An Assessment of the Impact of Forest Management Systems on Households: A Case Study of the Kakamega Rain Forest

By

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DECLARATION

I. the undersigned, declare that to the best of my knowledge this is in> work and it has never been presented to any other institution for academic examination.

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Signature . Date

This project has been submitted for examination with our approval as the University Supervisors.

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Prof. Mohamud Jama
Signature i)ate /

DEDICATION

This research project is dedicated to my late father; Timothy Mulinya Asamba, once a Forest Guard and who taught me to love nature.

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ABSTRACT

For many years forests have been mainly exploited as sources of timber and their climatic functions. Yet forests present opportunities for additional numerous uses. More recently, forests are increasingly gaining appreciation as important sources of livelihood options to forest adjacent communities in their daily lives. However, there are a number of factors that impact on the utilization of forests by local communities. Key among them is the forest management system which impacts on the local community by either encouraging or discouraging use of the forests.

Kakamega forest is one of the four remaining indigenous forests in Kenya. The forest neighbours constituencies that experience high poverty levels, despite it's potential to impact positively to households incomes. This observation inspired and results in this research project. The study set out to assess the impact of the current forest management of Kakamega Rain Forest on households. The study was conducted in Shinyalu constituency, Kakamega District. Face to Face interviews were conducted within the local community using a structured questionnaire. In-depth interviews were also conducted with key informants using a discussion schedule.

Findings from the study reveal that the government solely manages the forest through the Forest Department. Like all other forests, Kakamega forest was placed under the stewardship of the government during the colonial era when formal forest management systems were implemented. This system led to the eviction of communities from the forest and excluded them from the forest's management.

Formal rules and regulations were developed to guide and control the communities' access and use of the forest under law enforcement with punitive measures such as penalties and fines being charged for those that did not follow the rules. At the time of the study, the Forest Department was in the process of changing this management system with the main focus being inclusion of local communities to forest's management.

The study found that though the community could access and use the forest resources, utilization of those resources was mainly limited by two issues; the laws and legislation enforced regarding usage of the forest's resources limited the extent to which the community can utilize the products and secondly; the community has not transformed the products they utilize from the forest into potential income sources thus the benefits that are derived from the forest remain minimal. The community was also found to have inadequate use of the forest. For instance, the community only focused on using products and did not utilize the potential opportunities that services from the forest could provide, for instance, tourism and camping.

This research study concluded that for the forest to impact on local communities households, there is need Ipr value addition to the products collected to enhance their competitiveness for trade, additional forest products and services need to be investigated and their potential to contribute to households assessed. The study recommends that all the forest stakeholders should partner up to chart a way forward on the possible opportunities that the forest provides for local communities and how these opportunities can be translated into positive impacts on households increasing the household wealth which could result into the possible reduction of the high poverty levels experienced by the local community.

CHAPTER ONE: INTRODUCTION

1.1 Background

Worldwide, forests have played an integral role in economic development. During the colonial era in developing countries and war periods in the developed countries forests were mainly used as a source of fuel. In Kenya, forests continue to rank high among important resources and are an integral part of national development (NEMA, 2004). They play an important role in modulating hydrological cycles, preservation of water catchment areas, balancing of atmospheric conditions in the form of carbon sequestration, supporting biodiversity and control of soil erosion (Godoy et. al. 2002 as cited by Biota, 2005).

The most cited socio-economic values of forests include sources of wood fuel for both domestic and small industrial use, provision of raw material for the pulp, paper and timber industries, tourist attraction sites and cultural and scientific research sites. More recently in scholarly discourse, forests are gaining importance as possible means of livelihood diversification for rural populations through exploitation of Non Timber Forest Products (NTFPs) that priftide a wide range of resources for variegated livelihood strategies (Chambers, 1997).

In appreciation and recognition of the importance of forests to the country's development, Kenya has formulated and implemented a number of policies and laws to manage and conserve forests; these have ranged from controlled utilization of forest resources to banning of timber logging and re-afforestation. Yet, Kenya's forests have continued to deteriorate to a current approximate size of 2.9% of the nation's total land

area (ACTS-UNEP, 2001), falling way below the world accepted minimum standard of 11% of a country's total land area. The declining forest cover is blamed on forest excisions, encroachment by people, charcoal burning and illegal logging (National Development Plan, 2002, ILEG, 2003).

Of the reasons above, perhaps forest excisions by public officials account for a large percentage; for instance, 'in 1999 alone, a Cabinet Minister and 8 other people were allocated public forests in Uasin Gishu, Keiyo, Trans Nzoia and Elgon districts of Kenya. The Minister was allocated a total of 232.1 acres of trees ranging from 20 to 26 years' (Daily Nation, 20/9/1999). The same time period saw an accelerated reduction as forests were converted into agricultural or land for settlement while some of the forest land left bare as the trees were converted into fuel.

The communities living around forests have not escaped blame for the reducing forest cover due to dependence on forests for wood-fuel, food and construction materials. This has led to the belief that the poor contribute significantly to forest depletion. NEMA (2004) asserts that while the poor are often victims of environmental degradation caused by other members of the society, they also often engage in livelihood activities that result in environmental degradation.

Reduction to the present level of just over 1% of Kenya's forest cover is believed to have taken place largely in Western Kenya, which was once covered with vast tracts of moist lowland forest but is now densely settled and cultivated (Wass, 1999). Forests in the Western region include the Kakamega and Mt. Elgon. This study will limit itself to Kakamega Rain Forest.

Kakamega Rain Forest is the only remaining section of the Cameroon-Congo tropical rain forest belt in Kenya. The forest contains three nature reserves; Buyangu National Reserve to the North, Isecheno Reserve next to the Forest Administration Headquarters and Yala Nature Reserve to the South. The forest contains some of Africa's greatest hard and soft woods among them Elgon Teak, red and white stink woods and several varieties of Croton and Aniageria Altisima. The forest also has the status of an Important Bird Area (IBA) with 357 bird species having been recorded and over 190 species of bees amongst other plant and animal species endemic to the forest (Biota, 2005). In addition to the above roles of socio economic significance, the forest also plays a critical role in regulating the rainfall regime in one of the most important water catchment areas in the East African region.

1.2 Statement of the Problem

Communities living around Kakamega Forest have tended to see themselves as it's custodians. Underlying this are a wide range of political, social, cultural and economic values derived from the forest. Denial of communities' access to forests began in 1933 consequent to the consequent to the Colonial Government's Forest Ordinance of 1911 where forests were gazetted and placed under government stewardship as national assets to protect the people from their own improvidence (Logie and Dyson, 1962).

The independence period saw the introduction of the Shamba System of forest management in a bid to facilitate community access to forests. The period between 1986 and 2003 was characterized by policy inconsistencies that were animated by contradictory government objectives that sought both conservation and excision for political purposes. For instance, from 1981 to 1988 the government initiated several

control measures over the forest with the objective of containing destruction. The forest was then split into two, where the northern area fell under KWS's jurisdiction, while the Southern area fell under the Forest Departments' (Biota, 2004).

Surveillance by Forest Guards was increased and access by communities denied. In addition, the government set up several institutions for conservation such as the Permanent Presidential Commission on Soil Conservation and Afforestation (PPCSCA); K.WS and a Provincial Forest Conservation cadre known as District Environment Officers. It also initiated tea production activities through the setting up of Nyayo tea zones leading to the loss of 4,773 hectares of forest land (IUCN May 1996 as quoted by Katumanga, 1995) during this same period.

The period between 1990 and 2000, was marked by pronounced declarations of the State re-affirming it's commitment to forest conservation yet in reality, the period was marked by increased excisions. For instance, compared to the period between 1933 and 1993 when the forest lost 6,926 hectares out of the original 23,632 hectares (an average of 0.5% annually), the period between 1994 and 2003 saw the forest lose 5,600 hectares (an average of 3.4% annually) bribing it's total size to 16,706 hectares (Biota, 2004).

Between 1983 and 1989, communities around Kakamega forest experienced high levels of poverty incidence. In 1989 the poverty level in Kakamega district was 51.76%. This contrasted with the years before when communities through the Shamba System could cultivate food crops and other forest products. By 1999, poverty had increased to 56.69% and in 2004; all the constituencies in Kakamega recorded poverty levels of over 60% with only Malaba recording a poverty level of 56%. The divisions directly bordering the

forest recorded higher poverty levels; 67.8% in Shinyalu and 59% in Hamisi (Economic Survey, 2005).

The above observations appear to be in line with Kaimowitz's assertion that poor rural households live better if they have secure access to forest resources and if they have effective and efficient social mechanisms to regulate forest use, manage their forests and distribute the benefits (Kaimowitz, 2003). This study attempts to explain this occurrence by responding to the following questions; what is the relationship between increased State control of forest and community livelihoods?; how have communities responded to limited use of forest resources?; what alternative systems of management can facilitate the duality of forest conservation and community development?

1.3 Research Objectives

Broadly stated, this study seeks to examine and analyse the effect of the existing system of forest management on the use of forest resources by local communities. In specific terms the study seeks to;

a) Examine and analyse the impact of controlled management on households adjacent to Kakamega forest.
b) Examine and analyse community responses to limited forest resource use.
c) Proffer research based recommendations geared towards enhancing forest conservation and improved community livelihoods.

1.4 Scope of the Study

This study will focus on the period between 1980 and 2003, a period that saw the government intensifying its management and control over the forest, yet it is the same period that saw the forest suffer intense deforestation. From the existing sources of data, it is difficult to ascertain the amount of forest acreage that was lost each year but records have shown that the period between 1994 and 2003 saw the forest lose a larger percentage of its cover compared to earlier periods as discussed above.

Beginning 1980, a number of policies and institutions were set up in an effort to conserve forests in Kenya. These were characterized by the setting up of the PPCSCA in 1981, partnering up of Kenya Wildlife Service with the Forest Department in management of forests in 1986 and the banning of timber logging in 1999 by the then President among others.

There are two divisions that mainly border the forest, these are Shinyalu and Hamisi. From a study that was conducted in 1994, it found that most of the villages that border the forest are within these two divisions. The Economic Survey (2006) recorded that Shinyalu division in Kakamega district recorded a higher poverty level of 67.8% as compared to Hamisi division in Vihiga district which recorded poverty level of 59%. The study thus limited itself to Shinyalu division.

1.5 Justification

An examination of the Forest Act (2005) points to attempts by the government to involve communities in forest management. Several issues are anticipated; that communities will be involved through their representative on forest committees. The said communities will be responsible for the day to day running and management of the forests. While this is a step towards democratizing management, the Act does not deal with the core issue of forest conservation that is mutually beneficial to both State and communities. It is this gap that our study seeks to address. We advance that conservation is sustainable where communities' stake and interest is recognized by the State through not only the process of involvement in management but also access and utilization. Our study seeks to examine alternative modes of facilitating this and in effect proffering the relevant policy alternatives.

