Addis Ababa University

Studies on the attitudes of communities towards native trees propagation in Meta Robi Wereda, West Shoa Zone, Oromia Regional State

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Studies on the attitude of communities towards native trees propagation

Damtew Bekele

Addis Ababa University, 2018

Abstract

It is evident that we are living in a world whose natural balance is greatly affected by human activities .The present study was undertaken to examine the prevailing attitudes of communities towards native trees propagation. The research was conducted in Meta Robi Wereda, West Shoa Zone, Oromia Regional State. This research work was conducted to fill the research gap by identifying and providing the necessary information about the attitudes of communities towards native trees propagation practices. Primary data were obtained through the application of structured questionnaire, as well as through conducting discussions with key informants and focus groups. Secondary data were obtained from published papers in scientific journals, books, project reports, unpublished materials and maps. A total of 120 sample respondents were identified using simple random sampling technique from three Kebeles, namely, Falé, Katkato Jijiga and Haro Walkete. Data were coded and entered into SPSS (Statistical Package for Social Sciences), and were analyzed accordingly. The study found that populations of native trees are generally on the decline. The major reasons for the decline were charcoal production, use for firewood, and extremely high demand for furniture production. The majority of communities involved in the present study had positive attitudes towards propagation of native trees, provided that propagation materials and skills in propagation techniques are available. However, these attitudes were influenced by gender, educational level, farming size and occupational status. It was observed that low level of scientific awareness about the values of native trees for the development of keystone natural resources such as soils, water, and biodiversity constituted a major factor for the demise of native trees. Also, absence of native trees seedlings in local nurseries, as well as dearth of information on the propagation techniques of these presented formidable challenges to their cultivation. We recommend that the Government, as well as the local councils formulate clear strategies on the propagation and cultivation of native trees, which we consider are critical for the development of keystone natural resources and, consequently, food, water and energy security.

Key words/phrases: Allelopathy**,** exotic trees, keystone natural resources, vegetative propagation.

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Abbreviations and acronyms

CSA-Central Statistics Agency

EDHS- Ethiopian Demographic and Health Survey

EPA-Environmental Protection Agency

FAO- Food and Agricultural Organization

FGDs-Focus group discussions

KIIs-Key Informant Interviewees

MNRDEP- Ministry of Natural Resource Development and Environmental Protection

MOA- Ministry of Agriculture

NGOs- None Governmental Organization

SPSS- statically packages of social sciences

UNCED- United Nation Conference on Environment and Development

WRI- World Resource Institute

1. Introduction

1.1. Back ground of the study

It is evident that we are living in a world whose natural balance is greatly affected by human activities (Ayele Kuris, 2010; Legesse Negash, 2010).The increasing number of humans on planet Earth, combined with a high level of consumption, waste, and pollution of the natural resources is becoming extremely unsustainable (Batterbury, 2001). These phenomena have brought long-lasting and global disruption to the natural environment (Warner, 2001).

There are strong indications that human activities are mainly responsible for the increase in global temperature, disturbance of the natural balance such as climate change, water depletion, massive soil erosion, and biodiversity degradation (Haykal, 2010). Consequently, the deterioration of natural resources and the very existence of human beings which depend on them have become the crucial agenda of those who are deeply concerned about the rapidly disappearing natural resources (Legesse Negash, 2010). Tackling this problem requires a combination of approaches including improved management of natural resources, strengthening awareness about the usefulness of native trees propagation and restoring native forests using native trees species (Badege Bishaw, 2001; Byabashija, 2004; Legesse Negash, 2010).

Unfortunately, in developing countries most tree planting initiatives have promoted exotic trees species (e.g., *Eucalypt* species), by ignoring native tree species whose populations are more adapted to local environmental conditions (Esegu and Kidiya; 2004). Consequently, keystone natural resources such as water and soils, as well as the resulting biodiversity have kept declining for decades and centuries (Legesse Negash, 2010; Legesse Negash and Berhanu Kagnew, 2013).

Ethiopia is one of the Sub-Sahara countries endowed with conducive environmental conditions for developing good quality tropical forests. Unfortunately, population pressure (of both humans and animals), land misuse, underdevelopment, and deforestation have led to extraordinary land degradation, water scarcity, soils depletion, and biodiversity degradation (Legesse Negash, 2010 and the references there in). In today's Ethiopia, there are less medicinal, nitrogen-fixing and keystone plant species than there were, say, 100 years ago. There are, therefore, serious needs for domesticating, propagating and cultivating native

trees, shrubs, herbs, and grass across Ethiopia's degraded landscapes (Legesse Negash, 2010).

1.2. Statements of the problem

This study was undertaken to assess the current attitudes of communities towards native trees propagation at Meta Robi Wereda, West Shoa Zone, Oromia Regional State. The study area is found in one of the Oromia regions known for its rich diversity of native trees, shrubs, bushes, herbs, and grasses. Unfortunately, native flora degradation in the study area has remained a major issue in the communities.

In the past several decades, various research studies related to the disappearance of native vegetation have been undertaken (Legesse Negash, 2010 and the references there in). But knowledge on the conservation and development of native trees has not been effectively disseminated among the rural communities of the study area. In light of this, this research work was conducted by identifying and providing the necessary information about the attitude of communities towards native trees propagation practices.

1.3. Research questions

1. How do communities perceive the relevance of native trees for their livelihoods?
2. What are the attitudes of the selected communities towards native trees propagation?
3. Why did they develop the attitudes they hold towards their native trees propagation?
4. What are the factors that influence the communities' attitude towards native trees propagation?

2. Objectives of the research

2.1. General objective

The general objective of the study was to assess the current attitudes of communities towards native trees propagation at Meta Robi Wereda, West Shoa Zone, Oromia Regional State.

2.2. Specific objectives

The specific objectives of the present study were to: -

- Examine the attitudes of communities towards native trees propagation,
- Assess the extent of communities' awareness about the usefulness of propagating native trees,
- Evaluate the degree of knowledge on native trees propagation,
- Identify the source of information for the communities' towards native trees propagation.

3. Literature review

3.1. Definition and concepts of attitude

The concepts of attitude can be defined differently by various perspectives. One of the earliest definition Louis (1990) defined attitude as "the sum total of a man's inclination and feeling, prejudice or bias, preconceived notion, ideas, fears, threats and conviction about any specific topic.

As the study of Holl (1995), pointed out three points: First an attitude is a state of readiness leading the individual to perceive things and people around him in certain ways; that is to be more ready with certain categories and interpretation than with others. In their everyday lives people are often ready to deal with objects and people as they meet them without having to stop and think about every encounter. Secondly, attitudes are not innate, they are learned, and they develop are organized through experience. These states of readiness are relatively enduring but they are modifiable and subject to change. The third aspect of Allports definition follows from this and that attitudes are dynamic. Attitudes are not merely latent states of preparedness awaiting the presentation of an appropriate object for their activation. They have motivational qualities and can lead a person to seek (avoid) the objects about which by they are organized.

These are affect, cognition and conation (Rosenberg, 1956). Affect refers to "feelings or emotional response to the attitude object"; cognition represents the "beliefs or knowledge about the attitude object"; finally, conation corresponds to "predisposition to respond in some fashion toward the attitude object" (Albrecht *et al.,* 1981).

The tripartite classification of a person's mental events comes from a long tradition of about two hundred years. The field of social psychology is defined as "interdisciplinary lodged between the disciplines of psychology, which examines inner lives and selves, and sociology, which examines the relationships between collectivises and organizations. Social psychologists argue that it is essential to examine how self and system interpenetrate" (Cook *et al.,* 2005).The social-psychological framework (Fair, 2005) with affect, cognition, and conation constituting at first a holistic definition of attitude, to be eventually regarded as three distinct attitudinal entities.

3.2. Importance of native trees propagation

The global interest in planting trees holds significant promise for restoring degraded ecosystems, mitigate effects of environmental changes, conserving biodiversity, yielding

products and services that support local people's (WRI, 2006:a),the ability of forest ecosystem restoration to mitigate the impacts of numerous environmental problems, and to slow and eventually reverse their negative effects, is widely recognized in international agreements, including the united nations frame work convention on climate change, the convention on biological diversity.

In spite of serious concerns that restoration may become a new excuse for continued agribusiness exploitation and expanded industrial plantation of exotic trees species that are not likely to enhance biodiversity and ecosystem services or benefit local communities (Alexander *et al.,*2011), growing global interest in reforestation and restoration is accompanied by an increasing interest in using native trees (Aronson, 2011). An important concern native trees propagation to humankind not only economical, environmentally, and industrially but also mentally, historically, and attractively, for they sustain human life through direct and indirect gains by providing a wide range of products for survival and prosperity (has both economically and environmental benefits)(Alexander *et al.,* 2011).

The benefits of propagating native trees, shrubs, herbs and grasses across degraded landscapes include biodiversity development, improvement of water quality and quantity, as well as regeneration and stabilization of the soil. Landscape restoration through the development of native trees and biodiversity will have wonderful impacts on health (e.g. sustainable production of nutritious foods, provision of medicinal plants, and availability of fresh water) and economic growth (e.g. development of forest-based products and expansion of ecotourism) (Alemneh Dejene, 2003).

Ethiopia underutilized the huge potential native trees resource because most people carelessly destroy native trees and propagating exotic trees in their local area since it is open to access. Therefore, leaving large tracts of mountains, mountain slopes and the delicate watersheds unprotected. Consequently, massive soil erosion and soil nutrient depletion have occurred resulting in widespread deficiency diseases in crops, animals and humans (Legesse Negash, 2002).

Therefore, urgent need to restore native trees, shrubs, herbs and grasses through propagation. Clearly, just as these resources are essential for saving us from the weapons of desertification, critical for 'pumping' up macro- and micronutrients (Legesse Negash, 2010).

