



DILLA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

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**ASSESSMENT OF FOREST CONSERVATION PRACTICE AND
MANAGEMENT PROBLEMS IN MAREKA WOREDA, SNNPR**

M.A THESIS

BY

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**Assessment of Forest Conservation Practice and Management
Problems in Mareka Woreda, SNNPR**

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of Arts in Geography and Environmental Studies,**

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DECLARATION

I, the undersigned declare that this thesis is my original work and contains no material published elsewhere that has not been used for the other thesis has been duly acknowledged.

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STATEMENT OF THE AUTHOR

I declared that this thesis entitled Assessment of Forest Conservation Practice and Management Problem in Mareka Woreda, SNNPR, and Ethiopia is my work and that all sources of materials used for this thesis have been appropriately acknowledged. This thesis is submitted in partial fulfillment of the requirements for Master's Degree of Art in Geography and environmental studies at Dilla University. I seriously declare that this thesis is not submitted to any other institution anywhere for the award of any degree or diploma. The thesis deposited at the University Library to make available to borrowers under rules of the Dilla University Library. Brief quotations from this thesis are allowable without special permission if accurate acknowledgment of the source is made. However, requests for permission for extended quotations from or reproduction in part of this manuscript may be granted by Dilla University, the school of graduate studies in all other instances, permission must be obtained from the author.

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ACRONYMS AND ABBREVIATIONS

CSA	Central Statistical Agency
DAs	Developmental Agents
DZCTIO	Dawro Zone Culture, Tourism and Information Office
EPA	Environmental Protection Authority
FAO	Food and Agricultural Organization
FGD	Focused Group Discussion
FRA	Forest Resource Area
HH	House Hold
MoA	Ministry of Agriculture
MoARD	Ministry of Agricultural and Rural Development
MWANRMO	Mareka Woreda Agriculture and Natural Resource Management Office
MWFEDO	Mareka Woreda Finance Economy Developmental Office
NGO	Non-Governmental Organization
WBISPP	Woody Biomass Inventory and Strategic Planning Project
WCMC	World Conservation Monitoring Centre

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ABSTRACT

Forest conservation involves the upkeep of the natural resources with in forest that are beneficial to both humans and the environments. This study was conducted to assess forest conservation practice and management problem in Mareka Woreda, SNNPR. The study employed a descriptive type of research, and survey method was used for this research. The data was gathered from both primary and secondary sources. The study was conducted in six kebeles that were purposively selected from 37 kebeles in the woreda. Then, 151 household heads were selected by using simple random sampling technique. Different data collection instruments such as questionnaire, focused group discussions, key informant interviews and field observation were also applied. The findings indicated that there was shortage of land in study area which discouraged farmer's ability to produce an adequate amount of crops to nourish their family due to increase in human population and land sharing among family members. This has led rural households to cut trees even in inaccessible and marginal lands to produce crops. The study also found that the major factors/causes/ contributing to the fast disappearance of the forest were attributed to agricultural land expansion, the rising demand for tree products for fire wood, expanding population pressures, lack of income, construction materials, demand for grazing land and lack of job. Agricultural land expansion takes the highest contribution for forest resources degradation in the study area. Shortage of sufficient cultivable land to produce an adequate amount food for the household exacerbated the rate of forest loss. Fuel wood consumption was found to be the second major cause of declining of forest in the study area and the local communities have an awareness of forest reduction which result in decline of soil fertility, loss of biodiversity and increasing of flooding. Therefore, investing on forestry by the government, community and private individuals is thus crucial.

Key words: *Forest Management, Mareka Woreda, Participation*

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

Forest conservation is the practices of planting and maintaining forest areas for the benefits and sustainability of future generation. The conservation of forest also stands and aims at a quick shift in the composition of tree species and ages distribution. Forest conservation involves the upkeep of the natural resources within forest that are beneficial to both humans and the environments. Forest are vital for human life because they provide a diverse range of resources: they store carbon and act as carbon sink, produce oxygen which is vital for exercise of life on the earth, so they are rightly called as earth lung, help in regulating hydrological cycle, planetary climate, purify water, provide wild life habitat (50% of the earth's biodiversity occurs in forest), reduce global warming, absorb toxic gases and noises, reduce pollution, conserve soil, mitigate natural hazards such as floods and landslides and so on. Approaches that integrate conservation and socio-economic development goals, support sustainable resource use and devolve forest management to local people have emerged as alternatives or complements to strict conservation (Mace, 2014).

The world's forests, oceans and other water bodies are the main life-supporting mechanisms for planet earth. The forests are key to sustaining the biodiversity of natural ecosystems and in regulating the world's climate system. Africa has about 16% of the world's forests (636 million hectares). The bulk of these forests are found in several countries in Central Africa (37%) and Southern Africa (28%). These two sub-regions account for 65% of the forest resources, with three other sub-regions together account for the remaining 35%: West Africa and North Africa with 11% each; and East Africa with 13%. About 38.4% of the African forest estate is tropical rain forests. The tropical moist deciduous and tropical dry forests cover respectively 24.2% and 29.2% of the forests; i.e. 53.4% of the total forest area. There are about 8 million hectares plantation forests (FAO, 2010).

Forest ecosystems are a critical component of the world's biodiversity as many forests are more bio diverse than other ecosystems. The area covered by forests is thus one of the indicators of Sustainable Development Goal 15 "Life on land".

According to FRA 2020, forests currently cover 30.8 percent of the global land area. The total forest area is 4.06 billion hectares, or approximately 0.5 ha per person, but forests are not equally distributed around the globe. More than half of the world's forests are found in only five countries the Russian Federation, Brazil, Canada, the United States of America and China (FAO, 2020).

It is an established fact that forests play a key role in maintaining a balanced eco-system in countries like Ethiopia where the majority of the people are living in rural area, forest means everything. It could be said that no forest-no life (Demele, 2001).

Ethiopia is one of the top 25 biodiversity-rich countries in the world (WCMC, 1994), and hosts two of the world's 34 biodiversity hotspots, namely the Eastern Afromontane and the Horn of Africa hotspots. It is also among the countries in the Horn of Africa regarded as major centre of diversity and endemism for several plant species. The Ethiopian flora is estimated to about 6000 species of higher plants of which 10% are considered to be endemic (Hedberget *al.*, 2009). Woody plants constitute about 1000 species out of which 300 are trees.

The forest degradation in Ethiopia is closely linked to the ongoing population growth. More people generally lead to an increasing demand on land for living and for agricultural production. The situation got a large numbers of people moved to South West Ethiopia in scope of organized resettlement programs. Consequently the pressure on the forest resources themselves increased due to a higher demand on fuel wood and construction timber. Finally, uncontrolled logging and the illegal export of wood stems to urban centers like Addis Ababa is a threat for the natural high forest of the country. The natural regeneration of the forest resources is difficult due to high populations of grazing and browsing livestock within the forests (Reusing, 2000).

According to several reports Ethiopian forest covered approximately 40% of the land a century ago but now has shrunk to only 3% (Berry, 2003). The extensive forest destruction has also led to the extinction of various biota's resulting in significant biodiversity loss. Additionally,

accelerated soil erosion on the landscapes without vegetation washed fertile top-soils leading to infertile and shallow soils with poor water storage capacity (Bishaw, 2001).

Over-exploitation of natural vegetation cover by rapidly growing population has threatened the ecological stability and the economic development of the country. As a result of forest resource degradation there is increased rate of soil erosion, decreased availability of water (both in quality and quantity), and decreased agricultural production and loss of wild life and of bio-diversity. The forests that remain are subject to uncontrolled wood harvesting and rapid rates of clearing to open up new agricultural land partly in compensation for land lost through degradation but mostly to accommodate the rapidly increasing population (Berhanu, 2001).

FDRE government pays close attention to the questions of natural resource conservation and development; concerned international and national bodies especially decision makers, planners, academicians, development practitioners and the communities also participate on the issue. The government also state that, a carefully managed resource conservation activities are undoubtedly necessary to be able to achieve sustainable resource development and the result of conservation activities became promising if and only if community's participation is combined with government effort.

The study area has varied agro-ecologies which resulted in endowment of different species of fauna and flora however, these resource, particularly the forest resource of the area are under due pressure. The forest resource of the study area is also degrading from time to time before the very eyes of government institutions meant to protect it and local communities. Therefore, this study was proposed to assess local communities participation in forest conservation practice and, its management problems, in the process of realization of sustainable environments in the Mareka woreda is found to be timely and critical.

1.2 The Statement of Problem

Forests have multifaceted benefits for rural livelihoods in Ethiopia. According to Bedru (2007) forest products have a significant role in rural livelihoods since they are sources of food, medicine, fuel, lumber, paper and habitats for a variety of life forms.

As natural resources are fundamental for improving livelihoods and achieving sustainable development, efforts of different knowledge systems should be made in management of these forest resources. Especially those are; land, soil, water, forest, plant and animal diversity, climate and ecosystems services are closely connected with human daily lives and they need regular management. According to Ivan (2002), all nations of the world with all knowledge systems were issued with a mandate to protect the environment for the benefit of present and future generations. Hence, Protection of the Earth's life support systems requires all sorts of knowledge and coherent information.

In the study area (Mareka Woreda) land inhabited by local community is rich in natural resources (Dawro) Profile by Zone Administration, 2012). People of Mareka Woreda, have been living with a traditional knowledge of managing forest resources to improve livelihoods, reduce poverty and advance economic growth. However, this area is suffering from environmental problems expansion of agricultural land, high demand for fuel wood and degradation of grazing area, negative pressure is growing on natural resource and vegetation's of the area (FARM/SOS, 2007). Even though local people employ their traditional practices against such environmental degradations in order to harness the occurrence of severe environmental and socio-economic consequences, on the other hand there is a necessity to exploit these forest resources to sustain their lives. This has become a challenge of the study area. Boven (2002) by his study indicates that understanding and tackling this complex challenge demands creative, integrative and holistic approaches by multiple stakeholders, to bring multiple and complementary perspectives, knowledge and skills to facilitate a socially equitable, economically efficient and environmentally sound development.

However, the contribution of awareness of local people and practices in forest resource management of the area has not been clearly set. Its capability in enabling the local people to balance conservation and consumption trend is not yet evaluated. The awareness of local people

in the study area even seems has not been given weight or significant attention so that it is being declined and even disappeared. The impacts (positive as well as negative) local people in forest resource management of the study area have not yet been documented. Lack of clear information on the impacts the awareness of local people in forest resource management in the study area resulted in lack of recognition that local people have their own ecological understandings, conservation practices and resource management goals.

This has its own implications. It has been creating a perception gap between modern technology and development agents and local communities. Local people are perceived as merely resource users, but they are not recognized as essential partners in environmental/forest management. People with modern knowledge and technologies have difficulties to communicate with farmers. They more focus on their conventional training and vision of development through transfer of modern/improved technologies than involving local people in the development programs. They tend to regard themselves as the teachers of farmers, as the agents of change to draw farmers out of the stagnancy of tradition. Most of them cannot imagine that they can also learn from (illiterate) farmers. This difference between scientific and indigenous worldviews continued to. ~ create barriers to meaningful collaboration in the study area. But a wealth of traditional knowledge can be harnessed through their cooperation and also their experiences can be shared and discussed to promote modern technology for resource management.

Thus, studies on forest conservation practices and management problems in Mareka Woreda SNNPR possible remedies for the ongoing situations in the study area need to be established before the situation becomes worse. The current study on the dynamics of awareness of local people in forest conservation is one such initiative.

1.3 Objectives of the Study

1.3.1 General Objective of the Study

The general objective of this study was to assess forest conservation practice and management problem in Mareka Woreda, in SNNPR.

1.3.2 Specific Objectives of the Study

This study has the following specific objectives

- To examine the status of forest resource conservation and development in the woreda;
- To assess participation level of local community in forest management practice in Mareka Woreda;
- To identify challenges of forest management in Mareka Woreda;

1.4 Research Questions

1. What is the status of forest resource conservation and development in the study area?
2. what are local community's participation in forest management practice in Mareka Woreda;
3. What are the challenges of forest management problem in Mareka Woreda?

1.5 Significance of the Study

The Woreda is nature based potential for forest resource development but there is less understanding about it. Hence, this study can be important for improving the knowledge and understanding on sustainable use of forest resources so as to develop a sense of ownership. The linkage between forest resource and rural livelihood is very strong because the environment matters for the people living in rural area for they depend on the capacity of the ecosystems to provide the basis for food production and other productive activities. However, the potential of awareness local people to cope with environmental problems and manage natural resources in the area is not well documented. On the other hand the federal as well as regional governments of Ethiopia have been undertaking the concept of utilizing traditional knowledge as one of the important elements for sustainable development.

Thus, the findings of the study provide some insights about the forest conservation practice and management problem in Mareka Woreda, in SNNPR. It is contribution and constraints in resource management to stakeholders (researchers, practitioners, policy makers, regional, zonal and woreda government. authorities, and NGOs) for any further intervention. They also bring out the way people in the study area interact with their environmental resources in various socio-cultural, political and economic settings.

1.6 Scope of the Study

Initially, this study confines itself to observing, interviewing, and discussing with to assess forest conservation practice and management problem in Mareka **Woreda**, in **SNNPR**. The study focuses on identifying forest conservation practices and management problems related to natural resource management, assessing their current status and contribution to natural resource management, and finding factors that determine their current condition. It focuses on the investigation of the role, constraints and opportunities of awareness of local people in sustainable natural resource management in the study area.

1.7 Limitations of the study

It is obvious that research work cannot be free of limitations. Likewise, this study has some limitations. These include shortage of financial constraints and lack of organized secondary data due to the lack of adequate documentation and organized database system in the study area. Moreover, there were absence of officials and some experts from office during data collection. In spite of these short comings, attempts were made to make the study as complete as possible. These attempts were arranging appropriate time schedule for every activity and paying tolerance to get the officers the required data.