Kaimowitz, 2003 draws a strong correlation between the levels of poverty among forest adjacent communities and the extent of exclusion by forms of forest management. He points the need for requisite legislation that can facilitate access and utilization. While his suggestions are appropriate, the dilemma is at the level of implementation, more specifically in Africa. Herorfhe challenge lies in the inability of institutions to effectively manage forests resources. This explains their reluctance to decentralize management and facilitate access and utilization. Our discussion therefore is underscored by the need to evolve alternative forms of management that can capture community interests and those ot the overall objective on sustaining forests as public common goods. Our academic justification is predicated on the foregoing.

CHAPTER TWO: LITERATURE REVIEW

This chapter is divided into three sections. The first section reviews literature on the various systems of forest management and conservation, with their relevant and associated benefits and consequences. The second section reviews literature on the role of forests in providing livelihood opportunities to communities living around forests analysing the constraints that face this sector's development. The third section reviews literature on utilization of Kakamega forest and the last section focuses on the conceptual framework.

2.1 Systems of Forest Management

Sustainable forest management is defined as being based on considering social, economic and environmental values when planning and implementing forest management activities and providing people with jobs, recreational opportunities and a healthy, sustainable forest, now and in the future (Mayers and Bass, 1999).

In the history of forestry,/Two main systems of management have dominated forest conservation; indigenous systems of forest management mainly characterized by traditional values and practices and their inclusive nature of local communities; and formal systems of forest management that are modern, implemented by governments and mainly exclude local communities. It is important to assess the main pillars of the indigenous and formal systems of forest management pointing out any differences in their practices, rules and regulations and the results that each can achieve as regards successful forest management.

2.1.1 Indigenous Systems of Forest Management

Indigenous systems of forest management existed before the colonial era. Forests had been preserved using indigenous knowledge systems for centuries. Communities' management of forests was guided by their long time horizons inscribed in their rituals, beliefs and world views (Banuri and Marglin, 1993). The forest was owned by the community and was believed to harbour important social, cultural, spiritual and economic values for the entire community.

The indigenous forest management system served two key functions; it ensured that the forest was preserved and secondly it provided for the multiple needs of the community that viewed the forest as a life supporting system. Different trees and forest sites were associated with important socio-cultural practices ascribing forests values of respect, reverence and sometimes total awe. Successful conservation of some forests has been attributed to this mode of forest management. Indeed some scholars note that cultural systems (knowledge systems) and institutions provide the means to identify and deal with the interface between the environment and development (Hjort-Af-Ornas and Lundquist, 1999, Banuri and Marglin, 1993).

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For the local communities living around Kakamega forest, forest conservation was an inherent aspect of their lives. A research study cited by Chambers (1999) links high population density with high tree density in Kakamega district. Chambers attributes this to the economic benefits derived from trees but implicit is the forestry culture that existed among the people through various important cultural norms and values associated with the forest. With the advent of colonialism, these traditional forms of environmental conservation were impaired; a new regime of laws was introduced that not only de-

participated people but also curtailed access to and use of forest resources (Katumanga, 1995) destroying the social structures and institutions that had been used to conserve forests (Jodha, 1995).

Elinor (2000) observes that common property regimes controlling access and harvesting from local streams, forests, grazing areas and inshore fisheries had evolved over long periods of time in all parts of the world, but were rarely given formal status in legal codes of newly independent countries. As concern for the protection of natural resources mounted during the 1960's, many developing countries nationalized all land and water resources that had not yet been registered as private property.

The institutional arrangements that local users had devised to limit entry and use lost their legal standing, but the national governments lacked monetary resources and personnel to monitor the use of these resources effectively (Elinor, 2000) living the resources open to abuse. Therefore forest resources that had been a *de facto* open-access common property regime enforced by local users were converted to a *de jure* government property regime, but reverted to a *de facto* open-access regime.

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From the literature discussed above, this System seems to be ideal for preserving forests, especially those that are important eco-systems and that provide important environmental services such as regulation of hydrological cycles. Obvious pillars of the systems' success stem from communal ownership of the forest, shared vales and norms amongst community members, the spirituality attached to forests and the resultant punitive measures that were taken against community members that disrespected the forest.

Because ownership of the forest was with the community, each member had a role towards ensuring the forest's preservation.

The indigenous forest management system solely focuses on preservation of forests failing to reconcile the resource needs of the changing economic and population demands resulting from modernisation and development. The rising number of industries exerts pressure on resources such as forests for need of raw materials such as timber while the population search for cheaper fuel alternatives in most cases wood and charcoal to cope with escalating energy prices. The growing population need land for settlement and agricultural activities. Can this system successfully combine economic interests of forest harvesting with the benefits of conservation?

It is apparent that formalization of forest's management during the colonial era interfered with and severed the structures and institutions that made indigenous forest management successful. Resettlement of communities that followed eviction of communities from forests resulted in heterogeneous forest adjacent communities with different and sometimes competing socio-cultural practices. How then can a common purpose of forest preservation be inspiptd in a heterogeneous community where the interests, belief systems and values are no longer shared?

This study attempts an evaluation of the values that made indigenous forest management successful and how this can be incorporated into the forest's management within mounting pressure on forests for land and other resources.

2.1.2. Formal Systems of Forest Management

Formal Systems of Forest Management were introduced by colonialists as a way of exploiting forests in a sustainable way. The proponents of this system justified its implementation on the basis that the population did not have the capacity to use the forest sustainably (Logie, 1962), and that State Ownership would internalize externalities (such as soil, water and biodiversity conservation) ingrained in open access, common and private use of forest resources, the cost of which the public would not be willing to bear (Sharmaet. al. 1994).

In Africa, this system favoured expropriation of forests by the State and was based on the assumption that the cohesion and discipline necessary for effective collective management could not be achieved or would break down, resulting in unregulated open access overuse (Arnold, 1999). Exclusion of local communities was considered necessary to protect vulnerable forested areas from degradation that would reduce the flow of environmental services, including timber and biodiversity conservation (Robinson et. al. 2005).

Formal Forest Managemefff Systems entail the separation of forestry from agriculture, enactment of forest legislation, establishment of forest administration, introduction of police control, scientific forestry practices and exclusion of local communities. Banuri and Marglin, (1993) assert that this system treats the forest as a resource to be exploited for commercial purposes where trees are classified as either 'valuable' or 'inferior'. Inferior trees cannot be marketed and are therefore destroyed without consideration of their contribution to ecosystems or communities.

Some scholars have argued that scientific forestry was/is a superior alternative not only to the 'irrational' and 'superstitious' indigenous practices but also to unfettered commercial exploitation which in the past led to severe resource deterioration in the West as well as in the South. Banuri and Marglin (1993) however note that in the South, these systems have not fared well; forest resources have degenerated both qualitatively and quantitatively.

The scholars attribute this failure to the destruction of customary arrangements of forest management by communities at the hands of a centralising bureaucratic system of management, asserting that such initiatives have all too often sought to legitimise development from top down, and to de-legitimise the actions, beliefs and practices of grassroots movements and community-based popular groups. Formal forest management systems are predicated on the presumption that the knowledge and values of local communities in forest preservation are insignificant alienating them from the resource.

Looking at the above literature, one cant help but question the actual purpose of the formal forest management system; was it truly sustainable forest utilization or did it entail a hidden agenda that would^nable the State to dispossess the community of forest' ownership with an ultimate aim of clearing parts of it for resources such as wood fuel for rail construction, land and construction of roads through forests, a development that local communities committed to preservation of forests would have strongly resisted?

In Kenya, formal systems of forest management can be blamed for insufficient benefits of forest resources to communities. The objectives and administrative practices of this system are oriented towards conservation, wood production, revenue collection and

regulation through punitive legislation which ends up alienating local communities from 'their' resource. As Arnold (1999) notes, the State may not be able to control manage or prevent degradation to a resource it has expropriated. This has resulted in open access regimes in many countries due to the inability of governments to reinforce security round the enormous forest boundaries that require high personnel numbers translating into high salary bills and investments in terms of training; a cost that many governments can ill-afford.

The focus of formal forest management systems is often on sustainable utilization of forests. However, the system has deprived local communities' ownership rights to forests and excluded them from forest's management. This has resulted in an indifferent and sometimes hostile attitude towards the forests' management encouraging rampant and illegal utilization by local communities whenever an opportunity arises. Where it had been felt that governments were better placed to protect and conserve forests, forests have continued to decline in size and depreciate in value in terms of species and ultimately value. Indeed it is recognised that when resources that were previously controlled by local participants have been nationalized, State Control has usually proved to be less effective and efficient thar^control by those directly affected, if not disastrous in its consequences (Elinor, 2000).

As implied in the above literature, focus of formal forest management systems on the exploitation of forests for commercial purposes in most cases has not benefited poor forest adjacent communities. The State has instead not involved the community in the forest's management neglecting the community's vital role for partnership. How then can communities participate in conservation of forests that they no longer own? What

would be the benefits of such participation? Is it realistic to expect poor forest adjacent community members to assist the State in protecting a resource that they do not benefit from?

These questions illuminate attempts to evaluate the impact of formal forest management systems on local communities and suggest ways of how the system can be modified to benefit local communities and encourage their participation.

2.1.3. Alternative Systems of Forest Management

Both the indigenous and formal systems of forest management discussed above seem to have limited success for the dual purpose of forest conservation and community benefits with identified contradictions and gaps that could be detrimental to forests. Taking advantage of the success factor and resolving the contradictions and gaps that exist has been the challenge of scholars and foresters the world over.

Scholars such as Hjort-Af-Ornas and Lundquist (1999) and Ahmed (2002) suggest the integration of the indigenous and formal systems of forest management. They assert that,

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there is need for interplay between central and community planning and between traditional and modern knowledge systems; the knowledge, skills and ideas among resource users themselves and not the competence and visions among governments and external 'development agents' must form the basis of strategies to improve resource management.

The above thesis is in line with Ahmed (2002), who notes that over the decades, local communities have used their indigenous knowledge to come up with coping strategies

and create their own safety nets; and that the use of this knowledge can lead to the development of transitional integrative generic models that will make communities more responsive to interact with planners and decision makers (Salih and Ahmed, 1993 as cited by Ahmed, 2002).

Indeed, various scholars and researchers have also argued that the only form of forest management that would best protect forests is that which comprises all stakeholders. Stakeholders comprise of governments, local communities, national and international NGOs, donors and the international community. Involving communities in natural resource management processes empowers individuals and communities to make decisions about the very resources upon which their livelihood depend (Anderson et. al 2006). Thus it is apparent that if local people do not have rights over forests or wildlife, these resources cannot become part of their livelihood and production system choices; and if they cannot capture benefits from the resources, the resources will be seen not as constraints on the systems that they capture benefits from.

The current implementation of the Forests Act, 2005 seems to borrow from the Alternative Forest Manageijjent systems. The Forest Act, 2005 encompasses Community Participation as core in forest management. In the new law, local communities can now participate in forest's management through registration in Community Forest Associations. The Act also states that the management agreement will confer on the association a number of forest user rights.

The Forest Act stipulates the creation of Kenya Forest Service (KFS) to replace the Forest Department. KFS will facilitate and give technical and financial support to the

local communities. The community associations will in turn assist KFS in enforcing provisions of the Act particularly halting the illegal harvest of forest produce, assistance in fire fighting and protecting trees declared as 'protected trees' by the President in accordance with the Act. It will also update KFS of developments, changes, occurrences within the forest that are critical to its biodiversity conservation (Land Update, 2006).

