

EFFECTS OF COMMUNITY ACTIVITIES ON KETUMBEINE FOREST ON
LOGIDO DISTRICT-ARUSHA: A CASE STUDY OF KETUMBEINE
MOUNTIAN

BY

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DECLARATION:

I Luca Mosses Ole Rikoyian Massangwa do here by declare to the Faculty of Social Sciences of Kampala International University that this work is my original Research and it has not been submitted for any academic degree in any other Institution. Any source of information is duly acknowledged.

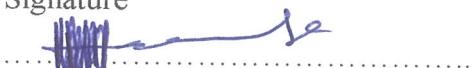
Signature

Date and place..... 23/10/2007.....

APPROVAL

This research dissertation has been submitted for examination with the approval by the university supervisor.

Signature



DR. ATEENYI TWAHA LUBEMBE

Date

23.10.2007

DEDICATIONS:

I dedicate this research to my beloved Mum, Birte. She has been the pillar of and fountain of my firm virtues

ACKNOWLEDGEMENT:

First and fore most my sincere gratitude goes to beloved my Mother Birte Wittkopf without whose financial assistance, advice and encouragement nothing would have been achieved.

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Lastly, I thank my fellow classmates for all cooperation they showed me since we began till the end of the course.

GOD BLESS YOU ALL.

LUCA

ABSTRACT:

Ketumbeine Forest Reserve is in Longido District Region, Tanzania. This forest has undergone rapid land use change resulted from population increase from 1980's to the present. Increase in population has put a lot of pressure on the forest land.

This study was carried between January 2007 and June 2007. The objectives of this investigation were to assess the contributions of community activities to the destruction of Ketumbeine forest and the overall loss of Biodiversity forest land. The specific objectives of this investigation are to identify the major social economic activities around Ketumbeine forest, to investigate the impacts of this activities on Ketumbeine forest, to determine the possible measures to control the impacts caused by community activities on Ketumbeine forest.

Systematic random sampling techniques were used to select a sample size of sixty respondents for five villages around Ketumbeine forest reserve. Photographs, meetings, observation and questionnaire were used to gather information from the community. Land use and land cover mapping classification systems was used to identify land use in the study area. Forest methodology was also undertaken during the study in order to identify different kinds of activities undertaken near the forest, describe by comparing between the present conditons and also mapping of the forest land.

The study found out that the major activity causing forest degradation was crop cultivation. Other activities like charcoal burning, bee keeping, live stock, and timber production also cause forest destruction. The number of immigrants is coming to occupy the villages around Ketumbeine forest is also high. This high population pressure results into high demands of forest products. The age group also determines the destruction of Ketumbeine forest. The age group between 31-45 as a high percentage as compared to the rest of the age group. This is because many of the people of this age have got their own independent homes and they need the forest resources in order to sustain the needs

of their families. The level of education also determines the rate of forest destruction. The study found out that pastoralists have a good contribution of conserving the forest on one way or another, this is because they do not frequently cut down the trees, they depend on their livestock and they just find it more suitable to graze their live stock in grasslands and not in the forest. They also use simple materials to construct house that is cowdung and near by bush. The study found out that many of the respondents have realized lost of environmental changes resulting from the destruction of Ketumbeine forest.

The study concluded that the change of forest land to other land practices in Ketumbeine has created so many problems to the natural environment. Some of those problems include soil erosion, loss of diversity, extinction of different species, climate change and other ills in the environment other home. Ketumbeine forest has played a greater role in protecting the water catchments of this land for so many years. Changing the live style of the Maasai community from normadic to agro pastoralism encouraged the destruction of Ketumbeine forest reserve.

The study recommends that the government should impose laws and policies to control the destruction of forest and if the laws and policies exist already strict measures should be put in place to re-enforce and punish those who go against them. Different NGO's should be introduced so as to ensure sustainability and regeneration of Ketumbeine forest. Government and NGO's should introduce alternative sources of energy to reduce the communities overdependence of forest for fire wood. Forest experts should be given opportunity and un divided attention during their publications and passing/offering of knowledge about forest conservation and management in Ketumbeine forest reserve.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 General

Tanzania is located in East Africa between longitudes 29 degrees and 41 degrees East and Latitudes 1 degree and 12 degrees South. Her neighbours are Uganda and Kenya in the North, Mozambique and Malawi in the South, Zambia in the South West, DRC in the West, Rwanda and Burundi in the North West and the Great Indian Ocean in the East.

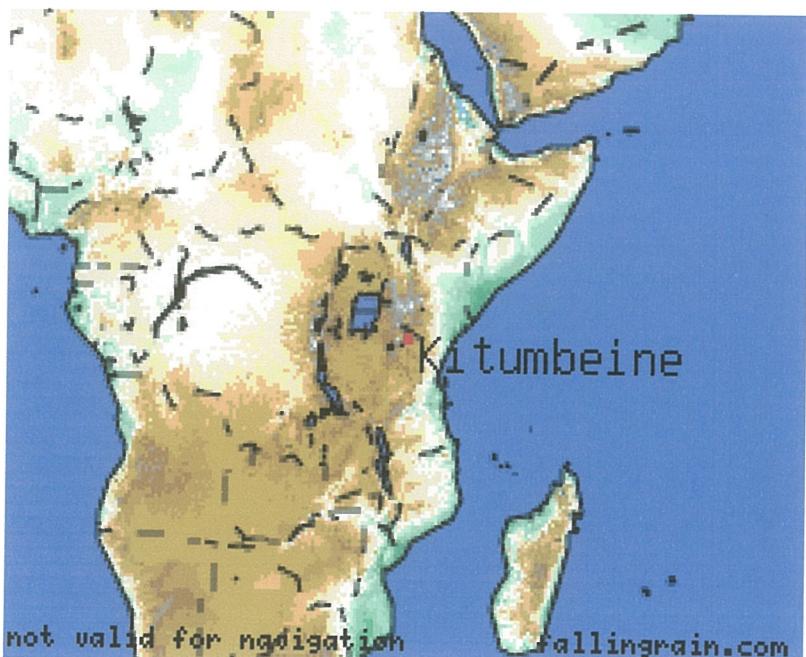


Figure 1.

A map of Africa showing the location of Tanzania and Ketumbeine forest in red colour.

1.2 Background Information.

The population increase in Ketumbeine has created many problems to the natural forest and the environment in general.

Initially, Maasae communities do till the land. The land was owned communally, and it was meant for livestock keeping. However, the majority of the pastoral communities have a polygamous nature of life. This increased population in a situation where land is a fixed resource. The overdependence of the fixed land for livestock keeping rendered so many challenges to the livestock keepers in Ketumbeine, especially during dry season when grasses are over or dried up and there are no reserved lands for grazing dry period. Many of the livestock in the Longido district died between 1997 and 2000. The starvation of livestock in Ketumbeine and Longido district as a whole, laid the beginning of crop cultivation to the Maasae community.

Many pastoral Maasae communities in Ketumbeine/ Longido started tilling the land in 1980's because of the need to diversify their economy (TFA, 2001). Because of climatic factor, the tilling of land is only possible in the higher altitude of mount Ketumbeine and other high lands in Longido district.

Since the land was owned communally, many people started settling and cultivating tracks/ plots of land around Ketumbeine forest.

As people grew in numbers, plots for cultivation also reduced and this has driven people to cult down the natural forest so as to get new plots to cultivate. However, the method used to clear forest is bush fire and unwise/ reckless cutting down of tree which ended up reducing the forest land year after year.

Population increase in Ketumbeine and its impacts on Ketumbeine forest, is doubled by the free movement of people throughout the country, attracting foreigners to settle and further destroy the forest, and on the hand, the overall illiteracy rates throughout the land gave room to a massive destruction of Ketumbiene forest.

