

CHAPTER ONE

INTRODUCTION

1.1. Background:

Global policy interest in forest ecosystem services has increased due to their role in mitigating climate change and providing services that are important to rural livelihoods in developing countries (Wunder, 2001 and Sunderlin *et al.*, 2005). In developing countries forest products are an integral component of the livelihoods of the majority of rural households. Forests provide multipurpose benefits such as timber, fuel wood and non timber forest products NWFPs. NWFPs are usually overlooked commodities, even though they are important products at both local and national levels (Hamid, 1998).

The contribution of NWFPs in the livelihood of rural and urban communities has been underlined. They are particularly important to rural communities in terms of food and nutritional requirement, medicines fodder, for livestock and related domestic supplies. The role of forests in the provision of wide range of NWFPs and services has been emphasized. Gum arabic is an important commodity from the woodlands in the drylands of west and eastern Africa.

Medicinal plants are other important NWFPs obtained from forests and woodlands. Forests are also important in beekeeping in providing nectar and pollen for honey and beeswax production; at the same time bees are important pollinators for some species. Agricultural crops production and Eco-tourism often depends on forestry resources (FAO, 1995).

There are about 100 species which have been reported to produce non woody products (Badi, 1993). They differ from honey bee keeping, fiber, food, fodder, medicinal materials, dyes to tannins. Forests also provide many environmental services, such as the stabilization of sand dunes in the semi-desert region, improvement of soil fertility, provision of habitats for wildlife and conservation of biodiversity. The most known and important Sudanese non wood forest products are gum Arabic obtained mainly from *Acacia senegal* (Hashab), *Acacia seyal* and

frankincense resin obtained from *Boswellia papyrifera*. The important fodder trees, which are browsed as well as lopped, are *Hyphoene thebaica*, *Ziziphus spin-christi* and *Balanites aegyptiaca*. *Acacia senegal* and *Acacia seyal* are not only important fodder trees for the nomads, but also as sources of gum arabic. Essential medicinal plants include *Acacia nilotica*, *Adansonia digitata*, *Senna alexandrina*, *Grewia mollis* and *Tamarindus indica* (Eltohami, 1995).

The rural population of Sudan, as well as much of its urban population, depends on forests. Trees are the main source of energy and provide timber for roofing and building. In rural Sudan, the extensive benefits derived from forests include grazing, hunting, shade, forest foods in the form of tree leaves, wild fruits, nuts, tubers and herbs, tree bark; for medicinal purposes, and non-wood products such as honey and gum Arabic. In addition, the commercial lumber industry is a small but growing source of employment. (FNC, 1988).

The livelihood of the majority of rural people in the dry land Africa depends on the forest and wood lands as a prime sources of agricultural land, fuel wood (fire wood and charcoal) , as well as for non-timber forest products (NTFPs) such as fruits , fibers and medicine (Barrow *et al.* 2002, Campbell 1986, Falconer 1990 , FAO 1983 , Packham 1993) Africa has abundant wild plants and cultivated native species with great agronomic and commercial potential as food crops , but many of these species ,particularly the fruits and nuts , have not been promoted or researched and therefore remain under – utilized (Gebauer *et al.* 2002 a) . Moreover, many of these species face the danger of loss due to increasing human impact on ecosystems in concurrence with changing climatic conditions. According to several reports (FAO 1998)Africa has been faced with serious problems of not being able to feed its population or supply it with fuel wood . Frequent crop failure in arid and semi-arid areas often resulted in the poor nutrition of local people (Maxwell 1991,Waterlow *et al.* 1998). For this reason it is imperative to find other sources for getting food for the growing population. In sub-Saharan Africa , forest goods and services

are extremely important for rural livelihoods , providing food , medicine , shelter , fuel and cash income (Kaimowitz , 2003) .

It is estimated that more than 15 million people in sub-Saharan Africa earn their cash income from forest - related enterprises such as fuel wood and charcoal sales, small – scale saw-milling ,commercial hunting and handicraft, In addition , between 200,000 and 300,000 people are directly employed in the commercial timber industry (OKsanen and Mers mann , 2003). For some countries, the forestry sector is an important foreign exchange earner. For example, between 1993 and 2002 , the value of net exports of various wood -based products from countries in sub-Saharan Africa amounted to more than us\$2 billion (FAO , 2003) . However, the national statistics on the contribution of forest products to the countries' economies are extremely poor (Mabugu and chitiga 2002; FAO,2004; Vincent, 1998) and only in a few countries are there comprehensive government programs of environmental accounting where forestry contributions to the national accounts are captured, e .g . South Africa (FAO,2004;World Bank ,2006) .

1.2. Problem Statement:

Forest is one of the renewable natural resources in Sudan, that could contribute significantly to community development and poverty alleviation specially in rural area .Despite Blue Nile state being a large state that covering with natural forest, a large proportion of population lives in poverty. Moreover, rural people have been or continue to be affected by the conflict and civil war that broken in the last two years. This mainly associated with low crop production, inadequate access to market, poor institutions and inadequate access to land resources.

Eldisa forest play major role in livelihoods for rural people in Eldamzine locality. Beside these, contribute meeting the basic needs for other people that face the Impact of the effect of climate change, such as water scarcity on their livelihood. These characteristic are unknown for policymaker and mangers in forestry sector, in order to consider the role of forest in sustainable livelihoods and poverty alleviation of rural communities through link forest management with

landuses in particular a agriculture and grazing, mixed system of crops and trees growing and utilization of this forest in sustainable manner.

1.3. Objectives:

1.3.1. General Objective:

To assess the role of forests in Improving the Livelihoods and poverty alleviation of local communities in Blue Nile State.

1.3.2. Specific objectives:

1. To assess the direct and indirect Contributions of Elaisa forest Resources in improvement the Livelihoods of local communities.
2. To investigate the main activities that practices by local communities which link with forest utilization.
3. To investigate the attitudes and perception of rural communities towards their participation in management and protection of Eldisa forest.
4. To drown recommendations for decision- maker in order to a dope strategy to sustain the unitization and management of forest with livelihoods of rural communities.

1.4. Research questions:

Some questions are formulated according to the objectives of study, which are:

1. How the forest products contribute to Improve and sustain the livelihoods of rural communities?
2. What is current status of Edisa forest in the study area?
3. Is there many rural communities depend on forest products in improving their Livelihoods?
4. What are the main factors that affect the use of forest by rural people?

CHAPTER TWO

LITERATURE REVIEW

2.1. Forests Resources in Sudan

Sudan forest area had been declined from 21.83 million hectares to 18.74 million hectares in 2012 (about 9.97% of Sudan area) .the annual removal rate declined from 207.86 thousands hectares to 174 thousand hectares during the period (2011 – 2015). The total of the reserved forest area in Sudan is 12.6 million hectares (6%) of Sudan area. About 22.5% of Sudan area that targeted to be reserved according to forest policy , for this condition it had been necessary to planting forest cover reach to the targeted percentage (20% of Sudan area)according to the current policy (about 37.8 million hectares). (FNC. 2014)

Sudan is one of the first countries in Africa and the Near East, which had an organized forest administration. The Wood and Forest Department established in 1901, now Forest National Corporation (FNC), shoulders the responsibility of forests management in the country .

Until the mid-1980s forestry programs concentrated on a forestation, reforestation and reservation of existing forest resources. As well, the forestry department used to organize some awareness campaigns from time to time through its information and public relation section (Suleiman, 1995)

The first phase in the development of Northern Sudan's forest policy culminated in the Forest Sector Review (FSR) in 1986 - the equivalent of a national forest programs. Often noted as a 6-year project, the FSR focused on strengthening central and regional public institutions, introducing incentives to engage the private sector in the conservation of wood energy and wood fuels. Resource constraints during the eighties resulted in the prioritization of activities, which involved less capital and yielded maximum benefits in the short-term. Later interventions concentrated on longer-term development. Using the FSR as a basis for national policy development, the. Minister of Agriculture and Natural Resources approved the Statement of

Forest Policy in 1986. In accordance with this statement and because of the need to restructure the forestry administration to carry out new responsibilities, the government passed the Forests Act in 1989, the same year it established *The Forests National Corporation (FNC)* _ a service-oriented parastatal body which reports to the Minister of Agriculture and Forestry. The Act provides for private forest ownership, community ownership, and forest reserves to be managed by institutions, in addition to national and regional reserves. All forest reserves are under the technical supervision of the FNC (F AO, 2006)

The 1986 forest policy: emphasized the following issues concerning community forestry :

- Recognized and encouraged the establishment of community, private and institutional forests .
- Stressed the role of people participation in forest plantation, management and protection stressed the role of forestry extension .
- Conceptualized the multiple uses of forests .

Meanwhile, in the Comprehensive National Strategy 1992-2002, the following paragraphs highlighted the community forestry objectives :

1. Awareness raising, environmental education and guidance in all educational and social institutions, starting by an intensive information campaigns aiming at environmental rehabilitation .
2. Encouraging the local population to participate in the preparation of projects and their execution .

1. Realization of agriculture and forest integration through introduction of trees in the agricultural rotation by 5% in irrigated schemes and 10% in rain-fed. This issue was also stressed by the 1989 Forest Law (Amended in 2000) and by ministerial tips and regulations (Abdelmagid, 1997)

Suleiman (1992) advocated that, it is apparent that the traditional approaches used to work with rural people in the management of forest and tree resources need to be strengthened and further developed, to one's which involves active participation of local people, rather than territorial

and policing function for the forest service. Now, there is an increasing realization of the need to involve villagers in forest resource management, hence an extension section has been established .

The people of Sudan must become involved in forest protection and a forestation activities if the destructive process of deforestation is to be reversed. Farmers in the mechanized rain-fed areas should be at the heart of the process, as they are the major cause of deforestation in Sudan (Elmahdi and Mahony, 1990). However, people's participation in forestry activities in Sudan was practiced earlier by allowing people to grow food and cash crops between the rows of trees; this activity was known as "Taungya System"

In 2002, the Forests and Renewable Natural Resources Act replaced the forestry laws of 1989, providing a framework for the management and protection of forests and renewable natural resources, including pastures, rangelands and aspects of agricultural land Use. It also serves as the basis for governing the forest sector as a whole. The Act calls for the creation of the National Forests and Renewable Natural Resources Corporation to manage natural resources, other than wildlife and water. However, it has not yet been established. In the interim, the FNC is performing the functions stipulated in the legislation, including the management of federal forest reserves. States manage state reserves, in accordance with FNC policies and technical plans .

Nonetheless, deforestation process in Sudan was aggravated by lack of coordination between land using institutions. For example, in El Gedarif area where there are many institutions involved in natural resources management; lack of clear environmental. Policy, lack of land use planning, lack of coordination and fragmented projects with little concerns for environmental protection resulted in the spread of mechanized rain-fed farming. Consequently, local people were pushed out of their traditional areas to fragile marginal lands that were incapable of adequately supporting their traditional way of life. The present situation indicates that most of the expansion was at the expense of forest and grazing areas (Atta Elmolla, 1995). Likewise, weak capacity and lack of resources, among other difficulties, have hindered enforcement of

both the 1989 and 2002 Acts. Forestry offences registered with the police versus those still pending investigation are indicative of the problem, as is the low number of cases brought to trial (FNC, 2006). The reservation policy adopted by government to manage the resource for the benefit of the whole nations was no longer effective and the management system was described by the local people as fragmented management without coordination with local people and intended to achieve sect oral interests without considering local needs, while extension was completely absent (Kobbail, 2005).

2.2. Livelihood Assets: the five categories of capital

According to the (FAO (2006), development workers draw on five categories t of assets to explore the various dimensions of well-being and the means for achieving it, these are:

1. Natural capital: Access to land and to resources such as trees or animals allows people to invest in productive processes. Poor people living in or near forests often lack formal rights to access, manage and use the resources. In many instances, they rely on forests for subsistence because they not only lack secure tenure, but also lack the technology and market information that would enable them to add value to products through processing, thereby increasing their chances to move out of poverty

2. Social capital: Relations among people are shaped by histories of interactions that regulate further interaction. Reaching agreements on collective forest management and enforcing the terms require strong social capital. If the State or outside businesses are involved, local people also need good links with external and more powerful interest groups. For many people living in and around forests, the critical deficit related to social capital is the uncertainty surrounding rights over resources .