3.2.1. Economical benefits

Historically, native trees have been very important for the livelihoods of the people of Ethiopia. The poor obtained the bulk of their fodder, fuel wood and income from common property resources (FAO, 1998). Native trees income is an important complement to household income and plays an important role in households, livelihoods by improving food security and reducing vulnerability (Warner, 2001). Native trees serve as an important means of rural livelihood through providing inputs like fuel, medicinal and food products. Besides these they diversify the farm household economy for they are characterized by easy access, requires low skill, and capital to be misused (Campbell, 2002).

Therefore, the need native trees propagation is fulfilling human requirements such as lumber for construction, fodder, fuel wood, charcoal production, improving food security, reducing vulnerability, traditional medicines, and resource base for the sustainable economic and social development, providing a large variety of wood products (Warner, 2001). Also important in Ethiopian religious beliefs; the people believed in holy spirits in the forest that they treat in the same way as human beings (FAO, 2000).

Yet, Ethiopia's capacity and knowledge base in the context of native trees propagation, domestication, cultivation, and utilization has remained very rudimentary. It is only relatively recently that systematic studies on the propagation biology of some of the threatened native trees of this country have been pioneered (Legesse Negash, 2004). In contrast, native trees propagation has occupied a very central position in the international nursery systems and forestry industries, particularly in countries where timber and other value-added wood products form the pillar of the economy. Consequently, a staggering amount of effort, finance, and skills have been invested into woody plant propagation (Macdonald, 1986).

Figure 1: Timber imported by Ethiopia from Austria.

Source: Courtesy of Legesse Negash (2010).

3.2.2. Environmental roles

FAO (1999) noted the role of native trees 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. Therefore, most of our environmental problems can be solved to a great extent if we grow more native trees, in both urban and rural communities (Legesse Negash, 2010).

Figure 2: Environmental benefit of native trees in biodiversity conservation. This picture was taken in February 2018 from Fale kebele of Meta Robi Wereda.

Ethiopia has many well-adapted native trees (e.g. *Acacia abyssinica* Hochst. ex Benth, *Militia ferruginea* (Hochst.) Baker, *Cordia africana* Lam., *Ficus* spp. L.), nevertheless over 97% of this country's landmass is nearly devoid of trees. This hazardous condition is the result of continued deforestation, and the cheerlessly low level of culture, knowledge, and skills for trees propagation, domestication and cultivation. Given the current objective reality, awareness of native trees domestication and cultivation is critical to Ethiopia's environmental restoration, and indeed to its very survival. It is no longer adequate to stay on unsuccessful generalities and get intoxicated with powerless "advocacy" that often saps much of Ethiopia's energy and resources. What we now require is healthy academic framework reinforced with practical solutions for tackling the underhand environmental crises (Legesse Negash, 2010).

3.2.2.1. Natural purifiers of the Environment

Native trees, including shrubs and trees, act as biological filters by helping cleanse the environment. They are the best natural purifiers of environment pollution; i.e., they improve the quality of the air we breathe. First, they act as the oxygen banks on this planet i.e., green plants, which possess remarkable facilities for trapping and transforming electromagnetic radiation to chemical energy, as well as synthesizing a variety of secondary products and play an important role in maintaining the oxygen cycle, which is essential for the survival of all forms of life. Second, they may help reduce pollution. Leaves can absorb gaseous pollutants on their surfaces, especially if their surfaces are waxy, spiny or hairy. In addition, stems,

branches and twigs can intercept particulates. Third, they reduce oxides of carbon in the air, can also fix atmospheric nitrogen, disintegrate waste and act as sinks of pollution or pollutant scavenges by absorbing and metabolizing toxic gases and heavy metals (Chakraverty and Jain, 1984).

Therefore, native trees propagation helps mitigate the impacts of devastating climate manifested in Ethiopia through frequent droughts, increased likelihood of desertification, and intensified flooding. Although Ethiopia cannot be held responsible for the current global climate change, it has to play a constructive role in the sequestration of CO_2, the primary molecule that causes global warming (Legesse Negash, 2004).

3.2.2.2. Environmental screens

When properly grown in urban and rural areas, native trees act as wind barriers by decreasing the force of the wind and reducing the level of noise from highways and other sources. Even individual trees, if strategically planted around a house, can provide relief from noise and annoying lights at night. Trees thus reduce stress on human beings. Ecologically they act as wind breaks and shelter belts, thus providing protection against soil erosion and a defence against encroachment by seas, floods and deserts (Hayel, 2003).

3.2.2.3. The physical environment

Native trees help to reduce temperature by providing shade and by intercepting, absorbing and reflecting solar radiation, especially in warmer places, where there is year-round warmth and sunshine (Schubert, 1979). Trees also function as natural air conditioners by evaporating water from their leaves through the process of transpiration and improve the microclimate; i.e., they help control and stabilize the climate of the region and of the world as a whole. A single tree standing alone may not affect the overall surrounding much, but a belt or groups of trees or many trees scattered throughout the neighbourhood can be quite effective (Schubert, 1979).

The issue of water in Ethiopia has remained a question of survival. Even large cities are now finding it difficult to supply their growing inhabitants with sufficient amount of clean water simply because the watersheds around these cities are not properly forested with the right types of native trees. This situation should not be allowed to continue.

Ethiopia's watersheds (i.e., areas of land that catch rain and drain or seep into wetlands, streams, rivers, lakes or groundwater) must be rehabilitated with appropriate native trees known for their water conservation qualities.

3.2.2.4. Wildlife

Native Trees, both native and ornamental, harbour wildlife. They directly feed and house the majority of world's creatures and animals like insects, birds, small mammals and reptiles, which we need in order to live. Thus they play a major role as one of the important components of natural and human made biodiversity (Hayward, 2004).

3.3. Methods of native trees propagation

Native trees propagation is the process of creating new plant (sexual and/or asexual) from a variety of sources: seeds, cutting, other plant parts, and has three different aspects: knowledge on the chemical, physical, and environmental manipulations, as well as command of the needed technical skills, fundamentals of plant biology and physiology, and expertise on specific plant species (Hartmann *et al*., 1990).

Sexual propagation refers to the natural dispersal of plants. Seeds and spores can be used for reproduction (through e.g. sowing). Seeds are typically produced from sexual reproduction within a species, because genetic recombination has occurred. A plant grown from seeds may have different characteristics from its parents. Some species produce seeds that require special conditions to germinate, such as cold treatment. Some plant species, including many trees do not produce seeds until they reach maturity, which may take many years (Hartmann, 1990).

Therefore, many productive and important trees species cannot be used commercially in forestry because they are difficult to propagate. The main problems in producing planting stock of important native tree species in Ethiopia are: absence of seed grading and seed certification, lack of seed storage techniques and facilities, over exploitation of some of the very important useful tree species, thus short supply of seeds as some of them are now found in small patches only, and no major scientific work on seed viability, dormancy and germination have been conducted on the majority of native tree/shrub species (Legesse Negash, 2002).

Asexual propagation has a number of mechanisms for asexual or vegetative reproduction. Some of these have been taken advantage of by horticulturists and gardeners to multiply or clone plants rapidly. Humans may utilize these processes as propagation methods, such as tissue culture and grafting (Hartmann, 1990).

Native trees are produced using material from a single parent and as such there is no exchange of genetic material, therefore vegetative propagation methods almost always

produce plants that are identical to the parent. Vegetative reproduction uses plant parts such as roots, stems and leaves as planting materrials .. In some seeds can be produced without fertilization and the seeds contain only the genetic material of the parent plant. Therefore, propagation via asexual seeds or apomixes is asexual reproduction but not vegetative propagation (Hartmann, 1990).

3.4. Cause of native trees degradation

Degradation of native trees is typical symptoms of an unsatisfactory socio-economic and political situation in most developing countries. The majority of the proposals and concepts aimed at solving down or even reversing the general trend, tend only to treat symptoms and not to heal the disease as such (Militon, 1991). The debate about the causes of degradation and other environmental harms has been largely confined to macro analyses, it has failed "to benefit from the wealth of data generated at the micro level-data which provide rich information on the social and economic factors that mediate the relationship between population and the environment" (Arizpe *et al.,* 1994).

In Ethiopia, encroachment into native trees and protected areas including the marginal lands cause accelerated land degradation resulting in a self-propelling down ward vicious cycle of degradation of natural resources, leading to declining crop yields, leading to expansion of cultivated land again leading to further natural resources degradation and to further decline in crop yields, thus substantially contributing to rural poverty and famine vulnerability (Gedion, 2003). The native trees 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 Kagnew, 2013).

The forest ecosystems are complex and diverse containing various native and endemic plant genetic resources of the country (Ayele Kuris, 2010). Despite housing a large diversity of biological resources, biodiversity in Ethiopia is being negatively impacted by human activities. Assessments of this impact have indicated that native trees have become depleted at a large scale as a result of expansion of agriculture and settlement areas (EFAP, 1992). Ethiopian native trees also face frequent grazing problem, as FAO (2009) indicate with 35 million Tropical Livestock Units, equivalent to 80 million livestock heads, Ethiopia has one of the largest livestock population in Africa. It is estimated that over 80% of the livestock are found in the high land (with an estimated stocking rate of 160 TLU per km2), causing

widespread over grazing and degradation on both arable and grazing land. In the low land areas over grazing by livestock leads to soil compaction and damage to natural regenerations.

3.5. Factors affecting people's attitude towards native trees propagation

Native trees species have faced a great danger in the recent past due to high population growth, which exerted high pressure on woodland resources (Ondachi, 1999). For a long time, mankind has relied on nature to provide such as charcoal production, firewood, expansion of agriculture, and generate income to support their family during security of food without managing them or putting in any effort to propagate them. This, coupled with lack of awareness on the rapidly vanishing natural resources, and knowledge base in the context of woody plant propagation has led to loss of native trees in the natural woodlands and forests (Ondachi, 1999).