The intensification of production of useful plants and animals, humans have made ever increasing demands on the natural environment (UNESCO, 1991). This “agriculture revolution” was a starting point for securing and raising food production and so encouraged settlement, population increase, division of labour and the formation of organized states. Ever increasing requirements of space for ever growing settlement demand additional natural resources, thereby creating special needs and more intensive use of the available space.

Large scales changes in land use and wide spread felling of virgin forests have led to serious forest degradation and regional changes in water balance (LaMoreaux, 1987). The impacts of such human have a global significance both for future socio-economic development and for the environment.

1.3 Statement of the problem.

Ketumbiene forest reserve in Longido district has undergone rapid change since 1980's resulting from community activities caused by population growth.

The growth of population is caused by both natural growths due to lack of enforcement and implementation of birth control laws. The rapid population growth has put a lot of pressure on the forest land and its resources. This has led to illegal falling of trees and burning of bushes in and around Ketumbiene forest. People have been clearing forest in order to get enough land for crop cultivation, livestock feeding grounds areas of settlement and for collecting raw materials for construction and other domestic and socio-economic purposes/benefits. All these community activities have led to destruction and however the reduction of forest land and other valuable resources.

The destruction of Ketumbiene forest has to a greater percentage contributed to irregularities in climate (rainfall and temperature) which in turn caused problems to the hydrological balance of the area.

Liniger and Decurtins, 1990 about the water balance of the Naro Moru river basin of Mt. Kenya, have shown that a forest is a larger contributor to the river flow and ground water recharge through infiltration.

The main factors contributing to the destruction of Ketumbiene forest reserve are; illiteracy and lack of awareness about importance of conserving the forest, government negligence on the local forest management and conservation of its natural ecosystem (UNDP-GEF-FAO Project, 2000).

Due to population increase associated with illiteracy and lack of awareness on conservation and management of forest resources in Ketumbiene ward, it is most likely that in the future more encroachment to the forest land will lead to many problems to forest resources if no adequate measures to be taken. This research is therefore, geared towards investigating different community activities and their effects on Ketumbiene forest resources.

1.5 Study Objectives.

1.5.1 General objective.

The general objective of this study is to assess the contributions of community activities to the destruction of Ketumbiene forest reserve and the overall loss of Biodiversity in Ketumbiene forest land.

1.5.2 Specific objectives

The specific objectives of this investigation are:

- To identify the major socio-economic activities ~~around Ketumbiene forest~~.
- To investigate the impact of these activities ~~on Ketumbiene forest~~.
- To determine the possible measures to control the impacts caused by community activities ~~on Ketumbiene forest~~.

CHAPTER TWO

2.0 LITERATURE REVIEW.

2.1 General Overview.

2.1.1 Concepts

2.1.2 Land use and land cover

Land use refers to the human activities or economic functions associated with a specific piece of land e.g. agriculture, forestry, mining, recreation, residential houses, industrial construction, grazing e.t.c. Hence, land use is a systematic manipulation of one or several ecosystem for human needs. This manipulation may lead to positive effects and to the enhancement of ecosystem's life support processes, or to negative effects resulting in land degradation and diminution of its productive capacity. But land is part of an ecosystem. Therefore, both land and ecosystem are dynamic entities and the magnitude of alternations in land's attributes depends on specific land use (Lal, 1994).

Land cover denotes the physical state of the land (Turner and Meyer, 1991). It embraces, for example, the quality and type of surface vegetation, water, and earth materials. Land cover changes fall into two major types i.e. conversion and modification. The former is a change from one class cover to another; for example from grassland to cropland. The latter is change of condition within a land cover category, such as the thinning of a forest or a change in its composition.

Land use is likely to cause some land cover change, but land cover may change even if the land use remains unaltered (Turner and Meyer, 1994).

Weber (2001) defines deforestation as the long term permanent loss of forest cover and implies transformation into land use. Different authors (e.g. FAO 2002, Shiobhan, 2004 and Hedger, 1997) define a forest as a minimum area of land of 0.05-1.0 hectares with free crown cover of more than 10-30% with trees, with potential to reach a minimum height of 2-5 meters at maturity in situ (FAO, 2002; Shiobhan and Catherine, 2004).

According to Rebledo (2001) and Scrase (2001), human communities are also part of the forest since many human beings live in them, interacting with forests and obtaining number of goods and services from them, which ensures their survival. A large scale commercial plantation is composed of one or few species of trees planted in homogeneous blocks of the same age (Rebledo, 2001; Scarce, 2001).

2.2 Causes and reasons of forest degradation

Myers (1991) identified poverty, unequal land distribution, low agricultural productivity, rapid population growth and various inappropriate and counter-productive government/public policies as underlying causes of deforestation. This view is also supported by Perlez (1991), Nicholson and Yin (2001), WTI (1985), Shukla, (1990). They argue that the rural poor, being themselves victims of the development process, are often caught in a vicious cycle of poverty that forces them into destructive patterns of land use to meet the basic needs for food and fuel. Other factors such as a break down of traditional common property management and commercialization of the forest resources have also led to increasingly severe pressure on forests in most developing countries (Salati, 1991). Therefore, to regard the problem of deforestation as a consequence of population growth alone and the subsequent increase in the demand for good, fuel and other forest products is to oversimplify the problem, creating a danger of mistakenly formulating inappropriate policies and strategies to solve it.

As national economies were drawn into the world market, peasant producers were increasingly drawn into national markets (MacGaffey, 1991). This meant intensifying agricultural production to produce the food required and a marketable surplus in order to obtain the income agriculture led to accelerated conversion of forest areas to crop and pastureland.

Coupled with the above, the modernization process that was initiated introduced cultural attitudes which saw the forest as a resource to be cut down and used (Jarosz, 1993). Lumber industries were started with the introduction of new technologies in order to meet

foreign demands for tropical timber. This led to the opening up of forests areas for commercial logging, which played a key role in the conversion of forests in most developing countries. Deforestation caused by commercial logging is thus believed to be, by and large, a result of economic expansion that fails to take account of the value of the environment (Information Unit on Climate Change, 1993).

A study represented by Lanly, 1982 indicates that, most types of forest encroachment involves clearing the land of trees, usually by burning, and cultivating it as long as it will produce crops. On fertile soils, with appropriate farming practices, it may be possible to continue farming indefinitely. Quite often, however such informal forest clearance marks the beginning a downwards spiral in the productivity of the land. The main reason is that the squatters who move into forest areas rarely have the knowledge or skills necessary to manage the land sustainably in accordance to traditional practices. Neither do they have the resources needed to practice modern agriculture often the land is farmed to exhaustion, leaving it permanently degraded and useless either for Agriculture or productive forestry squatter families are then faced to move deeper into the forest, and clear new areas to farm. Mountainous areas are at particular risk. Covering the steep hillside to permanent agriculture requires a variety of measures such as contour ploughing, the construction of terracing, the selective retention of trees in critical areas, and careful choice of crops and ground cover plants to protect the soil. Frequently, these are beyond the skills and resources of most squatters.

The importance of fire is emphasized in the recent FAO report on tropical forest resources;

According to Lanly, (1982), fire probably represents the most serious factor for degradation in open trees formations and coniferous forest. Accidental fires are rare; the majority of them are started for various reasons for grazing, for cleaning, for collection of secondary products, for hunting, for cropping e.t.c. these fires are rarely controlled and they all burn more easily. And are all the more destructive, the later they are started in the dry season.

2.3 Effects of community activities on forest

From the preceding discussion, Jarosz (1993) also asserts that growth of herding on marginal lands has also had a significant impact on the region's forests. As increasingly marginal land has come under cultivation, particularly within semi-arid countries, pastoral agriculture has been pushed out further to the fringes (Jarosz, 1993; Matloff, 1995). In many instances, farmers are forced to harvest forest products to feed their herds (Perlez, 1991). Not only do these practices reduce Africa's forest resources; they also accelerate the process of desertification. A review by Anderson (1993) emphasizes that while overgrazing kill the grasses that are necessary to complete the effects of soil erosion, grazing within forested areas damages the foliage and root systems of the plants and trees which not only maintain the health of the soil but provide a bulwark against erosion and desertification.