Implementation of the Forest Act, 2005 is a positive step for Kenya's forests. It will be necessary to constantly monitor and evaluate it's implementation to ensure that it's intended objectives are met. Community members are important stakeholders in forest management and their participation and benefits from the forests will have to be researched continuously and improvements made. Since the implementation of this system is still at the preliminary phases, this study will attempt to anticipate any challenges to its implementation and address them.

Even though Alternative Forest Management Systems emphasize the importance of participation by local communities in management of forest resources, literature on this system fails to outline a process that will lead to successful incorporation of local communities in forest's management considering past indifference and hostility of most forest adjacent communities to the government. This study will attempt to offer suggestions on how this can be achieved.

2.2 Utilization of Kakamega Rain Forest

Kakamega forest like any other rainforest has served the local communities through the years. An important and maybe fading function has been the forest's significance to the community's socio-cultural activities. Since time immemorial, Kakamega forest has been used by the local communities for various socio-cultural activities. Certain trees and forest sites were used for certain communal functions that ranged from oathing ceremonies, circumcision, deliberative activities to other functional uses such as medicinal and economic purposes. An individual's value in society was graded around his capacity to set up a home; the home was considered incomplete if it lacked trees and particularly huge ones under which one could meet and hold deliberations with his contemporaries who came to hold consul with him. Certain trees were also planted to mark grave sites for elderly members of the family (Katumanga, 1995).

Kamugisha et al. (1994) as quoted by Mogaka (2004) observes that in the early 20th century, the communities inhabiting Kakamega forest adjacent areas for example used the forest and specific trees to discipline wrongdoers. The latter were taken into the forest and made to swear by certain trees not to repeat an offence lest death or punishment from ancestral spirits follow, as ^s believed. It is further noted that some of the small forest blocks in Kenya have remained because local communities have looked after them and extended traditional control over their use, for example Kisere forest in Kakamega district (KFMP, 1994 as cited by Mogaka, 2004).

Forests are also important for education and research purposes, Sharma et. al., (1994) observes that, Africa's forests constitute living laboratories for the study of animal and Plant life, and this is true for Kakamega Forest. A number of scholars from both within

and outside the country have and continue to conduct studies within the forest. Nature tourism is also practised; user fees are charged for forest services and products through licenses and gate entry fees by the two institutions that manage the forest, that is, the KWS and the Forest Department. The revenue collected, is split mainly between KWS/Forest Department and the government which controls the revenue accruing to the county councils (Biota, 2004).

Kakamega forest suffers from excessive and illegal utilization (Kakamega Development Plan, 2002; Biota, 2005). There is concern that legal as well as illegal collection of wood fuel (at 5 times the sustainable rate) is hastening the downfall of the forest along with over-harvesting of various plants for local medicinal use, pole wood for construction of homes, and fibber for ropes (Earlharm College, 2005). Licensed extraction of timber is allowed. The extraction is almost entirely of plantation material and should average some 400 cubic metres annually (Earlharm College, 2005) but in 1991, Kifcon estimated that 3800 cubic metres of indigenous timber was being illegally removed each year together with over 500 tonnes of charcoal made from indigenous species.

Beneficiaries of the forest i*mge from logging companies, institutions and individuals. A total of 43 institutions in Shinyalu and Hamisi division were estimated to be using over 850 lorry loads of wood fuel (a total of over 7,000 cubic metres) annually (Kifcon, 1991). The institutions were supplied by local traders who obtained the forest products legally as well as illegally. Urban and peri-urban populations are also increasingly resorting to wood fuel due to exorbitant electricity tariffs. Energy pricing impacts on forests (ACTS-UNEP, 2001); it determines whether people will utilize alternative energy means or opt for wood fuel.

Forest Officials mandated to protect the forest also engage in the illegal extraction of forest resources. In 1999, a local newspaper reported that District Forest Officers in Kakamega region (along with other areas in Kenya) were illegally authorizing timbering of endemic trees from 'conserved' areas of the forest. The article blamed the illegal harvesting along with poor but legal logging management to over 50% of the forest being lost in the last 25 years.

The article further indicated that the forest was not only growing smaller, but it was also being fragmented into islands of indigenous growth separated by clear cuts and forest plantations (Daily Nation, April 20, 1999) engendering destruction of important vegetation, ecosystems and consequently destroying the important environmental services generated by the compactness of a large forest area. Part of the forest was excised for purposes of construction of public institutions and resettling displaced persons. In the late 1980s parts of the forest were executed by Shikusa Prison officers, who used prisoners to cut down trees which they sold and then planted maize on the cleared forest area to supplement their incomes. The State, through the former President (Moi) also played its role in the deforestation that occurred in the 1990s.

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A new district; Vihiga was created by removing it from Kakamega district. Thousands of people were displaced to create space for the district headquarters. To resettle these people, the government cleared a significant area of the Kakamega forest. In 1990, the President allocated land from the forest to the Agricultural Society of Kenya (Kakamega) for the construction of a new agricultural show ground. Despite objections from different sectors, politicians took advantage of this allocation, to further fell additional trees and put the additional acreage under personal use (Katumanga, 1995).

The above literature notes the importance of the forest in terms of it's role in socio-cultural activities. It also discusses the economic roles of the forest like the supply of firewood to institutions within the district. Apart from the socio-cultural function, the community seems not to benefit much from the forest. Main beneficiaries of the forest seem to be the government, logging institutions, corrupt forest officials and rich individuals (who are able to pay bribes).

Illegal harvesting and utilization of the forest and the politically motivated excisions of the forest are obvious challenges that the literature does not address but which are crucial for the forest's survival and in turn the survival of those that depend on the forest for their livelihood. This paper attempts to offer suggestions on how the challenges of community indifference and lack of benefits from the forest, illegal utilization and corruption can be addressed to curb the demise of the forest and more importantly benefit all stakeholders, especially the local community.

2.3 Empirical Evidence of Forest's Contribution to Livelihoods

The forestry sector in Africa performs poorly in relation to other regions by providing only 2% of global value added and exports due to a variety of political, economic and structural problems which must be of concern to policy makers (FAO, 2004 as cited by Anderson et.al., 2006). Whiteman and Lebedy (2006), estimate that the gross value of NWFP production in Africa is at least USD 1.4 billion per year. For instance literature on bush meat especially in Central Africa highlights a significant contribution that bush meat production makes to local income, employment and nutrition. At around 0.18% contribution to employment, Africa is less than other regions and the world average of 0.46%. Yet it is estimated that over two-thirds of Africa's 600 million people rely

directly or indirectly on forests for their livelihoods including food security (CIFOR, 2005 as cited by Anderson et. al. 2006). The authors attribute the generally low contribution of the sector to under-development of processing activities and low intensity of forest management and harvesting in Africa (Whiteman and Lebedy, 2006).

The article *'Uses of Forest tree species in some SADC countries'* on the FAO website ***(www.fao.org****/docrev/0Q5/ac850e/ac850e08.htrn)* demonstrates how NTFPs can generate revenues both at the national and international level. The article reports that; in Zambia, 38 indigenous tree species are known to produce tannins, 19 produce dyes and 11 species produce resins and gums. In South Africa, species such as Rumohra adiantiformis and proteas are used in the florist trade. In Namibia non-wood forest products such as beverages are estimated to have an annual economic value of N$1.5 million (US$680 000). In the same article, Masuka (2002) estimates that mushroom production in Zimbabwe's pine plantations was about 807 tonnes annually although only 100 tonnes are harvested annually and exported generating some US$1.5 million. In Tanzania, 756 tonnes of bark of Cinchona spp. valued at US$258 000 was exported in 1991 (FAO, 2000). In Namibia, 600 tonnes of Harpagophytum spp. worth US$1.5 to 2 million in 1998 was harvested (Hail\ya, 1999 as cited by FAO, 2000). In 1992, Zambia produced honey and beeswax amounting to 90 tonnes and 29 tonnes respectively which was valued at US$170 000 and US$74 000 (FAO, 2000).

The above literature outlines and presents examples of various NTFPs that have been successfully exploited. The literature however does not indicate the obvious beneficiaries of this exploitation; is it the poor forest adjacent communities who desperately need these incomes or is it entrepreneurs who could be outsiders to the communities? To generate

the amounts of incomes discussed above, the production of NTFPs needs to be bulk. Further analysis reveals that most countries benefiting from these incomes have relatively large forest areas as compared to Kenya. For instance, the forest cover in Tanzania and Zambia is quite significant with Zambia having a forest cover of over 40% of it's total land area compared to Kenya's forest cover of approximately 2.9%. The forest cover in Tanzania represents 7% while that of Zambia represents 6% of Africa's total forest cover and is among the top 10 most forest-rich countries that account for 70% of the total forest area in Africa (Kelatwang and Garzuglia, 2006). For a country like Kenya that suffers from a depleted forest cover, does the potential of NTFP production exist?

From the literature discussion above, a number of gaps and challenges have been identified; how do communities settle on NTFPs with most potential and specialize in their production? Can the depleted resource of Kakamega forest generate sufficient amounts of NTFPs for trade? If yes, can these NTFPs be transformed into valuable commodities for trade as has been done in countries like India, Zambia and Cameroon among others? Do the conditions underlying successful production of NTFPs in those countries exist in Kenya? Which markets would provide maximum profits for the communities; is it local or fiweign markets? How would the NTFPs reach these markets?

2.4 Conceptual Framework

Most governments in Africa are said to capture only a small fraction of the substantial value or economic rent of the mature closed canopy tropical forests of which they are proprietors thus failing to invest enough in stewardship and management of forests (Jepma, 1995) leading to the high rates of deforestation experienced in Africa. Infact, FAO (2001), and Braeuer (2003) as cited by Biota (2005) opine that the threat of

deforestation is mainly due to the underestimating of the economic value of tropical rainforests. Indeed statistics from a FAO publication "State of the world's Forests 2005" indicates that Kenya's forests contribute at least 19% to the Gross Domestic Product (GDP) while Kenya's Economic Surveys for various years indicates that the sector has only been contributing 1.1% to GDP.

The conceptual framework attempts to present a case for importance of forests to livelihoods and communities exploring various issues of forest utilization and management and ends up presenting a model management framework that rakes into account the issues brought out.

2.4.1 Forest Utilization as a Source of Livelihood

Substantial use value is derived from environmental services provided by forests. Forests and trees in cropland help replenish soil fertility, sustain critical nutrient cycles, and improve climate. They protect fragile soils by intercepting rainfall and stilling wind velocities, facilitate nitrogen fixation, reduce high temperatures, stabilize watersheds and act as carbon sinks. They also regulate the quantity and quality of water resources lowering evaporation that drains surface water limiting siltation from watersheds (Sharma et al. 1994). The environmental services provided by forests contribute indirectly to economic activity. At a micro level, people living around forests use fresh water from streams that emanate from forests, experience frequent and prolonged rain seasons conducive for agriculture, while at a macro level, the rest of the world receives net benefits in the form of carbon sequestration, biological diversity and hydrological services (Godoy et. al., 2002 as cited by Biota, 2005).