1.8 Organization of the thesis

The study includes five chapters; the first chapter includes the introduction, statement of the problem, the objectives, the research questions, the significance of the study, limitations and scope of the study, and the organization of the study as well. In the second chapter the literature review is included. The third chapter is all about the study area description and research methodologies. Where as in the fourth chapter the collected data has analyzed and interpreted and lastly but not least, in the fifth chapter the summery, conclusion and recommendation of the paper is represented.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 Concepts and Definitions Forest Conservation

Forest conservation is the practices of planting and maintaining forest areas for the benefits and sustainability of future generation. The conservation of forest also stands and aims at a quick shift in the composition of tree species and ages distribution. Forest conservation involves the upkeep of the natural resources within forest that are beneficial to both humans and the environments. Forest are vital for human life because they provide a diverse range of resources: they store carbon and act as carbon sink, produce oxygen which is vital for exercise of life on the earth, so they are rightly called as earth lung, help in regulating hydrological cycle, planetary climate, purify water, provide wild life habitat (50% of the earth's biodiversity occurs in forest), reduce global warming, absorb toxic gases and noises, reduce pollution, conserve soil, mitigate natural hazards such as floods and landslides and so on. Approaches that integrate conservation and socio-economic development goals, support sustainable resource use and devolve forest management to local people have emerged as alternatives or complements to strict conservation (Mace, 2014).

In forest conservation, participation is often associated with community forestry, which refers to forest management or co-management by people living close to the forest. The proper use of forests, forest products, and sustainable management contribute to income and employment generation and thereby reduction in the level of poverty and also provide vital role for biodiversity conservation, environmental protection and ecological balance of the nation (Ranjit, 2012). Although these people are all in some way dependent on forests, they have little else in common. In recent years, however, it has become much harder for forest-dependent people to use local forests and their products, owing to deforestation, logging, population pressure or legal initiatives such as the declaration of state forests, national parks or wildlife reserves. Thus local participation is important in forest conservation and often depends on additional factors such as

institutional or legal frameworks, and the education or interests of local people and other stakeholders (Isager et al, 2001).

2.2 Sustainable Forest Management

Sustained forest management entails the balancing of the economic, environmental and social functions and values of forest for the benefit of present and future generations (FAO, 2009 :).

The concept of sustainability began to increase in importance at the end of the 1980s and at the beginning of the 1990s with the Brundtland report (1987) and the Conference on Environment and Development held in Rio de Janeiro, Brazil, in 1992 (the so-called Earth Summit), respectively. Nevertheless, the need to preserve natural resources for use by future generations had long been recognized. According to Million. B(2011), it refers to recognitions of the needs of forest dependent communities; increased benefits from forest resource utilization for the rural population, increased local involvement in decision making on forest development and conservation programs; establishment of compensation mechanisms to offset lost benefits in resources utilizations.

The negative influence of past use of forest resources, as well as the needs for continued use of these resources for future generations was already noted as early as the 17th century (Wiersum, 1995). However, it was not until the 18th century that the concept of sustainability was specifically referred to, as follows: “every wise forest director has to have evaluated the forest stands without losing time, to utilize them to the greatest possible extent, but still in a way that future generations will have at least as much benefit as the living generation” (Wiersum, 1995).

This first definition was based on the principle of sustainable forest yield, with the main goal being sustained timber production, and it was assumed that if stands that are suitable for timber production are sustained, then non wood forest products will also be sustained (Peng, 2000). This assumption focused on the sustainability of the productive functions of forest resources, while other functions such as ecological or socio-economic functions were largely overlooked. This occurred because social demands for forests were mainly utilitarian.

However, increased environmental awareness and improved scientific knowledge regarding deterioration of the environment have changed society's values and the global structural policy, which in turn have significantly influenced forest management objectives in 20th century (Wang and Wilson, 2007). Nevertheless, nowadays more and more researchers think climate change is changing the paradigm and sustainability shouldn't be referred to what we had before.

Although there is no universally accepted definition of sustainable forest management, the following concepts are widely accepted: *“the process of managing permanent forest land to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment”* (International Tropical Timber Organization, 1992), and *“the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems”* (ministerial conference for the protection of the forest, 1993). The latter concept harmonizes ecological and socio-economic concerns at different scales of management and for different time periods. Nevertheless, both concepts are just refining the definition of sustainable development gave by the Brundtland Commission (1987) “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” to apply it to forests.

2.3 Community Participation in Forest Resource Management

Many definitions have been given to community participation. These include corporate participation, local participation, people's participation, integrated management and the like. All these however denote that there is an interaction of particular group with others so as to achieve certain specific outcomes as far as the management of forest resource is concerned. Many people participate for several reasons. According to Cernea (in Akitanda 1994) local participation is when people are given the power to gather together their own efforts so that they become public actors rather than inert subjects, to take care of their resources, make decisions and organize the activities that affect their lives. Sayer (2004) views community

participation as a deliberate procedure of bringing together the various aspects of natural resource utilization into a structure of sustainable management to meet the expectations of those who utilize resource, managers and others who have a share in the resource. To accomplish its objectives, an incorporated natural resource management strategy is essentially adaptive, among various disciplines and includes a different group of stakeholders. Meela(2001) described popular participation“ as the interaction of large group of people in choices, implementation and assessment of programs and projects intended to bring about imperative progression in the levels of living. Pretty (in Meela 2001) put across an additional view of participation where „two schools of thought and practice“ have developed regarding participation. One sees community participation as a way of enhancing competence, the innermost opinion is that if people are engaged in the activity then they are more probable to have the same opinion with and agree to the new development or service. The other sees community participation as a privilege where the most important objective is to instigate mobilization for cooperative action, empowerment and organization building.

According to Pound (2003) participation increases the significance of the resource management in numerous way such as by bringing forward innovative information and responses into participatory learning and adaptive management, through increasing the power to deal with difficult issues and in various ways and by adding some information that have been put down in the recognition of problems and monitoring a transformation.

He continues that participatory learning is an important element of research for growth and adaptive administration of complex ecosystems. Participatory research has a very important function to perform in creating awareness of the learning procedure, the force which organization can draw on various types of information or ideas and is not influenced by just one clarification of major cause-effect relationships. When power relations in the participatory research procedure are discussed in a place, where diverse opinions of „cause-effect“ can be aired, then research increase the importance of participatory management as a result of conveying innovative information which all stakeholders can employ towards building an agreement.

2.4 Socio-Economic and Environmental Effects of Forest

The role of forest and forestry in any country or region will be settled by two poles, the forest resource (supply) on one hand and the need by the society (demand) on the other hand. Neither supply nor demanded are static. The forest resource can be managed for the purpose of optimal supply, but with time, society changes its use of products and services in quality as well as in quantity (shibiru, 2012). Forest and trees is an important resources base for a sustainable economic and social development, providing a large variety of wood products, non-wood products and services. The role of forest and trees with regarded to the protection of soil, water and the environment is of vital importance in many regions of the world and for most mountainous area (Militon, 1991:10). FAO (1999:24) noted the role of forest as follow conservation of biological diversity, carbon storage and sequential for mitigation of global climate change, soil and water conservation, provision of employment and recreation as opportunities, enhancement of agricultural production system, improvements of urban and per-urban living conditions and protection of natural and cultural heritage. Moreover, the cultural influences of the forest have been recognized throughout the age and poets, painters and philosopher and have derived inspiration from it.

The forest has left a deep impression on the minds of men from the earliest times, and is associated with religious belief among the people of many land; this finds expression in the preservation of sacred grows and in the veneration of certain kinds of trees, while, the folklore of many primitive tribes is bound up with the forests and the sprits which inhabits them (Hummel, et al, 1984: 163).

WRI (2006:6) put the contribution of forest and trees to agricultural production as “maintain the soil and water for agricultural production, particularly in upland watersheds, by reducing erosion and moderating streams flow, restore soil fertility in shifting agriculture; increase farm crop yields by 20-30% in arid and semiarid areas by slowing wind and increasing soil moisture; increase soil nitrogen content through use of leguminous nitrogen fixing tree species; and provide a significant proportion of livestock feed requirements especially, in upland and semiarid regions. The production of wood for industry and, in some cases, for the export of forest product

has been and is likely to continue to be the main policy objectives for a large proportion of the managed forests of most countries and it constitutes the main sources of income from forestry.

But in many developing countries and especially those with limited forest resources, the provision of fuel wood and of other wood for domestic use in rural areas is even more important. In these countries most people depend almost entirely on wood to cook their food and this situation is not expected to change much in the foreseeable future. Trees are essential sources of fodder for livestock. They also provide fruits and nuts, honey, gums, oils, resins, medicines, tannins, fibers, and other materials. There is growing recognition of the importance of small-scale forest-based enterprise as a source of on farm employment and income (WRI, 2006: 5).

According to Ermias (2003), factors causing deforestation includes economic stagnation and poverty, poor governance and political tolerance, protracted civil wars, entrenched bureaucracy, rampant corruption, weak policies and inappropriate institutional arrangements including tree or land tenure insecurity and population pressure.

2.5 Forests and Forestry Practices in Ethiopia

According to FAO (2001), the vegetation Ethiopia which may be qualified as forest includes natural high forests, woodland, plantations and bamboo forests, with an estimated area of 35.13 million ha. In other words, Ethiopia lost over 2 million ha of her forests, with an annual average loss of 140,000 ha (FAO, 2010) between 1990 and 2005. Currently, the area is estimated at 12.3million Ha, 11.9 % of the total land area. Of this, the remaining closed natural high forest is 4.12 million ha or 3.37% of Ethiopia's land area. The area of forest is unevenly distributed in the country. Oromia, Southern Nations and Nationalities Regional State and Gambella regions account for 95% of the total high forest area (WBISPP, 2004). On the other hand, the recent data on forest resources of Ethiopia indicates that the country is among countries with forest cover of 10-30% (FAO, 2010).

The historical development of institutions for forest resource management was marked by a total disregard of sustainable use of the resource during the monarchical period (before 1974) and a very protective and exclusionary state control of the resources (between 1974 and

1991) that resulted in persistent conflicting interests between the state and local people (Bekele, 2003).

The lack of a strong enforcement of forest rules and regulations and the occasional political power vacuums during times of government transition precipitated de facto a situation of open access and spells of severe deforestation. Besides, the forest sector is characterized by weak governance and regulatory frameworks expressed in terms of lack of policy, weak law enforcement, institutional instability, poor human and logistic capacity, and meager budgetary allocation. Institutionally, the sector for instance, experienced 45 rounds of organizational restructuring since 1935, which has resulted in fast turnover of employees, discontinuation of programmers and projects, confusion of responsibilities and mandates, misplacement of documents and files, and progressive weakening of forest operations (Yemishaw, 2002). The imperial government that ruled the country from 1930s to 1970s encouraged agricultural expansion through indiscriminate individualization of the forest resources to increase its tax revenue. The socialist government, from 1974 to 1991, nationalized all forest resources of the country, making itself, not only the exclusive owner, but also the sole forest developer. The approach also undermined the roles of local communities, their traditional institutions and knowledge in forest management practices, and considered local communities as enemies /destroyers of the forests (Yemishaw, 2002).

According to FAO (2009), forest management in Ethiopia is not sustainable, primarily because of forest sector institutional instability; unstable land-tenure system, property right over forests and lack of forest and land-use policies. Moreover, severe financial and technical constraints, policies and economic hurdles hinder the state forestry administrations ability to control deforestation and limit effective implementation and adoption of community-based forest management.

However, planting activities, in the form of afforestation and reforestation programs, has a long history in Ethiopia. According to historical records, a forestation started in the early 1400s by the order of King ZeraYakob (1434-1468) but modern tree planting using introduced tree species (Australian Eucalyptus) was started when Emperor Menillik II (1889-1913) looked into solutions for alleviating shortage of firewood and construction wood in the capital, Addis Ababa (Yitebituet *al.*, 2012).

Dessalegn (2001) argued that there was a limited attempt by the imperial government to promote forestry in the country and to protect state forests in the early 1960s. This shows that the forest resource management paradigm during that time was environmental protection type because the forests were preserved and protected for their economic value mainly as a source of fuel wood and construction material, in addition, little attempt was made for new plantation. The Ethiopian forestry association (EFA), which was set up in 1960, launched a farm woodland campaign to encourage peasants to plant trees on their plots as an economic and conservation measure (Dessalegn, 2001). During the second half of the 1960s, the government began to show greater concern for environmental problems and under too several initiatives to promote afforestation and soil and water conservation. In response to pressures from different corners, several national parks and game reserves were set up in various parts of the country in the second half of the 1960s and the early 1970s with the support of UNESCO and expert staffs (Dessalegn, 2001).

During the Derge regime (1974 - 1991), rapid expansion of large scale and community plantations occurred which resulted in the establishment of large scale plantations mainly for supplying the huge demand for wood products in Ethiopia. Later on, *Derge* applied mass mobilization and forced campaigns to rehabilitate degraded lands with vegetation and area closure scheme was designed. As explained by Million (2001), plantation forests during that time were mainly for commercial timber- for sawn wood and poles as well as non-industrial plantations like fuel wood and construction. Dessalegn (2001) described the situation as “many of the state forests managed by the ministry of agriculture during the *Derge* regime were enlarged by expropriating farms or grazing land. Afforestation thus posed a threat to many peasants because it encroached on farmland, evicted households living in or near it, and took away land that was common property and had economic, social or cultural value.”

In addition, one of the four pillars of the green economy plan of Ethiopia (FDRE, 2011) focuses on protecting and re-establishing forests for their economic and ecosystem services, including carbon stocks. Since deforestation rates in Ethiopia historically correlate with the expansion of agricultural land reducing the need for additional farm land enables to minimize the pressure on the remaining forests of the country. In line with this, the proportion of new

land for agriculture that is taken from forests will decrease from 70 to 55% in 2030 (FDRE, 2011).

Two million hectares of pastureland will be afforested up to 2030 and 1 million hectares of degraded land will be reforested (FDRE, 2011). The forestry policy put general direction wherein, among others, expansion of forests and agro-forestry is needed to accelerate economic development of the country (Sisay, 2008). Forest decline has been an eminent phenomenon in Ethiopia, and endangered 19 indigenous tree species in state forests are thus banned from any kind of logging.

2.6 Problems of Forest Management

Nowadays, in Ethiopia the remaining natural high forests are located in the southern and south western parts of the country (Bishaw, 2001). Forests and woodlands are, therefore, converted to other land use types because of different human induced factors. This indicates that there is an alarming rate of forest destruction in the country which needs sustainable implementation of forest management policies. By minimizing further destruction of natural forests, it is possible to preserve and conserve ecosystems, improve legal access of local people to forests, to supplement food, energy and income (Medhin, 2002). In this respect, protected areas will contribute to the conservation of Ethiopia's remaining natural forests if local communities in and around forest areas are participated.