According to the Republic of Uganda (1997) another contribution to the problem of deforestation in Africa is that many Africans depend on the use of forest products principally wood and charcoal to meet their cooking and heating needs. Because of the demands of an ever-increasing population and the effects of externally driven economic reforms, alternate sources of energy have become very expensive and difficult to obtain. Currently, almost to meet ninety percent of Africans depend on firewood, charcoal and other biomass fuels to meet their basic energy needs. As Africa's population continues to grow and get poorer, forest resources will represent ever more important fuel resources, reducing the likelihood of the implementation of sustainable forestry practices (United Nations Environmental Programme, 1987; World Resources Institute, 1985).

In addition to its environmental consequences, continued unsustainable forestry practices will have a negative long-term effect on the region's economy. Forestry plays a more important role in the African economy than in regions (Porter, 1991).

Recent studies by Whitney (1996) have revealed that Africa has been devastated by deforestation. The thought that Africa is mostly jungle and wide open savanna with all sorts of wild animals roaming around is more myth than fact (Anderson, 1993). Africa's

open plains have been reduced mostly to grazing land and its rain forests are becoming less and less a prominent feature throughout the continent (Cleaver and Schreiber, 1993).

A critical study by Hamilton (1982) revealed that economic exploitation of poorer countries by the world's industrialized nations underlines much of the over-exploitation of tropical ecosystems by populations without land or employment. This insight must become the foundation for the reform of bilateral and multilateral aid policies and relevant world trade practices if the tropical rainforests are to be saved. This will mean among other things, dealing with the problem of Third World Debt (Hamilton, 1982; Burgess, 1993).

Variations in the rate of deforestation, however, exist from one country to another. In Ivory Coast and Nigeria, for example, the rate has been high as 5-6% a year (Jarosz, 1993; and Information Unit on Climate Change, 1993). Ivory Coast alone is believed to have lost over 56% of its forest cover since 1965 (WRI, 1985) Burkina Faso loses about 85,000 ha a year to make way for cash crops.

The result by Houghton (1991) revealed with the largest rainforest areas are also among the world's most heavily indebted countries. Hence they are now under tremendous pressure to cut and clear rainforests to finance debt repayments (Houghton, 1991; Hecht, 1985).

In Burundi, rates of forest clearing have risen by almost 48 percent since the close of the 1990s. in total, Burundi lost 137,000 hectares- or 47 percent of their forests cover- between 1990 and 2005. today only some 153,000 hectares remain in the country- one of which is considered intact forest. As a result of this forest loss, gorillas and elephants are extinct in Burundi (WOODEC, 1987; FAO 1988).

Tanzania, like many African countries has been experiencing rapid rates of deforestation. However, estimates of the magnitude and rate have varied widely. Antoshhek (1998) estimated that Tanzania has been losing between 300,000 and 400,000 ha of forest per annum. The FAO and World Bank estimates give an average annual rate of 130,000 ha or

0.3% (WRI 1985; World Fund For Nature, 2000). FAO (2002), on the other hand believes that the annual rate of deforestation has already exceeded 700,000 ha. Such disparities of data have made it difficult to assess the magnitude of the problem and to come up with strategies aimed at minimizing it and dealing with its impacts.

Kichodo (2003) and world Bank (1995) outlines the reasons for the disappearance of forests in Uganda as, among other; population pressure on land, increased demand for food, increased energy requirements, forest fires, unfavorable political climate, poor harvesting methods of forests, and poor agricultural techniques. Kichodo (2003) also outlines the effects of forest destruction as follows:

Reduces amount of rainfall, the green house effect, serious soil erosion on steep slopes, destruction of wild game habitat which leads to extinction of some animal species for example white rhino which is now extinct, dwindling levels of lakes and rivers, and the destruction of bio-diversity.

According to FAO, 1983a on increased demands for commercial forest products, argue that (FAO), forests are being cleared or degraded by local people cutting wood to use for home construction, fuel (charcoal and fire wood), and many other products. Total consumption of wood fuel in developing countries increased from 1,100 to 1,400 million cubic meters between 1973 and currently amounts to 82 percent of all the wood harvested in developing countries.

International tree crops journal 1985 wrote about the “Increased Demand for Fodder and Grazing” said that forest and wood lands supply browse and pasture for livestock but as in the case of fuel wood collection, more intensive exploitation has led to overuse and depletion of tree resource, particularly in region of lower rainfall. The combined effects of soil exhaustion and erosion from one non sustainable agricultural practices, fuel wood harvesting, and grazing have resulted in the severe desertification of 1,350 million hectares, of 30% of the world’s arid and semi-arid lands. Clearing forest for commercial grazing is the major cause of deforestation in many Latin American countries. Poor grazing practices can be inhibiting re growth of vegetation.

Amrit L. Hoshi, Kumd Shretha, Harihar Sigded on Deforestation and participatory Forest Management Policy in Nepal saw that, deforestation (changing of forest into the other uses) and forest degradation (the deterioration of forest quality, together make up one of the biggest socio-economic and environmental problems in Nepal). Various reports suggest that, deforestation and forest degrading which have occurred in the middle of hills, was common for the last hundreds of years and that the rate of deforestation is neither rapid nor local market, such as fuel wood charcoal and small timber. Once deforestation took place other problems occurred such as land slide, floods, forest fires and shortages of firewood, timber, fodder, grass, livestock bedding and compact for farming in the locality.

2.4 Importance of forests on the environment

2.4.1 Water recycling;

Water is an important forest product. Forest soils are against sponges. They soak up rain (water) during wet season so that the water seeps slowly into the ground during the dry season. This helps to regulate floods during rainy season and allows streams to flow steadily in dry season balancing the water availability between two seasons (Kuechli, 1997).

In high mountains forests, winter snow is shaded from the sun and sheltered from drying winds and often lasts well into summer. Most towns and cities depend of forest reservoirs (Weber, 2001). But when the forests are cut, the soil is exposed and washes away or blows away. The rain runs off quickly causing erosion and floods. Little water penetrates in the soil and this explains why areas where forests have been cut dry faster and have little water available al year around (Van Male, 2003; Poschen, 200).

2.4.2 Source of wildlife

Forests are not only vital to the survival of wildlife, but are also the starting point for many rivers. These rivers provide water. These bodies of water act as filters and sponges for toxins that would otherwise pollute valuable drinking water. This water source must

be preserved and restored where possible In order to maintain critical habitat for wildlife and abundant sources of water for everyone. (Pedroni, 2001; Perry, 1991; Poffenberger, 2000).

2.4.3 Control of floods and erosion:

Forests do greatly in control of floods and soil erosion. Forests on hillsides especially control running water that would take way soil in large volumes. Where forests are established, floods are always regulated (Richard, 2001). While the forest is there the root keeps the soil porous so it can absorb large amounts of water (Cavelie *et al*; Watershed, 1998; UNEP; 2002).

2.4.4 Nutrients to the soil:

The decayed leaves and other decomposition plant materials add a great of humus to the soil making it spongy. This enriches, the soil hence supporting plant growth (Lester, 1984).

2.4.5 Social environment:

People look at forest as places for recreation, hiking, pick-nick, sight seeing, fishing, hunting, swimming and other outdoor activities become more popular every year (Sigurdson, 2000).

2.4.6 Cultural environment:

Within Huri forest, of the Congo Basin the Mbuti are among African most ancient residents (Hoesfloodt, 1997). And they have retained high degree of dependency on the forest resource base and skills to exploit it efficiently; they are a population of hunters and gathers. Related to the Mbuti are a dozen of other ethnic groups such as Efe, Aka and Asua, inhabiting the forest of nine African countries across Congo basin. Although outsiders commonly refer to these people as pygmies, this generic term is rejected by the Muti, Efe and other people, and is inadequate to cover the wide diversity found in their languages, cultures and ecological relationship with the forest. Deforestation therefore

means displacement and extinction of such cultures (Nicholson and Yin, 2001; Poffenberger, 2000).

