effective ways and means to discourage the use of biomass as energy for consumption, by promoting the use of alternative energy sources such as fuel-efficient stoves, and others like *gonzie*, biogas stove, subsidizing either the price of botanic gas and kerosene or the price of stoves. These measures would aim at reducing the air pollution in the study area considerably.

6. In most urban areas, a market for fuelwood has emerged over time, with the commodity being traded on an almost competitive basis. The market is the linkage between consumers and the sources of fuelwood. Understanding the linkages between household economic activities on one hand, and the supply of fuelwood on the other, facilitates the development of policies and strategies aimed at minimizing the impact of biomass energy consumption on the environment on the one hand, and enabling consumers to improve their welfare on the other. Such a win-win situation can be achieved by considering and stimulating the motivations of all agents involved, and understanding how these are transformed into physical entities like fuelwood demand.

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Appendices

Appendix 1: Questionnaires

Appendix 1.1: Questionnaire for Household (HH) Survey

PART I Demographic Profile and Socio-economic Characteristics

1. Region_____ Zone_____ Kebele_____ Village_____

2. Sex:

(1) Male (2) Female

3. Age: _____

4. Residential status: (1) Migrant (2) Native

5. Educational level:

5.1 Illiterate

5. 2 Read and write

5.3 Alternative Basic Education

5. 4 Primary Education (1st cycle, grades 1-4)

5. 5 Primary Education (2nd cycle, grades 5-8)

5. 6 Secondary Education (1st cycle, grades 9-10)

5. 7 Secondary Education (2nd cycle, grades 11-12)

5. 8 Above 12 grade

6. Marital status:

(1) Single (2) Married (3) Divorced (4) Widowed (5) Separated

7. Religion background:

(1) Orthodox Christian (2) Protestant
(3) Muslim (4) Catholic (5) Others specify_____

8. Household Head's Gender.

(1) Female (2) Male

9. How many persons belong to the household (family size)?

(1) Male_____
(2) Female_____
(3) Total_____

10. Are there any absent household members?

(1) Yes (2) No

(Determine whether or not to consider them part of the HH, using question 10. 11 and 12)

11. Why are they absent (seasonal labor migration, education, staying with family elsewhere, start own household)? (Pease choose one)

---

12. Are they absent for a period longer than 6 months?

(1) Yes (2) No

13. **If the answer to the Q. N. 11 is 'yes'**, are they part of a household in the place where they stay?

(1) Yes (2) No

14. **If the answer to the Q. N. 12 is 'yes'**: (Do not consider as HH member)

15. Do some present HH members stay in the house for less than 6 months a year?

(1) Yes (2) No

(Determine whether or not to consider them part of the household, using Question 15 and 16)

16. Are there any absent household members?

(1) Yes (2) No

(Determine whether or not to consider them part of the HH, using question 16, 17 and 18)

17. Why are they absent (seasonal labor migration, education, staying with family elsewhere, start own household)? (Pease choose one)

---

18. Are they absent for a period longer than 6 months?

(1) Yes (2) No

19. **If the answer to the Q. N. 18 is 'yes',** are they part of a household in the place where they stay?

(1) Yes (2) No

20. **If the answer to the Q. N. 18 is 'yes'**: (Do not consider as HH member)

21. Occupation: (more than one answer is possible)

(1) Civil Servant (2) Farmer (3) Firewood collector (4) Petty trader

(5) Self-employed (6) Others, specify_____

---

22. Number of years in occupation: (more than one answer is possible)

(1) Primary_____

(2) Secondary _____

(3) More than, specify_____

23. What is your income?

23.1 Daily_____

23.2 Weekly_____

23.3 Monthly_____

23.4 Yearly_____

24. What is/are the source(s) of income for the household? : (more than one answer is possible)

(1) Household head
(2) Husband
(3) Parents of the household head
(4) Mather-in-law/Father-in-law
(5) Child/children (son/daughter)
(6) Others (specify)

_____

25. The contribution of each income source from the total income

Total Income

Source of income	Birr/Day	Week	Month	Year
1. household head				
2.				
3.				
4.				
5.				
6.				