3. Human capital: Forestry affects human capital to the extent that rural people's health is often linked to forest products used for nutrition and medicine. Moreover, sustainable forest management as well as enterprise development requires skills and knowledge, which are in short supply when access to education and information is weak or nonexistent .

4. **Financial capital:** People need money to make long-term investments in forests, tree crops and equipment, but access to financing is often problematic for those who live in rural and remote areas. Where there are clear rights over forests and trees, these resources can serve as collateral for enterprise development.

5. **Physical (built) capital:** Buildings, roads and tools provide the security, mobility and capability that allow people to produce, transform, exchange and consumer goods. Although people living in remote forested areas have easy access to fuel wood and medicinal plants as well as timber for construction, they often do not have access to markets because roads and transport facilities are lacking .

2.3. Forests and rural people

Forests play an important role in the lives of many poor people. Millions of rural people live in or near forests in tropical and savannas areas and rely on forests for fuel, food, and income or chopping them down for crops and pasture . In addition to providing food, shelter, clothing and heating, a significant number of people living near forests depend on trees outside forests to generate income through employment and through the sale of remaining goods and services. However, the extent to which these resources can alleviate poverty and improve food security for vulnerable populations is not well documented or unclear to most policy-makers (FA O, 1989). Even less is known about ways to capitalize on the untapped potential of forestry to lift people out of poverty or at least mitigate its effects .The importance of forests to rural people in developing countries is three folded: Forest trees provide fuel and other goods essential to meeting basic needs at the rural household and community level. Forest and forestland provide food and the environmental stability necessary for continued food production. Finally, forests and forest products generate income and employment in rural community (FAO, 1987)

According to the (World Bank (2001) more than 25 percent of the world's population relies on forest resources for their livelihoods, and of these almost 1.2 billion live in extreme poverty. These people lack the necessities to maintain a decent standard of living: sufficient and nutritious food, adequate shelter, access to health services, energy sources, safe drinking water,

education and a healthy environment . In the Sudan, forests play a vital role in the economy and welfare of the Sudanese people. The main domestic energy Sources in Sudan are wood, charcoal and other biomass material; they constitute 85% of the total energy requirement (Ibrahim, 2000)

2.4. Wood Forest Products

Forests, particularly those established by man, have traditionally been seen as a Source of wood. There are many direct and indirect economic benefits associated with the production of wood. These include direct financial benefit to individuals from the sale of timber and to the wider community through various flow-on effects. Up stream flow-on benefits include those to the nursery and forest supplies sectors, and employment in planting and tending. Downstream benefits include the development of harvesting and processing industries, tourism and tertiary processing industries such as furniture manufacturing and wood- and fiber-based industries. The final use of timber products from forest can vary greatly depending on regional economic and social factors. -for example in developing countries fuel wood and charcoal are major uses of timber. In contrast in developed countries, timber is used primarily for wood-based products such as paper, lumber or composite wood products depending on a range of factors such as species, availability of markets, prices and cost of transport. Often, and particularly for industrial-scale forests, timber production has been viewed as the prime use and all other uses considered subsidiary (Harrison *et al*, 2000)

2.5. Fuel wood

(FA O (2004) defines wood fuel as all types of bio-fuels from trees and shrubs grown in forest and non-forest lands including farms. The term includes fuel wood and charcoal derived from silvicultural activities such as thinning, pruning and harvesting - tops, roots and branches. It further includes industrial by-products from primary and secondary forest industries; and recovered wood such as construction materials and pallets that are used as fuel. The definition also encompasses wood fuels from forest energy plantations .

Fuel wood is of particular importance to sustain livelihoods for rural and urban communities. Volumes of domestic trade in fuel wood are increasing rapidly with the expansion of urban centers. According to FAO in 2004, fuel wood accounts 7 to 9 percent of global energy consumption, 80 percent of wood harvested in developing countries is consumed as fuel (Mersmann, 2004). For millions of rural people, the gradual disappearance of fuel wood means that it is becoming increasingly difficult to cook and keep warm. In parts of West Africa which suffer a serious shortage of firewood, people had to change from having two cooked meals a day to only one. In the upland of Nepal, farmers grow only vegetables, which can be eaten raw. In these and many other communities the lack of wood is already change the traditional way of life (FAO, 1985 and FAO, 1987)

2.6. Wood industries:

The Forest Products Consumption Survey in the Sudan (FNC, 1995) reflected that the industrial 'sector in 1994 used only 6.8% of the total wood consumption. Its consumption was 1.07 million m³ round wood. Brick kilns were the highest consumers, consuming about 51.5% of the total wood. The furniture industry consumes a small Proportion (1.5%) of the total wood Supply equivalent to Household per capita of 0.009m³ Saw milling industry consumes not more than 1 % of the total wood produced in the country (FOSA, 2001). There are no other industrial uses of Wood not even the simple ones like; the manufacturing of match sticks, pencils or Wood-based boards. Moreover, there are no chemical industries depending on wood or NTFPs. Most of the sawn softwood and all wood-based panels currently consumed in the Sudan are imported. Local and global changes are expected during the next two decades to influence the future of forestry development, forest utilization and the type of forest products. This will be generating the establishment of forest -based industry and will give an opportunity to engage local labor in the growing and delivering of raw material. Hence, development of sound forest industries in response to the expected increasing demand can be an engine for further economic growth in the country (FOSA, 2001)

2.7. Non-Timber Forest Products (NTFPs)

Non-timber uses of plantations tend to vary considerably depending upon the region of the country and are strongly associated with the social context of the forests, especially for those uses associated with traditional activities. Some discussions of the non-timber benefits tend to exclude those benefits that lack a traditional market such as environmental services. There are many non-timber products or benefits that may be provided by forests include such as watershed protection, recreation opportunities, carbon sequestration and wildlife habitat. The products may include harvest of honey, mushrooms, berries, or other wild fruits (Harrison *et al*, 2000) .

For generations, NTFPs have provided valuable economic resources in rural communities; it provides the rural people with many benefits in various fields of their life e.g. economic, health and nutrition. Food from forests represent 42% of the total volume of consumed food, in September every year in Zambia people has no way to cultivate, they only concentrate their effort on collection of NTFPs. In Zaire, when the agricultural operations stop in July, the wild life hunting reaches its peak (Falconer, 1990). In Tanzania, majority of households have seasonal food shortage and some households are severely food insecure. There is still intensive use of forest products for food especially during the periods of food shortages. Forest foods are also used to diversify diet and sometimes as a Source of income (Dembner, 1995).

Edible products include mushrooms, seeds, nuts, fruits & berries, wildlife, greens and roots. Wholesale or commercial wild collection of most of these products would not provide enough volume to make market sale possible and profitable and would deplete and likely endanger the resource for both local human use and for wildlife. Many species are now cultivated and more could be cultivated and marketed. Collection of forest fruits and berries is a traditional activity for some rural households and provides a nutritious and tasty source of food for the household. Soil and climate favor these fruits and berries that could be cultivated on a larger scale without pesticides or herbicides. Cultivated berries and fruits could be sold fresh, and local skills exist to can, freeze, and produce pies and jams. Nuts have been an important Source of food for many

centuries in Appalachia (CFPMM, 2007). Badi (1993) prepared an exhaustive list of forest species bearing non-wood forest products. The list includes above 150 tree species. Forest fauna is also contributing to food security through the provision of different kinds of bush meat. Permitted hunting in hunting blocks is targeted against some wildlife species that are known for its quality meat. While the later is connected with tourism, local communities share the former, During the periods of drought that hit the Sahel, the fruits of *Cordia africana* and the fruits of *Boscia senegalensis* were used extensively by local people as famine foods. Forestry was making the difference between being and not being for rural communities at these critical moments.

2-8.Sustainable Forest Management

Sustainable forest management is defined as the process of managing permanent forest land to achieve one or more clearly specified objective of management without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment (Newton, 1995). Although the prime objective of forest management is often the sustained production of wood or other forest products, there is also a need to meet other multi-purpose management needs (Lanly, 1995). The goal of the integrated land use plan is to institute multiple-use, sustained yield management of natural woodlands so that not only are various forest Products and services made available, but temporary agriculture and grazing/browsing of animals can be conducted simultaneously. Integrated land use management goes a step further than multipurpose forest management in which only the forest is managed to produce a variety of forest products and services (FA O, 1989). Hence, integrated' land use.

2.9. Forests for sustainable Livelihoods

2.9 1.Forests and poverty reduction:

The relationship between forests and poverty, asserts that poverty causes deforestation, or vice versa. Although poor subsistence farmers cut down trees, so do rich ranchers and plantation owners. Deforestation can deprive poor people of resources, but it can also provide them with sustainable incomes from cash crops (Chomitz et, al, 2007)

Much of the forestry and development debates in international discussions focus on how forests can contribute to the UN Millennium Development Goals of halving poverty and food insecurity by 2015. Today the poor need safeguards more than ever. The world's natural forests are shrinking, and global climate changes are expected to have serious impacts on forests and agricultural systems. At the same time, demands on forests and trees are increasing, with about 1.6 billion people relying heavily on forest resources for their livelihoods. According to a World Bank study, 60 million indigenous people living in the rain forests of Latin America, Southeast Asia and West Africa depend heavily on forests. Moreover, 350 million people living in, or next to, dense forests rely on them for subsistence or income; and 1.2 billion people in developing countries use trees on farms to generate food and cash (FAO, 2006)

While appropriate changes at the national level both within and outside the forest sector can indeed bring about improvements, experience has shown that sweeping reforms to policies and legislation are not always a prerequisite to making a positive difference in the day-to-day lives of those who face difficulties. For example, foresters and others working with communities can assist poor people to increase their benefits from forest resources by helping them to access markets, acquire processing skills, obtain improved varieties of trees, combine trees and crops on their land, and form associations to jointly manage resources, strengthen negotiation power and market products. Pressures on forests will not disappear soon. Croplands, pastures, and plantations are expanding into natural forests and will likely do so for the next 30-50 years. Expansion is driven by both wealth and poverty.

A huge rural population relies on low-Productivity agriculture for subsistence. A growing, increasingly wealthy urban population demands commodities produced at the forest's edge: beef, palm oil, coffee, soybeans, and chocolate. The contribution of trees outside the forest to combating poverty has not found the care of study and analysis as for the forest trees (Garrity, 2004). In fact, forests and trees outside forests play a significant role in all aspects of poverty reduction as they make people less poor, enable them to escape from poverty and prevent those on the margins from becoming poor. Better forest management and processing of specific

products can increase incomes or improve the health of poor people even if those goods do not lift them out of poverty .Improvements in forestry can also be central to a more ambitious strategy for helping people to move out of poverty. For example, clarification of tenure rights can be combined with improving skills and knowledge and strengthening market access for forest products (FAO, 2006). Many FAO Forestry Department efforts highlight the relationship between poverty reduction, food security and forestry. A turning point in this connection was the organization of a forum to attract international attention to the contribution of forests ad ways to enhance it. The Forum on the Role of Forestry in Poverty Alleviation was held in 2001 with support from the United Kingdom Department of International Development (DFID). The resulting policy brief, how forests can reduce poverty, recommended actions for international agencies to consider for increasing forestry's contribution to poverty alleviation. These included the following four-point agenda for action :

- 1- Strengthening the rights of the poor, local capabilities and governance‘
- 2- Reducing vulnerability of the poor
- 3- Capturing emerging opportunities through removing constraints to access to profitable and dynamic opportunities in forestry
- 4- Working in partnerships .

The agenda provides a basis for practitioners to design interventions to reduce poverty (FAO, 2001a) .