The destruction of forest is due to the subsistence oriented farmers and unsustainable resource use practice including clearing up steep lands of vegetative cover in the quest of fuel wood and crop lands (Berry, 2003). An inappropriate land use system and land tenure policy enhances deforestation and loss of biodiversity. Large livestock pressures on land create conditions which lead to deforestation and land degradation (Barnard *et al.*, 2000).

2.6.1 Fuel wood and charcoal making

People who are living in developing countries depend largely on fuel wood as major energy for cooking and heating. The collection and burning of fuel wood create environmental problems including soil erosion, loss of watershed areas, and emission of particulate and other

pollutants (De Souza *et al.*, 2003). Firewood gathering and charcoal making have significantly contributed to land degradation and forest destruction.

In most developing countries, more than 80% of wood extracted are being used for fuel (Union of Myanmar, 2000). Fuel wood consumption is one of the main causes of deforestation and excessive cutting trees for firewood before they are fully grown, leads to the loss of potential growth of the forest stands in these countries. In Ethiopia, 85 percent of domestic energy consumption is derived from forest products and this clearing land without selection to expand agricultural lands is the main cause of loss of biodiversity (Girma. *et al.*, 2002). As population increases household energy consumption also increases. Large population of the country depends on fuel wood and charcoal. For the poor in rural areas, it is not only a source of energy but a means of income generation too.

In Ethiopia, felling trees for different domestic uses and making charcoal have decimated the vegetation and most of the land is now cultivated leaving forestlands fragmented in to small patches (Zerihunet *al.*, 1991). Charcoal making and selling is a major non-farm employment along main roads of the country (Mulatet *al.*, 2004). Scarcity of fire wood has become acute in many parts of the country causing a continuous rise in prices, and thus increasing the economic burden on house hold budget. Animal dung and crop residues are increasingly being used for household fuel rather than being added to the soil to improve soil fertility, thus further exacerbating the problems of environmental degradation and deforestation. This indicates that the situation with energy use is one of the most critical land degradation issues in Ethiopia.

2.6.2 High population growth

Rapid population growth affects the quality of the environment and living standard of the people and the reverse is true. Population growth means an increasing number of people with no proportionally growing alternative sources of livelihood. This unbalanced growth of population and alternative resources may lead to environmental deterioration such as deforestation, overgrazing, soil erosion, water pollution and others (Woldeamlak, 2002). According to Solomon (1994), land-use and land-cover changes and socioeconomic dynamics have a strong relationship. That is population increases the need for cultivated land, grazing

land, fuel wood; settlement areas also increase to meet the growing demand for food and energy, and livestock population.

Million (2001) stated that new settlements in forest are increasing from time to time and hence resulted in the conversion of forest land to agricultural and other land use systems. In spite of the growing public concern about forests, the increase in population and pressures for social and economic development continue to drive the trend towards more forest clearance. This problem is further increased by the domination of short-term economic and market forces over environmental considerations, which frequently results in the acceptance of unsustainable activities.

In most parts of Ethiopia, rural households are depending on subsistence agriculture; use forest products as fuel, fodder, and building materials. In poor rural communities the continued need for family labor supports high fertility and rapid population growth that places additional pressure on natural vegetation (De Souza *et al.*, 2003). Similarly, Medhin (2002), in his report titled with „Sustainable Development in Ethiopia,“ described that unchecked population growth, coupled with overgrazing, has brought about the encroachments of the marginal areas as steep slopes and ecologically precious lands to meet the need for wood, fuel and grazing. The subsequent removals of natural vegetation and improper land use practices have resulted in the degradation of the land and eventually conversion into wastelands.

2.6.3 Agricultural land expansion

The rapid population growth coupled with accelerated land degradation has led to an increasing demand for agricultural land. The rapid degradation and depletion of the forest resources base is already finding its expression in the different sectors of the economy such as agriculture, water resources, energy and biodiversity (Mulugeta, 2004).

The expansion of agricultural land by clearing forests is the major cause of deforestation in Ethiopia (Mulat *et al.*, 2004). The greatest threats to the remaining natural forests of Ethiopia are man-made clearing for farm land expansion at present level, the clearing of forests by investors for coffee and tea plantations, and indicated that uncontrolled exploitation of the timber and fuel wood in the remaining woody vegetation. These threats are well organized by

the forestry sector and are highlighted as the major threats in the environmental policy of the country (Eduwards and Ensermu, 1999).

In line with this, Million (2001) indicated that the increasing demand for more food and farm land remains points of conflict between agricultural development and sustainable development. The core conflict is that the agricultural areas have to expand to increase the production of food and farmers are continuously looking for agricultural land, which results in clearing of vast areas of forests by farmers yearly. As a result, land degradation is a typical phenomenon in many areas, which is caused by over exploitation of the woodlands and farming of fragile hill slopes. The expansion of agriculture, especially towards the steeper slopes due to ever-growing population has accelerated soil erosion.

2.6.4 Overgrazing

In the highlands, the expansion of grazing land beyond the land's carrying capacity occurs at the expense of the remaining natural vegetation and further land degradation. The scarcity of grazing land and livestock feed causes the wide spread use of natural vegetation particularly forests to feed livestock (MoARD, 2007).

Livestock pressure and stock management (mainly based on free grazing system) are major sources of land degradation .Only 25 percent of Ethiopia's high livestock population graze in the rangelands, where as 75% graze in the highlands (EPA,2010). Overgrazing destroys the most palatable and useful species in the plant mixture and reduces the density of the plant cover, thereby increasing the erosion hazard and reducing the nutritive value and the carrying capacity of the land.

In Ethiopia, overgrazing is mainly due to keeping large number of cattle in forest and wood lands. The consequences of overgrazing have been land degradation, soil erosion, soil compaction as well as reduced species diversity and density of the vegetation (Chamshama and Nduwayezu, 2002). Heavily grazed plots result in poor quality of physical and even chemical properties of soils. High soil compaction is clearly observed in heavily grazed plots than less grazed plots (Girmaet. al, 2002).

2.6.5 Rural livelihoods poverty

It has been estimated that approximately one billion poor people worldwide rely on forest resources to obtain their livelihoods (Yemiruet *al.*, 2010). Plus, in developing countries, two thirds of rural populations occupy marginal agricultural lands“ such as highland watersheds. Farmers employ forestry, mono-crops, tree crops and agro forestry techniques on their land (Scherret *al.*, 2003). For these reasons, the poor would be likely seeing their situation worsened by deforestation.

Declining standard of living of farming communities leads to close dependency on forests like clearing forests for subsistence farming and cutting trees and shrubs for fuel wood, charcoal making, and construction materials and for market. The loss of forestlands reduced the opportunities of the local people, increase disasters and lead to local communities to absolute poverty (Singh and Singh, 1992).

According to Thomas and Million (2002), many Ethiopians have been affected by poverty. This in turn leads to deforestation and land degradation in the country. Poverty - led environmental degradation is responsible for much of the degradation of marginal lands, deforestation, overgrazing of fragile range lands, and cultivation of steep slopes, which consequently, affect the majority of rural people who rely heavily on forests for income and subsistence (Chamshama and Nduwayezu, 2002). This signifies a threat to food security and survival of the people living in these areas as well as vegetation conservation which can be the result of more likely to arise from human activity.

2.7 Approaches and Significance of People’s Participation in Forest Management

According to FAO (2003), the role of active community participation in ensuring sustainable development is obviously known and undeniable. Currently, people are considered as the most important factors and agents of development and their participations are highly required as it is the central focus (Gebremedhin, 2004).According to him development is unthinkable without the participation of the native people and People should be placed first in development projects if

their development is what the activity plan aims to promote and the real aim of development should be to improve and change the livelihood of local people. Directly and indirectly a given development project particularly forestry program affects the life of indigenous people; since they live with forests and they are primary users of forest products.

Isageretal,(2004) contended that forest conservation without genuine local participation has not only become a subject of failure but also results in conflict, violence and the participation itself provides no guarantee of success. That is why Agrawal and Angelsen(2009), justified excluding local communities is likely to work against community interests, and may aggravate illegal harvesting, fire and fire-raising in forests or other illegal activities that reduce carbon storage. From this point of view community participation is imperative at every stage to be effective and sustained forest management.

Natural resource management theory and practice has been well adopted significantly in recent decades. According to Wood (2008), historically showed in most countries natural resources management had been geared towards in the hands of national or state governments, with little recognition of the people living closest to the resource. However, the idea that local people have a greater role to play in the planning and management of their surrounding environments is gaining ground. Studies show that the last two decades have witnessed a paradigm shift in conservation and natural resources management away from costly state centered control towards approaches in which local people play active role (Wily, 2002). The authors further advocate that reforms purposely aim to increase resources user participation in natural resources management decisions and benefits by restructuring the power relation between central state and communities.

2.8 Inhibiting factors of people's participation in forest management

The livelihood of the rural poor depends on forest therefore, forest management policy and programs should be based on the interest and willingness of the local people to be sustained (Kugonzaetal.2009). According to them a major constraints and reason for the high failure rate of most participatory forestry projects is unsustainable or weak economic incentives for local forest users and weak participation of other stakeholders to participate in forest management. Moreover, majority of rural poor are marginal, live in risk prone area and they are also prevented from participation in development activities due to prejudice and discrimination (Tola, 2005;

FAO, 2010:11). In addition to this plans to protect forest ecosystems have failed to consider the needs and knowledge of local people (Isageret *al.*, 2004). There is also a problem of identifying the gap clearly between what is ongoing on and what the policies and principles set by the government are dictating to do as far as community participation in environment and forest conservation is concerned (Gebremedhin, 2004).

According to FAO (2000), conflicts often emerge because people have different uses for resources such as forests want to manage them in different ways. Disagreements also arise when these interests and needs are incompatible, or when the priorities of some user groups are not considered in policies, programs and projects. Such conflicts of interest are an inevitable feature of all societies. In recent years, the scope and magnitude of natural resource conflicts have increased and intensified. These conflicts, if not addressed, can escalate into violence, cause environmental degradation, disrupt projects and undermine livelihoods.

2.9 Conceptual Framework

A conceptual frame work is analytical tool with several variations and contexts. It is used to make conceptual distinctions and organize ideas. Accordingly, this conceptual framework identifies issues related to forest conservation practices and management problems such as the major causes of forest management: direct and indirect cause; the impacts of deforestation on environment and socioeconomic condition of rural households. Moreover, the framework included efforts done by rural households, stakeholders and others in forest conservation practices and management. It is possible to observe from the conceptual framework in Figure 2.1 that by proper conservation of forests, it can be possible to decrease both cause and effects of deforestation on rural community. Conversely, lack of conservation measures would bring about further destruction of the remaining natural forests.

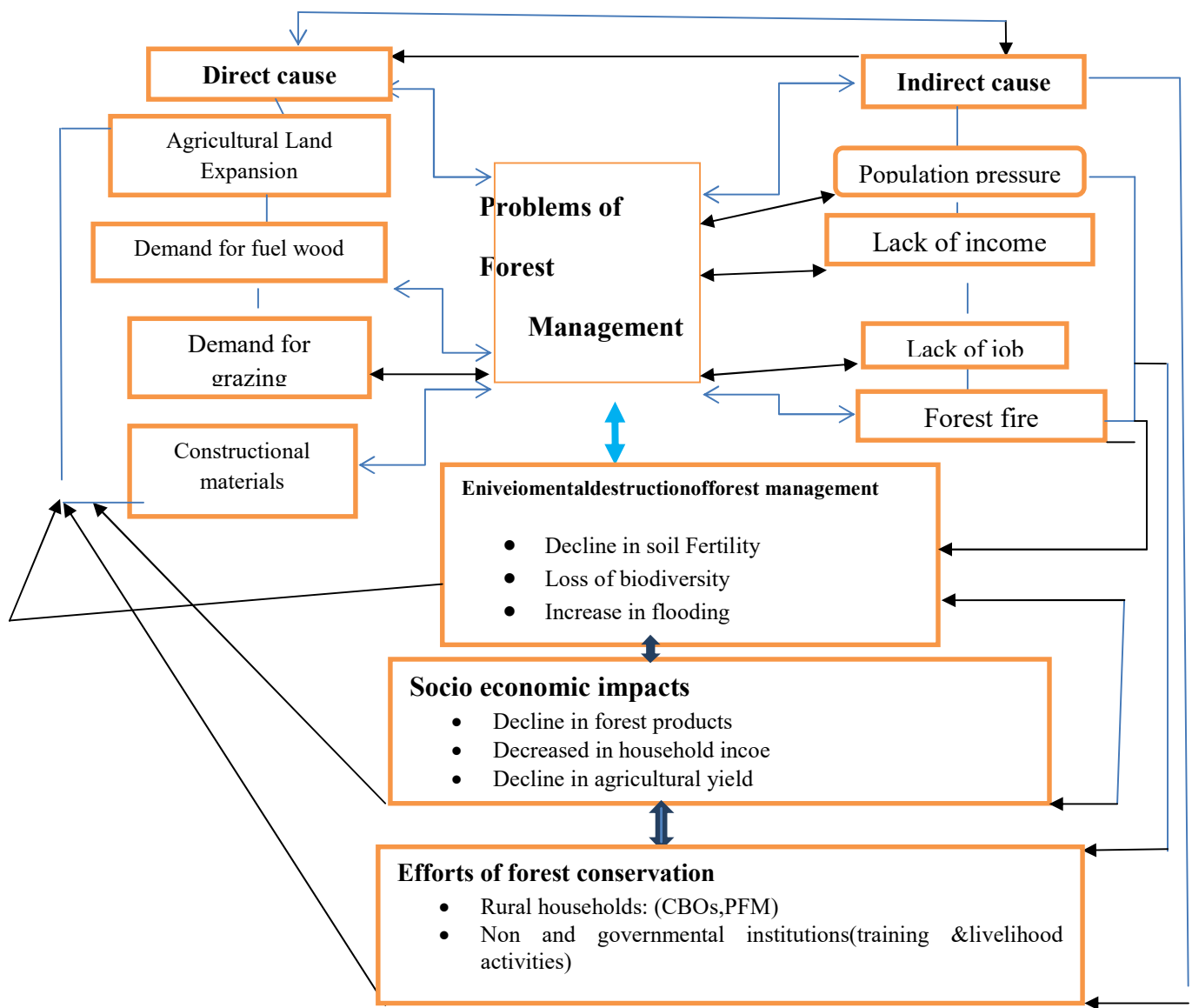


Figure 2.1 Conceptual Framework. Source: designed by the researcher, 2020

CHAPTER THREE

3. DESCRIPTION OF THE STUDY AREA AND RESEARCH METHODOLOGY

The methodological part of this research deals with the study design, description of the study area and target population, sources of data, the way of sample selection, and data collection instruments development.