26. Is a Household with a large number of dependants a problem?

(1) Yes (2) No

26.1 **If your answer to the question above is yes**, explain why

_____

26. 2 **If your answer to the Q. N. 26 above is No,** explain why

---

PART II Livelihoods Conditions

27. Do you undertake any activity in the forest reserve?

(1) Yes (2) No

27.1 **If yes to Q. No. 27**, what activity do you undertake?

(1) Farming (2) Civil servant (3) Logging (4) Firewood collection (5) Others, specify;

27.2. **If yes to Q. No. 27, h**ow often do you undertake that activity in the forest?

(1) Daily (2) Weekly (3) Fortnight (4) Monthly

27.3 **If yes to Q. No. 15, i**n case your activity in the forest is firewood collection, how often do you carry firewood?

1) Daily (2) Every two days (3) Weekly (4) Fortnight (5) Monthly

28. Do you undertake any activity in the off-reserves?

(1) Yes (2) No

28.1 **If yes**, what kind of activity do you undertake?

(1) Farming (2) Hunting (3) Logging (4) Firewood collection (5) Others, specify:

---

29. Do you depend on the forest for food (grass cutter, mushrooms, other)?

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

30. Do you obtain materials for house construction from the forest?

(1) Yes (2) No

30.1 **If your answer to Q. No. 30 is yes,** how much do you sell it/them for?

---

31. Do you obtain materials for making furniture from the forest?

(1) Yes (2) No

32. **If your answer to Q. No. 31 is yes,** how much do you sell the furniture for? __

---

33. Do you collect herbs from the forest for medicine?

(1) Yes (2) No

34. **If your answer to Q. No. 33 is yes,** how much do you sell them for?

---

35. Do you use forest materials for customary purposes?

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

36. The forest is important to me for fuel wood collection.

(1) Fully disagree (2) Partly disagree (3) Neutral (4) Partly agree (5) Fully agree

37. In case you **(5) fully agree,** how often do you collect firewood from the forest?

(1) Daily (2) Every two days (3) Weekly (4) Fortnight (5) Monthly

38. What do you do with the firewood you collect from both reserve and off-reserve forest?

(1) For home consumption (2) For sale

39. **If your answer to Q. No. 38 is (2) for sale,** how much do you sale a load/bundle of firewood?

(1) Minimum price_____Birr (2) Maximum Price_____Birr (3) Average_____Birr

40. Do you have any other source of income?

(1) Yes (2) No

41. **If yes**, specify all income generating activities and amount of time spent on work.

Activity	Income	Time spent on activity per day
1.		
2.		
3.		
4.		
5.		

42. How long have you been collecting firewood?

43. How many women is there collecting firewood?

_____

44. How many men is there collecting firewood?

_____

45. If there are no men undertaking this kind of activity, what do you think the reason is? Explain.

_____

46. Have you got any idea of how many eucalyptus trees were there where you collect firewood 10 to 15 years ago?

47. How many eucalyptus trees do you think there are now?

48. How much time do you spend? In:

48.1 Firewood collection hours/day_____

48.2 For transport from place of collection to place of sale_____ hours/day

48.3 To sale_____

49. How far do you travel to collect firewood, hours/day?

(1) Dry season_____ (2) Rain season_____

50. When is it difficult to collect firewood?

(1) Dry season_____ (2) Rain season_____

51. Why?

_____

_____

52. What kind of activities do you normally do?

52.1 In the morning, wake up time_____

52.2 In the evening, before going to bed_____

52.3 State other kind of activities you are engaged in, if any:

(1) _____

(2) _____

(3) _____

53. How many meals do you usually have in a day?

(1) One meal (2) Two meals (3) Three meals

54. How long have been living in your present house?

(1) Months_____ (2) Years_____

55. The house you are living in

(1) Own
(2) Rent
(3) Parents
(4) Others, specify_____

56. **If your answer for Q. N. 55 is rent,** then who pays for the house you are living in?

57. How much do you pay for the rent?

Birr/month_____

58. How many rooms does the house you are living in have?

(1) One
(2) Two
(3) Three
(4) More than, specify_____

59. Is there a latrine?

(1) Yes (2) No

60. Do you normally use latrine?

(1) Yes (2) No

61. **If your answer to the Q. N. 60 is yes,** where is the latrine located?