The present thesis looks at the extent situational factors explain communities' attitudes and influence the relationship between communities' attitudes and their native trees propagation. The situational variables examined in the present studies are respondents' demographic and socio-economic variables, direct contact with nature, ecological knowledge, social interactions, and perception of the regional governmental agencies. Different reasons drove the choice of these situational variables. On one hand, some were chosen because they have been commonly used in environmental social psychology research, thus represented useful means of comparisons, yet, have at times brought antagonist results, thus deserved more insight (e.g. socio demographic variables). On the other hand, others were chosen because they have been sparsely found in environmental social psychology studies and/or seldom tested on samples of farmers, yet, have shown promising results (e.g. direct contact with nature).In the rest of this chapter, the effects of these situational variables on communities' attitudes and behavior towards the natural environment are reviewed.

The purposes of native trees propagation are multi-dimensional out of which humanity sheltered biological, economic, ecological benefits and ensure his survival (Oslon, 2002). Attempts to link conservation and community development through natural resource management are emerging as important propagation strategies in Africa, and elsewhere around the world (Ghimire and Pimbert, 1997). However, the specific geographical, ecological, demographic, cultural, political and socioeconomic contexts in which propagation

strategies are implemented make it difficult to generalize the outcomes. Therefore, a detailed understanding of the interactions between propagation and communities is crucial for the successful implementation of propagation strategies.

3.5.1. Demographic factors

Sex: is one factor that significantly affects people's attitude, and practice towards trees propagation. Men have got the opportunity to command techno scientific component of the society that enabled them acquire scientific and technological knowledge to dominate nature and socialized un-ecological attitude towards environment. On the contrary women are denied of acquiring this knowledge because they have no access to the techno scientific knowledge. Despite this fact, they are socialized to ecological helpful roles of mother and nurture, as it is observed in their reproductive and child rearing activity in the community. So, for this view, men have more exploitive and negative view to the environment than women (Hayes, 2001)

3.5.2. Socio-economic factors

People's attitude and propagation towards native trees is also affected by socio economic factors like education, type of activity or industry, access to farm land, contact with nursery, and place of residence, access to media and income. At present accessible high native trees areas are exposed to various development project pressures including eucalypt and cash cropping, human resettlement, grazing and logging operations (MOA, 1991).

Education could be taken as an optimal measure of the socio economic status. As a result, it has strong correlation with economic status, access to information, resource and many other benefits. Educating women, raises women level of awareness on environmental issues and increases their role in the propagation activities.

For instance, universal primary education is given due emphasis in the Millennium Development Goals of United Nations implying that it is one of the development challenges of the developing countries. Once women are educated, because of their role in the household and the community, they could serve as propagation knowledge conveying agents to the rest of the communities. Studies indicate that women in the developing countries, as compared to men, have less access to education and resources. This fact has been confirmed in the EDHS 2005 that there is large disparity between the educational attainment level of men and women in Ethiopia. Education, therefore, will have a remarkable impact on women's relation with

the physical environment through affecting their social and economic status. Therefore, uneducated women failed to understand the link between propagation and development as compared to men and have also little understanding about linkages between rights to resources and cultivation responsibilities.

The type of activity or industry that an individual engaged has also impact on his/her knowledge and attitude towards the environment. For instance, in Ethiopia, according to the (2005) National Labor Force Survey, 75 percent of women and 84.3 percent of men are engaged in Agriculture, Hunting and Forestry related activities. Based on the type of individual's economic activity, it is expected that men who deal with the environment in larger proportion than women have better knowledge of the environment and attitude towards it (Temesgen, 2007).

Urban areas have better infrastructural development like education, health, media (television, newspaper etc.) than rural areas. People in urban areas have better access to make use of these opportunities and they could easily access different environmental research findings and become aware of issues concerning the environment. The study conducted in Costa Rica shows that urban lower class feels more strongly the effect of environmental degradation than the rural groups. There is also variation between the lower and upper classes in Costa Rica where lower classes have better knowledge than the upper classes (Holl, 1995). Despite this fact the Ethiopian Native Restoration Center Action Program identified large section of urban population in Ethiopia is an aware of environmental issues while the reverse is true for the rural people. According to the action program, rural people are against their environment not because they have no knowledge of the environment but it is their poverty that leaves them to over utilize the resource (MNRDEP, 1994).

The type of activities at the two places of residences also differs. In urban areas, non-agricultural activities are dominant while the reverse is true in the rural areas. So that it is obvious that their perception towards the environment vary accordingly. Out of the total population of the country, 80.2 percent are engaged in agriculture related which leads to destruction of native trees practice. Of these, only 13.0 percent are living in urban while 88.5 percent are living in rural areas. The employment to population ratio is also high in rural areas, which is about 82.0 percent and 50 percent in urban areas (CSA, 2005). As described earlier, the largest proportion the ratio in rural areas is engaged in agriculture and related activities and the reverse is true in urban areas. Therefore, rural people as compared to their urban counterpart, have close day to day interaction with their environment in order to sustain

their life. Moreover, they are expected to develop positive attitude towards the environment and acquire better knowledge of the environment. The environmental policy of Ethiopia has recognized and identified Environmental education and awareness as a key strategy to transform knowledge of environmental issues to the people (FAO, 2000). Demarcation and area enclosure without community participation resulted in failure as learned from experience. State demarcation and management planning of forest land which often encompassed farming communities was under taken with little or no participation of those communities. This coupled with the inability of the government forestry agency to effectively police all the protected natural forest with native trees land led forest to being increasingly encroached up and cleared and turned to farm land because this farm land was "illicitly" obtained. Farmer perceived that they had even less security of tenure on it and consequently had no desire to invest in soil conservation work (EPA, 1997).

3.5.3. Land tenure system

Land tenure is the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land. It can be defined how access is granted to rights to use, control, and transfer land, as well as associated responsibilities and restraints. In simple terms, land tenure systems determine who can use what resources for how long, and under what conditions. Land tenure is an important part of social, political and economic structures. It is multi-dimensional, bringing into play social, technical, economic, institutional, legal and political aspects that are often ignored but must be taken into account. Land tenure relationships may be well-defined and enforceable in a formal court of law or through customary structures in a community (FAO, 2000). Alternatively, they may be relatively poorly defined with ambiguities open to exploitation. The long duration of human settlement, land tenure system together with increasing demands of the growing human and animal population, exploitative land use practices including excessive degradation for expansion of cultivation, grazing, fuel wood and timber have resulted in reduced protective native tree cover (FAO, 2000).

3.5.4. Institutional factors

Institutions are commonly understood rules and norms that stipulate what actions are required, permitted, or forbidden in particular situations (Ostrom, 2000). The broadest definitions of institution include both formal institutions such as administrative structures, and also informal institutions such as customs and practices (Cortner *et al*., 1998).

Institutions are crucial determinants of societies' capacity to manage and govern natural resources (Ostrom, 2000). While environmental degradation is the result of aggregated individual decisions and choices, individual choices are responses to incentives and other forms of guidance from governments and other national institutions via laws, taxes, and even normative pronouncements. Militon (1991) indicate that the traditional tools of forest policy such as legislation, institutions, and forest policy alone unable to solve the problems as long as a number of political, education, economic, social and organization prerequisites do not exist in a country without changing the attitudes of communities towards native trees propagation. Without effective institutions to limit and regulate harvesting levels and management practices, natural resources such as native trees can be overharvested and even irreversibly destroyed, as is often the case in "open access" forests (Ostrom 2000). Local institutions can be taken to be those institutions that emerge in a particular situation or that are practiced or constituted by people who have had a degree of continuity of living in, and using resource of an area. Local institutions represent established local systems of authority and other phenomena derived from the Socio-cultural and historical processes of a given society (Watson, 2003).

3.5.5. Education and Research

Environmental Education is also learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and foster attitude, motivations, and commitments to make informed decisions and take responsible action. The basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and built environments resulting from the interaction of their biological, physical, social, economic, and cultural aspects, and acquire the knowledge, values, attitudes, and practical skills to participate in responsible and effective way in anticipating and solving environmental problems, and in the management of the quality of the environment (Haykal, 2010).

As indicated earlier the environmental policy of Ethiopia has recognized and identified environmental education and awareness as a key strategy to transform knowledge of environmental issues to the people (EPA, 1997). Education could be taken as an optimal measure of the socio economic status. As a result, it has strong correlation with economic status, access to information, resource and many other benefits. Educating women, raises

women level of awareness on environmental issues and increases their role in the native trees propagation. For instance, universal primary education is given due emphasis in the Millennium Development Goals of United Nations implying that it is one of the development challenges of the developing countries. Once women are educated, because of their role in the household and the community, they could serve as conservation knowledge conveying agents to the rest of the communities. Studies indicate that women in the developing countries, as compared to men, have less access to education and resources. This fact has been confirmed in the EDHS (2005) that there is large disparity between the educational attainment level of men and women in Ethiopia. Education, therefore, will have a remarkable impact on women's relation with the physical environment through affecting their social and economic status. So that uneducated women are highly likely to lack knowledge and resource to be invested on environmental conservation as compared to men. In the study of Flintan (2003) uneducated women failed to understand the link between conservation and development as compared to men and have also little understanding about linkages between rights to resources and conservation responsibilities.

Adequate natural resource education, research, and extension service are needed to meet the demand for and challenges of managing natural resources on a sustainable basis. Strengthening the country's education and research institutions to train qualified natural resource professionals with appropriate knowledge of native trees and agriculture in Ethiopia is required. Research in agro forestry in Ethiopia in general should emphasize the development of appropriate technologies to increase agricultural productivity and the reclamation of degraded highlands. Research in plantation native trees should also focus on production of fiber and other benefits while maintaining ecosystems (Badege Bishaw, 2001). Native trees propagation should be given adequate attention, and research should focus on improving the natural regeneration of the various species native trees. A multidisciplinary approach is needed for success in agro forestry and natural resource education, research, and extension. All professionals concerned with agriculture, forestry, and natural resources should come together and work toward developing strategies for sustainable agro forestry and natural resource management that will ensure food security for the rural poor and long term sustainability of the resource base upon which other development sectors depend (Badege Bishaw, 2001).