3.1 Description of the Study Area

3.1.1 Location

Mareka woreda found in **6° 55' 00" to 7° 10' 00" N Latitude** and **37° 0' 00" up to 37° 15' 00" E Longitude..** It is located to the Southwest of Ethiopia at a distance of about 445 and 510 Km from Addis Ababa across Butajira-Hosana and Jimma via Tarcha respectively and 314 Km from the regional capital (Hawassa). It is bordered on the southwest by Essera, on west by Tocha, on northeast by GenaBosa and on southeast by Loma woreda of Dawro zone. Mareka district has a total of 37 kebeles, of which 35 are rural based kebeles administration areas and 2 are urban kebeles (MWFEDO, 2020). The total land surface area of the wored is about 46,724 hect. From the total area of the woreda, about 12834 ha are utilized for agriculture, 200 ha are covered by forest and 11,550 ha is pasture land. The overall elevation of the district ranges between (947 and 2546 m.a.s.l) (MWRDAO, 2020).

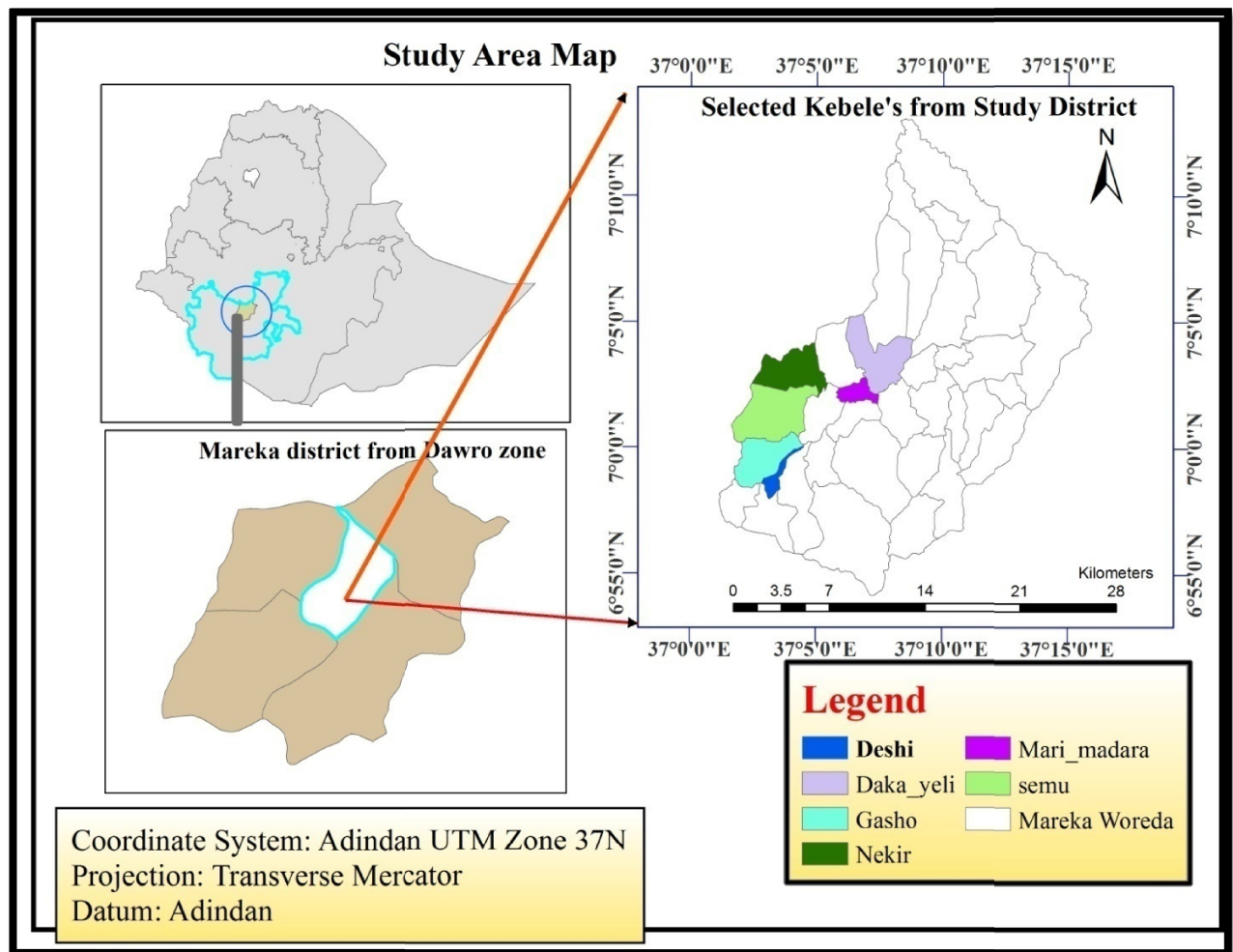


Figure 3.2 Map of study area, Source: Dawro Zone Agricultural Department

3.1.2 Population

The district has a total population of 147,913 and out of the total 78,016 was male and the remaining 69,897 are female. Out of these 10.95% live in urban area and the remaining 89.05 live in rural areas. Agriculture sector is the mainstay of people in the district with the major crop production of *Enset*, maize, grass pea, barley, bean, wheat, *Teff*, maize, and root and tuber crops. In agriculture sector, production of livestock is also another important source of income and food next to crop production. Production of livestock includes cattle, beekeeping, sheep, goat, horse, donkey, mule and poultry are a very common practice. The non-timber and timber forest product include high land bamboo and cedars also have good importance in district (CSA, 2007)

Mareka woreda is potential in honey production and about 3,988 households produce honey from 19,176 households in the district. In Mareka woreda there are about 55,126 traditional hives, 573 transitional hives and 1,820 modern hives. Mareka district honey production is 3930.07 quintals in 2018 one production season (MWANRMO, 2019). The average productivity per hives were 5.84 Kg/hive, 16 Kg/hive and 25.63 Kg/hive from the traditional, transitional and modern hives respectively.

3.1.3 Climate

Based on the altitudinal difference indicated above, the three different agro climatic zones observed in Mareka woreda. These are dega, woinadega and Kolla zone in regarding to the Ethiopian local climatic classification. Though there is little seasonal variation in the amount of temperature and rainfall in the agro ecological zones, due to altitude effect the spatial variation of rain fall and temperature are clearly observed among the agro ecological zones. Generally, in the region, the months between June to September are the time of the wettest(maximum rainy) season whereas, the dry season takes place mainly from December to February and in the remaining season, little rainfall observed with some variation from place to place MWANRMO, 2019.

According to the agro-climatic classification of Ethiopia, the agro-ecology of the Mareka district is classified as 8.23% is Kola (500-1500m.a.s. l), 50% Woinadega (1500-2300m.a.s.l) and 41.77 % Dega (>2300 m.a.s.l). The minimum and maximum temperature ranges between 160c to 23.40c and the minimum and maximum rainfall amount is about 1050 to 1516 mm (MWANRMO, 2019).

3.2. Study Design and Target Population

This study is based on primary data which was gathered through a cross sectional survey of households. Secondary data is also referred for further information. The target population of the study is therefore, farmers of the selected kebeles (Nekir, Semu, Mari madara, Daka yali, Gasho and Deshi) in Mareka woreda. These six kebeles are randomly selected among the 37 kebeles. Urban kebeles of the woreda (Marri and Waka) are not included in the selection because the target population of this study is farmers in the rural area.

3.3. Data Sampling Procedure

Purposive sampling was employed for the selection of Mareka Woreda among the five districts in Dawro Zone. First, as Mareka is the central woreda in the Dawro Zone, it shares different traditional experiences and management practices with other adjacent woredas (Isara, Tocha, and Loma and Gena Bossa) of Dawro and hence it can represent other woredas that employ awareness of forest resource management. Second, this woreda has many kebeles and highest population number while compared to other woredas in the Dawro zone. Most of the residents (about 85.03%) are farmers and live in rural areas that their life is strongly attached to varieties of natural resources available in their surroundings. Since there is high population pressure, there could be high resource exploitation and environmental challenges in this woreda.

Hence, there is high probability of employing various local people practices in reaction to the environmental challenges. Finally, because of its location Mareka is the preferable woreda to access information from all possible directions efficiently.

The population number of Mareka Woreda according to the 2007 population census is about 147,913 and it has about 37 kebeles. Considering this, 6 rural kebeles (Nekir, Semu, Mari madara, Daka yali, Gasho and Deshi)) were randomly selected out of 37 kebeles.

Therefore, the total number of households of the six kebeles is about 4228. The sample size determination is calculated from 4228 HHs. To calculate the total number of households to be conducted, this study used one of the approaches to determining the sample size. The formula that the study used was a simplified formula to calculate sample sizes provided by Yamane (1967) is: $n = \frac{N}{1 + N(e)^2}$

Where n is the sample size, N is the population size, and e is the level of precision. When it is calculated by using the above formula: $n = \frac{4228}{1 + 4228(0.08)^2} = 151$ households. Then the study was carried among 151 households and 25 households from each kebele were selected through simple random sampling technique. This process was held taking cost, speed, accuracy, destruction of test units, and other useful information in account.

3.4. Sources and Methods of Data Collection

3.4.1. Primary Data

To address the objectives of the research, qualitative research methods have largely been employed through qualitative descriptions. Factual field observation of the situation over the study area was made. This observation included the current conditions of land and other natural resources, vegetation cover of the area, traditional practices of the farmers, religious places and protected areas, resources that are given special attentions and other incidents in the study area.

Then key informants' in-depth interview (individuals and group) and focus group discussions were other main sources of data for the study. The researcher also conducted household survey (using simple random sampling procedure) for some overall information.

3.4.2. Secondary Data

In order to get substantial information books, published and unpublished works on this area, useful documents, records of offices regarding the issue and any reports that could contribute to the study were reviewed. Any helpful information sources from Agricultural Offices and Rural Development Agents, Culture and Tourism Offices, Natural Resource Management Departments in Zone as well as Woreda level have been conducted.

3.5. Methods of Data Collection Instruments

A. Questionnaires

Individuals, mainly heads of households, from local people responded to questionnaires. As the research is more qualitative, this household survey is carried only to gather general information.

The questionnaires contained both close ended and open ended questions. Questions that were raised included; household characteristics (background information), common resource use, environmental problems and its impacts on local livelihoods, local people practices in forest management, and others. These questions were first developed in Amharic and later on translated in to English as well as local language. Before conducting the actual survey, pre-test was made in order to identify unexpected problems in the time of actual survey.

B. Personal Observation

Direct observation has been an important indicator or mechanism to crosscheck the data gathered through other methods and supported the whole information through eye witness. It was undertaken in the selected kebeles in order to get a clear image of the land feature, natural resources coverage, agricultural practices and land use, traditional practices, protected areas, resource management styles and other overall situations that were supposed to be helpful for the study. Different practices with regard to natural resource management by local community were given special attention during field observation and participatory transact walk.

C. Key Informants Interview

In addition to other tools, this study used key informants interview (KII) in collecting primary data. Face to face interview with some open-end questions were undertaken. The questions were with clear and simple beginning just to help the respondents understand the question easily. As the nature of the study is more tilted toward qualitative, more focus was given on this method. It gives an opportunity to extend other questions depending on the responses. In an effort to get into depth about the issue under consideration, unstructured interviews were conducted with key informants such as community (elderly) representatives, department of agriculture sector heads, woreda agricultural officials, development agents as well as experts. The total number of people participated in KII was nineteen. The selection of those informants was purposive depending on the information they could provide on the issue under consideration.

D. Focus Group Discussion

Focus group discussions (FGD) were held to gain further insights on issues that were not adequately covered by the questionnaires and other means. Local community especially farmers (men and women) were the main targets under this method. Three focus group discussions containing people were held in three kebeles. FGD # 1 was held in Nekri kebele and it contained three people and they were all farmers. FGD #2 was carried in Gasho kebele and it included about three people. Among these people there were two model peasants and one vise chairpersons in discussion. FGD #3 was held in Semu kebele among six people and the remaining seven FGD # 4 was Das and woreda agricultural officials. The group contained influential farmers, one DAs and chairperson of the kebele. Group members were deliberately

selected from the households under study with enthusiasm to the issue. During the group discussion some leading question were raised by the researcher and the results of discussions under each topic were carefully noted. The group discussions were given primary attention as sources of qualitative data. The size of the group was determined by taking things such as accuracy, cost requirements and time allocation under consideration.

3.6. Method of Data Analysis

In the case of this study, both qualitative and quantitative data analyzing methods are used. The analysis of qualitative data collected through focus group discussion, key informants interview, and personal observation has been analyzed by using predominant qualitative descriptions, narrations, discussions and logical presentations in line with the presented data by elaboration and cross tabulations. Analysis of quantitative data obtained through questionnaire survey has been analyzed using descriptive statistics such as graphs, charts, percentage, and frequencies. Logical argumentations, triangulations (cross-checking the data through different sources) are also employed during the analysis. Socio-economic and spatio-temporal data have been analyzed by using the Statistical Package for Social Science (SPSS) and the results are displayed in various forms (e.g. tables, charts and/figures).

CHAPTER FOUR

4. RESULT AND DISCUSSION

4.1. Demographic Characteristics of the Respondents

This section provides the surveyed households' profiles, which includes sex, age, marital status, household (family) size and their educational background of the total households included in the survey, the majority 146 (96.7%) were male-headed households while 3.3% were female-headed households. With regard to the age structure, the majority (41.7%) of the respondents was between 46-60 years old, followed by 37.1% of respondents aged 31-45. The respondents above 60 years accounts for 11.9% of the sampled households, and only 9.3% of the respondents were between 15-30 years.

Regarding to marital status, the majority (90%) of respondents were married. About 2%, 3.4% and 4.6% of respondents were single, divorced, and widowed household heads respectively.