(1) Inside the compound (private)
(2) Inside the compound (shared)
(3) Outside the compound (shared)
(4) Others, specify_____

62. Where do you normally get water supply from?

(1) From well
(2) From river
(3) From a pipe system
(4) From others, specify_____

63. **If from a pipe system**, where is your water point?

(1) Inside the compound (private)
(2) Inside the compound (shared)
(3) Outside the compound (shared)
(4) Others, specify_____

64. What source of energy do you normally use in your house?

(1) Electric
(2) Kerosene
(3) Others, specify_____

65. Which of the following physical capital do you have?

(1) House of your own
(2) Telephone
(3) Television
(4) Refrigerator
(5) Dining set
(6) Sofa set
(7) Radio
(8) Tape recorder
(9) Electric *metad*
(10) Bedroom set
(11) Cooking gas stove

66. Do you have any of the following natural capital?

(1) Land resources
(2) Others, specify _____

67. Do you have any financial capital?

(1) Yes (2) No

68. **If yes**, would it be a kind saving account?

(1) Yes (2) No

69. **If yes**, which of the way of saving do you exactly use?

(1) Iqub
(2) Idir
(3) Bank
(4) Others
(5) None the above

70. How much do you save per month?

(1) Iqub
(2) Idir
(3) Bank
(4) Others
(5) None of the above

71. Do you get credit service?

(1) Yes (2) No

72. **If your answer to the Q. N. 71 is yes,** which of the following gives you credit service?

(1) Bank
(2) Micro saving enterprises
(3) Individuals
(4) Relatives
(5) Others, specify_____
(6) No credit service

73. Would you be able to pay for medical treatment in case you or one of your dependents become ill?

(2) Yes (2) No

74. **If your answer for Q. N. 73 is no**, do you have any kind of Medical Insurance?

(1) Yes (2) No

75. **If your answer f or Q. N. 74 is no**, have you ever applied for free medical treatment when someone in your household was sick?

(1) Yes
(2) No
(3) No one in my household ever needed medical attention or treatment.

76. **If your answer for Q. N. 75 is yes,** did you get free medical treatment?

(1) Yes (2) No

77. **If your answer for Q. N. 76 is no,**
why?_____

78. How many members of your household

78.1 Went to a day school?

(1) Female (2) Male (3) Total

78.2 Went to an evening school

(1) Female (2) Male (3) Total

78.3 Did not go to a school at all, why?

(1) Female (2) Male (3) Total

79. If any did go to a school at all, why not?

(1) Too young / too old
(2) Could not afford it
(3) Not a priority / did not wish to
(4) Others, specify_____

80. Do you have cloths other than the one you are wearing now?

(1) Yes (2) No

81. **If your answer f or Q. N. 80 is yes,** how many pieces do you have?

(1) One
(2) Two
(3) Three
(4) More than, specify_____

82. Do you normally wear shoes?

(1) Yes (2) No

83. **If your answer f or Q. N. 82 is yes**, how many pairs of shoes do you have?

(1) One
(2) Two
(3) Three
(4) More than, specify_____

PART III. Attitude towards Eucalyptus Forest Resources

84. How do you perceive the forest resources?

(1) In terms of human use
(2) In terms of the need for protection from erosion
(3) In terms of the need for protection of biodiversity
(4) In terms of environment as a whole
(5) In terms of need to take care of
(6) In terms of attraction for its greenness
(7) Others, specify and explain

---

85. How do you see the importance of forest resources? (Multiple choices are possible)

(1) It is a source of income

(2) It is a source of domestic energy (fuelwood)

(3) It is a source of food

(4) It is important for pollution absorption

(5) It is an habitat for biodiversity

85.1Explain your choice of answer

---

(2) Yes (2) No

86. Peri-urban forests are

(1) Decreasing in high rate
(2) Becoming better
(3) Increasing

(4) Unchanged

87. **If your answer to the Q. N. 86 is any of the above, except N. (4)**, what do you think the reason for the change is?