2.4.7 Economic environment:

The uses of forest products are very numerous. It has been estimated by (Poffenberger, 2001) that trees and tree products are used in about 5000 different ways. Lumber business is one of the most importance branches of Canada's great forestry industry. It supplies man's daily needs. Lumber resources permits large shipments to other countries thus increasing her international trade (Crutzen, 1990)

2.5 Measures of forest degradation

In Madagascar, the problem of deforestation began when it was annexed as a French colony in 1986 (Burgess 1993; And Bassett, 1993). Other researchers (WWF For Nature, 2000, Chazen, 1998; and Hamilton, 1982) reported that if the forest continues to be rapidly destroyed without taking this biodiversity measure into account, it could have serious ramifications on Madagascar, Uganda and the world.

The international Union for Conservation of Nature and Natural Resources, 1980, raised a full discussion on genetic and Ecological Giversity and strategies to address on the importance concerns. This discussion of the consequences of deforestation clearly indicates the need for those countries that depend heavily on forest and trees to reassess the ways and means of managing the resources to re-establish a satisfactory balance between trees and land. One major means was through social forestry programs.

CHAPTER THREE

3.0 DESCRIPTION OF THE STUDY AREA AND METHODOLOGY.

3.1 Description of the study area.

3.1.1 Geographical location – 2°50'S 36°15'E.

Ketumbiene forest is located in Longido District - Arusha Region in the north of Tanzania. The reserve covers the isolated peaks of Ketumbiene to an altitude of 2860 m. It is surrounded by the Great East African Rift Valley.

The study area

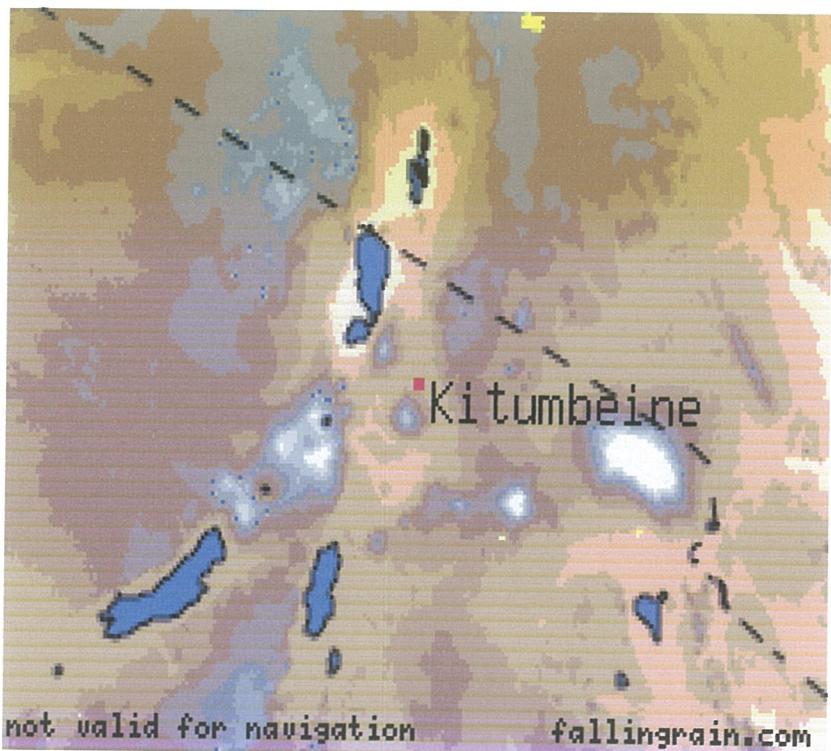


Fig. 2 A Map of Northern Tanzania showing the location of Ketumbiene forest in red colour.

3.1.2 Topography and Drainage.

The five villages around Ketumbeine forest are located on the locally rather gentle slopes of mount Ketumbeine. The whole land is full of valleys and most of them are V-shaped valleys, steep slopes, rivers and sub-hills. At the foots of the Ketumbeine mountain, there are plains lands and gently sloped lands begins to about 1900m up the mountain.

The forest has occupied the locally gently sloping areas the steep slopes and the mountain peak to about 2860m at the top.

2.1.3 Soils.

Volcanic. The lower slopes and surrounding country are covered with loose stones and boulders.

3.1.4 Vegetation and Land use.

The lower slopes are covered in dry woodland from 1370-1670 m. Dry montane forest occurs above 1670 m.

Grassland occurs on ridge tops between tongues of dry montane forest, and two large glades known as *Esikalet Glades* occur at 2680,.

Dry woodland: *Acacia spp.*, *Balanites sp.*, *Combretum sp.*, *Cordia sp.*, *Osyris sp.*

Dry montane forest: *Calodendrum capense*, *Cassipourea malosana*, *Cussonia Spicata*, *Erythrina abyssinica*, *Euphorbia candelabrum*, *Ficus sycomorus*, *Juniperus procera*, *Olea europea subsp.africana*, *Olea capensis*, *Teclea sp.* At higher altitudes, *Juniperus procera* is concentrated in some places and scattered in other places with: *Cassipourea malosana*, *Clausena anisata*, *Ekebergia capensis*, *Hagenia abyssinica*, *Olea capensis*, *Prunus Africana* and *Teclea sp.*

Grassland: *Cynodon dactylon*, *Cyperus spp.*, *Eleusine jaegeri*, *Juncus spp.*

3.1.5 Catchments Values.

There are seventeen streams coming off Ketumbeine, of which nine have water flow. Water from Irporokwa River is piped to Ketumbeine village and is the only water supply on the east side of the mountain. It is used by people, domestic animals and the game. Elang'ata Dapash river flow south, and on the north Olipakini stream supply water to Ilorienito and their domestic stock.

3.1.6 Timber values

The largest concentration of East Africa Cedar (*Juniperus procera*) is on the south side near Okejurangai where a saw mill is operated, and it also occurs in the West. Loliondo (*Olea Capensis*) is abundant on the west side. Other timber includes: *Albizia gummifera*, *Calodendrum capense*, *Cassipourea malosana*, *Ekebergia capensis*, *Olea europea* subsp.*africana* and *Prunus africana*.

3.1.7 Biodiversity values

This study evidenced that the area is suitable for the conservation of world life and nature in general.

3.1.8 Climate

3.1.8.1 Temperature and Rainfall

Oceanic rainfall with continental rainfall. Nearest rainfall station is Longido. Estimated rainfall: 500-750 mm per year; with a mist effect at higher altitudes. Dry season is May to October. Estimated temperatures: 22°C maximum (March), 17°C minimum (July) at lower altitudes.

3.2 Methodology.

Primary data on land us and land cover and forest conditions was obtained through carrying out the field work (ground truthing).

Secondary data was obtained through searching from previous publications such as previous research, fliers, Arusha times news paper, the IUCN bulletin.

3.2.1 Land use and land cover mapping.

There is no land use and land cover classification in system in Tanzania. The classification that was used was the USGS lad use and land cover classification system (Anderson et al., 1976). The classification was adapted to include the following classes grazing land, Agricultural land , forestry land, crop cultivation land, settlement land. Therefore the investigation was able to identify five land use in the study area. This study was confined to an area of about 12860 ha and mainly covered the five villages around Ketumbeine forest.

3.2.2 Forest survey methodology.

The main reason for forest survey is to identify different kinds of activities undertaken near the forest, describe by comparing between the present conditions and the past conditions and also mapping of the forest land.

A period of 7 weeks was available to prepare the field work. A small map was compiled indicating possible access roads, the drainage system and settlement was drawn after studying the aerial photograph covering the area and this was under a mirror stereoscope.