Table 4.1 Demographic characteristic of the respondents

Demographic Characteristics		Frequency	Percent
Sex	Male	146	96.7
	Female	5	3.3
	Total	151	100
Age	15-30	14	9.3
	31-45	56	37.1
	46-60	63	41.7
	61-75	18	11.9
	Total	151	100
Marital Status	Single	3	2
	Widowed	7	4.6
	Married	136	90
	Divorced	5	3.4

	Total	151	100
Household size	1-3	4	2.8
	3-5	30	20
	5-7	68	45.3
	7-9	33	21.5
	9-11	16	10.4
	Total	151	100
Educational Status	Can't read and write	91	60.2
	Grade 1-8	23	15.2
	Grade 9-12	24	15.89
	College and Above	13	8.6
	Total	151	100

Source: Own Survey, 2020

Table 4.1; also depicts the size of the households per family. Of the total surveyed respondents, 77.2 % of them had a family size of five and more children. About 20% of the respondents had a family size between three and four children. Only 2.8% of the sampled households had a family size between 1 and 2. This, in turn, indicates alongside an increase in household size, that there has been related change in the pattern of agriculture, which expands the cultivated area, mostly in to forest land (MoA, 1993).

Educational status of the community influences household decisions, which determines the wellbeing of the community. These factors affect health income and their outlook towards using forest products. Accordingly, significant proportions (60.3%) of the sampled households were uneducated. About 15.2 % of the respondents were able to primary School (1-8). The 15.9% of respondents who attended secondary and preparatory school (grade 9-12) and 8.6% of the respondents were attend College and above. This indicates that as grade level increases, the number of households attending education decreases which would have an

4.2. Forest product and current status of forest coverage

Forest resources play the most important role in the socio-economic development of many countries as well as serve as protective function of the environment. Local people in the study area utilize forests for different purposes. Forests are exploited to gather natural resources, including timber for construction and furniture making, for sale, for firewood, and for the production of charcoal.

Table 4.2 Forest product obtained by respondents and its current status

Items		Frequency	Percent
Forest product obtained	For firewood	85	56.3
	For construction materials	23	15.2
	For sale	35	23.2
	For making furniture	8	5.3
	Total	151	100
Current status of forest	Very declined	89	58.9
	Declined	47	31.1
	No change	6	4
	Increased	9	6
	Total	151	100

Source: own Survey, 2020

As it can be understood from table 4.2, the respondents were asked which forest products they extracted from the forest. Accordingly, more than half 85(56.3%) of the respondents reported that they gathered fuel wood for home consumption and 23(15.2%) gathered fuel wood to sell at nearby markets. About 35(23.2%) of the respondents replied that they exploited forest resources for construction of different materials. Only 5.3% of the sample households responded that they were clearing the vegetation for making household furniture.

According to key informant's information, forests covered their local area before past two decades. During that time, the forests had been inhabited by a great diversity of wildlife. Nonetheless, deforestation dislocated wildlife and biodiversity from this area. The researcher's

field observations also showed that most of the forest areas were converted to other land use types in the study area.



Figure 4.3. Picture showing the conversion of the forest land to other land,

Source Field survey, 2020

Similarly, table 4.2 shows that the sample households were requested to describe the current forest coverage in the study area. Accordingly, the majority 89(58.9%) of the respondents asserted that forest coverage has extremely dwindled. About 47(31%) of the respondents reported that the forest coverage has declined in the past few decades. The proportions is 9(6 %) and 6(4%, respectively) of surveyed households claimed that there was either an increase or no change in forest coverage in the study area. One of the key informants stated that previously was a dense forest in his local area where rural households used to travel a short distance to gather forest products. However, forests would be found in inaccessible elevated areas where households ought to travel to collect wood. One can infer from these findings that forests have been utilized and degraded by local people for various purposes.

In addition, land holding size and livelihood activities are also the major contributing factor for the decline of forest status in study area.

Table 4.3 Total Farm land size and trend in landholding size of the households

Item		Frequency	Percent
Total size of Farm land	0.1-1.0 ha	50	33.1
	1.1-2.5 ha	74	49
	2.6-4.0 ha	21	13.9
	4.1-10.0 ha	6	4
	Total	151	100
Trend in Land hold size	Increasing	8	5.3
	Decreasing	121	80.1
	No Change	22	14.6
	Total	151	100
Major Livelihood Activity	Crop production	14	9.2
	Livestock Rearing	9	6
	Mixed farming	113	75
	Selling forest products	8	5.2
	Timber production	7	4.6
	Total	151	100

Source: own Survey, 2020

As it is indicated in table 4.3 above, the significant proportion 124(82.2%) of the respondents owned less than two and a half hectares of land. About 21(13.9%) of household heads possess between 2.6 and 4 hectares of land. Not more than 6(4%) of the sample households owned between 4.1 and 10 hectares of land.

The CSA (2007) indicated that 80% of Ethiopian farmers in high lands cultivate a land which is less than one hectare. As increasing rural population overtime, the number of households with no or small landholdings also increase due to limited land resources.

This in turn resulted in destruction of forests for expansion of cultivable lands. As the rural population increases overtime; the number of households with small or no landholdings will also increase due to limited land resources.

In table 4.3, regards to the size of landholdings, the majority of households 121(80.3%) indicated that the size of available agricultural land was decreasing in their area. About 22(14.6%) of respondents reported that there that was no change in the size of their land over time. Only 8(5.1%) of the respondents stated that their landholdings had increased in size over time. In addition to response obtained from household heads, the participants of FGD have confirmed that the high population growth in the study area caused deforestation and decrease in size of the land overtime. This implies that people would likely to move to forest area to get more land.

In table 4.3, households were also asked to state their dominant sources of livelihood. Accordingly, the majority 113(75%) of respondents were dependent on mixed farming whereby farmers practiced both crop production and animal husbandry on the same plot of land; followed by crop production alone 14(9.2%); livestock rearing alone 9(6%), selling forest products 8(5.2%) and timber production 7(4.6%). In the study area, family size is increasing. As a result, farm land owned by the heads of household is distributed among family members. Since there are no additional alternatives economic activities, the only chance they have is to increase additional agricultural land at the expenses of vegetation. In thus, local communities are enforced to depend on forest and its products and which finally lead to dwindling of the forest in study area.

4.3. Local Community Participation in Forest Conservation in Study area

It has become quite necessary for communities to participate in the management of forest resources because their participation can improve the value of the resource. Since most of these forest communities live close to the resource, their participation would encourage them to take good care of the resource so as to ensure its sustainable use. According to Pound (2003) participation increases the significance of the resource management in numerous ways such as by bringing forward innovative information and responses into participatory learning and adaptive management, through increasing the power to deal with difficult issues and in various ways, by adding some information that have been put down in the recognition of problems and monitoring a transformation. The following table 4.5 shows local community participation in forest conservation in study area.

Table 4.4Community participation in forest conservation effort

	Alternatives	Frequency	Percentages
Participation in forest conservation practice is important in your kebele.	Agree	110	72.8
	Disagree	30	20
	No opinion	11	7.2
	Total	151	100
Technical and material support from DAs and other experts contributed more for current afforestation.	Agree	134	88.7
	Disagree	17	11.3
	No opinion	-	-
	Total	151	100
Penalizing those who violate rules and regulations should be strictly enforced in your locality in forest management?	Agree	38	25.2
	Disagree	112	74.2
	No opinion	1	0.6
	Total	151	100

Source: Own survey, 2020

As indicated in Table 4.4, about 110(72.8%) of the respondents said that local communities were participated or involved in forest area conservation activity in their locality even there is variation on level of participation. If there is low level of participation of local people which will leads to the ineffectiveness of the conservation strategies. For sustained forest management in the area, active participation is very important. FGDs also showed that currently households planted more trees in response to the observable environmental degradation in the area. The technical and material support from experts is also important for the change obtained.

Even if it varies among the sampled kebeles majority of the respondents about 134(88.7%) agree with the contribution of DAs and experts for the afforestation activity this implies that DAs and experts contributed more for afforestation program. The institutional weakness to penalize those who violate rules and regulation was observed in the study area mainly in seedlings planted in the area. About 112(74.2%) of the respondents responded that there is a weakness in enforcements of the law and regulation on those who violate it.

4.3.1 Ways to involve the community in the management of the forest in study area

This research tried to find out from the respondents the forms of activities that they would like to be engaged in forest management practice in the study area. Community members were asked to give ways in which they would want to participate in the management of the forest.

Table 4.5 Ways to involve the community in the forest management

Items		In No.	In %
Ways to involve local communities in management of forest	Awareness creation and training	139	92.05
	Cultural and indigenous knowledge	12	7.95

Source: Own survey, 2020

As indicated in above table 4.5 above; local communities involved in forest management through awareness creation and training which accounts 92.05% and cultural and indigenous activities (7.95%) as very small respondents responded.

4.3.2. Local community training on forest conservation in study area

Training is inevitable in order to conserve and manage the forest resources and other natural resources from destruction. Accordingly, the sampled households were asked whether they had been given training on forest conservation and management by experts from the woreda forestry department and non-governmental organizations working on natural resource management particularly forest resources.

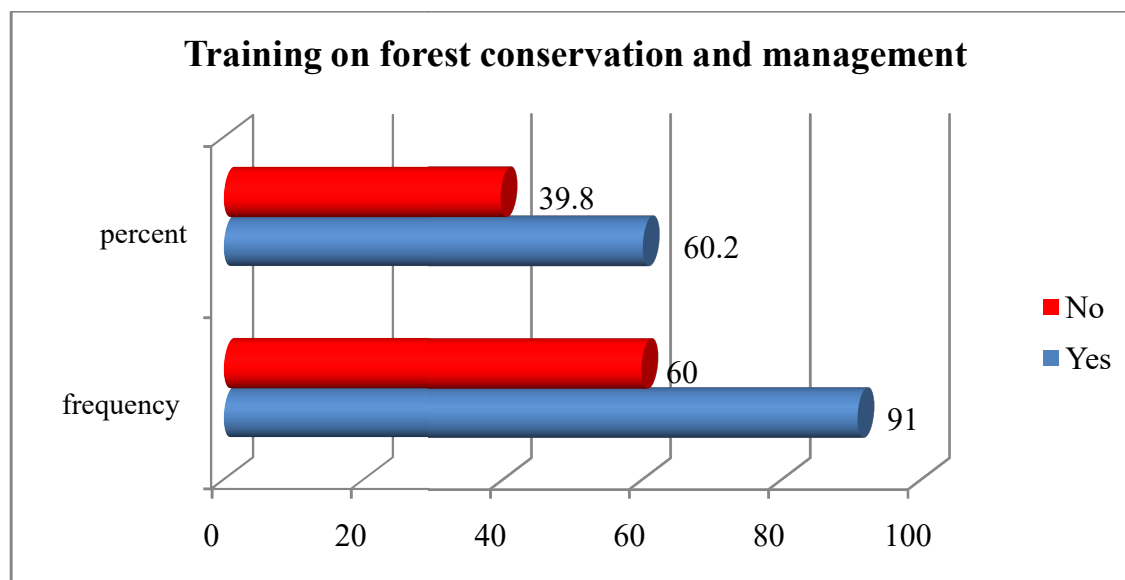


Figure 4.4 Respondent responses on training on forest conservation and management

Source: Field survey, 2020

As indicated in figure above 4.4, about 91(60.2%) of the respondents received training on forest conservation and management by woreda forestry expert and NGO working on forest and/or natural resource management, climate change issues and livelihood diversification, whereas 60(39.8%) of the respondents did not get any training on issues under consideration.

Experts from different organizations, as key informants, described that society was sensitized and mobilized through different panel discussions, workshops, training and establishing community committees. The training given to the community also includes conservation, protection, development and utilization of forest resources. Information on how to develop business plan, livelihood diversification and resource assessment were also taught to the community. However, some of key informants and participants FGD argued that the training and/or education given to create awareness were not enough and on a regular basis to change the community's attitude and perception on forest resource degradation. This would have future implication for those actors to provide the training appropriately so that the establishment process ends up with success.

In addition, the respondents were asked whether they put it into practice the training rendered to them by conserving and planting trees. The role of local communities is not only preventing

deforestation and forest degradation, but encouraging forest regeneration. Also they have responsibility in implementing adaptation and mitigation actions in the study area.

Table 4.6 Local communities training and planting trees

Items	Frequency		Percent
Have you implemented the training?	Yes	71	78.02
	No	20	21.98
	Total	91	100

Source: Own Survey, 2020

As clearly portrayed in table 4.6, the majority of 71(78.02%) the respondents implemented the training given to them by woreda's forestry expert working on forest conservation and management; while 20(21.98%) of the respondents did not implement the training to conserve the natural forest. Those respondents who had not implemented the trainings forwarded different reasons. They said that the trainings rendered to them were not given adequately and continuously so that they faced some ambiguities in forest conservation. Some of them also suggested that they were not directly engaged in activities related with forest degradation like agriculture and cattle rearing; they led their life by participating in livelihood activities such as basketry, pottery making and others. That is why they did not put in to practice the training.

One of the key informants who were working on forest conservation argued that his office distributed different species of indigenous plants seedlings to rural communities though its management was not in sustainable manner so that few planted tree species had tendency to grow on good manners. However, despite some efforts, the trend of rural households in planting trees after removal is at a low level which requires the attention of all stakeholders.

4.4 Challenges of forest management problem in study area

According to figure 4.5 below, conversion of forest land to agricultural land, the rising demand for tree products for firewood and charcoal, expanding population pressure, lack of income, a

need for construction materials, demands for grazing land, and lack of jobs are the major factors contributing to the fast disappearance of the natural forest of the woreda.