Similarly, the World Bank's 2004 Forest Strategy and Operational Policy included the following three interdependent parts: (World Bank, 2004)

1. Harnessing or linking the potential of forests to reduce poverty by:

- Strengthening rights of people-especially marginalized groups-to forests and fostering their participation in forest management.
- Promoting sustainable forestry, community forestry and agro forestry .

2. Integrating forests in sustainable economic development by :

- Improving forest governance and introducing legal and institutional reforms .

- Encouraging investments that catalyze production of forest products, including environmental services .

3. Protecting local and global environmental values by:

- Establishing protected areas .
- Improving forest management in other areas .
- Developing markets and finance for international public goods such as biodiversity and carbon sequestration, and helping governments create national markets for environmental services from forests .
- Addressing cross-sector links that affect environmental values .

For people to invest in forestry, however, they need the security that comes with clearly defined rights and tenure, including protection from outside interests, whose actions may not always be legally sanctioned. They must also have access to the skills and expertise required to manage the resource on which their investment depends. Without such conditions, people will tend to forgo greater returns in the long term in order to reap immediate benefits .

Secure tenure and access rights as well as good governance are often prerequisites to successful interventions to reduce poverty . Forest resources contribute directly to livelihoods and can complement other key components of poverty reduction (e.g. food production, education and primary health care). The challenge is to support specific changes that will lead to a greater role for forest and tree resources in the livelihoods of the poor. In this connection, a people-centered approach can increase the impact of forests and trees in reducing poverty. Benefits to local livelihoods from people-centered forestry approach can include the following :

- 1- Rights to access, control and use of forest and tree resources
- 2- more say in decisions over Use and management of forest resources
- 3- reduced Vulnerability, not only through secure forest resources but also political empowerment
- 4- income from forest goods and services
- 5- improved governance through more effective local institutions

- 6- partnership to enhance capacities
- 7- direct benefits from environmental services; and
- 8- Increased powers of negotiation .

While earlier efforts to address poverty issues focused on overall economic growth, recent emphasis has been on livelihood enhancement. Although this evolution has been reflected in recent trends within the forestry sector, yet a number of issues still need to be addressed. Such issues include the following :

- 1- Where should forestry interventions focus to enhance contributions to livelihoods (e.g. meeting subsistence needs, income generation or other indirect benefits)?
- 2- When is forestry not an-effective way to tackle poverty?
- 3- How can the forests' potential contribution be reflected better in Poverty reduction strategies?

2.10. The Concept of Poverty

To be poor is to be deprived of the means for a decent life. Because poverty expresses itself in many ways, several approaches are used to assist those who are affected, Strategies focus, in varying degrees, on material and social deprivations such as those related to health, safety and living conditions, as it is easier to observe and measure these aspects than it is to observe and measure people's ability to achieve meaningful and dignified lives vis-a-vis other people. All forms of poverty are, in fact, relative and subjective because it is in relation to social contexts that they are judged unacceptable. Description of the various dimensions of poverty assist in better understanding of how forestry can help to reduce it through both the creation of wealth and the protection of forest functions that support livelihoods. There is an argent need of working with rural communities through forest-based interventions (FAO, 2006)

People who are involved or could be involved in forestry must consider the ways in which people's livelihoods might be affected, for better or worse, by any changes in the management and use of forests and trees outside forests(FAO,2001)

2.10.1. Poverty and environment in Africa

The United Nations Conference on Environment and Development (UNCED) recognized both the relationship between poverty and environmental degradation in underdeveloped countries, as well as the problem of unsustainable production and consumption patterns in developed countries. The protection of the environment and of natural resources is an essential part of development: without adequate environmental capital, development is undermined and this in turn may reduce the resources available for investing in combating environmental damage. Hence, poverty alleviation is not only a proper essential but also a precondition for environmental sustainability and sustainable development (World Bank, 2004).

Africa faces many challenges related to sustainable development. Over the past 30 years, the environment in Africa has continued to deteriorate. Thousands of people in Africa have already died from starvation brought about by environmental degradation. Millions more people are faced with imminent disaster because their water sources have run dry; their land has become so denuded they cannot rear livestock, and the soil so poor they cannot cultivate it. Moreover, according to the (World Bank (2004), persistent poverty has contributed to accelerated degradation of natural resources. The majority of poor people lives in rural areas and depends directly or indirectly on terrestrial and marine natural systems for income generation. It is estimated that two-thirds of the region's people live in rural areas and depend primarily on agriculture and other natural resources for income. In Africa, the poor depends on natural ecosystems for their livelihoods and lives in the most fragile rural areas. Though offering an enormous potential in natural and human resources, Africa is plagued by a rampant poverty affecting both rural and urban populations along with tremendous impacts on the environment. Alongside this situation, the standard of living has drastically deteriorated due to the lack of an efficient system of domestic and/or industrial waste management.

According to the (FAO (2006), "poverty alleviation and environmental protection will remain the most important priorities over the next two decades". In this respect, empowering key stakeholders through policy and institutional changes and creating conditions to support

sustainable resource management would be the main thrust of strategies in most countries. Real, lasting poverty reduction is only possible if the environment is able to provide the services people depend on, and if natural resources are used in a manner that does not undermine long-term development. African countries' ever increase population demands creative efforts to find new ways of producing more food from the country's finite resources. African governments should link biodiversity conservation with policies on overcoming poverty, especially in local communities that live around protected areas and in zones richly endowed with biodiversity, through the sustainable use of the resources (World Bank, 2004).

2.10.2. Rural poverty in the Sudan

Poverty in the Sudan is deeply rooted and is largely separated in rural areas. In 2002, some 20 million people were living below the poverty line of less than US\$ 1 a day. About 19 million people i.e. 85 percent of the rural population are estimated to be living in extreme poverty. Most of them struggle to feed themselves and their families and have little or no access to safe drinking water and health services. The United Nations Development Programmer's Human Development Index ranks Sudan as the 61 st from among the 77 least developed nations in the world (IMF and World Bank, 2003). The incidence or rate of poverty varies considerably according to region. In part, because economic growth has been unevenly distributed; but also, because of the economic and social devastation caused by conflicts in certain parts of the country .

A rapidly growing population is putting significant pressure on already fragile ecosystems, a situation which has been exacerbated by the displacement of peoples, by either drought or conflict. In addition, erosion, loss of soil fertility and damage to watersheds are affecting r Sources. Agricultural productivity is decreasing because of a lack of technological and modern methods in the rain fed agriculture, so food security a livelihoods are threatened as a result (IFAD, 2008).

In general, small-scale farmers and herders in the tradition rain fed farming and livestock sectors are more vulnerable groups to poverty than those in irrigated areas. Those without land

are dependent on cash earnings from casual labor, such as collecting firewood and making charcoal . Isolation is one of the key fact affecting poverty. Settlements located away from main thoroughfares have little or no access to social services and markets. Within rural communities, households without assets and labor power are the poorest - consisting of elderly or disabled people, or households headed by women with young dependants. Women and girls are the most disadvantaged member, less than one third of them have access to education (IFAD, 2007)

It is not possible to determine accurately the level 'of poverty in Sudan due to lack of recent data. The last national survey about families' income and expenditure was conducted in 1978. Moreover, there is only one document prepared in 1997 by the National Ministry of Finance depending on variety of indicators; hence, it included varied results. While government institutions estimated the poverty rate by 50 - 60% among the population, some research institutes estimated poverty with higher percentage (NPSP, 1997)

Some surveys conducted for other purposes, not including poverty level but can be used for its indicators; those surveys are: family Budget Survey in 1992, Secure Motherhood Survey in 1999 by Central Peru of Statistics and UNFPA, and the Multi-indicators Survey by UNDP and UNICEF, The National Poverty Strategy Paper (NPSP) used these surveys for measuring poverty dimensions (Survival, Literacy and deprivation Survival: A person's possibility to death before reaching 40 years, and a child mortality before completion of his first year of age . Literacy: The ability of adult (15+) to read & write, and the percent of children in school age and not going to school or the adult in secondary education.

Deprivation: has been measured with compound indicators of lack of having minimum standard of adequate living levels, it is measured from percentages of who are unable to access electricity, clean drinking water & latrine or sanitation; it is found that the percentages are higher in rural areas than in urban areas .

Despite recent improved macroeconomic performance, per capita income estimated at \$330 in 2001 remains low, poverty is widespread, and inequality is generally high in Sudan as reflected by the several surveys. The dynamics shown by these surveys is that poverty, on the headcount

basis, had affected 90% of the population at mid-1990s compared to 70% at the beginning of (1990NPS, 1997 and ADB & ADF, 2003). The high levels of poverty are also evident in a variety of human development indicators, for example the United Nations Human Development Index (UNHDI), which lists the country at 139. Indices measuring factors that enable a minimum standard of decent living reveal significant rural/urban disparities. On average, 87% of rural people have no access to electricity, 53% have poor sanitation and no access to safe drinking water, and 92% depend on biomass for energy (FAO, 2006).

2.10.3. Causes of poverty

The causes of rural poverty in Sudan are to be found in the sustained urban bias of the development strategies adopted since independence. These tend to neglect the traditional agricultural sector, which is the main source of rural livelihood and is where the vast majority of population lives. This resulted in high rural to urban migration unaccompanied by either increased productivity in the sector or sufficient urban development to generate the necessary urban employment opportunities. Not that the development of the agricultural sector was completely ignored but that it was dichotomous in nature in the sense that islands of modern irrigated agriculture coexisted side by side with vast traditional rain-fed agriculture. While the former benefited from modern scale specific technologies and market access, the latter lagged behind in terms of production technologies, finance, management, research, extension, market access and rural roads. Consequently, the traditional agricultural sector continued to be the major source of unlimited supply of unskilled labor to urban centers exerting additional pressures on already limited and overstretched social services and facilities. These trends were further aggravated by those displaced by both natural and manmade disasters (NPS, 1997). Nonetheless, causes of rural poverty are more complex. Part of the explanation is certainly the lack of rural focus in the various development efforts since independence as discussed above. The other part of explanation relates to the basic characteristics of the traditional sector where the so-called *subsistence* sphere plays a prominent role in supplying traditional producers with significant portion of their consumption requirements (food crops, dairy products, and housing),

while money incomes cover only a small part of their requirements. It is only when the *subsistence sphere* fails to fulfill its role (as in years of crop failure, poor pastures, and scarce water), that cash needs increase to meet food expenses and pastoral inputs (fodder and water). The resilience of the traditional sector stems from the operations of the *subsistence sphere* that depends first and foremost on natural factors particularly rainfall. However, while such dependence on nature may be viewed as a cause of resilience, it simultaneously constitutes an important source of vulnerability (FAO, 2006).