Important to note is that except for forests that are habitats to wild animals that destroy crops thus are avoided by many, areas surrounding forests are heavily farmed due to the constant rainfall and existing fertile soils. This presents an obvious challenge of communities possibly extending their agricultural activities into forest boundaries especially if the institutions that manage the forests are not able to effectively monitor and control such activities.

The forestry sector contributes significantly to national economies though this is most often overlooked. Whiteman and Lebedy (2006) found that the value of exports from the forestry sector in Africa from the year 1990 to 2000 increased significantly from USD 1.8 billion in 1990 to USD 3.2 billion in 2000. They found that the value of exports from the woodworking sector accounted for most of this increase, along with a slight increase in the value of pulp and paper exports. They also noted that the value of Non Wood Forest Products (NTFPs) exports increased. In addition, governments collect revenue from the forestry sector from fees, taxes and charges levied on trade and processing activities as well as general taxes such as value-added tax and income tax. The average level of annual revenue collection over the decade amounted to USD 95 million, indicating an upward trend in total revenuofcollection (Whiteman and Lebedy, 2006).

The wood sector is usually limited to a small percentage of the population. It is confined to large companies that are able to purchase the expensive equipment necessary and pay the initial taxes and licenses fees required by the government through the Forest Department. Local communities rarely benefit from these companies as all profits go directly to the companies while taxes go to the government. This necessitates the following questions; what is the local communities' reaction to this? How can local

communities benefit from the income generated by these companies? What mechanisms are in place to ensure that the profit motive does not override the conservation motive?

An emerging area of study and debate among scholars and development partners is forest's significant contribution to rural people's livelihoods through Non Timber Forest Products (NTFPs). Forests long regarded in western scientific and development models primarily as sources of industrial timber, are gaining appreciation as sources of multiple products and services, and as important sources of livelihood for forest-based people (De Beer and Mc Dermott, 1989, Falconer, 1990, Nepstad and Schwartzman, 1992 and Plotkin and Famolare, 1992 as cited by Belcher et. al. 2004). Non Timber Forest Products (NTFP) also known as non-wood forest products or special forest products refer to all products derived from forests with the exception of timber. They include products that are collected from the wild (natural regeneration) and managed and cultivated products, both plants and animals. These range from fodder, roofing material, fruits, vegetables, medicinal herbs, honey bees and animals collected from the forests by people who live around forests for use in their homes.

According to IUCN (2000yNTFPs are a sub sector that has the potential of contributing to both forest conservation and rural poverty alleviation goals. Indeed a study conducted by Bogahawatte in 1999 in India found that there is a large number of NTFPs collected, though the income from NTFPs ranked far below that from both off-farm income (which was the highest) and farm income. Despite this, the researcher found that people were still willing to participate in the management and protection of forest resources; reasons being the important roles the forest and NTFPs in particular played in the lives and religious practices of the people. A survey conducted by Gordon and Ayiemba in 2003

also found that amongst the people benefiting from the Kipepeo project (a butterfly farming project at Arabuko Sokoke forest in Kenya) attitudes of the farmers benefiting from the project who had wanted to clear the entire forest for agriculture had fallen from 59% to just 16% (Gibbon et. al., 2005).

Controlled extraction of NTFPs represents a potential income source, plays a central role in maintaining food security and potential for improving the livelihood of the local populations (Jodha, 1995; Chambers, 1999). Belcher et. al., (2000) notes that many forest products are available as common property resources in traditional systems or as de facto open access resources in State forest lands thus are readily available especially to the poor. They can be harvested and used with little processing, using low cost (often traditional) technologies. Some NTFPs are likely to be available for direct consumption or sale when crops fail due to drought or disease, or when shocks hit the household such as unemployment, death or disease. For NTFPs that are sold, they provide much needed rural employment and cash income. In maintaining food security, indigenous fruits, for example can be processed into a variety of products that store well and used in periods of food scarcity. Also important and an aspect that seems to be often overlooked is the fact that the leaves, animals, ediWe worms, insects and mushrooms found in both indigenous and exotic forests add to the diversity and payability of diets providing different nutritional requirements and contributing significantly to the health status of local communities.

Marshall et al. (2003) points out that commercialization of NTFPs can provide multiple benefits to community members. Apart from increasing financial income, it has been ggested that NTFP sale can also strengthen community organization and improve

social justice presumably by increasing the involvement of disadvantaged members of the community in economic activity. Trade in NTFPs can also benefit a broader community of traders and consumers who should therefore be considered in any comprehensive assessment of the impacts of NTFP commercialization (Marshall et. al., 2003, Belcher et. al., 2000).

From the literature discussed above, we see that forests have various advantages that not only contribute to communities livelihoods but also that commercialization of NTFPs can lead to strengthening of community organization. But more importantly, we see that people who benefit from the forest are more likely to want to protect the forest. The literature however fails to advice and give direction on how the large number of people supported by forests can best exploit without endangering it. Should each individual extract NTFPs or should they be extracted communally? Are conflicts likely to arise due to this and how can they be resolved?

Anderson et. al. (2006) asserts that globally 77% of the worlds' forests are owned and administered by governments, 11% is reserved for or owned by local communities and 12% is owned by individual The scholars note that although there have been a series of moves towards more community and local ownership and claims that a significant transition is underway globally there does not seem to be much progress in Africa in allowing local control and community ownership of forests. The scholars point out that, complementing tenure and property rights, procedurals rights and rights of association are needed if local people are to benefit from forest resources and other natural resources. These rights include access to decision-making, access to information and justice. Without such rights, lies the danger of extravagant and or misuse of resources.

Whiteman and Lebedy (2006) point out that very little information is available about the quantity and value of NTFPs produced for subsistence or sale. Apart from the lack of record keeping and monitoring of the harvest and use of NTFPs, most communities that use NTFPs exist in a non-monetized cash economy (Mogaka, 2004), whereby they either use the products directly in their household or exchange with other households for other products. Lack of such supportive data would definitely present a challenge for the justification of requests for funds allocation to the development of the sector through services such as research, extension and marketing. Thus the sector continues to be under developed denying communities potential incomes and profits that would positively impact household livelihoods.

To have real value, products must have a market and it must be possible to commercialize them (Flynn, 1998, Arnold and Ruiz Perez, 2001 and Wunder, 2001 as cited by Shackleton and Shackleton, 2002). In a study conducted in Mexico and Bolivia by Marshall et. al. (2003), marketing and sale were identified as the main processes constraining successful commercialization. Yet for the poor, barriers to market entry are widespread and include lack of access to capital, and credit, limited market contacts and information, and low level^of technology. Furthermore, because volumes and values can be low and dispersed, markets tend to be segmented (Anderson et al. 2006). The poor tend to be remote, with weak markets for NTFPs and weak resource tenure. Many of these N 1 F-Ps are used as inputs in local processing industries that face thin markets and, because the entry barriers are low, there is often heavy competition from other producers that limits profitability (Belcher et. al. 2004).

Flynn (1998) notes that producers of NTFPs face numerous market failures and barriers-to-entry in commercializing their products: First are the classical market failures - lack of capital and information. Producers may have immediate access to products in which the market has great interest, but firms and producers usually do not know about each other and face huge investment costs in bridging the gap. Second are the socio-political failures: these stem from marginalization of forest producer groups by government and are characterized by lack of resource ownership/tenure rights, barriers to collective action and organisation, lack of educational options and lack of transport infrastructure (Flynn, 1998).

Lack of specialization on NTFP development as a source of livelihood limits the sector's potential and development. Some of the reasons for the lack of specialization have been cited as; little choice - no one source of income is sufficient. Secondly, using various NTFPs in an economic portfolio allows households to spread risk and to modulate the timing of income. Also NTFP markets are often thin and unpredictable, so poor people (especially) are naturally reluctant or unable to concentrate or "specialize" on any one product. Finally, diversification allows households to balance seasonal labour requirements. And in situations where the cost of market transactions is high, production for direct consumption is sensible, and a diversity of products is desirable (Belcher, 2004). It seems that most people will only use NTFPs when it is necessary and as a last option and immediately another livelihood opportunity presents itself, they forget about NTFPS. Specialization leads to quality and efficiency and consequently profits, a state that cannot be achieved with communities using NTFPs only as last alternatives to their livelihood options.

There also exists the problem of transporting products successfully to markets because of long distances to points of sale and or poorly developed infrastructure. Lack of financial instruments such as loans or credit, lack of access to market information are also significant challenges. Such results highlight the need for business planning, marketing development and market analysis as key requirements for successful commercialization of NTFP resources (Lecup et. al. 1998 as cited by Marshall et. al. 2003).

Inability to raise the license fees charged to utilize forest resources by the poor ensures that the poor are unable to access/use these resources. Secondly, the poor normally are not able to attain formal education denying them exposure to the diverse and alternative uses of forest resources in addition to those that they are already aware of through informal education. Inability to access knowledge sources/bases such as books, the internet, other forest groups and any other sources of knowledge that will expose them to different ways of utilizing forest resources denies them access to the forest's product potential in contributing positively to their livelihood. Inaccessibility to the forests due to the poor roads and the high transport costs related to such roads also limit the potential for the exploitation of the NTFPs.

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Management for NTFPs also presents a significant challenge for transforming these NTFPS into livelihood alternatives for communities living adjacent to forests. Belcher et. **al.** (2004), note that the management approach is a key strategic decision for NFTP **producers.** An individual or group of producers can increase their earnings by improving **the quality,** quantity, or timing of production through intensive management (there may **also be scope** for improvements through stronger bargaining and improved marketing). **Management** options range from gathering from the wild through to intensive cultivation.

2 4 2 Nature of Resource and the Consequent Management Challenges

Forests generally fall within the category of common pool resources (CPRs). These are resources to which access cannot be easily controlled (exclusion is infeasible) and consumption is joint and non-rivalrous (Thomson 1992). Ostrom (2000) assets that all common pool resources share two attributes of importance for economic activities; 1) it is **costly to** exclude individuals from using the good either through physical barriers or legal instruments and ii) the benefits consumed by one individual subtract from the benefits **available** to others.

Common pool resources share with public goods the difficulty of developing physical or institutional means of excluding beneficiaries. Unless means are devised to keep non authorised users from benefiting, the strong temptation to free ride on the efforts of others will lead to a sub optimal investment in improving the resource, monitoring use and sanctioning rule-breaking behaviour. Secondly, the products or resource units from common pool resources share with private goods the attribute that one person's consumption subtracts from the quantity available to others. Thus common pool resources are subject to problems of congestion, overuse and potential destruction unless harvesting or use limits ar^Sevised and enforced (Ostrom, 2000).