87.1 Explain your choice of answer

_____

_____

_____

88. **If your answer to the Q. N. 87 is N. (4)**, is it

(1) Good?
(2) Bad?

89. **If your answer to the Q. N. 88 is 'Bad' in relation to Q. 86. (4),** what do you think it should be done?

89.1 Explain:

_____

90. Do you know how many hectares of eucalyptus trees were there where you collect fuelwood between 10 to 15 years ago?

(1) Yes (2) No

PART IV Problems associated with firewood collection, transportation and selling.

91. Where do you collect fuelwood from?

(1) At the foothill of Entoto Mountain
(2) At the side part of Entoto Mountain
(3) At the top of the Mountain

92. Are you aware that the forests in the Entoto Mountain and the surroundings belong to the Government?

(2) Yes (2) No

93. Are you aware of the existence of any government regulation concerning the forest?

(1) Yes (2) No

94. Do you know the reason why the government established regulations, if any, for those areas where you collect fuelwood?

(1) Yes (2) Not

95. Do you know the implication of indiscriminate cutting off trees to the environment?

96. Have you ever heard about deforestation?

(1) Yes (2) Not

96.1 **If yes**, explain

_____

97. Do you understand the relationship between deforestation and soil erosion?

(1) Yes (2) No

98. Do you know that collecting fuelwood in those areas is an illegal activity?

(1) Yes (2) No

99. **If your answer to the Q. N. 98 is yes,** why do you collect fuelwood there?

99.1Explain:_____

100. Have you ever had an encounter with the guards keeping forest resources?

(1) Yes (2) No

101. **If your answer to the Q. N. 100 is yes,** what happened when you were caught?

(1) Arrest
(2) Bribe
(3) Beating
(4) Other, specify_____

102. Have you ever been rapped while collecting and/or transporting fuelwood?

(1) Yes (2) No

103. **If your answer to the Q. N. 102 is yes,** are you aware of health related consequences of this act?

103.1 **If yes**, please explain_____

103.2 **If No**, please explain_____

104. What are other risks your work entails?

104.1Explain:_____

105. How far is the market from firewood collecting point?

(1) 5 km
(2) 10 km
(3) 15km
(4) Other, specify_____

106. How do you manage to get to the market?

(1) On foot
(2) By taxi
(3) By donkey
(4) Other, specify_____

107. **If your answer to the Q. N. 106 is by taxi**, how much do you pay a taxi to carry your bundle of firewood to the market?

(1) 1Birr
(2) 2 Birr
(3) 5 Birr
(4) Other, specify_____

108. How often do you carry a bundle of firewood to the market?

(1) Once a day
(2) Twice a day
(3) Other, specify_____

109. **If your answer to the Q. N. 106 is by donkey,** do you own one?

(1) Yes (2) No

110. **If your answer to the Q. N. 109 is no,** then how much do you pay for a donkey to carry the bundle of firewood to the market?

(1) 0.50Birr
(2) 1 Birr
(3) 5 Birr
(4) Other, specify_____

111. How often do you carry a bundle of firewood to the market?

(1) Once a day
(2) Twice a day
(3) Other, specify_____

PART V. Community Perceptions of Law Enforcement on their Livelihoods

112. I am readily informed about forest policy and forest law changes that affect me

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

112.1 By whom?

_____

113. Forest laws are favorable for my livelihood activities

(1) Fully disagree (2) Partly disagree (3) Neutral (4) Partly agree
(5) Fully agree

113.1Explain your choice of answer

_____

114. Forest law restricts my access to the forest

(1) Fully disagree (2) Partly disagree (3) Neutral (4) Partly agree (5) Fully agree

114.2 Explain your choice of answer

---

115. What activities of the Forest Service's Authority (FSA) affect you in your daily life?

---

116. The activities of the FSA are beneficial for my livelihood

(1) Fully disagree (2) Partly disagree (3) Neutral (4) Partly agree (5) Fully agree

117. Do you need a permit to collect NTFPs?

(1) Yes (2) No

118. How difficult is it to get permits to collect NTFPs?

(1) Very difficult (2) Fairly difficult (3) Neutral (4) Fairly easy (5) Very easy

112.1Explain your answer

---

119. Do you think that efforts to reduce illegal firewood collection are effective?

(1) Yes (2) No

119.1Why?