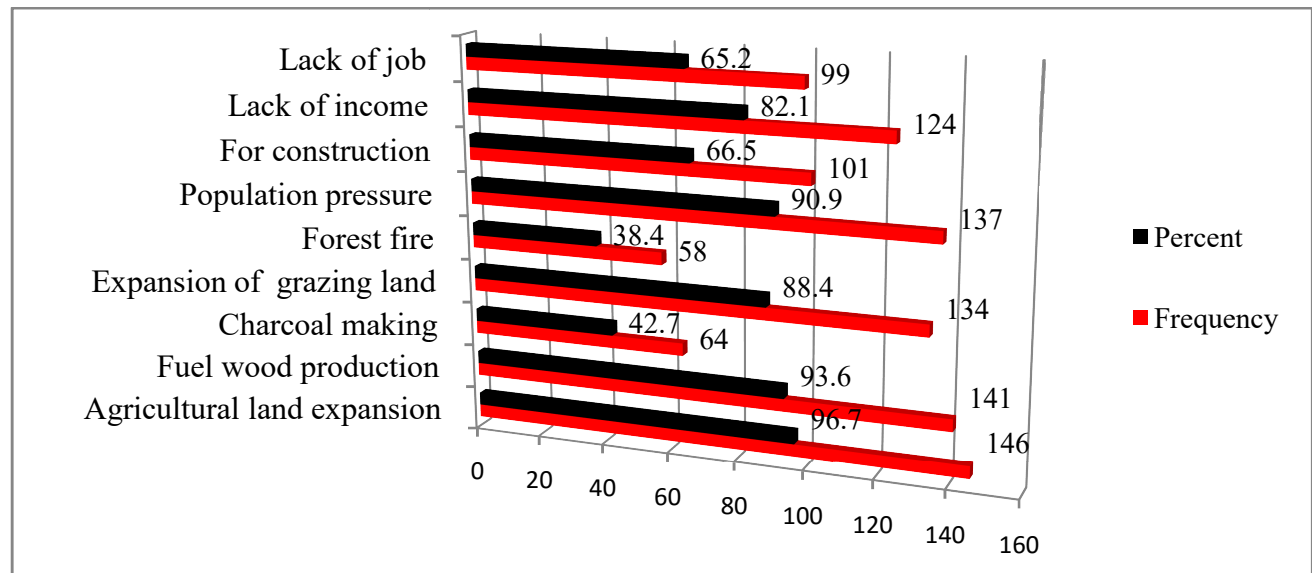


Figure 4.5 Major problems perceived by respondents Own Survey, 2020

As figure 4.5; clearly shows, the majority 146 (96.7%) of the respondents replied that agricultural land expansion was the major problems for forest management and this cause emerge deforestation in the study area, followed by fuel wood production 141(93.6%), expanding population pressure 137(90.9%), allotment of grazing land 134(88.4%), lack of income 124(82.2%), the collection of construction materials 101(66.5%) and lack of alternative jobs 99(65.2%). Fewer respondents 64(42.7%) and 58(38.4%) argued that charcoal- making and forest fire were the major problems of forest management in the study area.

4.4.1. Agricultural land expansion

Agricultural land expansion was the major problems for forest management in study area. The rapid population growth, coupled with a high demand for food, has added to further destruction. As aforementioned figure 4.5 above, the largest proportion (96.7%) of the respondents stated that the conversion of forest land into farmland was the major problem in their local area. As it was learned from the field observation, most of the rural households did not have adequate cultivated land to produce an adequate amount of food for their households. Similarly, participants of FGD

described that the people in the study area were highly dependent on agriculture as their main means of livelihood, in spite of its low productivity. They added that the uncontrolled increase in population led to the clearing of forests cover to produce crops.



Figure 4.6 Farmland expansion by clearing trees study area:- Own Survey, 2020

The respondents were also asked to tell the reason behind a decrease in land productivity over time. Accordingly, as described in Figure 4.6, the main reason for the decline in productivity of their farmland was rain fluctuation 47 (30.8%), followed by loss of forest resources 43(28.8%), loss of soil fertility 29(19.5%), and a combination of other factors, like the fragmentation of farm size 22(14.6%). The smallest contributor 10(6.3%) in the decline of land productivity was soil erosion. The participants of FGDs mentioned that the decrease in rainfall and its irregularity alongside decrease in farm land size brought about by the population pressure are the two serious causes for the decline of productivity of farmland overtime.

It can be understood from the above discussion that the combined effect of a number of factors, such as erratic rainfall conditions, soil fertility decline and a decrease in farmland due to population growth, are the major obstacles for the suitable production of crops for the society. In turn, this has led to a decrease in investments made by the farmers in relation to forest management practices.

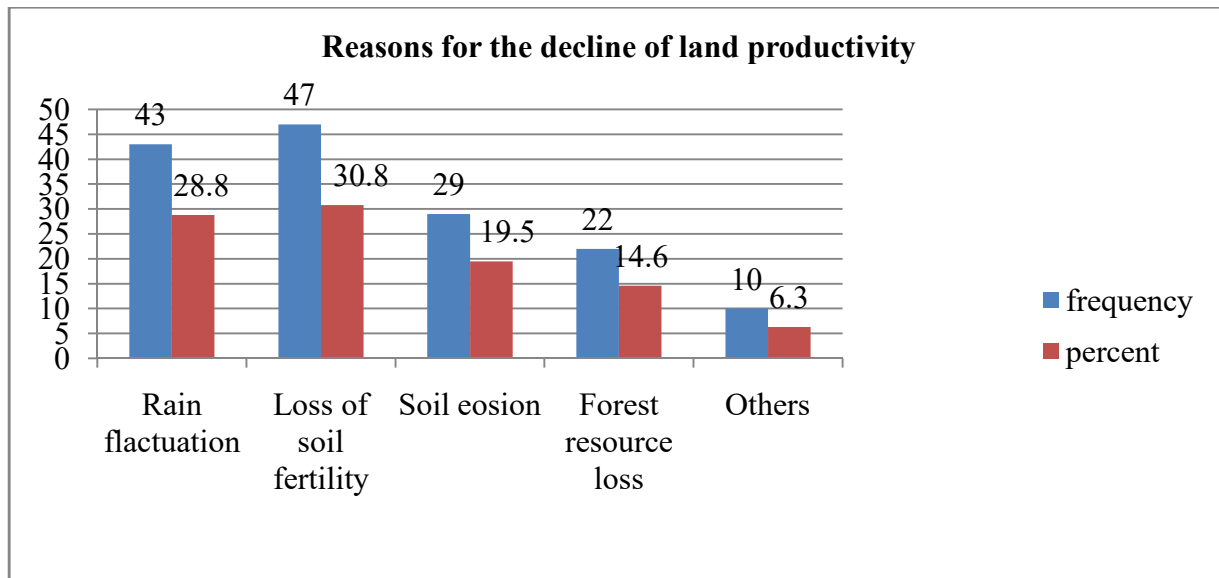


Figure 4.7 Reasons for the decline in land productivity

4.4.2. Fuel wood production

Fuel wood production was the second highest problem of forest in the Mareka woreda. Wood is required for fuel in rural areas. The excessive cutting of trees for firewood before they are fully grown leads to the loss of growth potential of the forest stands. As indicated in below figure 4.8, significantly large proportion 98.7% of the respondents confirmed that fuel wood production was a major problem of forest management next to agricultural land expansion in the study area.

In most developing countries, more than 80% of wood extracted from forests is being used for fuel (Union of Myanmar, 2000). In relation to this, most of the key informants noted that they were collecting a lot of firewood to prepare food and heat their houses as there were few or no sources of alternative energy in their locality. The demand for fuel wood is much higher than what the forests are capable of providing. This indicates that much of the rural livelihoods do not have access to alternative energy sources like biogas, solar energy and electric energy.

In connection with this, the respondents were also inquired to describe the source of energy for household use (cooking and heating). The following figure 4.8 below shows the source of energy used by the respondents in the study area.

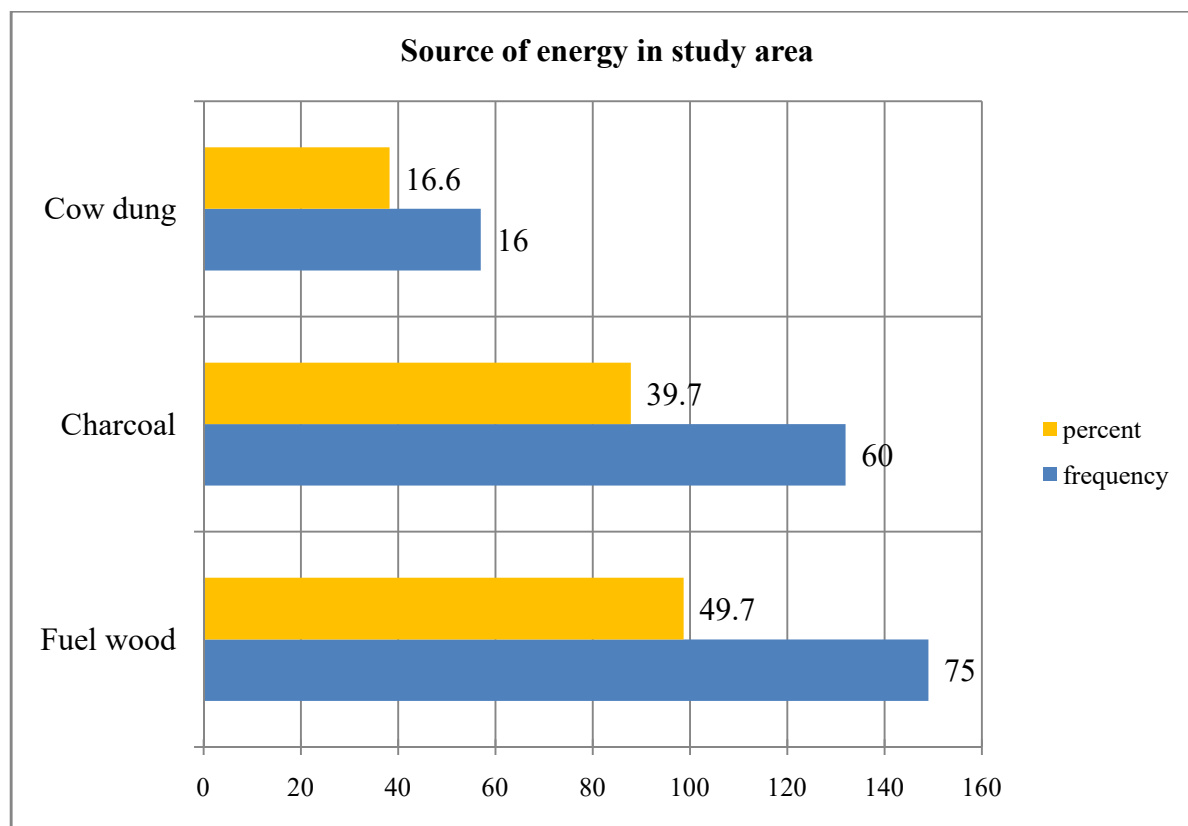


Figure 4.8 Source of energy in study area

As clearly portrayed in figure 4.8; the great majority 75(49.7%) of the respondents confirmed that fuel wood production and consumption was dominant source of energy for households in the study area, followed by charcoal and cow dung which accounted for 60(39.7%). Only 16(10.6%) of the households responded that kerosene was used as their energy source. None of them used that they use biogas, solar energy and other energy sources like electric energy as their alternative source of energy.

During the FGDs, the respondents said that people collected fuel wood daily either for home consumption or selling in towns like Mari and Tocha (town in neighbor woreda). This is in accordance with the study of Solomon (2005) which showed that the average annual consumption of domestic energy in his study area was largely dominated by fuel wood, followed by cow dung and crop residues. This indicates that fuel/fire/ wood are by far the most important factors contributing to disappearance of natural vegetation of the woreda.



Figure 4.9 Tree cutting for fuel wood in Study area

4.4.3. Population pressure (growth)

Population growth can be one of the challenges for management of forest in study area. The household questionnaire revealed that about 137(90.9%) of the respondents reported high population pressure on land was one of the major (underlying) challenge for forest management in the study area as aforesaid. To this end, Million.B (2013) indicated high population growth in agricultural sector led to an increase in ratio of population to land causing high demand for crop grazing land, fuel wood, construction as well as expansion of settlements in the forests.

One of the key informants described that that poor and landless people encroached to marginal land and steep slopes in search for cultivation and grazing land which further contributed to forest destruction. He further added that over exploitation of forest resources in the study area

caused shortage of fuel wood in which people had to travel along distance in search of it. This would take much of their time otherwise they spent on productive activities.

The respondents' responses indicate that the average family size of the study area is found to be 6 children per a household. Besides, during the field survey, the investigator observed that the household had a large family size with limited landholdings. Due to this fact, he was observed that more people required more food and space which in turn necessitated extra land for agriculture and habitation. This in turn resulted in additional clearing of forests.

4.4.4. Expansion of grazing land

The main livelihood activity was predominated by mixed farming with livestock rearing taking a lion share in the study area. There was shortage of grazing land due to high number of livestock in the area. As it has already been portrayed in figure 4.10; about 141(93.7%) of the respondents considered searching for rearing of livestock and 134(88.8%) grazing of livestock in the forest was one of the main problems in the study area. The study area has large number of livestock such as cattle, sheep, goats, pack animals and poultry and rearing of those animals requires conversion of those lands in to grazing land.

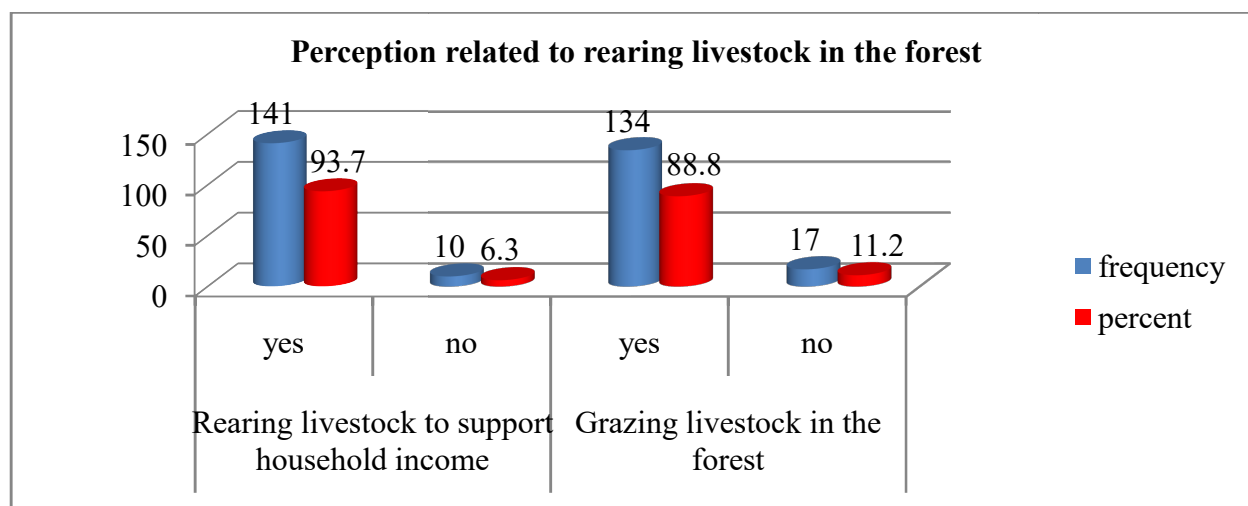


Figure 4.10 Respondents' perception related to rearing livestock in the forest

The above figure 4.10; shows perception of respondents pertaining to rearing livestock to support the household income and whether they graze livestock in the forest or not. In view of that, considerably large proportion 141(93.7%) of the sample households replied that they have reared

livestock to supplement their family income with other activities. As to grazing livestock in the forest, the majority 134(88.8 %) of them responded that they reared livestock in the forest due to shortage pasture land and other types of fodder. Only 17(11.2%) of the respondents stated they did not use at all forests as a grazing area.