Lack of proper mechanisms for the management of common pool resources can easily lead to tragedy of the commons. Hardin (1968) explains this concept by stating that people face a dangerous situation created not by malicious outside forces but by the apparently appropriate and innocent behaviours of many individuals acting alone. He asks us to imagine the grazing of animals on a common ground. Individuals are motivated to add to their flocks to increase personal wealth. Yet, every animal added to

the total degrades the commons a small amount. Although the degradation for each additional animal is small relative to the gain in wealth for the owner, if all owners follow this pattern the commons will ultimately be destroyed. And, being rational actors, each owner adds to their flock. Ruin is the destination toward which all men rush, each pursuing his own interest in a society that believes in the freedom of the commons (Hardin, 1968 as cited by De Young 1999).'

In managing Common Pool Resources, averting a tragedy involves restraining both consumption and access. De Young (1999) asserts that Hardins and others have argued that the most straightforward way to achieve restraint is through coercion, generally administered by outside agents. In its most extreme formulation this prescription involves the centralized authoritarian control of a resource (e.g. direct management by a government agency). This seems not to have worked and two differing schools of thought have emerged in regard to the management of common pool resources.

One school of thought is of the opinion that common pool resources would be more effectively and efficiently managed as private property. Private property is fronted as being more efficient, equi^ble and sustainable as opposed to common property. The privatization of the commons which while less severe, also involves external factors and the force of law to defend the rights of the private enterprises to manage the commons as they see fit (De Young, 1999). This prescription is also articulated by Smith (1981) as cited by Ostrom (2000) who states that 'the only way to avoid the tragedy of the commons in natural resources and wildlife is to end the common property system by creating a system of private property rights.'

considcraf pre^rct,ons f^or the inevitable over exploitation of a commons were based solely on **access syst >** S o oPen access situations. Infact case studies document that tragedies do occur when an open **m supplants** a pre-existing successful **CPR** management system (De Young **1**999).

The private property rights system as discussed above presents the security of property rights as a key incentive to the conservation of the forest. There are however three major weaknesses to this system; one is the cost of fencing off the resource or hiring enough personnel to guard the resource from would be illegal users. The second weakness is the risk that the owner could decide to put his economic interests first and turn the resource into an income generating facility weakening the resources environmental services. The most important weakness is that the resource would not benefit the intended target which is the local communities.

The other school of thought opines that Common Pool Resources are better managed as common property. Common Property Resources are defined as those where members of a clearly demarked group have a legal right to exclude non-members of that group from using a resource (Jodha, 1992; Arnold, 1999 and Elinor, 2000). CPRs are managed at least to some extent; exclusion is difficult and they are subtractible (Bromley and Cernea, 1989; NAS, 1986 and Ostrom, 1990 as cited by Arnold, 1999). Important to note is that access to and control of CPR products and services and exploitation and investment rates in the CPRs is usually only partial and not entirely successfully.

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McKean (1995) as cited by Arnold (1999) asserts that forests are part of resource systems that are subjected to heavy population pressure, have congested and competing uses, thus coordination among users is essential to cope with problems caused by multiple uses or with interrelationships such as the effect on farmers of forest use in upland areas in a watershed and land use in lower areas. Furthermore, forests that are managed for their climatic function and outputs such as wildlife and the variety of ecosystems provided by **forests** (Arnold, 1999) need to be managed in their entirety.

The above character of forests necessitates collective control, so as to sustain long term use, limit resource use, undertake various forms of active management and to ensure that users do not over invest in capturing available supplies and under-invest in managing a CPR and in capturing new supplies (Thomson, 1992 and Poteete and Ostrom, 2004) implying common property regimes. Also, group control and enforcement of rules can be an efficient way of coping with the costs of monitoring otherwise porous boundaries and of enforcing restraints on use within those boundaries (Arnold, 1999). As McKean, (1995) cited by Arnold, (1999) observe, common property offers the privatization of rights to use a resource without having to divide it into individual holdings

Ostrom (2000), advancing management of natural resources as common property, asserts that devising property regimes that effectively allow sustainable use of a common pool resource requires rules that limit access to the resource system and other rules that limit the amount, timing and technology used to withdraw diverse resource units from the resource system. Analyzing the design of long-enduring CPR institutions, Ostrom (1990) identified eight design principles which are prerequisites for a stable CPR arrangement:

- clearly defined boundaries,
- congruence /between appropriation and provision rules and local conditions,
- collective-choice arrangements allowing for the participation of most of the appropriators in the decision making process,
- effective monitoring by monitors who are part of or accountable to the appropriators,

  graduated sanctions for appropriators who do not respect community rules,

  conflict-resolution mechanisms which are cheap and easy to access,

- minimal recognition of rights to organize (e.g., by the government),
- In the case of larger CPRs: organisation in the form of multiple layers of nested enterprises, with small, local CPRs at their bases.

In line with the principles above, Schlager and Ostrom (1992) as cited by Ostrom (2000) identified five property rights that are most relevant for the use of common pool resources, these relate to access, withdrawal, management, exclusion and alienation. These rights are important for all the stakeholders as they ultimately impact on the on how responsible all the beneficiaries from the resource will be towards it's usage.

Benefits derived from managing CPRs as Common Property include the following; common property regimes impact positively on local communities; feasibility of exclusion has an important impact on people's incentives to care for a resource. In general, the more feasible it is to control access, the more the rights-holders feel that they have tenure security; people believe that they will be able to gain the benefits of their property. When people feel that their tenure rights are secure, they are generally more willing to invest in improvements in the resource. In many cases, a higher feasibility of exclusion as provided by common property regimes is associated with stronger incentives to nurture, protect and invest in a particular resource. Individuals are likely to feel a stronger incentive to protect resources from which they gain subtractive benefits. When benefits are joint, people feel less of a personal stake in the resource, thinking that someone else will take care of the problem (Thomson, 1999).

Common property resource management systems that are strong enhance the possibility of low-impact use of reserve resources by communities. One of the factors underlying

the swing to community based wildlife management is the recognition of effective common property resource management systems surviving and or emerging in a wide range of situations. Through consultation and well managed common property resource management systems, communities adjacent to the resource benefit, not from negligible tourist or hunting revenue, but from licensed and co-managed access to resources important to their livelihoods (Rogers et. al. 1999).

Finally, common property regimes typically function at a local level to prevent the overexploitation of a resource system from which fringe units can be extracted. Thomson (1992) however warns that when collective decision making replaces voluntary or private decision making, the potential for abuse of power exists. It is also further cautioned that disregard of CPRs and their contributions by welfare and production programs does not only lead to their marginalization as a useful resource, but is also causing their depletion in terms of area shrinkage and productivity decrease. This in turn induces further falls in their pay-off, to be followed by further neglect and degradation (Jodha, 1992).

As a way of protecting natural resources and to ensure sustainable use, States have in the past taken over their management. The most pervasive form of State Intervention is expropriation of forest and woodland as forest reserves or some other form of state property. This involves replacing users' rights to the forest with a more limited set of privileges related to use of specified forest products usually governed by restrictive regulations and exercisable at the whim of the officials of the responsible government department. The second form of State intervention, particularly in the post-independence era has been the increase of government control over local activities. The inevitable conflicts with existing power structures and allegiances encourage measures to

undermine and remove previously functioning local governance and management systems, and replace them with political and bureaucratic structures and regulations (Arnold, 1999).

Excluding rural resource dependent people from forests displaces some activities into other forested areas that have less effectively enforced exclusion rules and replaces some extraction with market purchases. Exclusion from an area that villagers have used for forest product extraction will decrease the welfare of the villagers even if the villagers can harvest the resource elsewhere in the forest or can purchase it from a market. Remotely located villagers for whom market transactions costs represent a significant economic barrier to market interaction bear a higher cost of exclusion than identical villagers who have more ready access to markets. Local populations are thus made worse off by exclusion policies because they incur higher costs to procure the resources. These people bear a potentially large cost when excluded from a protected area and that cost may not be offset by locally-accruing conservation benefits (Robinson et al. 2005).

Also as States take over the responsibility for natural resource management and conflict resolution, people increasingly leave management of local tree resources to the Forest Department to avoid the high social transaction costs of organizing the management of small areas of forest in such difficult and adverse circumstances (Lawry, 1989 and Shepherd, 1992 as cited by Arnold, 1999). Core of the problem for forest communities is that they derive insufficient benefit from the forest. This is so often attributable to conventional forest management objectives and administrative practises, an orientation towards conservation, wood production, revenue collection and regulation through punitive legislation and regulation. The task of forestry for development of such

communities is consequently to engage them more fully, positively and beneficially in its utilization, management and protection (Robinson et al. 2005).

As Hjort-af-Ornas and Lindquist (1999) point out, property control and power relations are crucial determinants for access to resources and of course, to goods and services that emanate from natural resources. Rogers et. al. (1999) suggests a planning process that institutionalizes participation by all stakeholders and uses a forum for negotiation, a process of consultation and a level of transparency that allows the emergence of solutions that all can own. He cautions that if this is not done, management policies will not work; that even if the loser stakeholders do not have the power to get their own way, they have the power to undermine, block or destroy the aims of the winning stakeholder (Lindsay, 1987, Western & Wright, 1994 as cited by Rogers et. al. 1999).

2.4.3 Community Based Management

The discussion in the above two sections points towards need for a management concept that will encompass the characteristic of the resource, the multiple and competing uses it inspires and the challenges that arise with addressing the issues. It has been realized that legal protection alone canncCensure actual protection; limited resources, lack of political will and other factors often limit the amount of enforcement possible (Jepma, 1995). Besides, experience has shown that for conservation and management approaches to be successful, they have to actively involve all relevant stakeholders particularly the local people (Purnomo et. al., 2005 as cited by Biota, 2005).

Over the last few years, scholars and policy makers have come to the realization that

'cipation of communities and stakeholders in managing forestry and conservation

projects can help improve forest productivity, alleviate poverty, increase environmental sustainability, and make rules governing forest access more enforceable. There is also the realization that uncertainty about rights, duties, liberties and exposures of various persons who use Woodstock can discourage investment of individual or collective effort in maintaining and enriching that resource just as much as inappropriate working rules that are reliably enforced. This encourages opportunistic behaviour from communities endangering the sustainability of the resource. To the degree that individuals believe in the rules, contracts and property rights of society, they will be willing to forego opportunities to cheat, steal or engage in opportunistic behavior (North, 1990, Thomson, 1992). This has led to the conclusion that sound resource management requires a coordinated approach to the intertwined social, cultural, economic and political problems leading to the development of the concept of Community Based Natural Resource Management.

Underlying the concept of Community Based Natural Resource Management (CBNRM) is the provision of incentives for communities to manage natural resources in a sustainable way through the transfer of management responsibility, decision making processes and user benefits from designated areas. The CBNRM approach combines conservation objectives with the generation of economic benefits for rural communities. It is based on three key assumptions; that locals are better placed to conserve natural resources; people will conserve a resource only if benefits exceed the costs of conservation; and people will conserve a resource that is directly linked to their quality of life (Thakadu, 2005).

CAMPFIRE (Communal Areas Management Program for Indigenous Resources) Zimbabwe is an example of Community Based Natural Resource Management that has been successful for a number of communities. The CAMPFIRE initiative was developed in an effort to provide local communities with access to, control over and responsibility for the wildlife resources on their land. Related objectives are to empower the communities to make decisions about those resources, to ensure that they receive an equitable share of benefits from exploitation of their resource and to support institutional strengthening at community level.