The names of the five villages around Ketumbeine forest (useful during orientation in the field) were obtained by looking on Longido map 41/1 (UNDP-GEF-FAO Project, 2000). Road and foot paths were distinguished provisionally.

The photo-interpretation started with the recognition of four land scales. These are mountainous, gentle slopes, plains and valleys. The recognition of the landscapes was on the basis of the preliminary aerial photo-interpretation using geo-pedagogical approach

(Zink, 1989). This has enabled the recognition of relief form such as hills, steep slopes, plains, gentle slopes, river/valleys.

3.2.2.1 Field Reconnaissance.

The ten days field reconnaissance trips were carried out. The purpose of the trips was to have an overview of the survey area with respect to all the relevant aspects including, topography, or relief, the landscape, forest land, the vegetation as a whole, land use and different uses of forest resources/ ecosystem.

During reconnaissance, different photographs were taken to indicate the land use practices, forest margins and the landscape. (See in plate no. 1-5b)

3.2.2.2 Design of the field survey.

The observation made from the field after field reconnaissance trips, were used to design the actual survey work for the forest and community activities. Foot paths and roads to the observation sites were marked basing on the land use and land cover, the relief and topography as observed on the aerial photographs.

A mark of a planted tree in each surveyed area was put to ensure forest margin at the time this study was carried out.

3.3 Techniques of the study.

3.3.1 Observation and site seeing Method.

The researcher was able to evidence different parts of forest where the community has destroyed because of crop cultivation, and open grounds for livestock feeding. This study evidenced that, to a greater percentage the observed sites of the forest land were destroyed by bush fire. The researcher found so many logs of tree remnants showing burnt sides. The pieces of burned logs are now used as fire wood after the government has intervened with laws and regulations about forest environmental management. However, these laws came so late in 2000 and the following years. Some villages like Olchorronyokye and Losirwa and Iloirienito have some squatter families in the forest

already for a period of more than 20 years from the year government laws and regulations were put in place, thereby, became so difficult to replace them out of forest since the land is occupied. This situation necessitated the re-mapping of new forest land. However, this has been done by the local authority/leaders.

It is evidenced by this study that the squatter families have been a great barrier for the development of natural forest. Keeping/ pasturing of domestic animals around and inside the forest margin have proved failure to the growth of young trees. Also continuous cutting down of trees around and inside the forest with the aim to obtain timber for construction and fire wood for food preparations, has further discriminated the development of forest land.

It is noted that, after harvesting, people burn wastes from fields and also bushes to get new areas for expanding their fields. Fire however knows no boundary and therefore, clear everything on site. Seasonal bush fires, has also contributed to the reduction of Ketumbeine forest.

Evidence of loss of habitats for wild animals was clearly identified during observation, where very few antelope species, leopard, buffaloes, elephant were hardly found in the isolated grasslands, however, inside the forest and at the peak of Ketumbeine mountain where thick bushes and small patches of grasslands are found. This indicated to the researcher's observation that, wild animals were pushed up to the mountain peak, because of community activities.

3.3.2 Photographs.

These were taken in different parts of the forest were community activities have shown a clear indication of invading the forest. Farms and other activities are clearly shown in photographs in different parts of the forest. These photographs brings further evidence to other scholars of researchers the extend of forest destruction in Ketumbeine.

3.3.3 Meetings.

The researcher conducted different meetings in different villages around the forest where people got opportunities to raise their views about the benefits of forest to the community, the consequences of their of their activities to forest, reasons for forest destruction, the role of forest government in protecting the forest and other related ideas were both included.

3.3.3.1 Benefits of forest to the community.

85% of the participants in different meetings were able to raise the following ideas about benefits of forest to the community.

Forest is mostly demanded by the majority in the population in order to obtain;

- Timber for construction and this is by 100% of the population.
- Fire wood also by 100% of the population.
- Honey 45% of the population.
- Climate moderation 80%.
- Medicinal plants by 90%.
- Beliefs, God of thunder and rains is believed to come from the forest by 10%.
- Livestock feeding – 75%.
- Only 15% remained with the idea that forest has only provided them fire wood and construction materials and that no other benefits has given them instead many costs, for example, forest keeps the dangerous animals like, lions and leopards which feeds on their domestic animals, baboons as well as gorillas invade their farms and eat crops.

CHAPTER FOUR

4.0 RESEARCH FINDINGS AND DISCUSSION.

4.1 Introduction.

Chapter four includes the findings of the research study and discusses critically each of the results obtained. It is arranged in sub-sections observing the order of the objectives of this study as; personal information of respondents, Types of land use practices around and within Ketumbeine forest.

4.1 Demographic characteristics of respondents (personal information)

The researcher used systematic random sampling techniques to select a sample size of 60 respondents from five villages around Ketumbeine forest reserve. The five villages were Olchorro nyokye, Elang'atadapash, Iloirienito, Losirwa and Isokon. 30 male respondents representing 50% and female respondents representing 50% of the total sample size were approached for face to face interviews using the questionnaires.

4.2 Types of land use practices around Ketumbeine forest

During the study, the researcher was informed that the major activity causing forest degradation was crop cultivation. However, the respondents further suggested that there were other activities carried out, these included charcoal burning, bee keeping, live stocking and timber production.



Plate. 1 Crop cultivation in the Olchorro nyokye village Ketumbeine.

The researcher also noticed that many of the inhabitant 63.3% had lived in the areas around Ketumbeine for more than 5 years, 18.33% had lived in the villages for the period of between 1-5 years and 18.133% of land just lived in the villages around Ketumbeine forest for a period of less than one year. The above result indicates that many immigrants are attracted to come and occupy villages around Ketumbiene forest. These have caused increase in populations hence resulting into more pressures and demands on forests and forest resources.

Many of the respondents interviewed said they were cultivators reaching (57%), pastoralists were 13%, charcoal burners 17%, timber processors 10%.

Table 1: Occupation of the respondents

Occupation of respondents/ activities	Frequency (n) respondents	Rank by percentage
Cultivators	34	57%
Pastoralists	8	13%
Charcoal burners	10	17%
Bee keepers	2	3
Timber processors	6	10%
Total	60	100.0

The respondents interviewed were of different age groups but the researcher grouped them into 4 groups as shown in the table below.

Table 2: Different age group

Age group	Frequency (n) respondents	Percentage
15-30	10	16.66%
31-45	22	36.66%
46-60	16	26.66%
60 + above	12	20%
Total	60	100

From the table, the age group between 31-45 indicates the highest percentage of the respondents because it is at this level / group, where forest resources are exploited to the maximum. Many people at this age group have got their own independent homes (families), thereby created greater desires on forest resources. This study has realized that, the need for timber (for construction), free space to expand their homes and farms, and other purposes/ needs, is mainly concentrated at this age group. The polygamous nature of the community around Ketumbiene forest is at higher percentage in this age group. Many problems facing Ketumbiene forest are in most cases caused by this specified age group.

Also, the researcher saw it easier to distribute questionnaires to this age group because many of the people went to school, therefore know how to read and write compared to those in the age above 45 years.

At the age between 15-30, many are still at school, therefore; still depend on parents for almost everything, thus the less impact they cause to forest.

Table. 3: Educational level

Educational level	Frequency	Percentage
Haven't gone to school	11	18
Primary school	27	45
Secondary school	19	32
University/ College	3	5
Total	60	100

From the table, the highest frequency of the respondent is 27, and have obtained the primary level of Education. This frequency was estimated to be 45% of the total population. According to the researcher's analysis this percentage represents little or no knowledge of conserving the forest. Many people have got basic Education and in most cases very little attention is given on conservation of nature and more specifically forest. Many people with primary education are not aware of the importance of having forest around them. Therefore this study was able to realize that, the destruction of Ketumbeine forest is associated with little knowledge that people have about conservation and sustainability of natural resources. This analysis has been obtained from the highest percentage of the primary school leavers in the population as it is indicated in the table above.