The unstable ecologies of rural Sudan, with their characteristic frequent rainfall variability, have alerted rural producers from time immemorial to the periodic oscillation from feast to famine situations. A basic strategy of rural producers was and continues to be hoarding of surpluses in good years to transcend the hardships of lean years. But to operate in a reasonable manner requires the adoption of policies and measures to conserve and consolidate the resilience of the *subsistence sphere*, such as the careful and strict separation of respective domains of farming and herding through demarcation and enforcement of grazing lines and the careful monitoring of rural/urban migration and gauging its results on the rural sector. These and other conservation and consolidation policies have been lacking in recent development policies, leading to increased vulnerability of the rural traditional sector (IFAD, 2008). The realities of human deprivation in these areas call, at least in the short run, for policies that mitigate the twin processes of impoverishment and vulnerability that eroded the viability of the *subsistence sphere*. Land reform to promote tenure security of traditional producers and explicitly recognize the entitlement of pastoralists to natural resources is one measure that is likely to produce favorable results over the short term. In the medium to long term development of the rural agricultural sector will depend on adoption of measures and policies to improve productivity while at the same time promoting education and vocational training to provide alternative employment opportunities outside the agro-pastoral production systems. Adaptive research and socio-cultural sensitization of development worker at the, local level are prerequisites for such a long-term strategy (Ali, 2002)

2.10.5. Poverty Reduction

(FAO (2006) defined poverty reduction as collective responsibility to fight all avoidable forms of deprivation. It involves collaboration to achieve the following goals :

1. Make poor people less poor (poverty alleviation).
2. Enable poor people to escape from poverty .
3. Build institutions and societies that prevent people from becoming

Pro-poor policies and strategies aim to address all three goals. Combined with the involvement of poor people in their implementation, they are important components in the fight against poverty. However, building poverty-free communities requires broader interventions because all segments of society must play a part in preventing its occurrence. It means building pathways out of poverty and protecting vulnerable people, both poor and non-poor - especially women, children and the elderly Poverty reduction refers to efforts ranging from the modest easing of some symptoms to the radical transformations that enable people to escape 'poverty altogether. Because the transition is seldom sudden, reducing poverty first means alleviating it by gradually addressing the severity of some components. This aspect of poverty reduction should not be confused with helping people to escape from poverty altogether or building a poverty-free society (FAO, 2006)

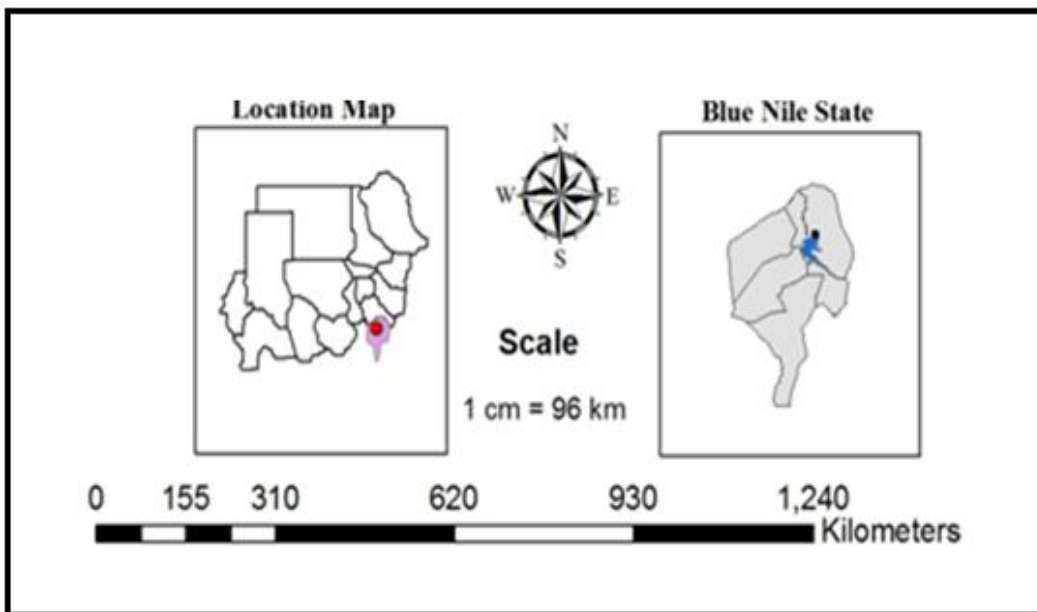
Distinctions are sometimes made between practical and strategic approaches to poverty reduction. On one hand, practical changes tend to involve poor people at local levels to address the material aspects of poverty _ mostly those related to subsistence needs by changing the relations between humans and the non-human environment. On the other hand, strategic changes address the indirect causes of poverty at local levels and higher, involve non-poor as well as poor people, and focus on social reform. Activities include building the organizational capacity of community groups, strengthening the rights of poor people to access, manage, use and sell products, and changing attitudes, beliefs and institutions (IFAD, 2007).

CHAPTER THREE

STUDY AREA

3.1. Location:

The Blue Nile State is located in the south- eastern part of the Sudan; in the semi-wet zone. It lies between latitude $9^{\circ}.30'$ and $12^{\circ}.30'$ N and longitude $35^{\circ}.3'$ and $33^{\circ} 5'$ E., with a total area of 40000 Km (UNDP, 2010).The main geographical feature in the State is the Ingassana Mountains that extend to about 72 kilometers. Fig. 3.1 shows the location of the study area.



Map (1) location of the study area.

3.2. Blue Nile State Administration Structure

According to the Constitutional Act No (4) for the year 1993, the Republic of the Sudan has been divided into 26 States. The Blue Nile State is one of those established States. The State consists of six localities, namely Damazin, Rosaries, Kurmuk, Gaissan, Baw and Tadamun. Each locality consists of several administrative units (Blue Nile Investment Map, 2004).

3.3. Population:

The total population of Blue Nile State is 832112, out of which 421758 are males and 410354 are females with an annual growth rate of 3% (Central B.S, 2009). This population consists of different tribes, mainly Fung, Ingassana, Bartta, Boroon, Gomuz, Fallata, Haussa, and other tribes (Blue Nile Investment Map, 2004).

The economic activities in the state are agriculture that occupies a large area of the state and practiced by most of the population, pastoralism which is practiced by some tribes and other activities, such as handicrafts, trade, traditional mining, charcoal production and non-wood forest product collection.

3.4. Climate:

The State lies in the tropical climate zone which is characterized by high temperature and heavy rainfall. It is divided into three climatic zones; Kurmuk is located in the wet zone with annual rain fall ranging between 900-1000 mm. In Gessan locality and south localities of Baw and Ruseires the annual rain fall ranges between 700-900 mm, while the third zone is characterized with an annual rainfall ranges between 450 - 700 mm (Blue Nile investment Map, 2004). The average daily temperature range from 31°C in the summer to 22 °C in winter (UNDP, 2010).

3.5. Vegetation :

According to Harrison and Jackson 1958, the distribution of the vegetation depends mainly on the quantity of the annual rainfall and the soil type. Woodland savannah includes mixed types of vegetation composed of grass with bushes or trees or both, in which the variable proportion of grass to bushes or trees is determined by the frequency and intensity of fires.

Rich savannah trees and shrubs dominate the vegetation cover of Blue Nile state and woodland/forests occupy about 26 % of the state area, marking the state as one of the richest in forests and grazing lands. Large tracts of savanna range land, with significant tree density cover, have been cleared in recent years for large scale mechanized agriculture (UNDP, 2010). Yearly fire destroys considerable amount of natural vegetation. These fires are mostly lit by pastoralists to suppress bushy vegetation and promote the growth of fresh grass.

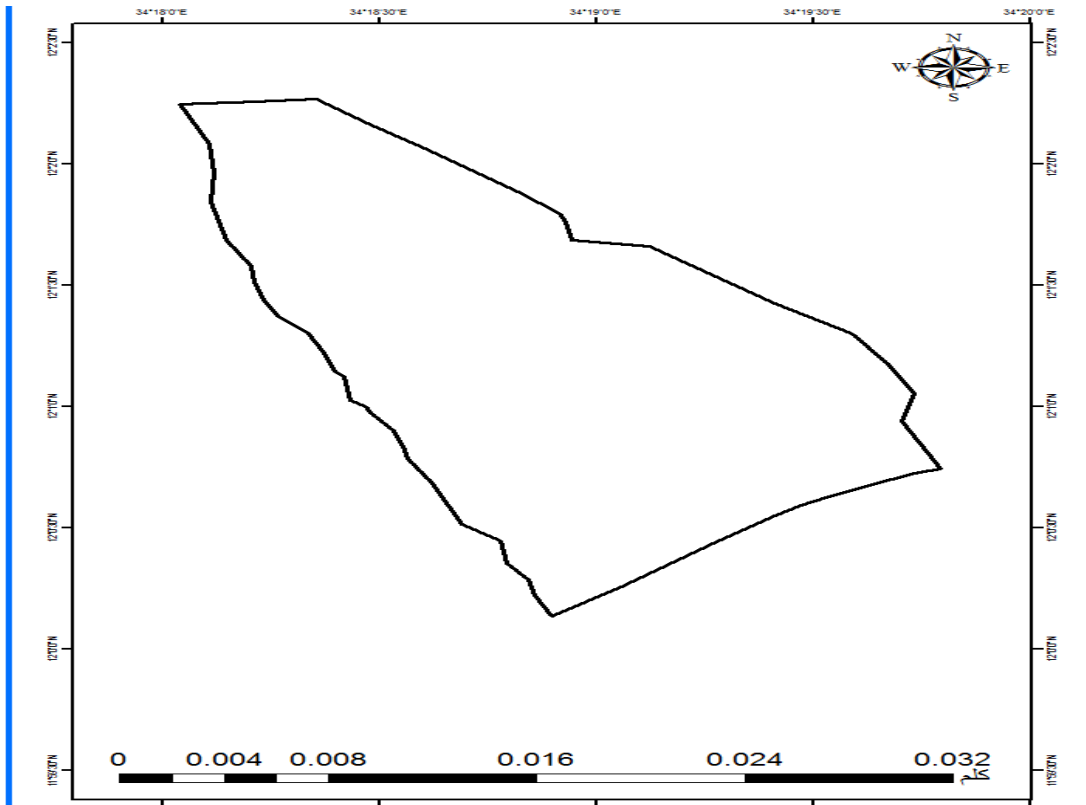
Deforestation took place during the war throughout the state, reducing forests by almost 75% with small parts remaining mainly in the North-west Dindir National Park. Drought in the 1980s also resulted in deforestation in the West (UNDP Report 2010). As a result of deforestation and war, the eastern part of Blue Nile became the main supplier of the wood production.

3.6 .Soil:

The FAO soil analysis department classifies the Blue Nile soils according to geographical sites to the following types from north to south. Loamy soils, clay soils and heavy soils (Blue Nile investment Map, 2004).

It is sharply divided into two extreme soil types, dark cracking clays in the east, and established sand-dunes in the west (Harrison and Jackson 1958). Thus two contrasting types of vegetation are found on the two soil types, which have been distinguished as low rainfall woodland savannah on clay and on sand respectively.

The topography of Eldisa Forest is generally flat with crack clay soil in northern-part and sandy soil in southern-part of the forest, which located 25km North Damazin, between longitudes 34° 18' 13. 5" N and 34° 19' 37.5"N and latitudes 12° 02' 17.1" E and 12° 00' 06.6 " E with total area of about 1479.7 feddan (Fig.3.2) and there are many species found in the forest Table (3.1).



Map (2) Eldisa forest in Bule Nile State.

Source: Blue Nile Forest. Damazin Technical office , area by F: 1479.7

Table.1.The dominant tree species in the study area

Latin Name	local Name	Latin Name	local Name
<i>Acacia. Nilotica</i>	Sonut (dominate trees)	<i>Pterocarpus.lucens</i>	Taraia
<i>Acacia.seyal</i>	Talih	<i>Moringa.oleifera</i>	Ruwag
<i>Acacia .senegal</i>	Hashab	<i>Acacia.polycantha</i>	Kakamoot
<i>Acacia. Mellifera</i>	Keter	<i>Dalbergia.melanoxylon</i>	Abanoos
<i>Acacia. Tortilis</i>	Seyal	<i>Adansonia.digtata</i>	Tabldee
<i>Acacia .sieberiana</i>	Koke	<i>Eucalyptus.</i> <i>Microtheca.‘</i>	Baan
<i>Ziziphus.</i> <i>Abyssinica</i>	Seder	<i>Dichrostachys.cierea</i>	Kadad
<i>Ficus.sycamorus</i>	Gomeze	<i>Acacia.albida</i>	Haraz
<i>Ailanthus. excelsa</i>	Elanses	<i>Khaya.senagalensis</i>	Mahoogany
<i>Balanites.aegyntiaca</i>	Heglege	<i>Anogeissus.</i> <i>Schemperi</i>	Seelag
<i>Tamaridus. indica</i>	Aradeb	<i>Acacia.nobica</i>	Laaout
<i>Capparis. decidua</i>	Tondob	<i>Grewia.tenax</i>	Godeme
<i>Cordia. abyssinica</i>	Andarab	<i>Medemia.argun</i>	Dome
<i>Sterculia.setigera</i>	Terter	<i>Calatropis.procera</i>	Oshar

CHAPTER FOUR

MATERIALS AND METHODS

4. General

In order to achieve the objectives of this study, the following methods were applied which including the following:

4.1. Primary data:

4.1.2. Direct Field Observation:

General survey and visits to the study area was adopted to assess of visual Indicators or aspects such as forest resources, vegetation cover, products diversity, Types and quantity, besides the general characteristics of rural communities in the study area.