Thakadu (2005) asserts that communities neighbouring protected areas should receive direct benefits from them and have a say in natural resource management and use if conservation policies are to be effective. Communities share an interest in conserving natural resources in their surroundings, as their livelihoods are intricately connected with these resources. Also people living closest to natural resources have more to lose from their degradation, and would therefore - if given proper tools and incentives- be the most likely to effectively preserve them. Furthermore, co-management with local communities is seen as a tool to ensuring that the people who live with natural resources also actively participate in their management.

It is argued that people living with the negative consequences of unsuitable resource management decisions and those receiving benefits have incentives to be good stewards. Only when communities derive real, meaningful and tangible benefits will their dedication to conservation be triggered. When a value of a resource is focused to meet a particular need, people will weigh the benefits of that resource against the costs of conserving it (Thakadu, 2005). Community participation in conservation efforts can only

be secured by the provision of appropriate economic and cultural incentives, such as guaranteed access to non-timber forest products.

Local people expect some benefits from their participation in forest management. Such benefits include employment in forest-management programs and continuous access to those NTFP that are important to their livelihood. They also expect to receive rural infrastructure in the form of roads and assistance in the building of temples (Bogahawatte,1999). Also and of importance, participation is important for human existence and general development; above all it enhances people's abilities to provide for them, increasing their knowledge and understanding of development problems and solutions (UNDP, 2004).

When local people's quality of life is enhanced, their efforts and commitment to ensure the future well-being of the resource is also enhanced. In addition they expect the forestry department to do its share in the implementation of the FSMP, such as giving technical assistance and material support to the people (Bogahawatte, 1999). And this is why CBNRM opts for economic benefits that have a direct positive impact on people's quality of life, as a means bring about conservation rather than social empowerment or economic development (Cassidy, 2000, Motladile, 2004 as cited by Thakadu, 2005).

The literature on Community Based Forest Management provides the basis for community participation in forest management. It borrows from the principles, values, and benefits of managing Common Pool Resources as Common property and this is the model that will be adopted for this study.

2.5 Hypothesis

The following hypotheses have been developed for this study;

a) That the poor livelihoods of local communities around Kakamega forest are a function of the State's controlled forest management that limit use of resources.

b) That limited community participation in resource conservation is a function of a felt sense of exclusion in utilization of the resource.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Target Population

3.1.1. Characteristics of the Population

Population in Kakamega district is relatively high due to high in-migration of labour to engage in forest activities mainly harvesting trees for timber and cultivation in the forestland. The population between the age group of 6 - 17 years represents 35% of the population in the district while that of 15 - 49 years represents 24% and the remaining 41% is represented by those over 50 years.

There is relatively high illiteracy in the district. The enrolment rates for boys and girls at primary school level are 82.1% and 81.3% respectively while in secondary school they are 68% for boys and 69% for girls. Drop out rate at high school are 5.3% for both boys and girls while in primary it is 28% for boys and 24% for girls. This might have reduced due to the introduction of the free primary education in 2003. The National Development Plan (2002 - 2008) lists the high school dropout rate as one of the manifestations of poverty in the district. The district's dependency ratio is estimated at 100:99 hence for every 100 working adults (15-64 years) there are 99 dependants implying that more savings are diverted to expenditure on consumptive goods.

Most of the people in the district have no access to training due to low income and irregular payments of their farm produce. The district is not well served with middle level and vocational training institutions which can impart industrial skills to school leavers. There is a low adoption rate of new agricultural technologies thus agricultural

productivity has been declining. There is also general lack of entrepreneurial and industrial culture among the large population in the district.

3.1.2. Socio-economic Patterns

The land surrounding the forest is intensely farmed with almost no permanent grassland or forest patches surviving around the forest. Shinyalu division particularly records the highest population density of 861 persons per Km^2 This is attributed to the fertile soils and favourable climate for agricultural activities (Kakamega District Development Plan, 2002-2008). Maize, beans and a variety of vegetables are grown all around the forest as staples of the people's diet. Tea plantations have thrived on the southern part of the forest and have been successfully established in a margin adjacent to the forest and between Kakamega and South Nandi forests. The Northern edge of Kakamega forest is bordered by a sugar cane zone, which now represents a considerable cash crop to local landowners.

Shinyalu market centre is mainly characterised by a few posho mills and some small shops. An activity that seems to be practised by a large number of male youths is transportation by boda-bodas, the bicycle mode of transport provided for people mainly using public means to access the forest as the distance between the last public transport point and the forest is about 8 kilometres.

3.2. Research Design

3.2.1. Sample Size and Distribution

The survey was limited to Shinyalu division, which is the area under the jurisdiction of the Forest Department, while the in-depth interviews extended beyond Shinyalu.

Population in Shinyalu is estimated at 14, 809 households with a total of 120,577 persons from the projection of the 1999 population census. 60 households were randomly selected from four villages that were purposively selected based on their distance from the forest. The households were selected during due to the non-existence of a population record that lists all the people residing in any particular village. One individual was interviewed in each household. The Sample comprised all adults over 18 years of age.

3.2.2. Household and Respondent Selection

At the village level, starting points were selected on the basis of a key administrative unit or geographical mark. In two of the villages, the starting point was five houses away from the Chiefs office and in the other the starting point was five houses away from a local high school. For every successful interview, the researcher would skip three houses maintaining a right hand turn at every junction. In the case of an unsuccessful interview, the researcher would visit the next household until a successful interview was conducted then three houses would be skipped. At the household level, all the people over 18 years of age were listed down and one person selected to be interviewed.

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Respondents were identified within a 10km radius from the forest boundary. Meffe and Carrol (1994) as cited by Kiragu (2002) assert that impact and interaction of the community with the forest decreases with distance from the forest. KIFCON studies (1994) also indicated that the greatest interaction of the community with the forest is by those living within a radius of 5km from the forest.

Key informants were chosen through snow balling. They comprised of people who had stayed near the forest and if possible utilized it in the past twenty five years and

representatives from key institutions concerned with forest management in the country. In total the key informants comprised of the District Forest Officer (DFO), Kenya Wildlife Services (KWS) Warden, two village elders, one old man who used to farm in the forest during the late seventies and early eighties and two representatives from Kakamega Environmental Education Program (KEEP).

The District Forest Officer and the Warden were relatively new in Kakamega. The DFO sits in the district forest head quarter's office at Lurambi and this is where the interview was conducted. The KWS warden sits in the KWS district office near the district headquarter offices in Kakamega town and this is where the interview was conducted. The Warden has another office at Hamisi forest station while the District Forest Officer is represented by a Forester at Shinyalu (referred to as the Isecheno Forest station). For both the District Forest Officer and the Warden, the researcher had to book prior appointments. Both respondents were friendly and shared their own personal experiences from the past when they were situated at different stations to explain some of their answers.

The two village elders we^ interviewed together in one of the villager's homesteads. The two were referred to the researcher by the Assistant Chief who was going for a meeting and could not be interviewed. During the period of the study, both the Assistant Chief and the Chief were held up in a number of meetings thus could not participate in the study. The two KEEP representatives were the former Chairman of the CBO and the treasurer. These two have been in the organisation since it's inception thus are well informed about the issues villagers have faced regarding the forest and the forest itself.

3.2.3. Data Collection

Data for this research was collected from both primary and secondary sources. Information on forest management systems mainly relied on secondary data sources. Primary data sources comprised of in-depth interviews with key informants and face to face interviews with selected respondents from the local community in Shinyalu division. The key informants comprised of one institutional representative from the Forest Department, Kenya Wildlife Service, a local Community Based Organisation and three other community members.

The tools for primary data collection included a close ended structured questionnaire with a few open ended questions for the local community and a discussion schedule for the key informants. Both questionnaires were translated into Kiswahili. Interviews with general respondents were mainly conducted in Kiswahili with a few respondents asking to be interviewed in Luhya while the key informants were interviewed in both Kiswahili and English. Primary data was collected during the month of August 2006.

Secondary Data was collected from different libraries including Moi University library and other libraries (Environmental Studies library, Chepkoilel campus library, Forest Department library Karura). It is important to note at this point that although the researcher came across a lot of research work conducted at the Kakamega forest, most of it had concentrated on scientific areas such as tree and animal species, climate matters, soil, among other scientific aspects of the forest. Scientific research is important for the forest but also the communities' attitudes and practices towards the forest need to be constantly researched as they are the main custodians of the forest and their inclusion is important for the forest's survival.

3.2.4. Data Analysis and Presentation

Data collected has been analyzed both qualitatively and quantitatively. For quantitative data, the Statistical Package for Social Sciences (SPSS) software was used to derive descriptive and inferential statistics. The key variables that were analyzed are forest management as the independent variable and represented by a number of attributes. Access, use and livelihoods were the dependent variables and are also represented by a number of different attributes.

Analysis of qualitative data began immediately in the field with the researcher observing some aspects directly while arranging information collected from key informants into different topics and then reporting the different views as presented by the key informants. The data will be presented in the form of a narrative with tables and graphs illustrating the findings.

3.3. Limitations

3.3.1. Accessing Shinyalu

Shinyalu can either be accused through Khayega or from Kakamega town. Public transportation is by old matatus where 14 people sit facing each other. Both roads are seasonal roads. Public transport vehicles end their journey at Shinyalu market centre which is 8km away from the forest. People visiting the forest thus have to either walk to the forest or hire the local transport mode in the form of bicycles, called boda-bodas.

The people seem to recognise visitors immediately one sets foot at the market centre. The main language of communication with outsiders is Swahili though during discussions,

some of the people talk in luhya on the assumption that the visitor does not understand their language. The community is relatively inquisitive wanting to know the interest of any person visiting the village. Respondents are generally friendly and willing to answer questions asked. At the end of the interview, they would like to know what the information would be used for and how it would benefit them.

During interviews, other people are usually curious and come to the scene of the interview to find out what the interview is all about. For the young males, on two different occasions, their friends who were listening to the interview would urge them to ask me for money for agreeing to answer the questionnaire. For the older women, they are generally kind and most of the time they would offer to pack for the researcher maize, avocadoes or any other fruit that they grow in their compounds despite the poverty that they obviously face.

3.3.2 Problems experienced during Fieldwork

A few problems were encountered though they were not unique, they comprised of the regular problems that are associated with the kind of information sought and the kind of respondents being interviewed.

- Most of the problems related to the time each interview took. Some respondents would digress from the questionnaire asking and giving detailed personal information that was irrelevant for the study.

- Some respondents especially the old ones preferred to be interviewed in vernacular which proved to be a major time challenge as the researcher spoke the

Maragoli dialect while most of the respondents interviewed spoke the Isukha dialect. Due to lots of explaining that had to be done, such interviews ended up taking much longer periods than should have been.

- In most homesteads, all the people present would want to participate in the interview and upon insistence of the researcher to only interview one person, the others would not take it kindly though nothing bad aroused out of this.