18% of the illiterates and 45% of primary level of Education together can have a greater influence on forest resources. Many people at this level of education still hold strong beliefs that, forest can generate itself. They not aware that it takes so many years (about 100) for the natural forest to regenerate itself again yet if they see any vacant place in the

forest, they use it for other activities e.g. grazing. All these activities influence the development/ growth of forest.

Even those with secondary and other levels of Education, might not have acquired enough knowledge of conserving the forest, thus lack of people who can Educate others about effects of their activities on Ketumbiene forest.

4.3. Effects of economic activities on Ketumbiene

4.3.1. Crop cultivation

4.3.1.1 Types of crops grown

This study was able to find that a variety of crops are cultivated in different parts of the five (5) villages around Ketumbiene forest. The most common crops are maize, beans, potatoes, groundnuts are cultivated for both commercial and domestic purposes, other crops like millet, sweet potatoes, sugar cane, and fruits are cultivated in small quantities, mainly for subsistence. Some illegal crops like miraa, bhang-are cultivated in some areas. This illegal cultivation is however practiced inside the forest where no one can be able to see unless if an indented investigation is done. Clearing of the land for these activities (inside the forest) have contributed to the reduction of Ketumbiene forest.

Different types of crops, frequency of people cultivating specific types of crops and their percentages.

Table 4: Different types of crops grown

Types of crops	Number of cultivators	Ranks/percentages
Maize, Beans, Potatoes	42	70
Vegetables, tomatoes, potatoes	10	17%
Sugar cane, millet, fruit	4	7%
Mirea, Bhang	4	67%
Total	60	100

4.3.1.2 Farming systems

The researcher was informed that, the most dominant type of cultivation is mixed cropping, but due to overexploitation of land which have led to exhaustion of soil fertility, people have adopted the system of having more than one field so that if one field is tired or exhausted, they shift to the new field. This study found that it is during shifting cultivation when unwise-clearing of land is done by the people.

People around Ketumbeine forest found it better to destroy the forest in order to get virgin fertile land (soils) to cultivate crops.

Shifting cultivation has however led to the reduction of Ketumbeine forest by 2% each year.

Increase in population. Increased people desire to acquire new lands for cultivation. The once open lands for livestock keeping (grass land) have been occupied by crop cultivators until they over. People around the forest saw it a better option to clear the forest for new lands (open ground) to feed their livestock. Therefore increase in population have moved or pushed the livestock keepers to open lands in the forest, the rely causing further degradations on forest.

4.3.1.3 Factors that lead to deforestation

This research found that the commonest methods of destroying forest were, bush burning, the use of panga, axe, spade and other tools to up root trees. Most of these methods are done manually.

Table 5: Deforestation factors

Types of cultivation	Respondents frequency	Percentage
Mixed cropping	23	38.3
Contour planting	5	8.3
Shifting cultivation	32	53.3
Total	60	99.9

Shifting cultivation is the main cause of Ketumbiene forest destruction. From Table 5, 53% of the respondents said that shifting cultivation is one of the common type of cultivation practiced in this area. Many supported their arguments basing on the idea of population increase. When population was still low, land was owned communally, but now, demarcations of plots is the principle role of the local government. This study was able to evidence so many plots around and some are inside the forest.



Plate. 2 a Shifting cultivation in Olosipa sub-village



Plate 3 Shifting cultivation in Losirwa village

According to the respondents, plots inside or around the forest ensure food security or the availability of food even during dry season, unlike plots outside the forest which can easily be destroyed by too much temperatures during dry season.

Some crops grow better in different plots with specific soil type and variations in climate. People can practice shifting cultivation according to suitability and favorability of soils and climates in the sense that if the soil is suitable or favourable for a specified crop inside the forest, many people will tend to find plots there or they shift that kind of crop to where it can grow better. During the process, people destroyed the forest especially in the time of expanding their fields.

Although mixed cropping has been practiced by 38% according to the respondents, still the ones practicing this type of cultivation are practicing it in different fields and since many of these villagers are around Ketumbiene forest, plots to undertake mixed cropping inside or near the forest still has been given a priority. The expansion of these fields has led to continuous forest destruction.

Since the villages around Ketumbiene forest are in mountainous slopes, 5 respondents in the sample of this study, represents 8.3% only are practicing contour farming and therefore are not involved in the destruction of forest resources. Their fields are able to maintain production for a long period of time. But this percentage is small compared to the population of the area.

4.4.2. Animal grazing/ pastoralism

4.4.2.1 Rank

The pastoral activities are undertaken by 13% of the people around Ketumbiene forest. Unknown percentage practice of the people around the Agro-pastoral activities in the area.



Plate 4 A small area for grazing animals in Ochorronyokye village

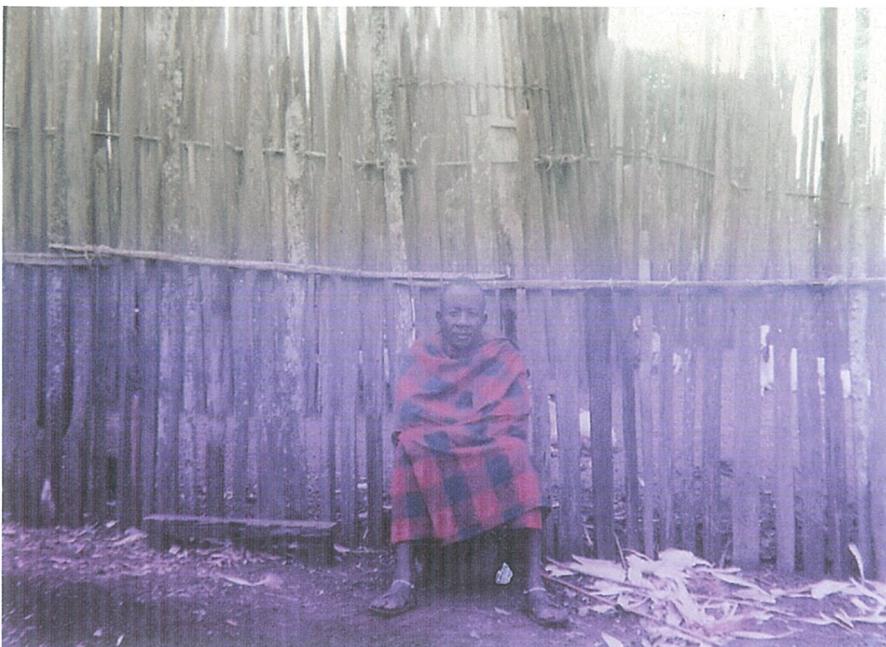


Plate 5 A man sitting near his cowshed made of timber

4.4.2.2. Contribution of pastoralism in forest conservation .

According to the information obtained during this study, pastoralists were seen to have good contribution of conserving the forest in one way or another. They don't frequently cut down trees because they are only looking where there are plenty of grasses to feed their live stocks and in most cases, the kind of they want are not found in the forest. They mostly find suitable grassland outside the forest and in open lands where forest has never occupied. They also don't need to cut trees for home construction because, they normally use simple materials from the nearby bushes and use their cow-dung for homes construction. The use of these simple materials has proved them innocent of forest destruction.

4.4.2.3. Harmful effects caused by pastoral activities to Ketumbiene forest

The researcher was informed that, during dry seasons the pastoralists normally burn the old pastures or grazing lands/ areas while preparing for fresh growth of the new pasture for their animals as soon as rainy season begins. The practice of summer bush burnings has led to un necessary bush clearing as well as destruction of forest/ trees. Since fire has no border and not selective of what to burn and what to leave, burning of grazing lands in

most cases has ended up destroying the forest in different areas of Ketumbiene. This study was able to evidence some burnt remains of trees in different parts of Ketumbiene forest. For example, many tree (logs) remains have been seen in olchani pus, Lolduka, Isoitopusi Olchorro nyokye village, olodung'oro in Elang'atadapash village, and Oikerumbwoti in Losirwa village.