4.1.3. Households Interviews:

This was conducted through structured questionnaires covering different parameters have been measured including the following activities:

- Socio- economic characteristics of rural communities in the study area
- Contribution of Eldisa forest in improving the income generation of local communities
- Supply of basic needs (firewood- Crop production and Animal herding)
- cash saving (direct use value of goods)
- Small- scale trade in forest goods and forest products.
- Cultural and spiritual benefits (local knowledge)
- Formal sector forest activities (at local level) in the study area
- Benefits from employment
- Involve of rural in forest management (as main stakeholders)
- The link between forest utilization and livelihood strategies.
- The role of Eldisa forest in food security and reduction of poverty among the rural communities.

4.1.4. Sample Selection:

Three villages namely (Goney, Elbangadeed, and El disa) were randomly selected on the basis of similarities in socio- economic activities and livelihoods levels (small-scale agriculture, charcoal production, animal husbandry and collection of forest products).

4.1.5. Sample Size and unit:

The sample size was select according to the number and list of all households in these villages. The Sampling unit in the household survey was the household head. 5% from the total numbers of Households in these villages were chosen for Interviews.

4.1.6. Key informants:

Direct Interviews was Carry out with key Informants to provide in formations on forest use and changes in use and management Links with sustain livelihoods of rural communities.

4.1.7. Focus group discussions:

This was conduct to obtain a broader under stander and the Role of forest use at the village levels.

4.2. Secondary data:

The inflammations about the forest in contributing to sustainable livelihood and poverty alleviation to rural communities was collected from the different document which includes the scientific papers, researches, reports, text book..... etc

4.3. Data analysis:

Quantitative was analyzed using statistical Package for social sciences (SPSS). The main statistical analyses applied were frequency analysis and descriptive statistics. Chi- square test for Independence will use determine associations between categorical variables.

CHAPTER FIVE

RESULTS AND DISCUSSIONS

5.1. Socio-economic characteristics of Respondent

5.1.1. Distribution of respondents according to age groups:

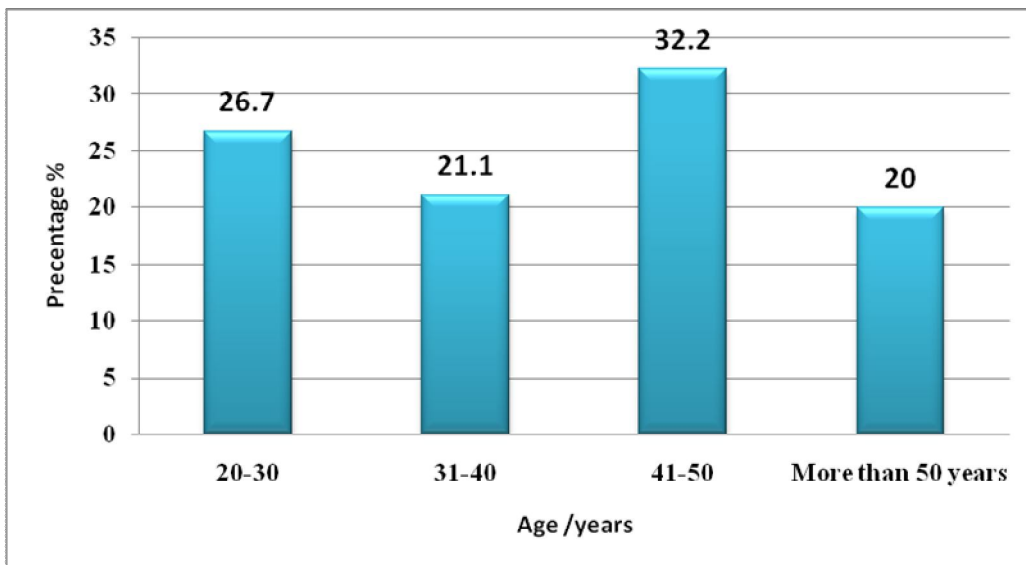
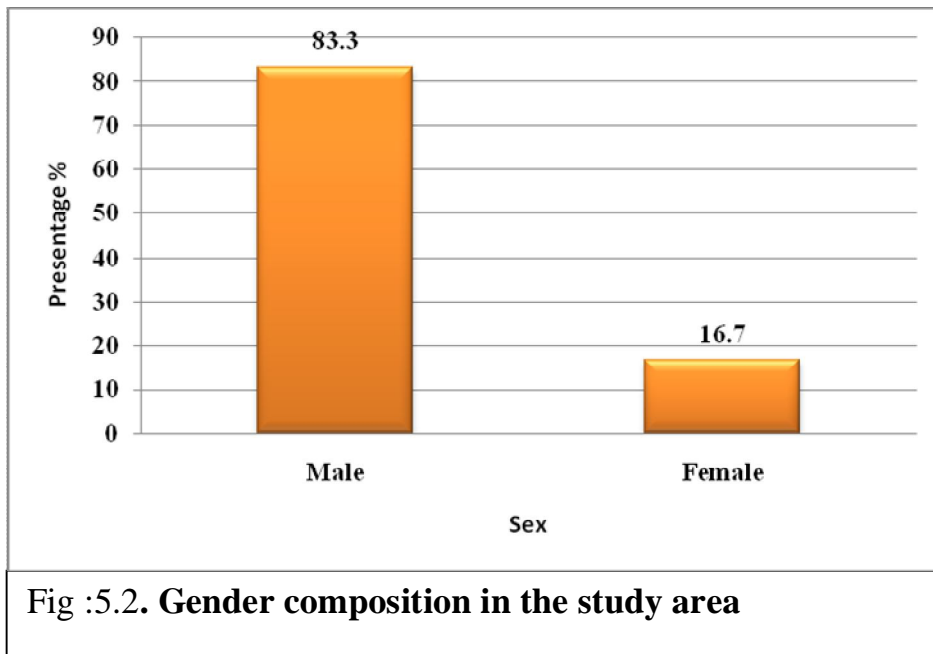


Fig 5.1. Distribution of respondents according to age groups

Figure (5.1) Showed that about 32.2% of respondent their ages range between 41---50 years while respondents their ages consisted about 26.7%, 21.1% and 20% to age from 20—30, 31---40 and more than 50 years respectively, that means the age from 20- 50 years was 80% of respondent. This result indicates that the majorities of respondents were youth, and this will support the main activities such as production and protection of the forest, on the other hand we found that only about 20% of them their ages more than 50 years which mean they have experience in management of forest and solves problem that faces the community.

5.1.2: Gender distributions in the area:



According to the figure (5.2) there were very high significant differences at ($p < .000$) between respondents about gender composition. About 83.3% of respondent were male while, only about 16.3% were female. This mean that most of forest activities depend on male rather than female such as felling and harvesting of trees, beside these the women mainly concentrated on seedling production and preparing the trees for planting.

5.1.3. Marital Status:

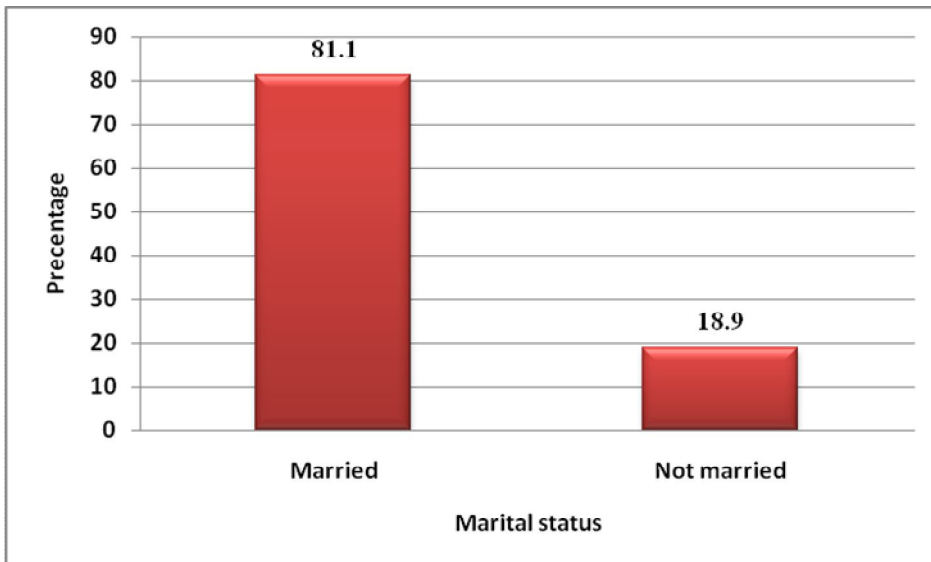


Fig:5.3. Distribution of respondents according to marital status

The result in figure (5.3) showed that about 81.1% of respondents were married and 18.1% only of them were not married. This revealed that the majorities of people in the study area care about the marriage. This might be due to tradition and culture which prefer to marry their children at early ages.

5.1.4. Education background of the respondents:

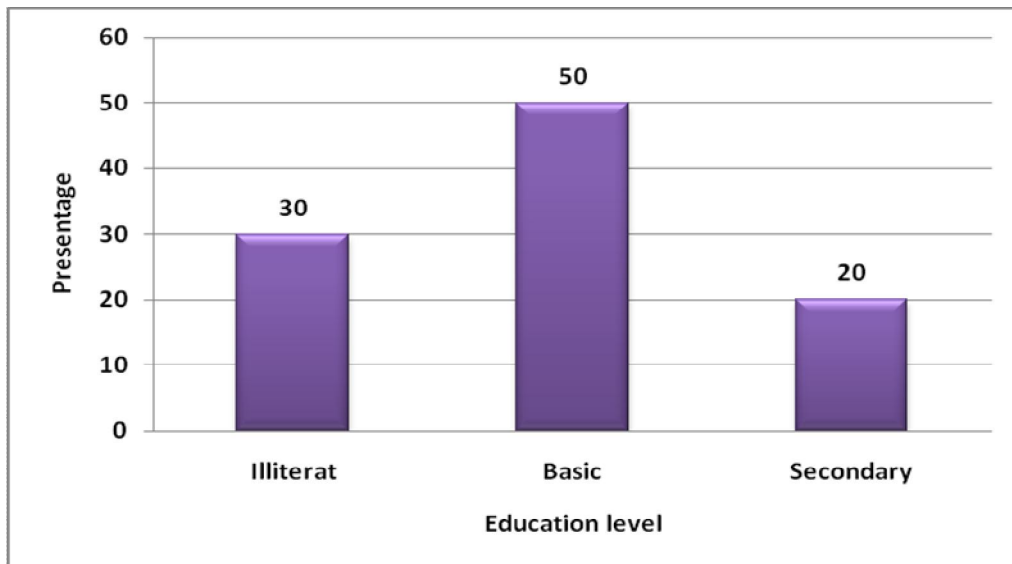
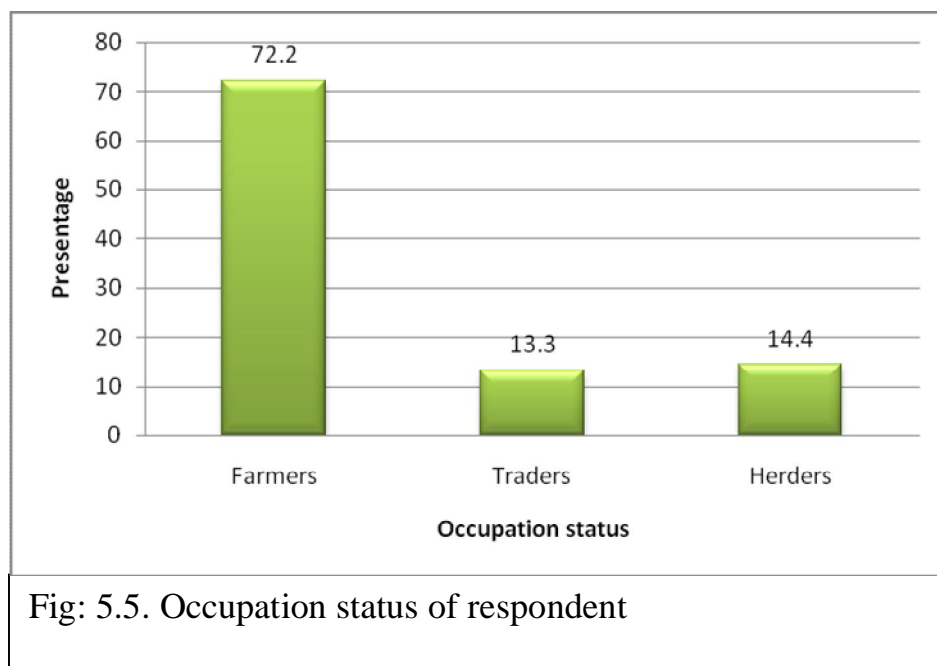