3.6. Conceptual framework

This Conceptual framework shows that the determinant attitude and native trees dependent rural households towards native trees propagation. The major dependent variable in this conceptual framework for this study is attitude and practice of the rural households towards native trees propagation. These dependent variables are affected by different demographic and socio-economic factors.

Sex, age, marital status and family size of the respondents are the demographic factors while, literacy status, occupation, land ownerships, access to media and education are socioeconomic variable which have strong relationship with knowledge/ attitude and practices in native trees propagation.

In the conceptual frame work, the arrow reveals the impact of the independent variables on the dependent variables. Each independent variable will have expected affecting the dependent variable positively or negatively. The figure below indicates the relationship between dependent variables and independent variables.

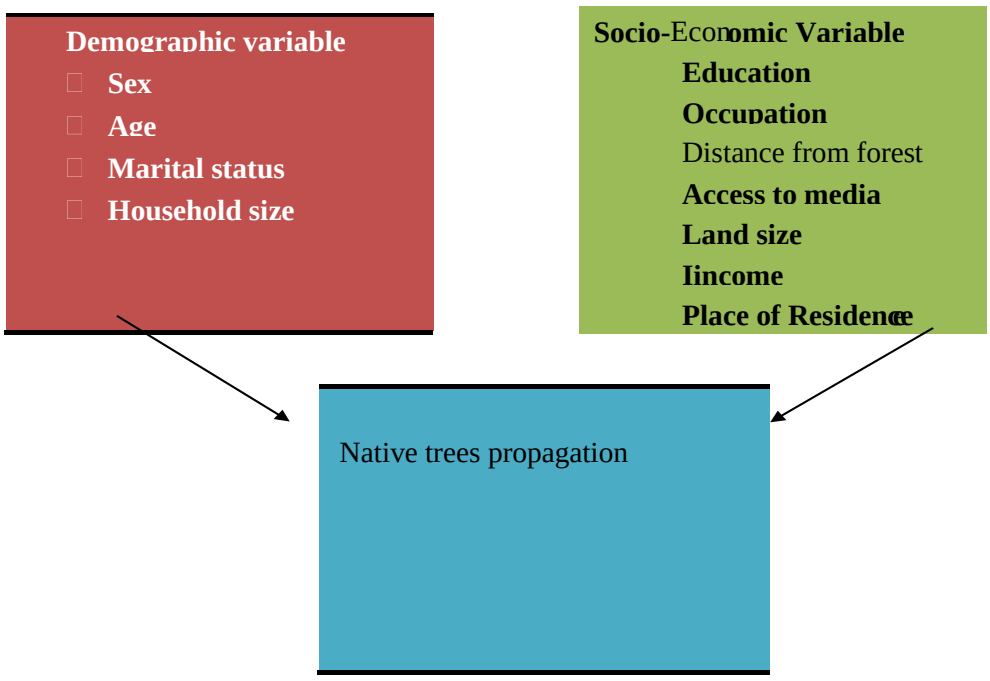


Figure 3: Conceptual frame work. The conceptual frame work that reveals the impact of the independent variables on the dependent variables while each independent variable will have expected affecting the dependent variable positively or negatively.

Source: Courtesy of Barr and Gilg (2007).

4. Materials and methods

4.1. Description of the study area

The study was conducted at Meta Robi Wereda of West Shoa Zone, Oromia Regional State, Ethiopia. The Wereda is located at 114 km west of the capital city of Ethiopia, Addis Ababa at $9^0$13" N to 9°42' 'N latitude and 38°8'' to $38^0$22'' E longitude (Figure 4). The Wereda covers a total area of about 45,104 ha and an elevation range of 1,200 to 2,900 m.a.s.l. This Meta Robi is comprised of 26 Kebeles with a total population of about 99,357 (males = 49,631 and females = 49,726) (Wereda Administration Office, 2016/2017). The rain fall pattern is bi-modal, with the little rainfall, called *Belg*, occurring from February to May, and the more extensive one, called *kiremt*, occurring from June to September. The soil is classified into two: types red soil (or nitosol) which covers 58.8%, and black cotton soil (or vertosol) which covers 41.2% of the study area. Economic activities are entirely dependent on seasonal rain fed agriculture with a subsistence mixed farming system, which produces both crop and livestock. Exotic trees propagation such as *Eucalyptus* and *Cupressus* spp. constitute the economic activities of the area.

Meta Robi Wereda was selected based on its past richness in various native trees, such as *Podocarpus falcatus (*Zigba*), Cordial africana (*Wanza*), Olea europaea L. subsp. cuspidata (*Woiera*), Hagenia abyssinica (*kosso*), Acacia spp (*Gharir*), Ficus sur (*shola*), and Ficus vista (*Warka*)* (Meta Robi Land and Environmental Protection, 2017). The Wereda was also chosen due to the fact that the current situation in native trees degradation is the major issue in the communities. Also, the present researcher's experiences show that the area is being extensively cultivated with exotic trees such as eucalypt trees.

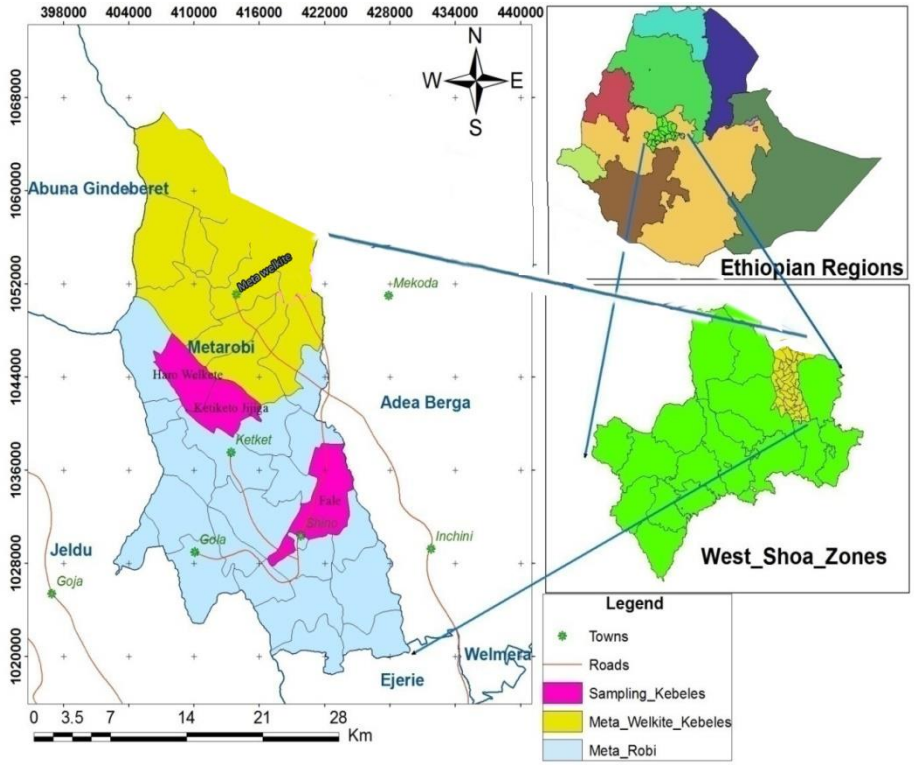


Figure 4: Map showing the study Wereda and adjacent areas. Meta Robi Wereda is found in West Shoa Zone, Oromia Regional State, Ethiopia, and is located at 114 km west of Addis Ababa.

4.2. Research design

The research design employed in this study was mixed research technique. The basic concept is that integration leads to maximizing the strengths of the quantitative and qualitative methods, and minimizing their weakness (Creswell, 2009). The approach also recognizes that every method has its limitations and that the different techniques can be complementary to one another. In relation to this, Ellis (2000) noted that qualitative techniques are useful for improving the depth of our understanding of the local circumstances, including how households operate and interact with their neighbors, while quantitative tools help us determine the breadth to which observed behavioral practices, resources or problems are distributed within a population.

In addition, the use of survey questionnaire for quantitative method, in-depth interview and focus group discussions representing the qualitative methods were employed.

4.3. Sampling techniques and selection of respondents

Multi-stage sampling techniques were used for the present study. In the first stage, Meta-Robi was selected purposively, based on the areas' past richness in various native trees, and also the fact that native trees degradation in the Wereda is the major issue in the communities from 22 Wereda of West Shoa Zone. Meta-Robi Wereda consist of 23 rural and 3 municipals Kebeles. Out of the 26 Kebeles in the study area, 3 of them (Falé, Katkato Jijiga and Haro Walkete) were purposively selected based on their intensive use, and exploitation of native trees products. Of the total of 172 households in the Kebeles, there are 60, 56, and 55 in Falé, Katkato Jijiga, and Haro Walkete. Sample size was determined by the formula given by Slovin's:

$$n=\frac{N}{1+Ne^2}$$

Where:- n=the sample size

N=the population size

e=the margin of error

Therefore, based on the above formula the sample size was calculated as:

$$n=\frac{N}{1+Ne^2}$$

$$n=172/1+172(0.0025)$$

n=172/1.43 (where the margin of error is 5%) n=120

From the three selected Kebeles, a total of 172 households were identified, and 120 were randomly selected through a lottery system based on their house identification numbers. The enumerators implemented the questionnaire survey via direct house-to-house visits. All questionnaire survey was achieved by considering various demographic and socio-economic (e.g., age, sex, income, family size, level of education) and cognitive (e.g., attitudes) variables (Kothari, 2016). Independent variables were derived from the following question, age, annual income, family size, level of education, sex, occupation, and dependent variables were derived from communities' attitudes towards growing native trees.

Table 1: Names of the three studied Kebeles and the corresponding Wereda and household sizes.

S/N	Selected Kebeles	Wereda	Household size	Determined sample size	Sampling technique
1	**Falé**	Meta Robi	60	42	Random Sampling
2	**Katkato Jijiga**		56	40	
3	**Haro Walkete**		55	38	
Total			172	120	

4.4. Methods of data collection

In the present study both primary and secondary data sources were used. The primary data were obtained from purposively selected Kebeles. The participants' households were randomly selected based on their similarity with respect to settlement location and economic activities. The primary data include interview, questionnaire, and focus group discussion.