---

120. How can these law enforcement structures be more effective?

---

121. I understand the responsibilities of the Forest Service Authority

(1) Fully disagree (2) Partly disagree (3) Neutral (4) Partly agree (5) Fully agree

PART VI Alternative Livelihoods

122. Would you like to change the activities you are now doing for a living?

123. Do you have any skills to change your occupation if necessary?

(1) Yes (2) No

124. **If your answer to Q N. 122 is yes**, what kind of skills do you have?

---

125. **If your answer to the Q. N. 123 is no**, would you be interested in attending any training program, if offered?

(1) Yes (2) No

126. **If your answer to the Q. N. 125 is yes,** what kind of training would you like to undertake?

---

127. **If your answer to the Q. N. 125 is no,** what non-forest economic activities do you undertake, if any?

---

128. How much does this contribute to your income?

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129. Have you ever participated in an alternative livelihood programme?

(1) Yes (2) No

130. **If the answer to the Q. N. 129 is yes**, what were the activities under this programme?

130.1 Plantation of trees
130.2 Artifacts
130. 3 Others, specify

---

131. Were they successful?

_____

_____

132. What alternative livelihood would you consider appropriate:

132.1 For your community?

_____

132.2 For you?

_____

Appendix-2: Check List to Guide Interviews (Individual Participants Surveyed)

Livelihood/Occupation details

- What are your main activities?
- Do you have direct/indirect access to the forest?

If yes, how and in which forest do you operate?

- How do you get firewood, do you buy it directly from the guards?
- Do you buy it from somebody else?
- Do you collect it yourself?
- **If you buy it from the guards,** how much do you usually buy it for?
- **If you buy it from somebody else,** how much do you usually buy it for?
- About how many people are permanently engaged in this kind of business?
- Are you married?
- Who is the head of the household you belong to?
- Do you have children of your own? (son/daughter)
- Do you normally carry your children (son/daughter) with you when collecting firewood?
- How old are they?
- Do they also carry fuelwood themselves?
- Do they attend school?
- Which one? (school's name, zone)
- What time do they go to school?

Market

- Which market do you sell your products in (local/export market)?
- How far is it from the firewood collecting point?
- How do you carry the firewood to the market?
- Who do you sell your product to
- How much do you sell the bundle of firewood you carry to market?
- How does the current law affect your activities?

What problems do you encounter with the current forest laws?

- How difficult is it to comply with the current forest laws?

Illegal fuelwood collection activities

- What is your idea of illegal activities? (What do you think constitute illegal activities?)
- What do you think are the causes of illegal activities?
- Does illegal firewood collection affect your business in any way?
- How do you handle these effects?

- What do you think could be done to reduce illegal activities?
- How would successful reduction of illegal firewood collection affect your business?

Alternative livelihood activities

- Have there been any past livelihood programs here?
- Which one has worked?
- Which one has not?
- And why?
- Suggest ways of improving those that did not work well.

Appendix-3: Check List to Guide Focus Group Discussion

(Kebele officers, Sub-city Authorities, NGO representatives, other stakeholders)

1. How do you see the Women Fuelwood Carriers' (WFCs) conditions in the Kebele?
2. How do you perceive the WFCs interaction with the local forest of the eucalyptus trees?
3. What is your attitude towards the WFCs activities, the existing forest conditions and the degradation of the natural resources?
4. What types of interventions/measures have been adopted by NGOs, Kebele Office, Sub-city Authorities and other stakeholders to improve the WFCs livelihoods?
5. What types of constraints faced and challenges encountered by WFCs in the locality?
6. What kinds of policies, legislations, rules and regulations are in place at different levels to protect soil erosion and biodiversity?
7. Is there any kind of forest management measures for the eucalyptus trees protections that envisage WFCs as well as the general public participation?
8. Are there any plans, key policies and legislation related to the forest that have impact on the forest dependent people's sustainable livelihood?

Declaration

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

Declared by

Candidate

Confirmed by

Advisor