Fig:5.4. Education levels of respondent

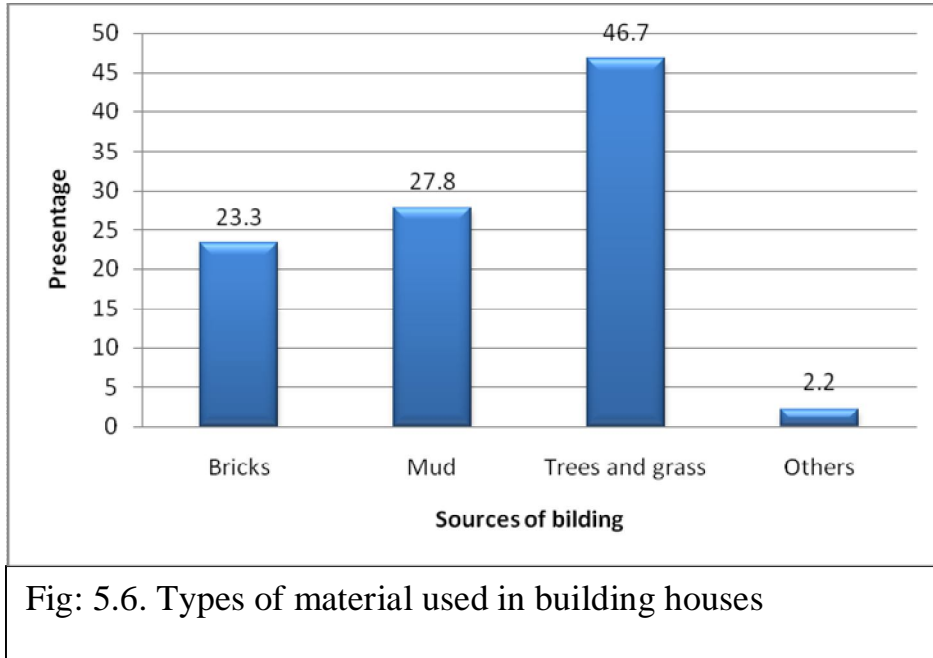
The According to the result in figure (5.4) which showed that there were high significant differences at ($p < .006$) among respondents in Education levels ,about 50% of respondent they educated at primary school, while about 30% were illiterate and 20% at high secondary school. These indicate that about 70% of respondent they were educated which could help to understand the extension message and participation in activities concerning the forest. This agreed with Singh a et. al. (2006) found that there was a positively significant relationship between the education level and participation level of the respondents in maintenance practices of forest resources.

5.1.5. Occupation status of respondent:



According to the figure (5.5) there were very high significant differences at ($p < .000$) among the respondents about the occupation status in the study area, about 72.2% of them were farmers, while 13.3 and 14.4% were traders and herders respectively. So the majority of respondent depends on agricultural activities to increase their income. This agreed with the Studies conducted by (Shackleton, 2005) showed that agricultural activity is often main source available for the population in remote rural areas. Being able to practice in order to meet daily needs of energy, shelter, food and medicine, allows the scarce cash resources to be used to secure other household needs and to attempt to accumulate the necessary asset base for a more secure livelihood. This includes the education of children, investment in agricultural tools, or capital for other activities that generate income

5.1.6. Types of material used by respondent for building houses:



The result in figure (5.6) expressed that about 46.7% of respondent were used trees and grass for building their houses, while 23.3% used bricks, 27.8% through used mud as materials to build their houses. The reason is most of respondent used trees because they were poor and unable to use other materials.

5.2. Contribution of forest in improving the livelihood for the local communities:

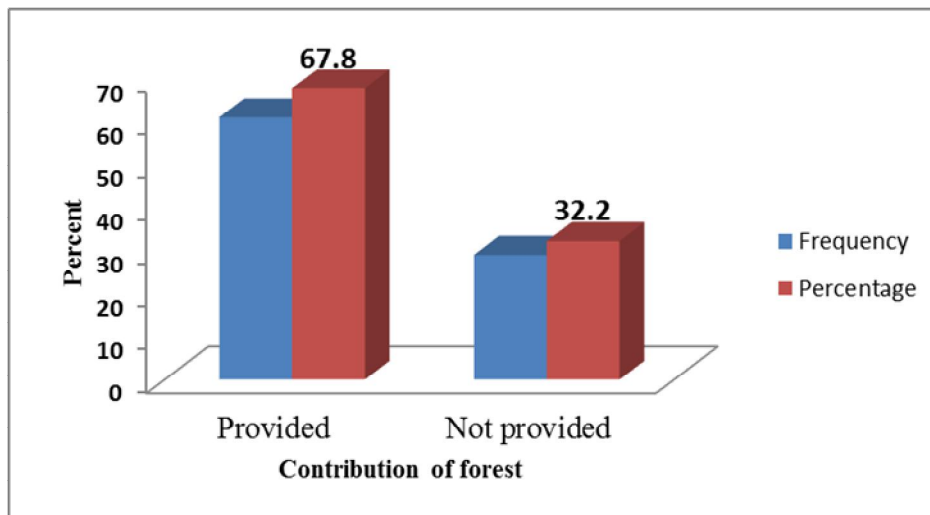


Figure : (5.7) **Contribution of forest in provided the basic need of people**

Figure (5.7) showed that there were very high significant differences at ($p < .000$) about 67.8% of respondent said that forests improved their livelihood, while only 32.2% of them were not mention the role of forest. This result revealed that the forest contributed mainly in providing the basic needs for the local people such as charcoal, firewood collection, opportunities of work inside the forest, producing honeybee and fodder for animals. This result explained that majority of respondent depend mainly on forest products for meet their basic need and improving their income generations. This result agree with Alseedig(2015) who stated that majority of rural community depends on forest production to meet their daily need, while there were no enough other alternative to gain money.

Table.5.8. The most direct benefits gain from forest by local people

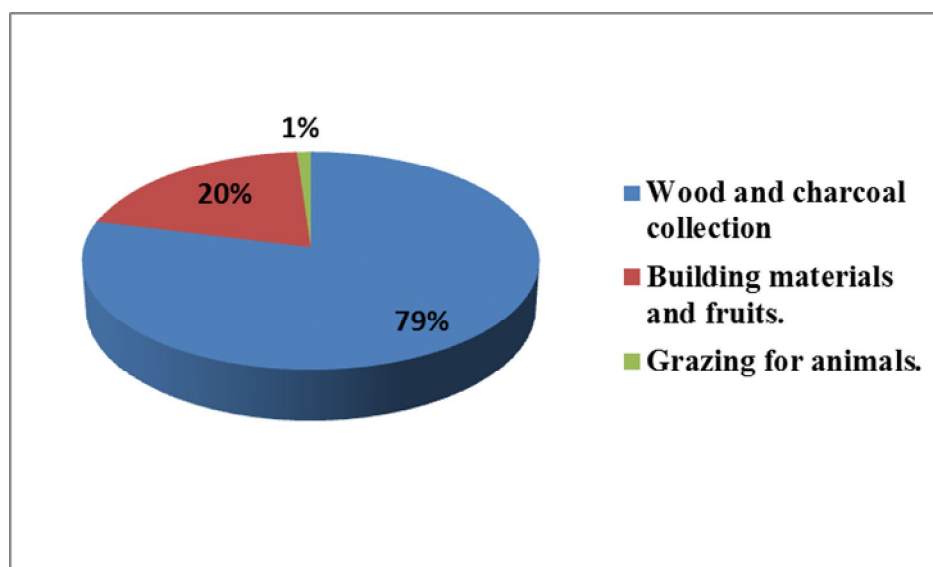


Figure: (5.8) Direct benefits gain from forest by local people

The result in figure (5.8) showed that there were very high significant differences at ($p < .000$) between respondents. Approximately about 78.9% of respondents have direct benefit get from forest like firewood collection and charcoal production. The rest of 20% of them depend on forest for collection of building materials and fruits, and only 1.1% they were depended on forest as source of fodder for their animal's. Several recent studies on the livelihood strategies of rural people in developing countries have highlighted the significance of livelihood diversification (Zoomers, 2001). Today, many rural households diversify their livelihoods and combine various strategies to obtain food, consumer goods and income, without focusing on a single activity, crop or even space (Ellis, 1998).



Plate No .1 Firewood collections by household after harvesting operation

Figure: 5.9. Indirect benefits of forest in the study area

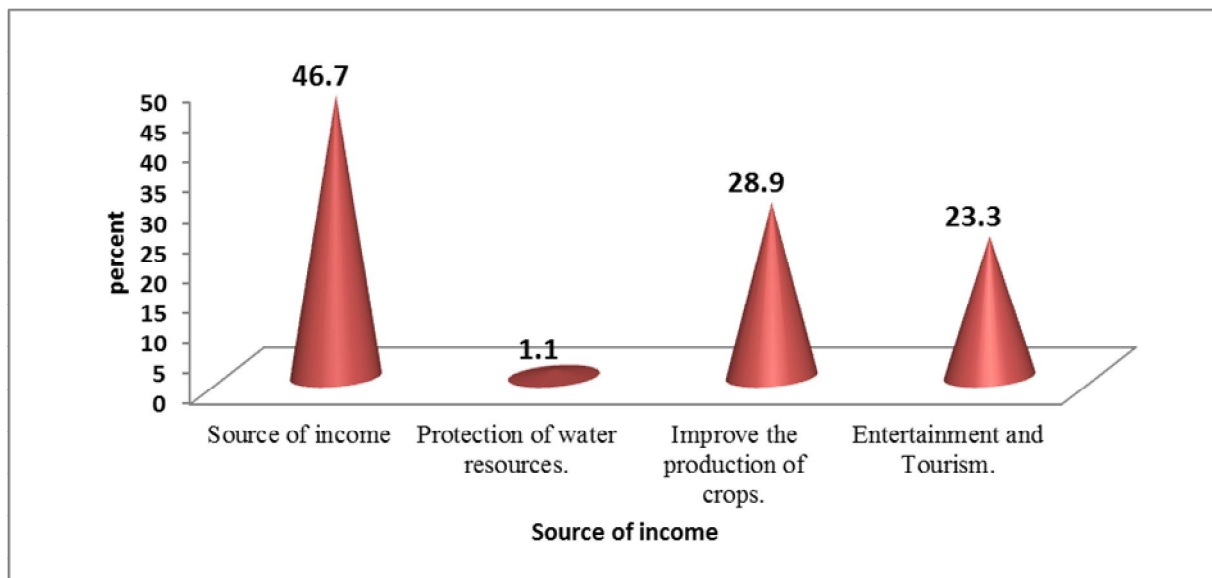


Figure 5.9. Indirect benefits of forest to local communities

The result in figure (5.9) indicate that about 46.7% of respondent describe that the forest provided other sources of income that contributed indirect to their life through representing as the source of income for poor family in surrounding villages through Small- Scale industries , while 28.9 answered that increased the crops production, followed by 23.3% have recreation and tourism values , and only 1.1% of them said forest contributed in direct in protection of water resources This agreed with (Barrow et al. 2002, Campbell 1986, Falconer 1990 , FAO 1983 , Packham 1993) found that livelihood of the majority of rural people in the dry land Africa depends on the forest and wood lands as a second sources of income through agricultural land, Handicrafts , as well as for non-timber forest products (NTFPs) such as fruits , fibers and medicine.