The secondary data were obtained largely through the analysis of various documents relevant to the study. These documents were obtained from various sources including Agricultural Departments of the Oromia Regional State.

4.4.1. Instruments of data collection

The main instruments of data collection were questionnaires, interviews, and focus group discussions. These interviews were accompanied by personal observations which allowed the author to judge the reliability of the given answers by selected villages. The major data which were collected through questionnaires, interviews and focus group discussions were prepared in English language and were translated in to Afan Oromo because the majority of the respondents were Afan Oromo speakers.

Questionnaires: Are the most important means of data collection to gather information from 120 respondents. The questionnaire was prepared to collect data from the sample household heads through the use of open or closed format questions. Pre-testing of the questionnaire was done on eight non-sample respondents and necessary modifications were made on the questionnaire based on the pilot study. Based on the modification data which refers to attitudes of communities towards native propagation practice in the local area was added.

Key informant interviews (KIIs): Key informant interviews were employed to collect qualitative data by using purposive sampling. Accordingly, four Key formant interviews were made in three villages. The key informants were asked to express their personal experiences about the consequences of native trees degradation and their attitudes towards native trees propagation in Meta Robi Wereda. The Key informant interviews method was used for informants who live in three Kebeles at least for 8 years old and who are older than or equal to 35 years of age.

Focus Group Discussions (FGDs): FGDs where employed to collect data from members of farming communities living in the three Kebeles of Meta Robi Wereda by using purposive sampling techniques. Accordingly, the present author used a total of three FGDs (with 12 participants) each has administered in three villages of Meta Robi Wereda. Participants of the FGDs where included Household farmers , Chairperson, Manager ,DA workers of farming communities who have lived in three Kebeles at least for 8 years old and who are expected to be knowledgeable about the consequence of native trees degradation on farmer's livelihood and their attitudes towards native trees propagation in the communities. The discussion with each group took about 10 to 15 minutes.Various open-ended questions were presented to the group so as to allow them express their own perceptions and response regarding the research problem under investigation. This technique enabled the researcher to explore what farmers know or think about the research problem, and then to verify, confirm and add depth to the results of the household survey. A special attention was given to recruitment and training of enumerators based on pre-test results.

Table 2: Instruments of data collection, status of participants, number of participants and sampling techniques used for focus group discussion and interview questions.

S/N	Instruments of data collection	Status of participants	No of participants from three kebeles
1	**Focus Group Discussion**	-Household farmers	3
		-Chair person	3
		-Manager	3
		-DA workers	3
2	**Interview Questions**	-Household farmers (community elders from the sample)	4

4.5. Method of data analysis

The data collected were analyzed through use of both qualitative and quantitative techniques. Information generated from the key informants and focus group discussions were analyzed through descriptions and interpretations in words and texts under qualitative techniques. With respect to quantitative data analysis, both descriptive and inferential statistics was used to analyze the quantitative data. Statistical Package for Social Scientists (SPSS) version 20 and Microsoft excel was also used to analyze the quantitative data collected mainly through structured questionnaires in this study. Stepwise binary logistic regression analysis was also used to explain the influence of some selected variables expected to affect the dependent variables. These variables included demographic and socio-economic factors such as gender, age, education, occupation and farming size.

5. Results

5.1. Demographic and socio-economic characteristics of the respondents

The demographic and socio-economic characteristics of the respondents are presented in Table 3. The majority (65.8%) of the respondents were aged between 31-40 years. The average family size was above eight people per household (41.7%). The total respondents, 61.7% were male and about 75% were subsistence farmers. It was found out that 50% of the respondents cannot write or read. About 53.3% of the respondents had an average annual income <100,000 ETB.

Table 3: Socio-economic and demographic variables, as well as the corresponding frequency and percentage values of the respondents who participated in the present study.

Variable	Frequency	Percentage
Age		
<20	1	0.8
21-30	20	16.7
31-40	79	65.8
41-50	18	15.0
>51	2	1.7
Sex		
Male	74	61.7
Female	46	38.3
Educational background		
Don't write and read	60	50.0
Primary school	20	16.7
Secondary school	20	16.7
Diploma	11	9.2
>diploma	9	7.5
Occupation		
Trader	10	8.3
Service Worker	20	16.7
Farmer	90	75.0
Annual income (Birr)		
<100,000	64	53.3
101,000-200,000	40	33.3
201,000-300,000	10	8.3
>301,000	6	5.0
Family size		
<2	6	5.0
2-3	8	6.7
4-5	16	13.3
6-7	40	33.3
>8	50	41.7

5.2. Communities' awareness about the cause and the impact of native trees degradation

Respondents' awareness about long term native trees destruction is provided in Table 4. All the 120 respondents were asked whether the currently native trees resource degradation is manifested or not. Accordingly, majority (74.2%) of respondents realized that the native trees resource of the study area is exposed to high rate of degradation, 3.3% of the respondents have no opinions. But, 10.0% of them strongly disagree about the degradation of existing native trees while remaining respondents, 9.2% agree and 3.3% disagree respectively.

The main threats to native trees are tree cutting for charcoal production and firewood collection, reported by 51.7% respondents', and 25.8% associated the cause with lack of environmental education, 22.5% of the respondents mentioned population growth and expansion of farm land as the cause of native trees degradation. This was supported by the information obtained from the Key Informant Interviewees (KIIs) participants. The participants pointed out that:

"Before ten years one can get native trees' after walking a distance of few minutes. But now due to fuel wood collection and charcoal production the native trees are far apart from us".

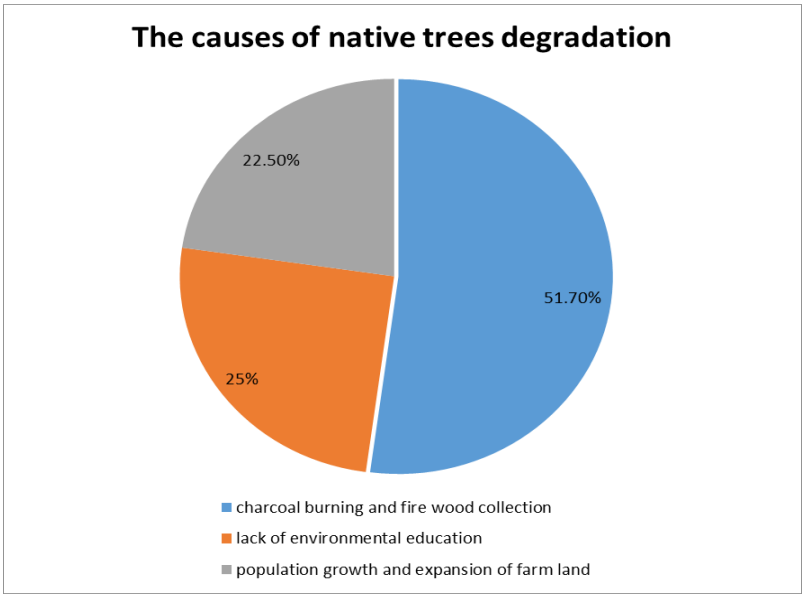


Figure 5: Percentage distribution of the respondents declared causes of native trees degradation.

The result of the Key Informant Interviewees (KIIs) revealed that the decline in native trees had resulted in severe environmental degradations and shortage of fuel wood and construction materials. These demands have led to the planting and growing practice of *Eucalyptus* species by the local people. *Eucalyptus* has adverse impacts on the environment, such as reduction in crop productivity and growth potential of grass when it is planted near farmlands, grasslands, and native trees, for example, due to the absorption of high amounts of nutrient and water through its massive root system, shading effects, and due to its allelopathy nature.

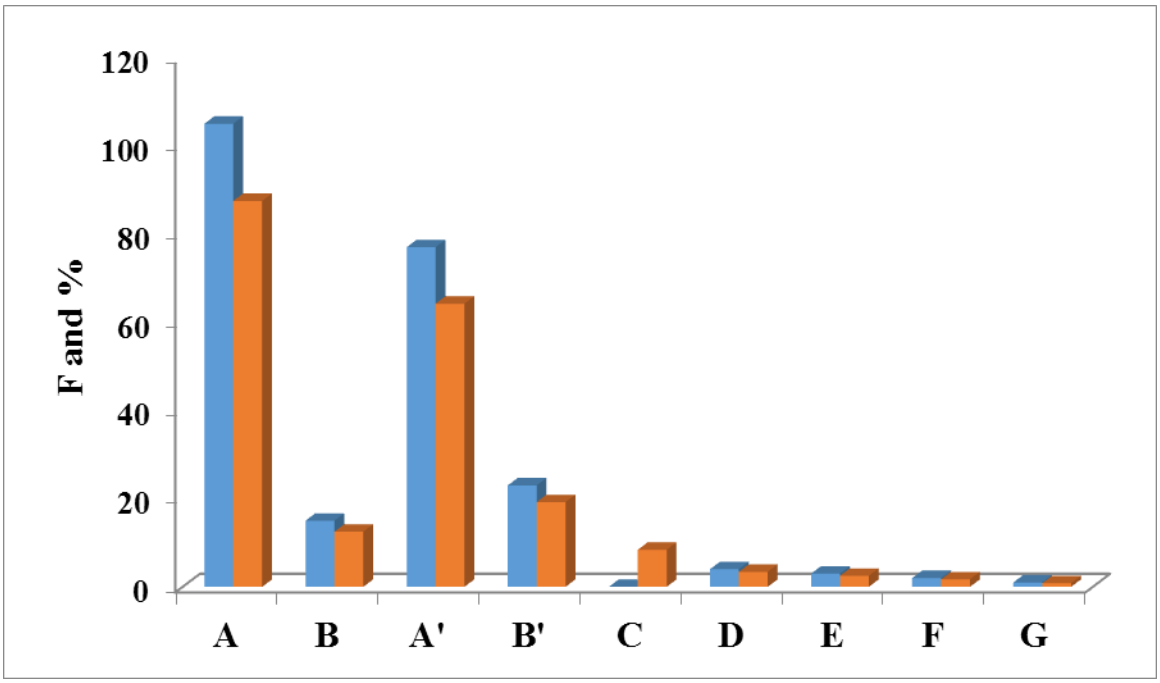
Also this section indicates respondents' perception about long term impact of native trees destruction. Accordingly, the majority of the respondents (50.8%) did not perceive the long term and short term impact of native trees destruction. It is only 30.0% of the respondents perceived the negative impact of the existing native trees destruction on the coming generation. The rest 19.2% perceived the current impact of native trees destruction (table 4). Generally doing not perceived the negative impact of the existing native trees destruction on the coming generation is not perceived.