- In some instances, the respondents felt that they were not knowledgeable enough to answer the questionnaire thus would refuse to take part in the survey.

- Some of the respondents especially the younger ones would ask for incentives for them to participate.

- The study would have immensely benefited from records especially financial records for instance records of revenues collected over the years, but these were said to be confidential and not open to the public.

3,3.3 Resolving of the above problems

The above problems were resolved in the following ways;

- For the time, the researcher would patiently steer the respondent back to the question explaining to them that this was a scholarly study and the answers were solely for that purpose.

The researcher translated the questions into the vernacular language. The difference in dialect contributed to the interviews taking a longer time period and this the researcher patiently explained ensuring that no meaning was lost when asking the question or taking down the answer.

For instance where people around the respondent would contribute answers, the researcher explained to them that the study only needed one person's response from a particular household and this was enough to make them quiet and after a while would live the interview to continue and go elsewhere.

In instances where respondents felt that they were not knowledgeable enough to answer the questionnaire, the researcher explained to them that it was their views and opinions we were after and not knowledge on any technical issue. Some would then agree but for those who refused, we would interview a different person who did not mind being interviewed.

The respondents that asked for incentives were explained to that this was a study being undertaken by a studenttfius there was no funding to provide incentives.

Despite the financial records being confidential, the information from the interviews with the officials from the forest department gave enough information to be used for the purposes of this study.

CHAPTER FOUR: RESEARCH FINDINGS

4.0 Introduction

The chapter presents and discusses the findings generated through depth and survey interviews. The chapter is divided into four sections; description of the respondents; forest management, access and utilization of the forest and hypothesis testing. We have also attempted to discuss the findings in relation to the literature and conceptual framework outlined in this project.

It is important to note that the collection and analysis of data for this project paper was done before the implementation of the Forest Act in January 2007. Therefore as opposed to Kenya Forest Service, the institution mostly mentioned in this paper is the Forest Department.

4.1 Description of the Respondents

4.1.1. Gender and Age

The sample comprised of 26 males and 34 females. Of the respondents interviewed 14 were between the ages of 18-25 years, 3 were between 26-30 years, 9 were between 31-35 years, 6 were between the ages of 36-40, 7 were between the ages of 41-45 years, 6 were of the ages of 46-50 years while 15 respondents were over the age of 50 years. This is summarised in the table below;

Table 1: Age of Respondents interviewed versus Gender

Age Category	Male	Female	Total
18-25 years	8	6	**14**
26 - 30 years	**1**	2	**3**
31-35 years	3	6	**9**
36 - 40 years	2	4	**6**
41-45 years	**1**	6	**7**
46-50 years	3	3	**6**
51-54 years	2	2	**4**
Over 55 years	6	5	**11**
Total	**26**	**34**	**60**

The age brackets of 18-25 years and over 50 years total 29 respondents representing about 50% of the people interviewed. Like most rural areas in Kenya, the sample in Shinyalu division mainly comprises the younger (18-25 years) and older (over 50 years) population. The younger age category mainly comprises of people searching for employment while the older category mainly comprises individuals retired from active service / employment. This poses a challenge for development in rural areas as the young lack exposure, experience, financial resources and sometimes the knowledge to instigate development while the older people lack the energy and zeal to run development causes. Under the direction and guidance of Experts, the young present a human resource opportunity for development in rural areas.

4.1.2. Occupation

Thirty three percent of the respondents practise subsistence farming, 5 are commercial farmers, 4 engage in professional service (this includes teaching, nursing), 1 is a civil servant, 9 are business people, 2 are in the Jua kali sector while the remaining 6 are engaged in other categories of occupation. Forty one respondents said they had resided in Shinyalu division for over 21 years. Nine of them had lived in the area for a period of

between 16-20 years. Six respondents had lived in the area for less than 15 years while only 4 respondents had lived in the area for less than 10 years.

4.1.3. Land Ownership

Twenty eight percent of the respondents own land size of between a *V** an acre and 1 acre followed by 17 respondents who own between 2 V2 acres to 5 acres of land. Eight respondents own between 1 *V** acres to 2 acres, five respondents own between 5 to 10 acres, while only 1 respondent owned over 11 acres. This constitutes the land that the family lives on and belongs to the Household Head. All the respondents had trees planted n their compounds, an indication that trees are significant. It also possibly implies that the community is investing in alternative sources for forest products especially wood.

4.1.4. Income Levels

Sixty eight percent of the respondents claimed to live on an income of less than Kshs 10,000 every month, 23% claimed to earn an income of Kshs 11,000 to 20,000 monthly while 3% earned between Kshs 21,000 to 30,000. Only 5% of the respondents earned over Kshs 30,000. Income ^has been used in analysing the data as a key variable. 18% of the respondents live in permanent houses, 78% live in semi permanent houses while 3% live in mud houses. Semi permanent houses are defined as those having iron roofs and or cemented floors but have mud walls which are the kind of houses that most people live in. The income levels are reflective of the high poverty levels in the division.

Table 2: Monthly Income Levels

Income Levels (Kshs)	Frequency	%
Les than 10,000	41	68.3
11,000-20,000	14	23.3
21,000-30,000	2	3.3
31,000-40,000	1	1.7
41,000-50,000	1	1.7
Over 51,000	1	1.7
Total	**60**	**100**

4.1.5. Level of Education

Of the people interviewed, 21 had received some primary school education, 14 had completed primary school, and 15 had some secondary school education while 7 had completed secondary school. Only 2 of the people interviewed had attained a college diploma and only 1 person had a university degree. The relatively low level of education might present a challenge to this community's ability to contribute to the division's development, though it was not found to be an obstacle to the basic knowledge needed for environmental conservation.

Formal education would normally impact on respondent's views differentiating their opinions alongside different education levels. However, for this study there seems to be no difference in the views of the people along different education levels as regards their views to the forest's management. This implies that informal education passed on along generations and environmental education provided by the NGOs and CBOs on the ground are sufficient for the forest's conservation. This observation also seems to concur with Anderson et. al. (2006), that literacy is no guarantee of good management and illiteracy no guarantee of poor management. In fact formal human capital measurements say very little about the very strong human capital that exists at local level for forest management.

4.2 Forest Management

Kakamega forest like most forests in Kenya is owned by the Government of Kenyan and managed by the Government through the Forest Department, now referred to as the Kenya Forest Service. The Kakamega District Forest Officer (DFO) explains this as conventional forest management which has not involved communities. He describes this kind of management as more of a prescription management whereby officials travel from Nairobi (the head office) having considered input from the ground but not necessarily incorporating it in the decisions/measures to be implemented at the forest. He defines it as a mostly top bottom approach which he says has failed thus the realization of the need to involve communities.

The Warden who represents Kenya Wildlife Services in the management of the forest believes that there is no way conservation can succeed without involving the local communities. Having realized the importance of local communities in the conservation of the forest, the DFO explains that the government is already in the process of incorporating local communities. At the time fieldwork for this study, the DFO stated that a stakeholder analysis survey had been undertaken and a mapping exercise conducted for the identificatfbn of the forest's stakeholders. The government was at the time in the process of designing benefit sharing structure to provide the basis upon which stakeholders would participate in the forests' management.

4.2.1 Organizations Managing the Forest

Kakamega forest is owned by the Government through the Forest Department and is co-managed by Kenya Wildlife Services (KWS). The KWS Warden explained that there is a Memorandum of Understanding between the Forest Department and KWS on the

conservation and protection of Kakamega forest that facilitates its joint management by the two organizations.

KWS manages 44 sq kilometers of the 240 sq kilometers of Kakamega forest while the Forest Department manages the rest. KWS conducts daily patrols; this, the Warden believes can reduce destruction of the forest by up to 60% without even arresting anyone. KWS can and normally arrest people found with freshly cut wood and charcoal and forward them to the Forest Department. Both the Forest Department and KWS have accommodation facilities at their forest stations that are used to accommodate employees from different stations or other visitors when they arrive at the forest, providing a minimal source of income due to the small capacity of the facilities. Both organizations can only cater for a total of ten individuals per night.

The community thinks that there are numerous organizations involved in the forest's management implying lack of information regarding the forest's management. The community mentioned a number of NGOs and CBOs that they thought are involved in the forest's management as shown in the table below.

Table 3: Organizations community thought are involved in Forest's Management

	Freq.	%
Forest Department	15	25.0
KWS	1	1.7
KEEP	24	40.0
ICIPE	6	10.0
Ministry of Natural Resources	1	1.7
Others	2	3.3
Don't know	11	18.3
Total	**60**	**100**

The organizations mentioned work closely with local communities on forest conservation influencing the belief that these organizations are involved in the forest's management. KEEP, a local CBO is mentioned by the highest number of respondents at 40% followed by the Forest Department at 25%. ICIPE is also mentioned by a relatively small number. KWS is barely known in this area; the area of the study falls within the jurisdiction of the Forest Department while KWS manages a different section of the forest. This finding exposes lack of knowledge of community members about the forest's management.

4.2.2 Forest Management Rules

a) Use and benefits from the forest

The community is allowed to visit the forest but can only collect dead material, herbs, and vegetables without any form of payment and on the basis that they do not enter the forest with any kind of cutting instrument (Hoe, panga or axe) or anything else that can be used to fell trees or kill animals within the forest. People carrying these instruments are not allowed into the forest and if found are arrested and charged. Also, where flora and fauna are endangered, a clearance letter is requested from the forest station. Such a letter contains details of theintended product of extraction and must be produced to the forest guards while in the forest (Kiragu, 2002).

Fees are charged for regular use of forest land and punitive measures taken against people who break the rules. People that graze their animals in the forest pay a monthly fee to obtain a license. If found grazing in the forest without the necessary license or receipt to show that the user fee has been paid, will result in the arrest of the animals until the owners pay the required fines. Quite often, the owners are unable to raise the

required amount of money for the fines, therefore the animals have to stay at the pen for a while without being fed or milked, in such instances the owners complain about the harsh conditions under which the animals are kept to no avail.

Exploitation of large scale forest products from the forest is also permitted but through a licensing process where user fees are charged. A general forest license is used for the extraction of major forest products such as sawn timber, pulpwood and large quantities of firewood whereas a monthly fuel license is for subsistence collection e.g. firewood and pasture. Permits are issued at the forest stations by the Forester in Charge. Records of the fees collected are kept but are not open to the public. The DFO however informed us that all the monies collected are directly forwarded to the Treasury Department. It would be more beneficial to the local community if a certain percentage of this money was forwarded to the Treasury Department while the rest was used for the local community's benefit under specific rules and monitoring.