Table . 2: The role of forest products in household Food Security in the study area:

Food security &Income Generation	Frequency	Percentage
Secure and generate	80	89
Not Secure and generate	10	11
Total	90	100%

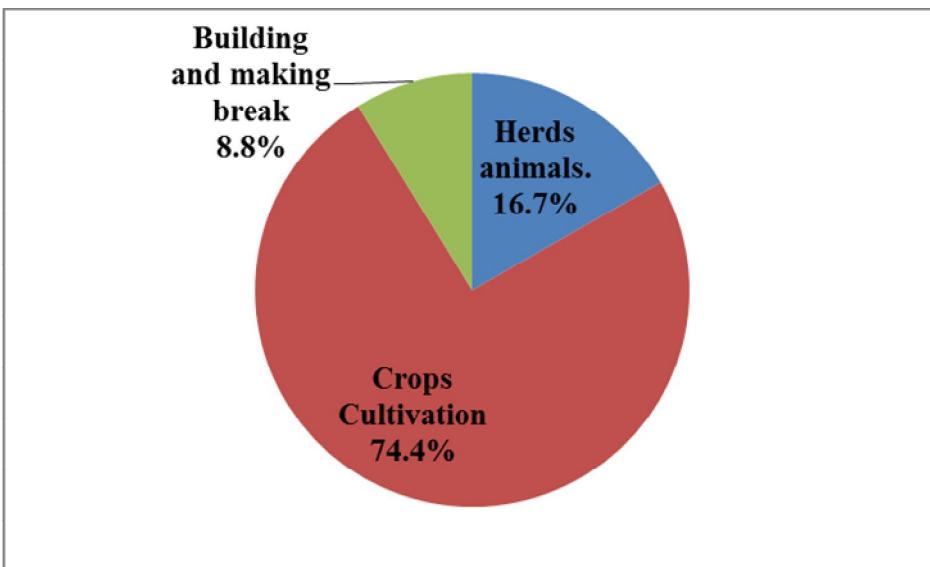
Source: Field Survey, 2016

The result in table (4) indicated that there were very high significant differences among respondents at ($p < .000$). About 89% of the respondents stated that many forest products of both plant and animal were consumed by household either directly as food or as supplement to other food products. Some are eaten in raw form without prior cooking, boiling or processing while others are only consumable after processing. These products play significant roles in supplementing household food in-take particularly during the period of scarcity of food when the previous year's crops are exhausted and the new crops are yet to mature. These due to increases in their awareness about the direct consumption and nutrition value of forest products which include different types. As stated by Olawoye (1996) forests make significant direct contributions to food security of the rural population by providing a wide range of food which provides essential nutrients especially at times when other food sources are not available, while the rest 11% of them said that was no clear role in used of forest products in food security.



Plate .No. 3: Contribution of Corps (groundnuts) in food security and income generation

5.3. The Economical activities practiced by local communities in the study area.



5.3. The economic activities Practices by respondent in the study area

Figure : (5.10) Main activities practice by local communities in the study area.

The analysis of data in figure (5.10) indicated that there were very high significant differences among respondents at ($p < .000$). About 74.4% of respondent depends on crops cultivation, while 16.7 of them depend on raising animals, followed by 8.8% were depend on Building and making break in their villages. This indicate that the most of the communities depend on the crops production because they practice agricultural inside the forest through Toungya system, on the hand the forest provide the animal by fodder through browsing the trees and the palatable grass inside the forest.



Plate No .3 : Production of Groundnuts inside the forest through practices of Toungya system

5.3.1.. Types of fuel consumed by local community in the study area:

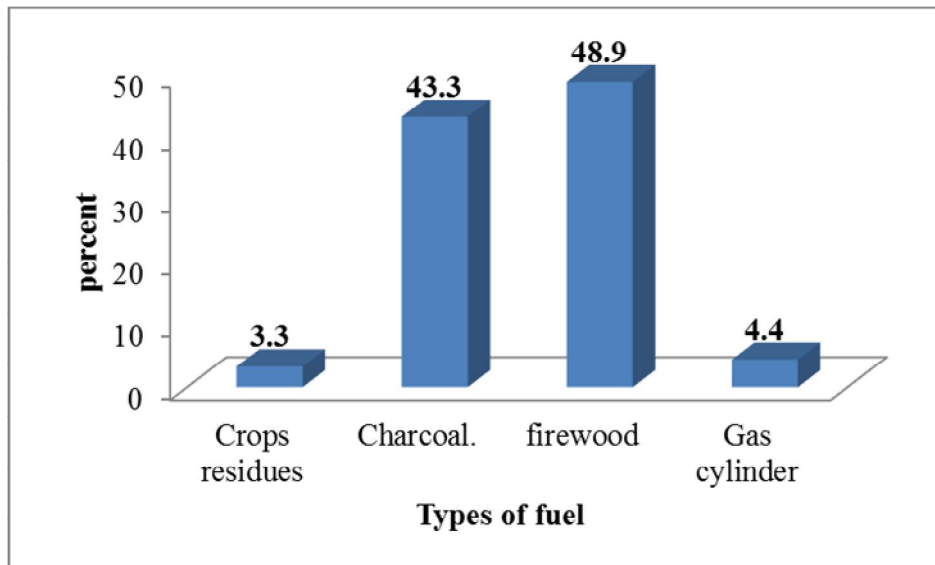
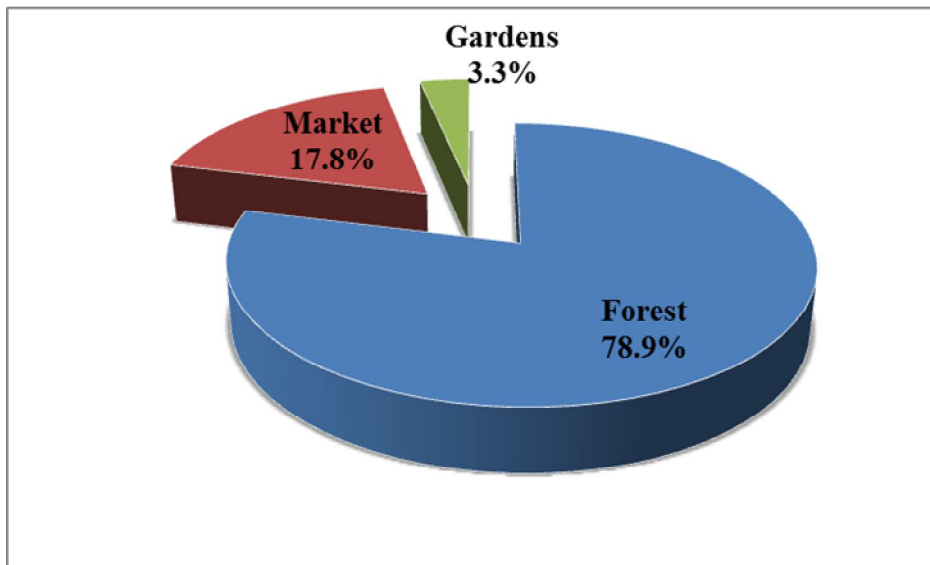


Figure : (5.11) Types of fuel used by the respondent in the study area

According to the result in figure (5.11) which showed there were very high significant differences at ($p < .000$), among the respondent in terms of types of fuel. About 48.9% Consumed the firewood as main source of energy followed by 43.3% were used charcoal, while 4.4% of them used gas cylinder and only 3.3% of them used agricultural residues. The result explain the rate which the respondent depend on fire wood and charcoal for energy ,this agree with Alsudig (2007) who state that alternative energy source should be introduce to reduce the pressure on forest by local people.

Figure (12) :Sources of fuel wood in the study area



The result in table (5.12) Showed that about 78.9% of respondent were depend on forest resource as main source of fuel and 17.8% of them from market and 3.3% of them from their gardens,, this indicated that the respondent depend on forest as the main source of wood energy because its nearly, and more accessible.

5.3.2. Access of respondent to utilized forest resource

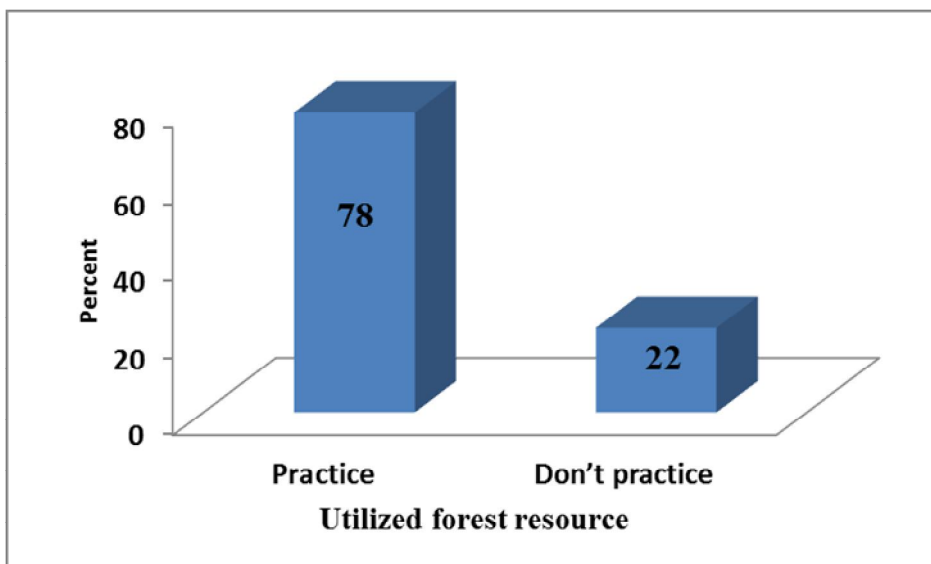


Figure (5.13) Practice of agricultural activities in side of the forest by local communities

The result in table (5.13) showed that 78% of respondent they have access to cultivate agricultural crops inside the forest. This mean the forest manger made contract with local people to cultivate their agricultural crops as same time they must look after the trees and regeneration.

5.3.3. Users of forest land for agricultural activities

Table (5.3) The Categories that have access to use the forest area

Categories	Frequency	Percentage
Farmers	83	92.2
Traders	16	6.7
Companies.	1	1.1
Total	90	100%

The result expressed in table (5.3) showed that there were very high significant differences at ($p < .000$) between respondents about their access to the forest area. About 92.2% of respondent agreed and mention that forest managers led them to practice agricultural activities in the forest according to agreements to generate their income, while 6.7% and 1.1% of traders and Companies ,they did not have access to enter this forest. These mean that the majorities of respondent can benefits from forest, beside their participation in all activities of rehabilitation and conservation of forest resources.

Table.5.4: Contribution of forest in providing fodder for livestock

Fodder for livestock	Frequency	Percentage
Provided	84	93
Not Provided	6	7
Total	90	100%

Source: Field Survey, 2016

According to the result in table (5.4) which showed that there were very high significant differences at ($p < .000$) between respondents about the role of forest in providing fodder for livestock. About 93% of the households mentioned that forests contribute in feeding their livestock in study area, through many types of trees such as: *Ziziphusspina-christi* *Acacia nilotica*, *Balanitesaegyptiaca*, while only 7% of them said that there was no clear role for forest in providing fodder for livestock. (Kamwend, 1999), stated that fodder from some trees and shrubs are particularly important during dry seasons when availability of grasses is markedly reduced. Feeding livestock inside forest therefore takes place during this season when resources within public land have been exhausted.