Table 4: Respondents outlook about degradation and the impact of native trees degradation of the respondents

Questions asked	**Frequency**	**%of respondents**
Native trees in your localities are exposed to high rate of degradation.		
strongly agree	89	74.2
Agree	11	9.2
strongly disagree	12	10.0
Disagree	4	3.3
No opinion	4	3.3
If agree, how do you perceive the impacts of native trees degradation?		
currently	23	19.2
On coming generation	36	30.0
I do not know	61	50.8

5.3. Communities' attitudes and their reasoning towards native trees propagation

Generally there were positive feelings towards native trees propagation (Fig, 6). The majority (87.5%) of the respondents were willing to plant the native trees as long as planting materials are available. Most of them value native trees (64.2% of respondents') for charcoal and fire wood for sale, 19.2% of respondents' for timber construction and sales, modification of micro-climate, provide shade for crops, animal at home, domestic consumption and sales, Ornamental, poles for construction & building materials, some of respondents (0.8%) conservation soil with water.



Y-axis: **F (blue) and % (orange)** represent frequency and corresponding percentage values.

Figure 6: Familiarity of community members to attitudes and reasoning towards native trees propagation of the respondents. A, Yes, B, No ,A', Charcoal and fire wood for sales, B', Timber for construction and sales, C, Poles for construction and building materials, D, Sources of medicines, E, Providing shades for crops and animals, F, Domestic consumption and sales, G, Conservation of soils.

Findings from in depth interview held with Key Informant Interviewees (KIIs), volunteers purposely selected household individuals of the selected Kebeles indicates that native trees resource of the Wereda have get benefit in the form of income by selling fuel wood and charcoal. Some of them send their children to collect wood to sell and support the family, and some of the children generate income to support themselves while food shortage and other problems face the family. They also understand that their consumption of native trees product increased when they take part in the process of plantation and re-plantation activities.

Figure 7: Socio economic benefits of native trees in the form of income by selling fuel wood and charcoal Falé kebele in Meta Robi Wereda.

5.4. Communities knowledge on propagating native trees

Results provided in Table 5, revealed that communities generally do not manage native trees, only a small number (19.2% of the respondents) indicated they were carrying out some of management such as Fire control, weeding, pruning, pollarding, and termite control and 80.8% of the respondents do not do any management to native trees in local area. Knowledge on propagation was very low among the respondents and only 20.8% said they were practicing some form of artificial propagation transplanting, direct seeding/sowing on farm land, sowing on the nursery and cutting. It is clear 79.2% respondents revealed that the communities still regard native trees as wild and propagating naturally.

Table 5: Familiarity of community members to management, methods of propagation, types of management and propagation practices

Questions asked	Frequency	% of respondents
Do you carry out any form of management for native trees?		
Yes	23	19.2
No	97	80.8
If yes, what kinds of management are applied?		
Pruning	5	4.2
Weeding	49	40.8
Fire control	58	48.3
Termite control	4	3.3
Pollarding	4	3.3
Do you know any local method of propagating native trees?		
Yes	25	20.8
No	95	79.2
If yes, which methods?		
Transplanting	63	52.5
Direct seeding/sowing on farm land	33	27.5
Sowing on the nursery	21	17.5
Cutting	3	2.5

5.5. Sources of awareness towards native trees propagation

Table 6, indicates that 80.8% of the respondents have information about native trees propagation, 23% of the respondents replied that they do not have awareness about native trees propagation. Most of the respondents have awareness about native trees propagation from the total households' respondents 72.5% of them replied that they get from DAs, 16.7% from agricultural office and again 10.8% from community elders. The majority (52.5%) of the respondents replied strongly disagree responses that they get technical and material support from DAs and other experts to contribute more practice native trees propagation program in the local area. About 16.7% of the respondents are also strongly agreed and support the idea. The rest parts of the respondent's i.e. 10.8% and 8.3% replied agree and dis agree responses respectively. Only 3.3% remains with no opinion response.

The information that gathered from Key Informant Interviewees (KIIs) and Focus Group Discussions (FGDs) indicates that in order to live in a sustainable healthy and protected environment the community should be aware of the effect long term of native trees propagation on of environmental degradation in general. The communities are not satisfied by the messages from the Wereda and zonally agricultural offices because the experts from any institution called meeting with the local people annually or periodically to tell and discuss about the use of native trees resources. But technical and material support needs close follow-up to strengthen the skill and knowledge of the local people to protect the native trees from any degradation. They also replied that every year those development agent workers and other experts try many times to address information about native trees resources but their efforts remain without any fruit because propagation activity needs practical evidences.

Table 6: Percentage distribution sources of awareness towards native trees propagation of the respondents

Questions asked	Frequency	% of respondents
Do you have awareness concerning the effect of native trees propagation?		
Yes	97	80.8
No	23	19.2
If yes, where is the source of awareness?		
Development agents workers (DAs)	87	72.5
Wereda and Zone agricultural office	20	16.7
NGOs	-	-
Community elders	13	10.8
Experts of native trees propagation	-	-
Technical and material support from (DAs), and experts contributed more for current native trees propagation.		
Strongly agree	20	16.7
Agree	13	10.8
Strongly disagree	63	52.5
Disagree	10	8.3
No opinion	4	3.3

5.6. Attitudes on the actual and potential socio-economic and environmental benefits from native trees propagation

Communities are generally less knowledgeable with regard to role and value of native trees propagation, majority (47.5% of respondents') slightly knowledgeable and 19.2% not knowledgeable (Fig. 8).

The information that gathered from Key Informant Interviewees (KIIs) of the respondents noted that the decline in native trees had resulted in severe environmental degradations and shortage of fuel wood and construction materials. These demands have led to the planting and growing practice of Eucalyptus species by the local people.

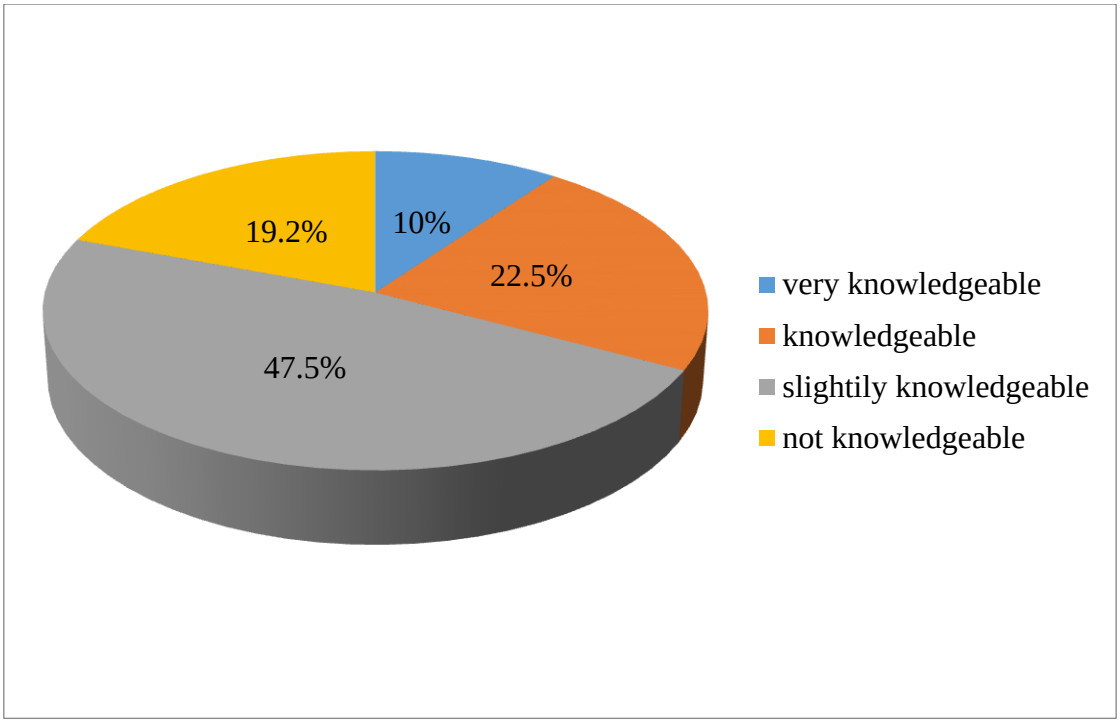


Figure 8: Respondent knowledge on the actual and potential socioeconomic and environmental benefit from native trees propagation

5.7. The demographic and socio-economic variables that influences communities' willingness to plant native trees

The binary logistic regression analysis of the relationship among the demographic and socio-economic variables and communities' willingness to plant native trees in local area (Table 7) indicates that gender, education, farm size, and occupation influences local area willingness to plant native trees.

Result of the model for attitude

Table7 presented predictors used to binary logistic regression analysis and categorical variable coding for attitude, Which contains the estimated coefficients and related statistics from the binary logistic regression model that predict the likelihood of an individual attitude towards propagation measures from the constant and the independent variables are presented. The coefficients, probability level and odds ratio indicate whether a particular variable is associated with attitude of propagation measure at statistically significant level. The odds ratios given in the last column of the table show change in the odds of having positive attitude of propagation versus negative attitude of propagation measure due to membership in

a particular sub group of a variable. The correlation can range from -1 and 1.If the value is greater than 1, the probability of having perfect positive correlation i.e.as one variable increases, so does the other. If the value is -1, indicates the probability of having perfect negative correlation i.e.as one variable increases, the other variable decreases. Our results revealed that age; family size, income, land ownership and marital status did not influence people's willingness to plant native trees while education, sex, occupation, and farming size did influences people's willingness to plant native trees in the community.