4.4.3. Charcoal burning

Charcoal burning in Ketumbiene was another activity undertaken by almost 17% of the total population around Ketumbiene forest.

According to the respondents, this type of activity is mainly practiced by people from outside the land. Immigrants from other parts of the country go there with the aim of offering man power in the indigenous farms. Because of low salaries given to them they tend to find other alternative sources of income to subsidize their salaries. The only seen alternative is through charcoal burning. The only alternative is through charcoal burning. This activity is however done illegally and however hidden very far from main roads.

Frequent cutting down of trees for logs to obtain charcoal has however, led to forest destruction. According to respondents, other ways of how wood biomass has been degraded are collection of fire wood for domestic purposes and during honey harvest and a process of men going to the bush to eat meat (orpul). Their firewood and other herbal-medicine collection come from forest and has led to forest degradation.



Plate 6 A woman collecting firewood in Isoitopusi sub-village village

4.4.3.1 Economy of individuals and its consequences

Many of the respondents were able to raise their opinions as to why forest destruction has been practiced throughout the land.

About one respondent represent 12% of the population said that people destroyed the forest in order to generate income through timber and charcoal burning.

About two respondents, represents 3.33% of the population said, deforestation is for getting new areas of settlement for the surplus population.

5 respondents representing 8.33% of the population said is for food production.

About 4 respondents which is 6.67% of the total population said, they need raw from the forest for home construction.

9 respondents representing 15% of the population said that they need spacious land for keeping livestock. In the sample of 60 respondents, the majority of respondents (about 39 respondents) said many people in the area destroy the forest in order to obtain all of the

above socio-Economic gains. The 39 respondents represent 65% of the total population around Ketumbeine forest.

The table below represents different reasons as to why forest destruction exist in Ketumbeine. The table represents respondent's frequency and their percentage in relation to the population.

Table . 6: Different reasons as to why forest destruction exist in Ketumbeine

Reasons for destroying forest	Number of respondents	Rank in percentages (%)
Income Generation	1	2
Settlement areas	2	3
Food production ground	5	8
Raw materials	4	7
Livestock keeping	9	15
All of the above	39	65
Total	60	100

4.4.3.1.2 Individuals views about the consequences of their activities to the forest.

This researcher observed that, many of the respondents did not know or are not aware of whether their activities are not carried out in a way that can support forest development.

Table 7 Response of individuals about the impacts of their activities on forest

Response	Number of the respondents	(%) Percentage
Yes	7	12
No	16	27
Am not aware	37	62
Total	60	100

Out of 60 respondents in his sample, only 7 respondents said that, their activities are not the cause of forestation. This is about 11.67% of the total population. 16 respondents said that, their activities do not support forest development. This represents 26.667 of the total population. And a big number of the respondents- 34 said that, they are not aware whether their activities can not cause problems on forest development or not. It is about 61.67% of percentage in the whole population.

Table 8: The rate at which forest destruction contributes to soil degredation

Response	Frequency of response	(%) Percentages
Yes	53	88
No	7	12
Total	60	100

Also 53 respondents said that forest destruction has led to soil degradation and this represents ~~88.3%~~ of the total population. 7 respondents said, forest destruction does not lead to soil degradation. This is about ~~11.7%~~ of the total population. They said so basing on the principle of using contour and application of organic measure methods to replenish the soil.

4.4.3.1.3 Changes occurred as a result of forest destruction

This study found that many of its respondents have realized lots of environmental changes resulted from the destruction of Ketumbiene forest.

Table 9 Respondents who saw changes as the result of forest destruction and the ones who did not see or saw positive.

Response to changes in the area	Frequency of respondents	Percentages %
Yes/ Negative	38	63
No /Positive	22	37
Total	60	100

About 38 respondents proved to this study that changes in climate, soils, catchments areas/wetlands, habits and other aspects have been realized since 1990's. This is about 63.3% of the population, and most of the changes occurred are negative to the forest and environment in general 22 respondents did not see any change or else, saw it in positive perspectives. This is about 36.7% of the total population.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS.

5.1 Conclusion.

The change of forest land to other land use practices in Ketumbeine ward has created so many problems to the natural environment. Land use practice like crop cultivation, livestock, keeping and settlement around the forest in general, has led to problems such as soil erosion, loss of Biodiversity and extinction of different species, climate change, reduction of yields and other associated ills in the environment as a whole.

Ketumbeine forest has played greater role in protecting the water catchments of this land for so many years. Rivers such as Orkeurangae, Elang'atadapash, Kipuye, and Irporokwa provided water to the community for almost throughout the year - up to 1990's. The destruction of Ketumbeine forest due to population increase doubled by high demands for forest products and areas for agriculture and settlement, which have been seen from to have existed from 1980's to the present, has led to the reduction of water volume and hence the reduction of the period of time that, these permanent rivers could maintain their water throughout the year. The only river which could maintain its water throughout the year is Irporokwa which provides water to the Villages of Ketumbeine, Iribilin, Ewua namanaa, and Imbarrangati. Others have remained with a Semi-permanent nature.

Some of the once semi-permanent rivers are left dry almost throughout the year, or could maintain flow of water in them only during the immediate time of rainfall and dries off few hours after the rain.

This study, witnessed some areas once covered by swamps (Wetlands) which dried off and loose their potentials to provide water and other services only because of forest destruction. Among them are; Esikalet swamps, Noosupukya, Olodung'oro, Orkerumbwoti, and some others in Ilorienito Village.

Loss of habitats for the wild animals was also witnessed during the study. Animals like Lions, Eland, Elephants, Rhino, Leopard and different species of birds are hardly seen. Harassment from community through bush fire, physical killing and chasing animals with spear and other weapons have driven the wild animals away from their habitats.

Change in the life style of the Maasae community from nomadic to agro-pastoralism has encouraged the destruction of the forest as described by studies of different scholars.

Andrew Conroy studied that, Agro-pastoralism given these cultural and physical limitations is an ecologically destructive system. It encourages an exaggerated maasae system of cattle management whereby, numbers rather than the quality of the animals is the main objective. The grassland resource base continued to shrink.

In Monduli district, Maasae did not describe wildlife as second cattle as discussed by Western, 1997. To Maasae, the conservation of wildlife is now often viewed as an impediment to their cropping expansion areas and areas to expand the livestock. Current situations will continue creating hostility to the wildlife.

The remove of the natural vegetation during plowing has increased soil erosion, water run off, and greater evapotranspiration (Andrew Conroy 1999). This research evidenced greater damage of soils around the forest resulted from forest degradation which has left the soils prone to degradation. Therefore, if land use change from natural forest to subsistence agriculture is put in place in the future, the farming system to be introduced should first consider the implications of these activities on physical, biological and other parameters of the whole environment. This calls for appropriate land evaluation and eventually land use planning that would ensure sustainable environmental conservation. This would greatly assist the local farmers and the relevant government institutions dealing with natural resource management in Tanzania to carefully plan for the use of fragile environment like forest.

5.2 Recommendations

Government should impose laws and policies to control the destruction of forest and if they (laws and policies) exist already, strictly measures should be put in place to reinforce and punish those who go against them.

Different NGO'S dealing with forest management should be introduced in the local authority's forest reserve (like the Ketumbeine forest reserve), so as to ensure sustainability and the regeneration of natural forest. These NOG'S will also play an important role in sensitizing communities about the importance of conserving the forest and their role in the management process.

Government and NGO'S should introduce the alternative sources of energy to reduce community's overdependence of forest for firewood, and if possible, priority should be given to the funding of cooperatives in the community so as to raise the income level of the people, thereby reducing too much rely on forest for construction and other consumptive materials. If people are financially stable, they will be able to purchase other construction materials like cement, iron sheets and others, thus reduce the need of timber for the whole process of construction.

Land use planning authorities should play their role so effectively to demarcate and plan for cultivation land, land for settlement and the forest land. This will ensure efficiency in the conservation and management of the forest and environmental resources in general.