According to the information obtained from FGDs and key informants, people reared animals in the forest because they lacked enough open communal or private grazing land-there was shortage of grass in the study area. They described that some farmers even settled amidst the forest with their cattle. Because of low crop productivity, these households opted for raising animals. By doing so, they have got income by selling the animals and their products to fulfill basic need of their family and /or have used for home consumption. They added that the settlement in forests brought about the disappearance and migration of precious wild animals from the area which had been there before a decade. Moreover, the participants of the interviews claimed that some rural households set fire into forest to expand grazing land. In support of this,Flavie (2010) in her study of developing the necessary tools to manage livestock grazing pressure in bale mountains national park“ indicated that grazing large number of animals in the Guda forest removed under story vegetation while the patches forests are burned down regularly. One can infer from the above views that over grazing is the problem which causes forest destruction in the studykebeles.



Figure 4.11 Expanding grazing land at expense of forest land in Study area

4.4.5. Lack of income and job

In Ethiopia, a leading cause of degradation of marginal forest land is caused by poor rural farmers and landless people who clear trees in order to grow crops. In their struggle for survival, people are driven to practices that damage the environment and, in the process, undermine their own future food security. This waste cycle is repeated endlessly, accelerating the environment degradation and adding to rural hunger and poverty (MoARD, 2007). Poverty related factors like lack of income opportunities, joblessness, resource poverty, low living standard, etc. are the underlying causes of deforestation.

As it has already been described in figure 4.12 below of the total respondents, about 82.1% and 65.1% of the sample household stated that lack of alternative source of income and joblessness were respectively the major underlying of forest management in their local areas. The economic situation of forest product suppliers is one of the factors that determine the frequency and extent to which they are engaged in this activity. From the field survey, it is clearly shown that the physical quantities of forest resources used per capita of households are significantly influenced by households' economic indicators such as income. In connection with this, the following figure depicts the total annual income the sample households generate from different livelihood activities.

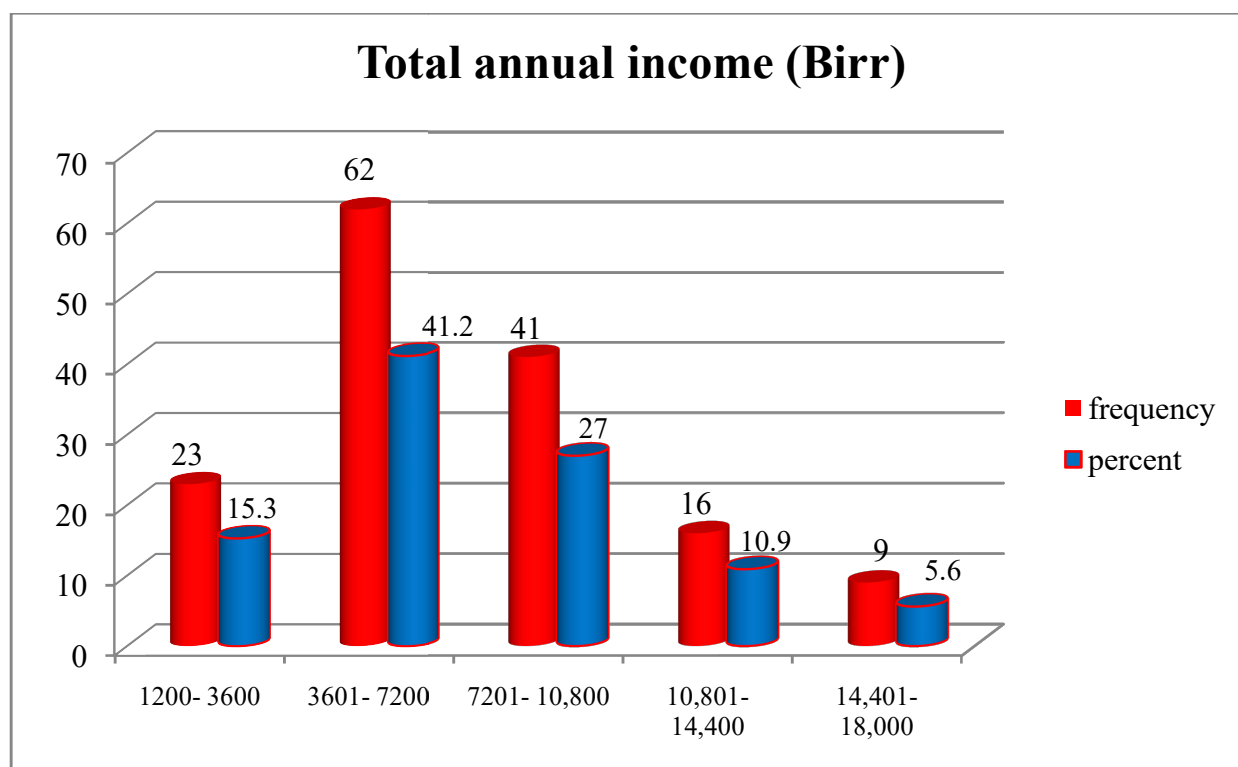


Figure 4.12 Total annual income (Birr)

Source own survey, 2020

It is difficult to establish precise information regarding household income, because the respondents could hardly tell sincerely their household earnings. However, an effort had been made to know their income by asking the amount of money they earned from all livelihood activities such as selling of grain, livestock and livestock products, vegetables, charcoal , firewood , bee products, local trades product and other non-farm activities. Accordingly, as indicated in the figure 4.12 above, the annual income distribution of the respondents ranges from 1200-18000.

According to the expert from Mareka woreda Agricultural and Natural Resources Development office, the forest resource at Mari area is shown to be an important constituent of the natural capital available to the local people. Forest productive activities and forest income are important components of household's livelihood strategies. Forest income plays a role in alleviating poverty, filling seasonal income gaps and coping with income crisis, particularly in the poorer households who are more dependent on forest income than better off households.

This finding is supported by Yemiruet *et al.* (2010) who using a sustainable livelihood perspective, found that in Southern Ethiopia, forest provides 24% of household incomes for high income groups and 52% for low income groups. In both groups, forest products generate both subsistence and cash incomes which let rural people tackle poverty or have income in crisis times. Rural households (poor and non-poor) commonly seek forest resources for support when they have to face emergency situation such as crop failures, shortfalls.

Meanwhile, the researcher observed that some households sell forest products from the local forest as additional source of livelihood to generate supplementary income, particularly in the rainy period/before harvest. In addition, those who did not have land or hold small land sizes gradually became involved in clearing the forests land into crop/or grazing areas as a coping mechanism to resolve their seasonal income insecurity.

One of the key informants from NGO working on natural resource management in wereda described that “forest resources are highly exploited due to the high market demand for firewood in the nearby markets.

The rural households were also inquired how often did they sell forest product like fire wood and other forest products to the market in order to get money for their household as well as whether their household income was disturbed if they stopped selling these forest products. This is illustrated in the figure below.

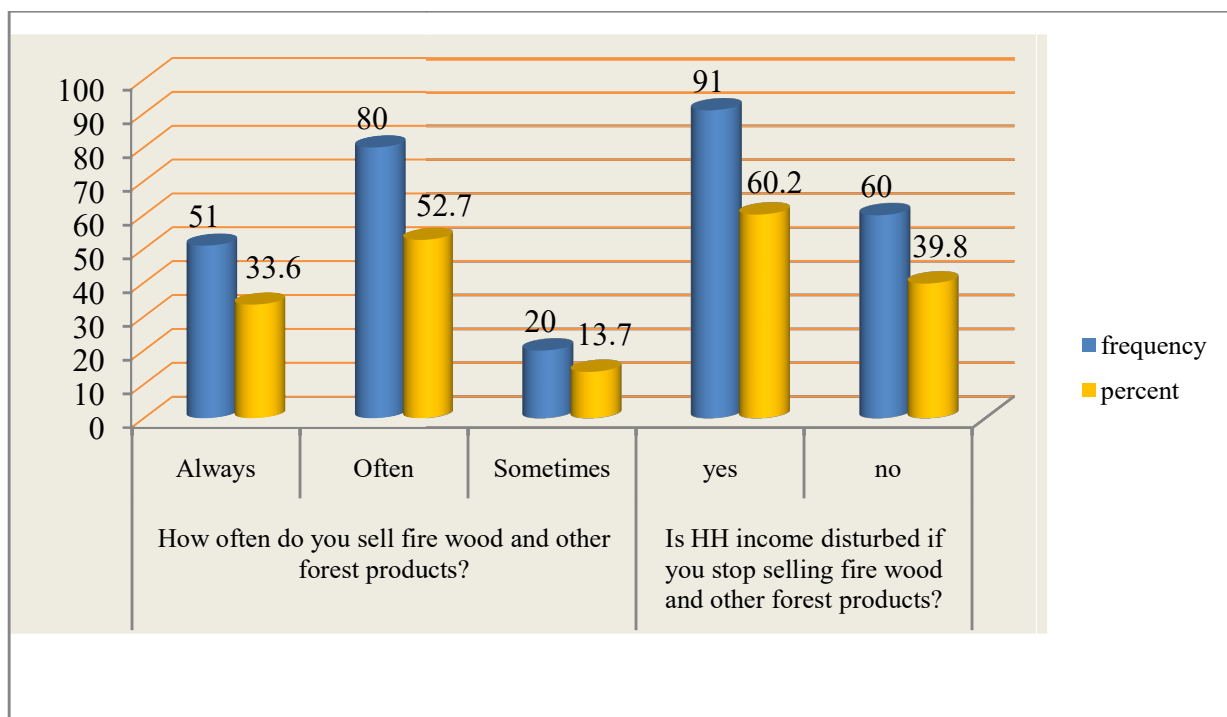


Figure 4.13Frequency of selling forest products Source own survey, 2020

As indicated the above figure, 4.13 out of total 151 sampled respondents, steadily more than half 80(52.7%) have confirmed that they sell fire wood and other forest products regularly and 51(33.6%) sell them all the time. Only 20(13.7%) of respondents indicated that they obtain income by selling fuel wood and other forest products occasionally. This indicates all households bring forest products to the markets to get money at different occasions.

Considering the disturbance of HH income as a result of stopping fuel wood and other forest products, the majority 91(60.2%) of the respondents suggested that their income can be disturbed while 60(39.8%) of them indicated their income could not be affected if they gave up selling fuel wood and other forest products. This indicated that the extent the local people are highly dependent on forest products to overcome poverty.

In line with the above findings, the participants of the FGDs revealed that the rural households usually have sold forest products such as fuel wood, timber, construction poles and charcoal due to various reasons. Most of them would sell forest products to fulfill basic necessities like oil, kerosene and others to supplement the income the household get from agricultural production.

Nonetheless, some of landless and jobless parts of the community made up their livelihood only by supplying forest products to the markets as since there were no sound alternative jobs opportunities created for them. During field observation, the researcher observed while people in this area were frequently bringing fuel and other forest products to sell in the market. In support of with this, FARM/SOS (2007) reported that wood flow from the surrounding mountains to Mari town seems unstoppable. The prevailing free riding condition over the natural resources is going even farther to hindering communities' "willingness of taking up sustainable resource management and wise utilization opportunities.

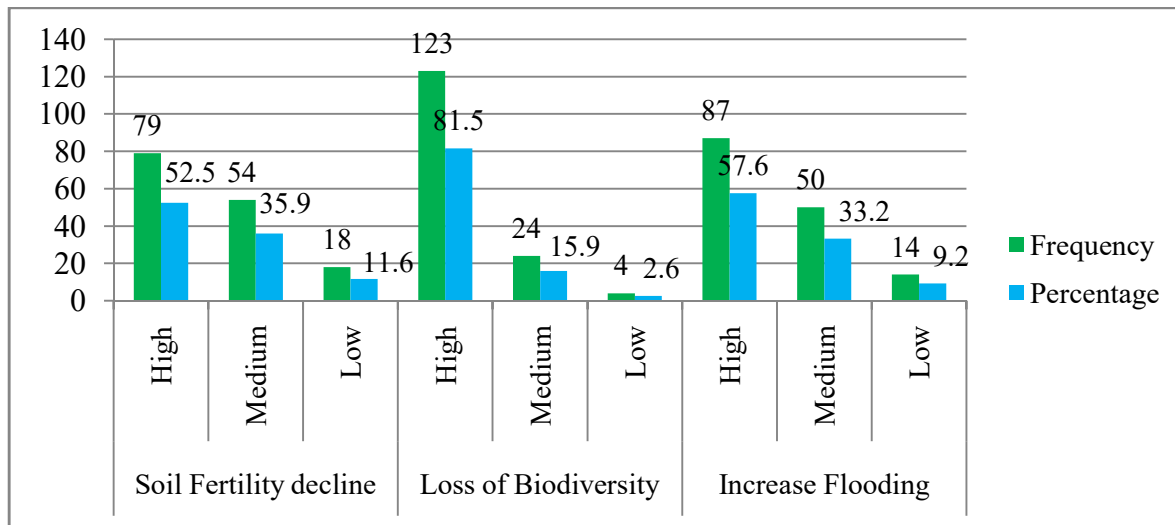


Figure 4.14 Effects of forest destruction as perceived by respondents

As it is portrayed in figure 4.14, the respondents have been requested to state the effects of forest decline on the environment of the rural households. Accordingly, out of the total respondents, 79(52.5%) replied that there was high decline in soil fertility, followed by 54(35.9%) medium decline, and the rest 18(11.6 %) said low decline in soil fertility in the study area. Meanwhile, the sample respondents were also requested on effects of forest destruction on the status biodiversity where by considerably large proportion 123(81.5%) confirmed that its effect was high and 16% medium. Only 2.5%of them argued that the effect occur on biodiversity was low. Furthermore, the sample households were inquired about the increment of flooding as result of forest decline. Consequently, the majority87 (57.6%) replied that the flood was extremely increased, 50(33.2%) said that it was medium and 14(9.2%) stated it was increased in insignificant amount.