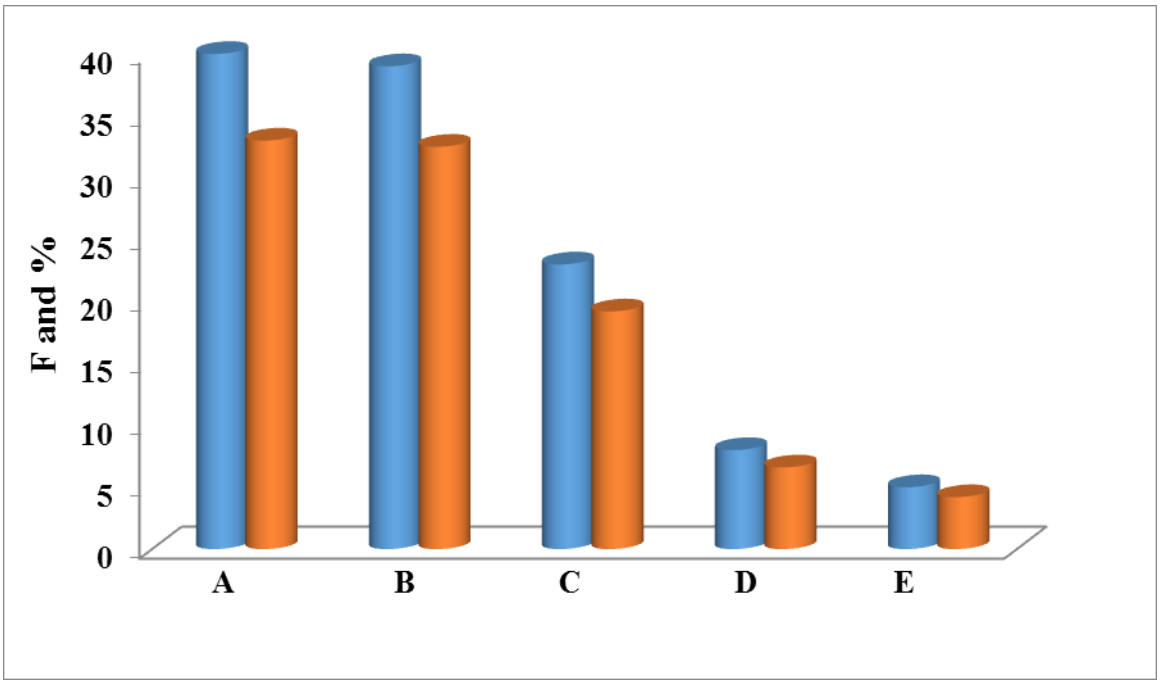
Table 7: Binary logistic regression analyzed of demographic and socio-economic variables that influences the communities' willingness to plant native trees

variables	Coefficient Correlation	S.F	Probability	R	Odd Ratio
Age	-0.73	0.19	0.64	-0.05	-0.13
Education	1.21	0.37	0.03	0.11	0.14
Family size	-0.97	0.16	0.40	-0.08	-0.01
Sex	0.83	0.25	0.01	0.18	0.16
Income	0.54	0.18	0.09	0.07	0.09
Land ownership	-0.88	0.40	0.82	-0.02	0.01
Marital status	-0.67	0.15	0.55	-0.04	-0.11
0ccupation	1.11	0.39	0.01	0.13	0.17
Farm size	1.17	0.44	0.04	0.16	0.19

5.8. Factors that determine communities' attitudes towards native trees propagation

The below figure 9 indicates that 33.0% of the respondents understand lack of seedling in local nurseries hinder the local community to support and participate in the native trees propagation. 32.5% of the respondents' dearth of information on propagation techniques, and (19.2%) of the respondents' unclear awareness about effect native trees propagation, the remaining 6.6%, 4.2%, of the respondents replied need to farm land, and shortage of grazing land as determining factors respectively.

The information that collected from Focus Group Discussions (FGDs) indicated native trees represent one of the important components of each and every terrestrial ecosystem and are a part of nature's precious gifts.



Y-axis: **F (blue) and %** (orange) represent frequency and the corresponding percentage values.

Figure 9: Familiarity of community members to factors that determines attitudes towards native trees propagation. A, Lack of seedlings in local nurseries, B, Dearth of information on propagation techniques, C, Unclear information about keystone natural resources, D, Need farmlands, E, Shortage of grazing lands

6. Discussion

The present study was a first attempt to examine attitudes of communities towards native trees propagation in Meta Robi Wereda. According to our results, 74.2% of the respondents said that the populations of native trees are declining in the study area. For example, Key Informant Interviewees (KIIs) of the respondents noted that the decline in native trees had resulted in severe environmental degradations and shortage of fuel wood and construction materials. These demands have led to the planting and growing practice of Eucalyptus species by the local people. However, biologists have increasingly become concerned about the expansion of eucalypt trees since it has numerous adverse impacts on the environment, including reductions in crop productivity, diminishing water resources, depletion of nutrients, allelopathic effects and aggressive completion with all forms of life, including microorganisms (Legesse Negash, 1990). A eucalypt stand has therefore been aptly epitomized as "Green on top, but Sahara beneath" (Legesse Negash, 2010).

In the recent study, Legesse Negash (2010) observed that, in Ethiopia native trees have rapidly been destroyed, leaving large tracts of mountains, mountain slopes and the fragile watersheds unprotected. Consequently, massive soil erosion and soil nutrient depletion have occurred resulting in widespread deficiency diseases in crops, animals and humans. Yet, result (50.8% of respondents) revealed that do not perceived the negative impacts of existing native trees degradation on the coming generation. Very unfortunately, this generation has inherited a highly destabilized highland system, with poverty and malnutrition widespread. The few remaining "natural" highlands are now under serious pressures by the growing population and an unwise exploitation (Vivero, 2003).

The analysis confirmed about 51.7% of the respondents said that the major driving forces behind the decline of native trees are cutting trees for charcoal production and fire collection. The widespread use of fuel wood and charcoal as energy has contributed to the native trees degradation process. About 95 per cent of the total energy consumption in Ethiopia is composed of traditional biomass fuels, with only 5 per cent coming from modern energy sources (UNCED, 1992). As a result the sizes of native trees are decreasing at alarming rate. The results revealed that communities generally do not manage native trees, only a small number (19.2% of the respondents) indicated they were carrying out some of management such as Fire control, weeding, pruning, pollarding, and termite control while 80.8% of the respondents do not do any management to native trees in local area. Knowledge

on propagation was very low among the respondents only 20.8%, said they were practicing some form of artificial propagation transplanting, direct seeding/sowing on farm land, sowing on the nursery and cutting .It is clear that the majority of communities still regard native trees as wild and propagating naturally. Yet, the communities are less knowledgeable with regard to role and value of native trees propagation, where 47.5% of respondents' slightly knowledgeable and 19.2% not knowledgeable respectively.

This supported by previous studies, Legesse Negash (2004), Ethiopia's capacity and knowledge base in the context of woody plant propagation, domestication, cultivation, and utilization has remained very elementary, particularly when it comes to native trees. This is, couple with a dearth of information on native trees that can be incorporated in the farming practices. There has been little effort to plant native trees, lack of awareness and unavailability to seedling, were said to be major constraints to planting native trees (Legesse Negash and Berhanu Kagnew, 2013). It is only relatively recently that systematic studies on the propagation biology of some of the threatened native trees of this country have been pioneered.

The result, Focus Group Discussions (FGDs) of the respondents described the several households in Meta Robi Wereda converted considerable parts of their agricultural lands to exotics species such as Eucalyptus species. A eucalyptus is an aggressive system "inimical to other forms of life", as one environmental scientist has put it. Eucalyptus depletes water supplies, depletes nutrient elements, produces toxins to neighbouring plants or plants growing under it, aggressively competes with other vegetation, and unsuitable as a home for our beautiful wildlife because its fruits and leaves are not palatable to the wildlife (Legesse Negash and Berhanu Kagnew,2013). Clearly, the various native trees species and the accompanying natural resources (including soils, water and biodiversity) are seriously endangered.

The results revealed that 80.8% of the respondents had information about native trees propagation, and 72.5% for households replied that they get from DAs. Yet, 52.5% of the respondents replied strongly disagree that they get technical and material support from DAs and other experts to contribute practice native trees propagation program in the local area. For example, Key Informant Interviewees (KIIs) of the respondents noted that in order to live in a sustainable healthy and protected environment the community should be aware of the long term effect of native trees propagation to prevent of environmental degradation in

general. The communities are not satisfied by the messages from the Wereda and zonal agricultural offices because the experts from any institution called meeting with the local people annually or periodically to tell and discuss about the degradation of native trees resources. But technical and material support needs close follow-up to strengthen the skill and knowledge of the local people to protect the native trees from any degradation. They also replied that every year those development agent workers try many times to address information about native trees resources but their efforts remain without any fruit because propagation activity needs practical evidences.

The results revealed that there were positive feelings towards native tree propagation. The majority (87.5% of the respondents) said that they are willing to plant native trees as long as planting materials are available. Most of them value native trees 64.2% of respondents' revealed that for charcoal and fire wood for sale, timber for construction and sales, modification of micro-climate, provide shade for crops, animal at home, domestic consumption and sales, Ornamental, poles for construction & building materials, some of respondents (0.8%) conservation soil with water.