Lastly, forest experts should be given opportunity and un divided attention during their publications and the passing offering of knowledge about forest conservation and management in Ketumbeine.

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APPENDICES:

1. QUESTIONNAIRES

KAMPALA INTERNATIONAL UNIVERSITY

Research Topic Effects of community activities on Ketumbiene Forest in Longido

Area of Study:

Ketumbeine Ward, in Longido District- Tanzania

Section A. - Personal Information:

Name of village.....

Age.....

Sex.....

Occupation.....

- | | | | |
|-------------------|-----|---------------------|-----|
| Educational level | (a) | None | () |
| | (b) | Primary | () |
| | (c) | Form four | () |
| | (d) | Form six | () |
| | (e) | University/ College | () |
| | (f) | Others | () |

Section B: Types of Land use practices.

1. What do you think are the main activities carried out around this forest?

Many wrote the following:

- Farming
- Pastoralism
- Bee keeping
- Timber producers.

2. Among these, which are do you major on?

- a. Cultivators ()
- b. A pastoralist ()
- c. Bee keeper ()
- d. Charcoal ()

e. Timber producers ()
f. Other (specify) ()
Total 60

3. For how long have you practice this activity?

- a. One year
- b. Between one to 5 years
- c. More than five years.

SECTION. C

EFFECTS OF COMMUNITY ACTIVITIES ON FOREST

4. Do you think some activities as mentioned in question two above have contributed to forest degradation?

Yes ()
No ()
Am not sure ()

5. According to you, are these activities, carried out in a way that support forest development? (Including your activity)

Yes ()
No ()
Am not aware ()

6. Do you know that forest destruction can lead to soil degradation and its associated ills/problems?

Yes ()
No ()

7. Since your time around this forest did you see or realize any changes that have occurred as a result of forest destruction?

Yes ()
No ()

8. Are the changes that have occurred, negative or positive to both environment and peoples' life?

Negative ()
Positive ()

SECTION .D

MEASURES/ SOLUTIONS:

9. If negative, do you think some measures can be sort out or introduced to mitigate these changes or impacts?

Yes ()
No ()

10. According to you, what are the most suitable methods to be put in place?

- Many had the following response.
- Alternative source of energy
- Create awareness
- Alternative source of income
- Enforcement of forest laws and policy.

11. Do you support the idea of Afforestation and agro forestry?

Yes ()
No ()

If no, why?

Many said.....

- It encourage dangerous animals
- It restricts smooth and healthy growth of crops
- It encourages animals which eat their crops.

12. Suppose forest conservation is to be introduced how would you be subjected to this idea?

(a) Would you ask for forest conservation to bring other means or alternative of power?

Yes ()
No ()

(b) Would you accept or comply with the idea of cut and plant tree?

Yes ()

No ()

SECTION E

ADDITIONAL

Roles of forest and it benefits.

13. Do you think the forest has a role to play in stabilizing the soils of your area?

Yes ()

No ()

I don't know ()

14. What reasons to people give (included you) in order to support their ideas forest destruction?

- a) For income generation through timber and charcoal ()
- b) Area of settlement for surplus population. ()
- c) Food production grounds ()
- d) Raw materials for homes construction ()
- e) All mentioned above ()

15. Is forest conservation a good idea to implement?

Yes ()

No ()

16. Are there any benefits that people get out of forest?

Yes ()

No ()

APPENDIX NO. 3

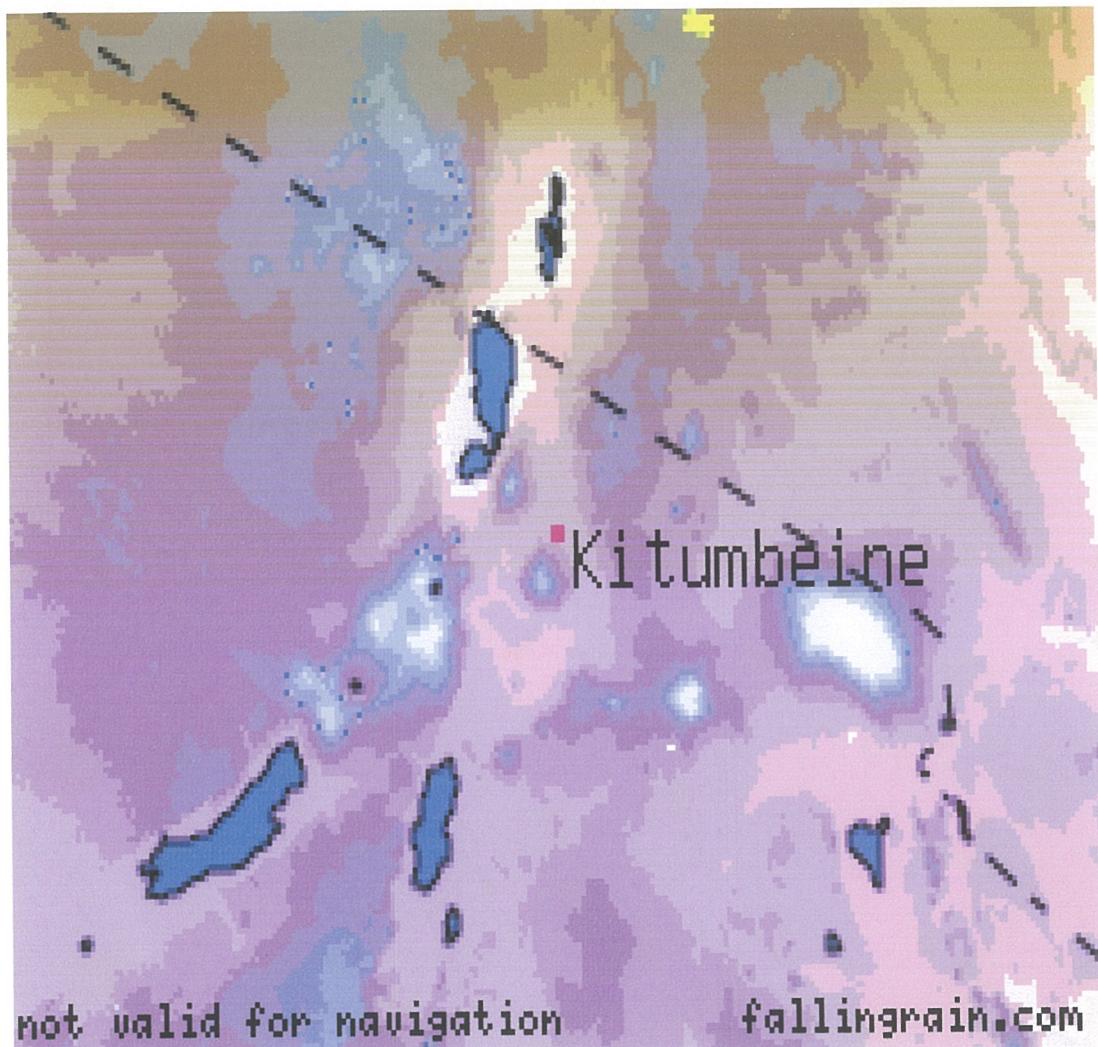


Figure 1 A map of Tanzania showing the location of the Ketumbeine Mountain seen in r



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FACULTY OF SOCIAL SCIENCES

To... KETUMBEINE WARD FOREST OFFICER
..... P.O. BOX 33 LONGIDO, ARUSHA.

This is to introduce to you Mr/Miss
who is a bona fide student of Kampala International University. He/She is
working on a research project for a dissertation, which is a partial requirement
for the award of a degree. I here by request you, in the name of the University,
to accord him/her all the necessary assistance he/she may require for this
work.

I have the pleasure of thanking you in advance for your cooperation!

Yours sincerely

Dr. ONGOPA EWOCH
Associate Dean
FACULTY OF SOCIAL SCIENCES
KIU 20000, KAMPALA