The depletion of tree stocks would in turn cause changes in the ecology of rural areas, mainly carrying capacity or fertility of the soil. As it can be observed from Figure 4.16, more than half 79(52.5%) of the respondents described that the decline of soil fertility in their environment was high due to forest destruction. This findings is in line with the study of Yirga (2007) and Mulugeta (2004) who noted that depletion of soil fertility resulting from soil erosion leads to declining of crop yields and rise in a number of people who do not have food security.

Forests can be considered as giant sponges absorbing and storing the stormy rains of the rainy seasons and releasing them as cool springs during hot and dry seasons. However, due to its decline, this vital role is disrupted. As it is indicated in Figure 4.16, large number 87(57.6%) of the respondents described that flooding has been greatly increasing from time to time in the study area. According to the information obtained from Mareka Woreda's Agricultural and Natural Resource Development Office (2019), the study area, within the Tiniara Mountain forest, is characterized by rugged topography, hills and dissected plateaus exacerbating run off where much of the soils have been taken away by floods. In the large part of the study area, the soils were getting shallower and shallower due to forest cover change and removed by flooding. Forest resources have high biodiversity resources and its reduction influences directly or indirectly both flora and fauna. Unsustainable use of forest resources and overuse of natural resources are the major factors that can hasten loss of biodiversity in the study area.

The sampled households, participants of the key informant interview and FGD were inquired to explain the tree species which were once abundantly found in their area but now declined and/or seriously endangered or disappeared owing to high rate of forest destruction. Most of these people described that trees like *Hygenia abssinyca* (Koso), *Podocarpus falctus* (Zigiba), *Olea Africana* (Weira), *Junipear procrea* (Tid), *Croton macrostchy, tas* (Bisana) and *Cordea Africana* (Wanza) were highly degraded in the study area. As respondents said these tree species were declined because of forest destruction but existed abundantly before one or two decades. Local people particularly traditional healers of the woreda used some of these tree species as medicinal plants to cure some diseases whereby most of these medicinal plants were declined during this time because of tree removal. The traditional health collectors and vendors had to go far away in search for these plant species to generate income for households as means of livelihood.

Accordingly, the respondents argued that there were a lot of wild animals in the past, but today few of them could be observed in the forest. Wild animals like antelope, tiger, and lion were endangered in the area. As mentioned earlier, there was loss of biodiversity in study area resulting from degradation of forests. In order to minimize the rate of destruction of biodiversity; the rural household had to take some mitigation measures. Hence, the respondent households and key informants described that the decline in vegetation can be lessened by planting new indigenous plants such as *Podocarpus falctus*, *Junipear procrea*, and conserving the existing forests in their area. Protecting culturally important medicinal plants using indigenous knowledge has also a paramount importance in biodiversity conservation. They also argued that landless and people with few plot of land have to get alternative sources of livelihood.

The respondents added that there were some people who deliberately set fire into the forests to get fuel wood, to expand grazing and cultivable land. This in turn led to the migration and death of precious wildlife in the area. This must be stopped by local people. The respondents also proposed that migrations of wild animals could be minimized by closing the degraded lands, by planting various trees species on sustainable way, and by conserving the forest resources in the area.

CHAPTER FIVE

5. SUMMERY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMERYAND CONCLUSIONS

Forest conservation is the practices of planting and maintaining forest areas for the benefits and sustainability of future generation. The conservation of forest also stands and aims at a quick shift in the composition of tree species and ages distribution. Forest conservation involves the upkeep of the natural resources within forest that are beneficial to both humans and the environments. From what have been discussed so far, it is evident that forest resources can be conserved in a better way when communities participate in its management. The management of many forest resources take the form of reserves creation for educational, recreational and tourism activities most of which are profit oriented. The objectives behind such activities would be achieved to a greater extent when the communities participate in the management activities.

Forests and woodlands are converted to other land use types because of different human induced factors. This study was targeted to Assessment of Forest Conservation Practice and Management Problem in selected kebeles of Mareka Woreda, in SNNPR. To this effect, the study was conducted in six kebeles that were purposively selected from 37 kebeles in the woreda. Then, 151 household heads were selected using simple random sampling technique. Different data collection instruments such as questionnaire, FGDs, key informant interviews and field observation were also applied.

From the data that was collected, the local communities used forest for firewood, as construction materials, for sale and for making different furniture which resulted the decline of the forest as 90.06% of the respondents agreed.

In addition the study found out that, communities in study area have greater interest in forest conservation and management practice, thus about 72.8% (110) were willing to participate on some management activities which is a positive sign for management of the forest to engage

them and the majority of 56.4% of the respondents implemented the training given to them by woreda's forestry expert working on forest conservation and management;

In addition the study found out that the major factors/contributing causes to the fast disappearance of the forest in study area were attributed to agricultural land expansion, expansion of grazing land, forest fire population growth, charcoal production fuel wood production, poverty related factors like lack of income opportunities and joblessness in study area made the forest resources to be extracted regularly and excessively. However, it is concluded from this that the forest income was used as playing a role in alleviating poverty, filling seasonal income gaps and coping with income crisis, particularly in the poorer households.

The study also revealed that local communities has an awareness on the declining of forest and it can be worsen if the government and local communities do not act promptly. They have an idea on declining of forest will have an impact on the decline of soil fertility, loss of biodiversity and increase in flooding. There were tree species and wild animals which were once abundantly found in study area but now declined, seriously endangered or disappeared owing to high rate of forest destruction.

5.2 RECOMMENDATIONS

The following recommendations have been forwarded based on the findings of the study.

- As the role of local communities in conservation of natural resources is invaluable, it will be beneficial if the people, practice, social administrative set ups and traditions of the local people are incorporated in the effort of conservation of natural resources. This can be done by building partnerships for joint problem resolution and systematically improving and modifying traditional knowledge through technology integration.
- Providing an extensive awareness and training on sustainable utilization and conservation of forest resources to the local people can preserve both natural resource and traditional knowledge. This is because communities receiving the most externally driven development assistance become less capable of handling their own affairs.
- Forest conservation measures depend on their sustainability to the local ecology and the farming systems. Therefore, designing and implementing culturally appropriate and participatory development programs would avoid costly mistakes, whereas top-down planning fails to promote effective natural-resource management at the local level.
- Greater efforts should be made to strengthen the capacity of local people for developing their own knowledge base, and to develop methodologies that promote activities for improving livelihoods in a sustainable way. For example, supporting innovative farmers (such as men of medicinal plants) and their experimentation would strengthen their capacities to seek out new ideas. By that they can be encouraged to be better able to experiment, to test new possibilities and to adjust to changing conditions. This can be carried out through Participatory Technology Development that refers to the collaboration between farmers, development agents and scientists (formal researchers) in a manner that combines the knowledge and skills of these various actors.
- Proper recording and documentation of traditional knowledge would be helpful for sustainable protection of forest and use of it. Central and local governments, environmental community and universities could become components of valuing, preserving and protecting the forest resource of the area.

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APPENDICES

DILLA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

QUESTIONNAIRE FOR MA THESIS

This questionnaire is used during a field work of data gathering. The study was conducted for a research purpose under the title “**Assessment of forest conservation practice and management problem in Mareka Woreda, SNNPR**”. The data is gathered by both researcher and enumerators who assist the researcher.

Dear respondent, this questionnaire has only research purpose. Thus, the outcome from this research would help to address the forest conservation practice and management problem in study area. Its finalization is thought to lead to a better and inclusive conservation and management of forest resource in the area. The government, community, NGOs and religious institutions would use it in their respective concerns. Therefore, I kindly request the respondent to fill this questionnaire. The information gathered should be used solely for academic consumption. Your cooperation would be greatly appreciated and is of great importance.

PART I: BACKGROUND INFORMATION OF HOUSEHOLD HEAD

1. Sex of household head: A) Male B) Female
2. Age of household head_____
3. Marital status of household head: A) Married B) Single C) Divorced D) Widowed
4. Size of household_____
5. Educational status attended by household A) Cannot read write B) Grade 1-8 C) Grade 9-12 D) college and above
6. Kebele _____

Part II. To examine the status of forest resource conservation and development in the woreda;

1. What type of forest product and resources the household obtain from the forest? A) For fire wood B) for construction C) for sale D) for construction E) For making furniture
2. What is the current Status of your locality? A) Very declined B) Declined C) No change D) Increased
3. What is the level of participation in the forest management? A). Maximum B). Moderate C). Minimum
4. What is the trend of forest in study area? A. Increasing B. Decreasing C. No change
5. Is the livelihoods are affected by the forest decline? A. Agree B. Disagree C. No idea
6. What is the major livelihood activity of your household? A) Rearing animals B) Crop production C) Selling fuel wood D) Timber production E) Others (Specify) _____
7. What is the responsibility of the local people to protect the surrounding forests? A. Agree B. Disagree C. No idea
8. What is the destruction of forest management? A) Increase in human population B) agricultural expansion C. Fuel wood production D. forest fire E. Charcoal making F. Expansion of grazing land G. For construction D) Others (specify) _____
9. Have you observed decline in land productivity in your locality A) Yes B) No
10. If your answer is „yes“ for question No.9 what are the reasons behind? A, Rainfall fluctuation B) loss of soil fertility C) removal of soil by erosion
D) Loss of forest resources
E) Others (Specify) _____
11. Do you rear livestock order to support you your household's livelihoods? A) Yes B) No
12. If your answer is 'yes' for question No. 11, have you been grazing your Livestock in the forests? A) Yes B) No
13. What is your average monthly income in Ethiopian Birr? ____ Is it enough to afford basic necessities for your livelihood? A) Yes B) No
14. Do you sell forest product (fuel wood) to market? A) Yes B) No
15. If your answer is „Yes“ for question No.14, how often do you sell fuel wood to the market? A) Always B) Often C) Sometimes

16. If you stop selling fuel wood or other forest products, is your household's income disturbed? A) Yes B) No

Part III. To assess local community's participation level in forest management practice in Mareka Woreda;

1. Ways to involve local communities in management of forest:- 1. Awareness creation and training 2. Cultural and indigenous knowledge
2. Participation is important for forest conservation practice in your kebele. 1. Agree 2. Disagree 3. No opinion
3. Annual plantation and replacement outnumbered your consumption of wood and wood products. 1. Agree 2. Disagree 3. No opinion
4. Technical and material support from DAs and other experts contributed more for current a forestation program. 1. Agree 2. Disagree 3. No opinion
5. Penalizing those who violate rules and regulations is the best methods of forest conservation. 1. Agree 2. Disagree 3. No opinion
6. Do you have awareness about forest resource management and conservation?
A) No B) Yes
7. If your answer is „No“ for question No. 6, what is /are reason/s?
A) Lack of trainings
B) Lack of interests to have awareness
C) Preference of forest resources to your own purposes
D) Others (specify) _____
8. If your answer is „Yes“ for question No .6, have you participated in community forest management and conservation in your area? A) Yes B) No
9. Did you get training about forest management by woreda forestry experts and DAs? A) Yes B) No
10. If your answer is „Yes“ for question No. 9, have you accepted and put in practice the training given by them? A) Yes B) No
11. If your answer is “Yes”, have you ever planted trees? _____
12. If your answer is „No“, What reasons makes you not to accept and implement it?

Part IV. To identify challenges of forest management problem in Mareka Woreda;

1. Are there any challenges between the management and the communities? ☐Yes☐No
 2. If yes, what forms of challenges exist?
 - A) Agricultural land expansion B) For fuel wood C) For charcoal making D) To get grazing land E) Forest fire F) Population pressure G)for construction H) Lack of income I) others (Specify) _____
 3. What are the main problems to you to participate in every activities of Forest conservation?
 4. What is your source of energy for household use (for cooking and heating) currently? A) Fuel wood B) Charcoal C) Animal /cow/ dung
-

APPENDIX-A

Interview Guide for Local Elders

1. What are the major problems of forest conservation in this area? Do you think that population growth is the root cause?
2. Do the farmers in your area have sufficient agricultural land? If not, why?
3. Do the local people sell forest products particularly fuel wood to the market? What makes them to do so?
4. Do you think that there is local community participation in forest conservation practice? How?
5. What is your perception in the area regarding forest degradation and related environmental problem?
6. What do you say about the current forest conservation effort in your locality?
7. What do you observe the current forest coverage in your locality?
8. Do you have observed decline or loss of tree species and wild animals in your area? If what so, describe them.
9. What is the role of people in conserving and management of forest resources?

APPENDIX-B

Key Informant Interview Guide for Woreda Experts Working on Forest Management

1. What is a major livelihood activity of rural households in this woreda?

2. Did you observe there forest resources decline in Mareka woreda over time?
3. What is considered the major problem leading to forest destruction in Mareka woreda?
4. What are effects of forest destruction on livelihood of rural people specifically on their environment and socioeconomic condition?
5. Do rural livelihoods have awareness about forest resource management and conservation?
6. As an expert, do you involve poor people of rural area in forest conservation?
7. To what extent the local people plant trees and conserve forest resources?
8. What are forest management strategies to reduce the rate of forest destruction and its impacts on rural livelihoods? Put them in order of their priority.
9. What is Community Based Organization (CBOs) in forest management in kebeles of the woreda?
10. Have you ever given awareness or training on forest conservation to the community? Was it enough?
11. Have there been any successful efforts of forest resources conservation and management in and around this woreda? If not, why

APPENDIX -C

Questions prepared for Focus Group Discussions

1. What is forest coverage currently? Decreasing or increasing?
2. What are underlying /root / causes of forest destruction in this area?
3. Is the scarcity of agricultural land in this area? If so, what has been done to get additional lands?
4. What are the problems of forest conservation on your livelihood?
5. Have you observed the problems of destruction on loss or decline of biodiversity / trees?
6. Have you got awareness or training in forest conservation from woreda and NGO experts? If you obtained, have conserved forests?
7. Do you sell firewood? If you sell it, why?

KEY INFORMANT INTERVIEWFOR DEVELOPMENT AGENTS

1. To what extent deferent trainings are provided to the rural people in relation to better fuel conserving alternatives in this area?

2. How do you evaluate the effectiveness of government institutional control for protection of forest resources?
3. Do you think the conservation of forest in the woreda have been effective?