However, propagation of native trees holds vast potential such as for halting biodiversity loss and promise for restoring degraded ecosystems, mitigating effects of environmental changes, and associated measures for restoration and rehabilitation of degraded ecosystems must be able to survive abiotic and biotic pressures, including social ones, in order to be self-sustaining and generate the products and services vital to supporting the world's population and environment for the years to come (Alexander et al., 2011).

The results revealed that 33.0% and 32.5% of the respondents respectively Peoples' willingness to plant native trees were influenced by lack of seedlings in local nurseries, dearth of information on propagation techniques, and poor propagation knowledge, limited knowledge by communities to plant and manage native trees, inadequate information about food values of native trees, lack of planting materials, slow growth.

As MNRDEP (1994) indicates the main problems and constraints of native trees propagation were: lack of the governments recognition of the seriousness of the situation and hence lack of genuine supports for forestry conservation and development program; lack of participatory approach in the planning and implementation of social propagating programs, and lack of appropriate technology and extension systems. The same is true for the local communities that inhabited in Meta Robi Wereda. Therefore, environmental education is the

main instruments in the processes of the application of native tree practices and developing knowledge about the environment in general.

The binary logistic regression analysis, the relationship among the demographic and socio-economic variables, and peoples' willingness to plant native trees in the community positive versus negative Gender significantly influenced local people's willingness to plant native trees in their community (Coefficient = 0.83, odd ratio = 0.16). Women are willing more than men to plant native trees in their gardens. The marginal change on the willingness to plant native trees as a result of gender is 0.16, indicating that the probability of planting native trees by female increases by 16%.Therefore,there should be an incentive to encourage women to invest their labour in native trees planting.

Education level positively influenced local people's perception to plant native trees. People with formal education are expected to be more willing to plant the trees than the uneducated people because they are better informed and conscious of ecological security (coefficient=1.21, odd ratio=0.14). The marginal effect of 0.14 of the willingness to plant native trees as a result of education implies that there is a 14% greater chance of planting trees if the respondent had formal education. For example, concerning their attitudes towards native trees propagation measures, information from Key Informant Interviewees (KIIs), indicates that variation observed among educated and uneducated populations. Information from question of key informant indicates that educated people showed positive attitudes towards native trees propagation and had knowledgeable that cause by native trees degradation.

In addition to the Key Informant Interviewees (KIIs), field observation during the study timed indicated that inhabitants who have primary and secondary education planted native trees on their plot and in the garden. Therefore, education is consistently associated with environmental concern. When we see through field observation the propagation practice of the community uneducated people were little propagation activities. In support of this finding Flintan (2003) recommended that uneducated people were observed to have low knowledge in establishing the link between conservation and development and have little understanding about the linkage between right to resource and conservation responsibility.

People whose occupation was farming were willing to plant the native trees than non-farmers (coefficient=1.11, odd ratio=0.17). The marginal change on the willingness to plant these native trees as a result of occupational status is 0.17 implying that if the respondent is a

farmer, the probability of planting native trees increases by 17%. Farmers usually attach values to trees and withstand high risks associated with planting and managing trees in their gardens.

Farm size positively influenced peoples' willingness to plant native trees (coefficient = 1.17, odd ratio= 0.19). The marginal change on the willingness to plant these native trees as a result of occupational status is 0.19 implying that if the respondent has larger farms, the probability of planting native trees increases by 19%.The larger the farms the more willing people are to plant native trees. Larger farms may have greater incomes and more cash reserves to sustain risks of crop failure and allocate resources to new inputs. Small farms are scarce in cash reserves and arable land.

7. Conclusion and Recommendation

7.1. Conclusion

The objective of present study was to assess on the attitudes of communities towards native trees propagation in Meta Robi Wereda. Meta Robi is one of the administrative Wereda West Shoa Zone, Oromia Regional State gifted with native trees past decades.The overall findings of the research showed that considerable proportion of the sample population indicated that the population of native trees is generally declining. The major reasons for the decline were charcoal production and firewood collection, as well as the commercial use of native trees for furniture production. The majority of communities involved in the present study had positive attitudes towards propagation of native trees, provided that propagation materials and skills in propagation are available. However, these attitudes were influenced by gender, educational level, farming size and occupation status. Low level of scientific awareness about the values of native trees for keystone natural resources and biodiversity development, absence of native tree seedlings in local nurseries, and dearth of information on propagation techniques were some of the major hindrances to cultivation of native trees. In contrast, the study revealed that most trees planting initiatives have promoted exotic species, ignoring native species.

7.2. Recommendations

Based on the finding of the study, the following recommendation points are forwarded to promote the attitude of communities' Wereda towards native trees propagation.

1. Creating awareness and promoting extension education to farmers and other stake holder about the selection of the best harvesting planting trees in sustain solution to environmental and development problems that consider broader social economic.
2. The local nurseries institutions and offices from national to local level should work hard to strengthen the coordination and cooperation among stake holders in the process of native trees propagation, which may solve the significant impacts of native trees destruction.
3. It should be advisable if adults and older people take part in the process of native trees propagation because adults and older people have experiences for a long period of time about native trees degradation and propagation practices.

4. Create income generation opportunities from trees nurseries and domestication of native trees for local people in the community.
5. The participation of NGOs is highly needed in the study area and local people association is important to attract NGOs.
6. There is a need especially by local governments and local councils to formulate clear strategies on conservation of native trees for example by establishing a community nursery and propagation center for native trees. Lastly, there is a need of further study to analyze the market environment for native trees compared with alternative possibilities such as exotic trees or agricultural crops.

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Appendix

A) Questionnaire to be filled by household respondents

Dear respondents, the purpose of these questionnaires is intended to collect relevant data to the study entitled, **Studies on the attitudes of communities towards native trees propagation in Meta Robi Wereda, West Shoa Zone, and Oromia Regional State.** Therefore, you are kindly requested to answer the questions with your frank assessment of the situation. Please, rest assured that your responses will not be used for any purposes other than for the current academic purpose.

Thank you!

Part I: General Information and personal data

Kebele: _____.

Age: Less than 20____, 21-30____, 31-40____, 41-50___, 51 and above____

Sex: Male_____, Female_____.

Educational background: No reading and writing____, Primary school (1-8) ____, Secondary school (9-12) ____diploma_____, above diploma_____.

Family size (per household): < 2 _____ 2-3 ____ 4-5 _____6-7_____>8, _____.

Annual income: < 100,000____, 101,000_200,000_____, 201,000_300,000_____, over301, 000____.

Occupation: ____, Trader_____, service worker____ Farmer_____,

Land owner_____, No land owner_____.

Part II: Please answer the following questions by circling the letter and jot down your response.

1. Native trees in your localities are exposed to high rate of degradation.

A. Strongly agree B. Agree C. Disagree D. strongly disagree E. No opinion

2. If agree with the above question, how do you perceive the impact of native trees degradation?

_____.

_____.

2. If agree question no.1, what is the main threats to native trees in your local area and the rest of the country?

_____.

_____.

3. Do you have awareness concerning the effect of native trees propagation?

A. Yes B. No

4. If yes, where is the source of awareness?

A. Development agent workers (DAs) B. Wereda and Zone agricultural office

C. NGOs D. Community elder's E. experts of native trees propagation

6. Knowledge of roles and values of Native trees propagation.

A. Very knowledgeable. B. Knowledgeable. C. Slightly knowledgeable.

D. Not knowledgeable

7. Would you grow native trees, if planting were available?

A. yes B. No

8 If yes, why would you grow them?

A. Domestic consumption and sale. B. Provide shade for crops, animal at home

C. Charcoal and Fire wood for sale. D. Source of local medicines.

E. Timber for construction and sale. F. Modification of micro-climate.

G. Poles for construction and Building materials. H. Ornamental.

I. Conservation soil and water.

9. Do you carry out any form of management for native trees?

A. Yes B. No

10. If yes, what kinds of management carry out?

A. Fire control B. Weeding C. Pruning. D. Termite controls E. Pollarding.

11. Do you know any local methods of propagation native trees?

A. Yes B. No.

12. If yes, which methods?

A. Transplanting. B. Direct seeding/sowing on the farm.

C. Sowing on the nursery D. Cutting.

13. What constraints hinder you from native trees propagation on your local area?

A. unclear information about their food values B. lack of seedlings in local nurseries

C. dearth of information on propagation techniques D. Source of income from native trees

E. Shortage of grazing land F. The need to farm land G, All

14. How would you like such problems to be overcome?

A. Provide planting material B. Inform communities with information on planting seasons

C. Educate communities on the values of native trees propagation

D. Provide security to the area

E. Assure local people of the markets of native trees seedling

F. Give money to local people to buy seedlings

G. Provide demonstration nursery to communities.

15. Do you have additional suggestion about the native trees propagation?

_____

_____.

B). Questions for Focus Group Discussion

Dear respondents, the purpose of these questions is intended to collect relevant data to the study entitled, **Studies on the attitudes of communities towards native trees propagation in Meta Robi Wereda, West Shoa Zone, and Oromia Regional State.** Therefore, you are kindly requested to answer the questions with your frank assessment of the situation. Please, rest assured that your responses will not be used for any purposes other than for the current academic purpose.

Thank you!

1. What is the attitude of the communities about the native trees propagation practices in your kebele?
2. What is the serious native trees related problem in your local area you have observed?
3. What are the benefits that you get from the native trees propagation?
4. Do you think the community is involving in native trees propagation practices?
5. What is the contribution of the kebele administration in native trees propagation?

C) Interview Questions for Key Informants

Dear respondents, the purpose of these questions is intended to collect relevant data to the study entitled, **Studies on the attitudes of communities towards native trees propagation in Meta Robi Wereda, West Shoa Zone, and Oromia Regional State.** Therefore, you are kindly requested to answer the questions with your frank assessment of the situation. Please, rest assured that your responses will not be used for any purposes other than for the current academic purpose.

Thank you!

1. What do you think about the importance of native trees propagation?
2. How have native trees population changed through time?
3. What is the level of the awareness of people about the propagation practices of native trees?
4. What are the factors that determine your attitude to take part in the propagation of the Surrounding native trees?