5.3.3.. Types of animals Owned by Respondents

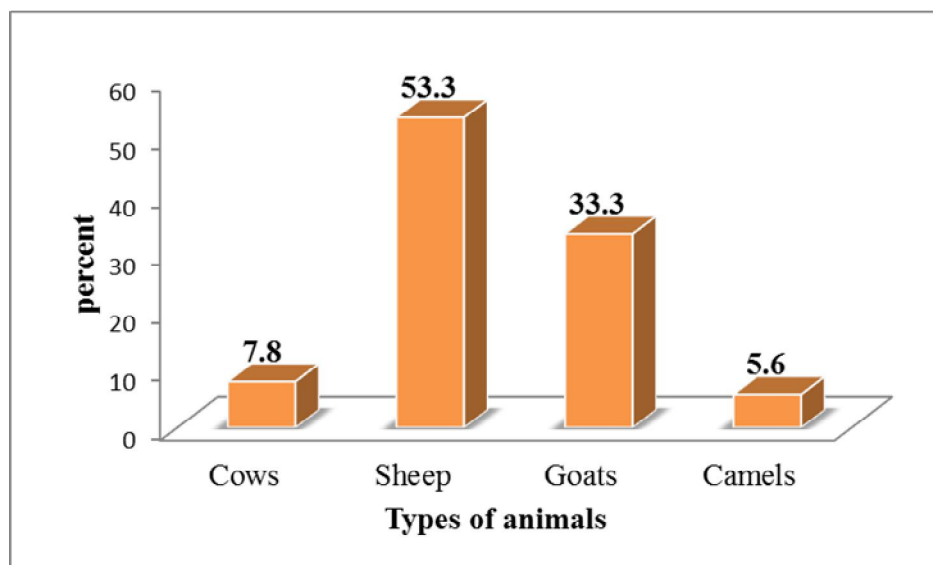


Fig : (5.14)Types of animals owned by respondent

The results in figure (5.14) show that there were very high significant differences at ($p < .000$) between respondents about types of animals that owned by the respondents. About 53.3% of respondent were owned sheep while 7.8% , 33.3% and 5.6% of them were own cows, goats and other respectively. These indicate that most of population care about sheep breeding and other rate of people cares about goats breeding and a few of them care about cattle/cows breeding. That is because of the quick profit of the sheep goats breeding and the easy way that people get when breeding sheep or goats not like other animals.

5.4. The contribution of the forest to reduce poverty among the local population of the area

Tables (5.5): Main Reasons behind increase the rate of poverty among the local communities in study area

Main reasons	Percent
The lack of income.	52.2
Low level of skills and abilities of people.	5.6
Shortage of health services	18.9
Conflicts and wars.	3.3
Shortage of malnutrition and the spread of diseases.	2.2
Lack of education.	17.8
Total	100

The result in table (5.5) showed that about 52.2% of respondent expressed the main reason behind the increase of poverty rate among the local people, this due to absence of sources of income fallowed by 17.8% of them mansion lack of education which result in their attitudes, also about 18.9% they said the short in health services in the study area. All this reasons lead to increase the poverty in area, because there were no permanents work and low price of crops.,

Figure (5.15): The role of women in increase the income generation of family

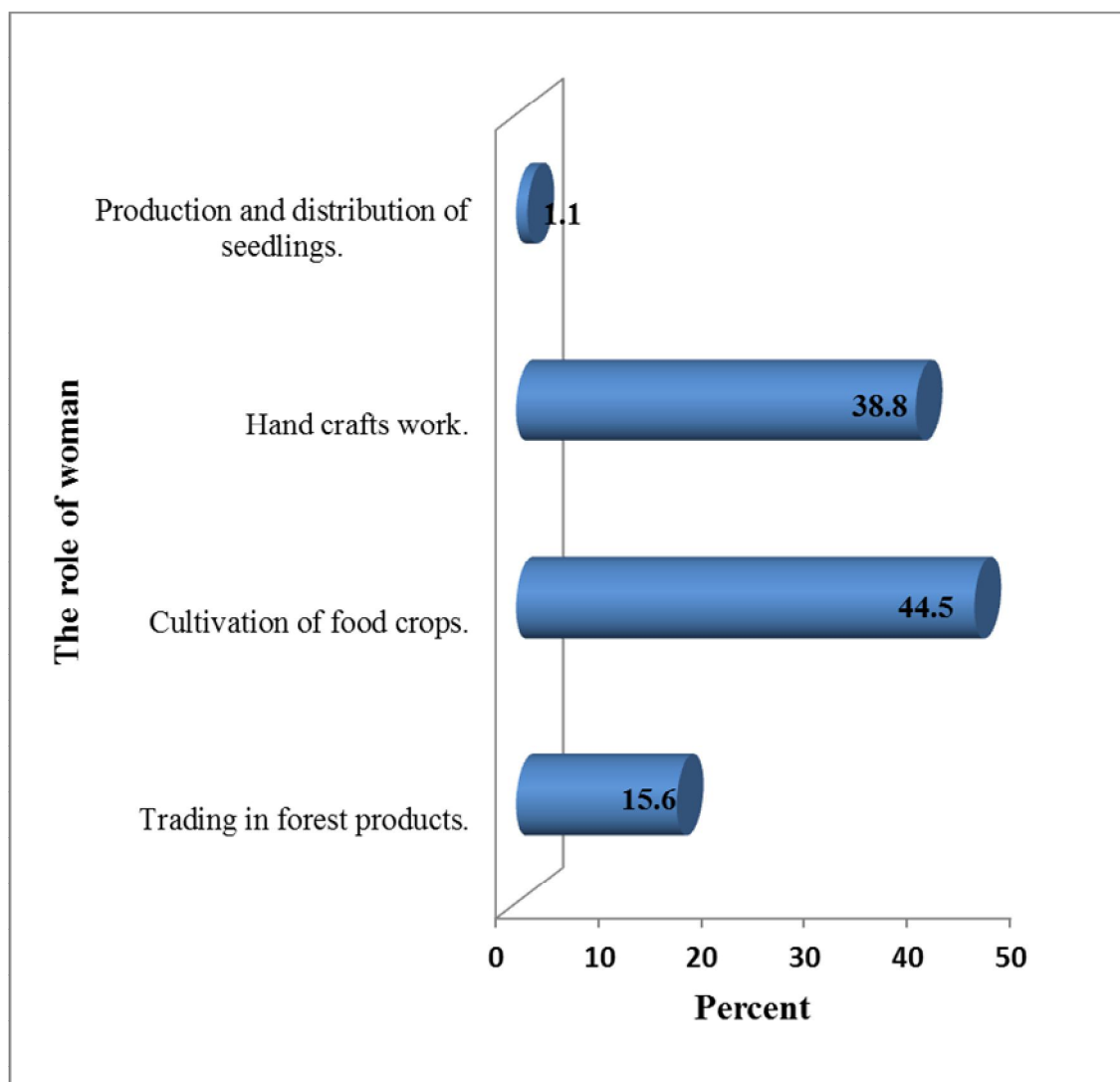


Figure (5.15) showed that 44.5% of women in study area cultivated agricultural crops to satisfy the basic need of household, then 38.8% they worked in hand crafts, while about 15.6% of them trading in forest products. Where the study found that women's contribution in the income represent in growing the crops beside the small-hand manufactures which made from the local products such as mat which made of palm tree leaves, hand bag. This happened as a result of the impacts of civil-war that leads women to work either because of the men minority who are the head families or they have disable affection or they died in the previous war. FAO (1997) who stated that women often dominate NTFPs extraction activities for both household's consumption and income generation.

Figure (5. 16): **The role of extension in increase the awareness of local people**

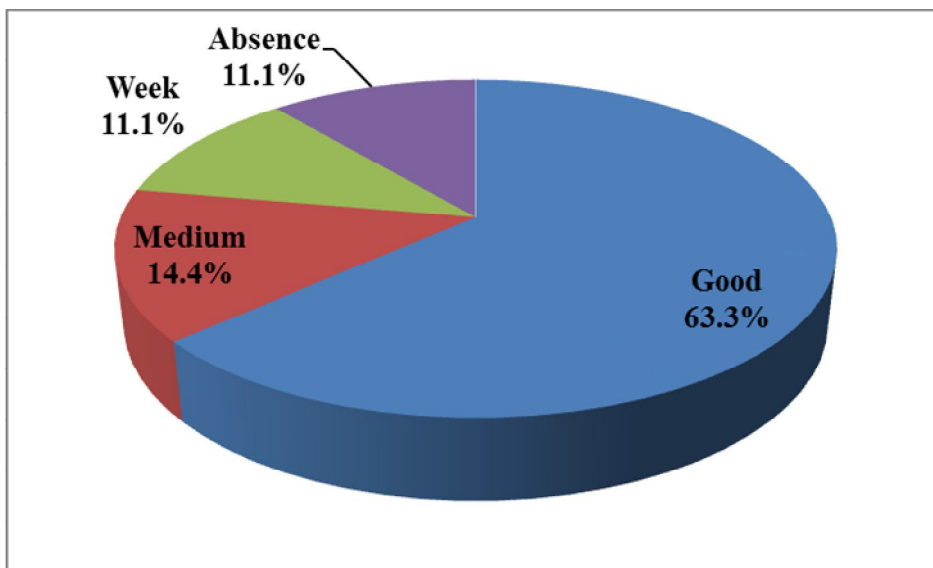


Figure (5.16) showed that about 63.3% of respondents were said that the forest extension have a big role in utilization of forest resource, then about 14.4% of them answered it has medium, while 11.1% of represented by group showed that there role of extension was week among the respondents and same as 11.1% of represented agreed that there were absences of extension.

The reason behind that due extension message that conducted in the study area which lead to increase the awareness of local people about the utilize the forest resource, on the other hand great awareness of the local people at the role forest in improving their basic needs.

Table (5.6): Types of extension message provided to local community

Types of extension	Frequency	Percentage
Training on forests activities	9	10.0
Production of seedling.	65	72.2
Protection and control fires	12	13.3
Others	4	4.4
Total	90	100

Table (5.6) According to the result above the majority of respondent mention that forest managers in study area provided different extension message. About 72.2% said that they production of seedling in home nurseries and distribution of those seedling, which reflected a great awareness a money the rural people about the improve of trees in their life, followed by 13.3% they Participation in Protection and control fires and only about 10% on the field of forests. These because they were aware about the important of trees in their life, beside these they have a great role in protection the forest against fires voluntary when helping needed.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusions:

- The forest contributed mainly in providing the basic needs for the local people such as charcoal, firewood collection, opportunities of work inside the forest, producing honeybee and fodder for animals.
- More than 50% of respondents were practice cultivation in forest through seasonal contracts and same time they look after trees and also they participate in activities such broad casting seeds, thinning and final cutting.
- The majority of respondent the deepened mainly on forest products (fir wood, charcoal) as source of energy.
- According to the result obtain most of respondent work in the forest through collection fuel wood and produce cheroot to support their income generation and improvement of livelihoods.
- Its population increase and depend on forest resource an increase need for agricultural crops which lead to expansion the area inside the forest.
- The forest products play significant roles in food security and supplementing household food in-take particularly during the period of scarcity of food when the previous year's crops are exhausted and the new crops are yet to mature.
- About 93% of the households mentioned that forests contribute in feeding their livestock in study area, through many types of trees such as: *Ziziphus spina-christi*, *Acacia nilotica* and *Balanites aegyptiaca*, beside residues of agricultural crops.
- Most of respondent about 70%of respondent were educated which could help to understand the extension messages and welling about their participation in activities concerning the forest

6.2. Recommendations

- Encourage of community forestry and participation of local people forest management lead to sustain production of forest and reduce the pressure to depend of people of natural forest.
- Enhancing extension methods to raise awareness of local people about the important of forest in their live.
- Alternatives source of energy and income generating should be introduce to reduce the consumption of wood and charcoal.
- The FNC should put a great attention for the role of forest in improving the livelihood of rural communities as integral part of national forest strategies planning.

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