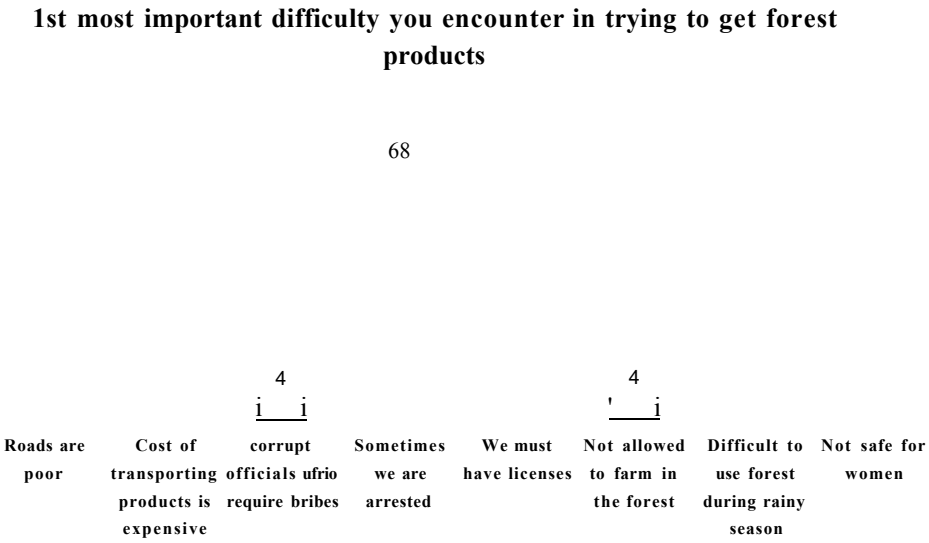
Regarding user fees, the Warden felt that fees should be charged for use of forest resources; he thinks that each individual should pay a fee including people from the local community. He believes that it^s only right for people to pay to use the forest because for the country to develop, he claims, we can not afford to entertain free things. While agreeing with the Warden, the researcher also thought that if possible the fee charged should take into consideration people from the local community realizing the role they need to play in successful conservation of the forest, the fee should also not be expensive considering the high poverty levels experienced in this division.

b) Ease of accessing the Forest

Access to forest resources can be summarized in three ways; physical access (distance of forest from respondent's house, means of transport available, state of existing roads), legalized access (rules that allow for access), knowledge (information to increase alternatives of accessing/using the forest) and technology (means to exploit the forest).

As regards physical access to the forest, 92% of the respondents said that they sometimes visit the forest, however many said they experienced a problem when accessing the forest. 83% of the respondents said they encountered difficulties getting products from the forest. Of these, 68% said their first problem was that they were sometimes arrested, *4%* mentioned corrupt officials who demand for bribes and 8% mentioned a must to have licenses as the most important problem.

Chart 1: Difficulties encountered in getting forest products



A total of 12% cited the poor road and or high cost of transporting products from the forest. Only 23% of the respondents associated the problems experienced with an

organization. The top six problems are directly associated with the Forest Department and or its representatives. Of the 23% respondents who associated the problems with a particular organization, 12% cited the Ministry of Natural Resources / Forest Department as the organization responsible for the problems while only 5% mentioned KEEP.

Frequent arrests of community members have impacted negatively on the community's ability to trust the Forest Department. One of the ladies that was interviewed narrated how a few years back, she had left her three day old baby to go to the forest to gather some herbs and was arrested and kept at the cell for three days despite pleading with the officials to let her go back home to her three day old baby. Such episodes discourage community members from any participation in forest activities. Threats to the forest such as illegal logging go unreported as the communities become more indifferent to the forest. Indeed some young men informed the researcher that they sometimes hear lorries going to and from the forest at night.

Feelings of exclusion and alienation from the forest seem to be deep rooted within community members presenting an urgent need for amicable solutions, most probably negotiations as opposed tp» punitive measures if community participation in forest management is to succeed.

According to Hjort-Af-Ornas and Lundquist (1999), access to information regarding the forest is part of access by the community to the forest. Concerning knowledge/information regarding the forest, 55% of the respondents said they got information about the forest from different sources; a total of 20% cited different CBOs as their source while only 10% cited the Forest Department. Compared to the number of

people that don't get information concerning the forest, a higher number of the respondents that get information about the forest also think that it is well managed implying the importance of communication with stakeholders as an aspect of good forest management.

Table 4: Information versus Perception on how Forest is managed

Forest	Is well managed	Not well managed	Total
Get information about the forest	24	9	**33**
Don't get information about the forest	15	12	**27**
Total	**39**	**21**	**60**

To counter check if the source of information influences respondents into perceiving that the organizations giving them information regarding the forest also manage their perceived respective areas well, correlation analysis was conducted. The correlation revealed a very weak relationship which was also not significant thus we can presume that the source of information does not bias their opinion as regards to whether the forest is managed well or not.

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From the analysis above we can conclude that the communities' opinion to the forest being managed well by the Forest Department is not biased towards their getting information from the Forest Department. However, the Forest Department in it's management still has an unfulfilled duty towards the community by not giving it information regarding the forest. This research does not state the reasons for lack of information by communities. We are not able to state whether the existing information is open to the public and the community does not obtain it either or if the information is not open to the public.

On the way forward regarding information about the forest, 57% of the respondents would like to get information on conservation methods while 23% would like to know how they can use the forest and 12% would like to know about the forest's status. 20% of the respondents believe that it is the Forest Department's responsibility to provide this information, 20% mentioned community elders and 15% mentioned government. The information exists, what lacks are the channels and means through which to distribute the information. To ensure that information about the forest reaches all community members, we recommend the use of channels such as village meetings and other public forums. The Forest Department could also consider recruiting extension workers who to visit villagers at their homes to discuss and teach them how best they could use the forest to improve their livelihood options.

Cross tabulation of problems experienced in collecting forest products with the organization that they thought managed the forest well revealed the following; 79% of the people that said the forest is well managed cited difficulties in getting products from the forest. 46% of those who experienced difficulties in getting forest products due to a cause associated with the Forest Department also said that the areas that were managed well were those managed^by the Forest Department. This finding reveals the community's unbiasness towards the management of the forest; they are able to point out the problems they experience despite thinking that the problems are a result of the Forest Department even though they think the Forest Department manages the forest well.

The following statements derived from principles of sustainable forest management presented to the respondents for them to either agree or disagree with them. The results are presented in the table below.

Table 5: Respondents' reaction to Good Forest Management Principles

Statements	Agree	Disagree
Good forest management should involve communities in planning and decision-making for the forest and its resources	100%	-
Good forest management should benefit communities living around the forest	98%	2%
Good forest management should teach communities how to exploit the forest while conserving it	93%	7%
Good forest management should allow communities to access the forest and use its resources	90%	10%

Over 90% of the community said they agreed with the statements. They felt that good forest management is that which will involve them in planning and decision-making for the forest's resources, benefit them by allowing them to access and use its resources, and educate them on sustainable ways of exploiting the forest. We can therefore conclude that the communities' expectations concur with the outline of sustainable forest management; that all stakeholders must be involved and there must be user benefits to all the groups that use the forest. The community is allowed to access the forest and use its products though use is limited as they are not allowed to carry with them any cutting instruments. Use is also limit^S due to the near non-existence of education on ways of exploiting the forest. The user benefits from the forest are thus not exhausted currently.

4.2,3 The Shamba System of Forest Management

The Shamba System is relevant for this study as it's main focus is to allow communities to access and use forest resources. The Shamba System was originally used to convert natural forest to forest plantations so as to supply wood for industrial and domestic use in

the country and ease pressure on natural forests (Kagombe and Gitonga, 2005). Kagombe and Gitonga (2005) record that after 1975, the system was revised so that resident workers became permanently employed by the Forest Department and offers of tenancy extended to other people resulting in a significant rise in the number of cultivators and a problem of supervision.

The KWS Warden explains that in Limuru (where he had been stationed at the time the Shamba System was introduced) it failed because people would pretend that they planted the seedlings yet they never grew. He however felt that it would have worked with proper management, closer supervision and transparency of all the stakeholders involved. Kagombe and Gitonga (2005) assert that success or failure of any management system depends on how well government guidelines are implemented and enforced. As a disciplinary measure all foresters were interdicted and a few reinstated but the damage had already been done.

The DFO believes that the Shamba System is a good management tool for preparation for planting trees. He says it is cheap and through it people can come up with good plantations. He however f^Jt that the Shamba system cannot work in areas with high population density due to pressure on land and the interest that comes with it; that everyone wants a Shamba in the forest because the soils are fertile.

As to reasons for the failure of the Shamba system, the DFO attributed the low succession rate of trees planted to the agricultural practices of the local community. He explains that during harvesting, maize is cut like napier grass, with people slashing everything without separation and in the process destroying any tree seedlings. After harvesting the whole

area is burnt completely destroying any surviving tree seedling. This he believes also contributed to many forest fires thus it had to be stopped.

The Shamba system of forest management is not a conservation tool rather it is an afforestation tool. Kakamega forest falls under the category of indigenous forests therefore the Shamba System should not have been introduced in the forest at all. In an article in the Daily Nation of 27th March 2006, Maathai asserts that the Shamba System should never be used on lands where protection, conservation and rehabilitation of indigenous forests is essential. It is a management tool workable on private woodlots or plantation systems. She further states that plantations should be strictly established on land that is outside indigenous forest lands like private land.

4.2.4 Roles of Stakeholders

Ingles et. al. (1999) identifies four major groups of stakeholders; users, governments, development agents and other private groups. In the case of Kakamega forest, the government is represented by the Forest Department and KWS while the community and donors are represented by NGOs and CBOs. The KWS warden explained that donors are increasingly asking for mobilization of communities to come up with enterprises to help in forest conservation. He adds that if a group is not organized and registered, it cannot be funded. KWS has helped mobilize communities and assisted them get registered.

The KWS Warden points out that 75% of wildlife lives with people outside protected areas, thus the need to have the community on board. Two community organizations were identified as engaging themselves in forest conservation though not in its management; these are Kakamega Environmental Education Program (KEEP) that works

closely with the Forest Department and the Kabi Kotoa group that works closely with the Kenya Wildlife Services.

KEEP is based within the forest and operates independently of the Forest Department. The CBO makes money through members offering tour guide services to the tourists. They also organize for forums, workshops and conferences to educate local schools and the community on environmental issues. KEEP through various donors have also put up an income generating project of bandas where tourists/forest staff are accommodated. The project not only generates an income for the CBO but also supplements the accommodation facilities offered by the Forest Department. Kabi Kotoa is located in Hamisi falling out of the scope of this study.

4.2.5 Community Perception about the Forest's Management

The respondents defined good forest management using two key indicators; 54% mentioned conservation of the forest's biodiversity and 30% mentioned continuous planting of trees. Involving the community, surrounding the forest with good infrastructure and fencing the forest were each mentioned by only one respondent. 25% of the respondents knew that the Forest Department was involved in the forest's management, 39% mentioned KEEP, a local Community Based Organization that teaches local schools, the community and adjacent communities environmental education.

Table 6: Definition of Forest Management by Gender

Forest Management	Male	Female	Total
Planting trees	7	9	16
Conserving the forest's biodiversity	16	17	33
Planting double the number of trees cut	1	1	2
Stop tree cutting in the forest	1	1	2
Fencing the forest	0	1	1
Surround the forest with good infrastructure	0	1	1
Good planning of forest resources	0	2	2
Involving the community	0	1	1
Don't know	1	1	2
Total	26	**34**	60

Fifteen percent of the respondents said they didn't know the organizations involved in forest management while 10% mentioned ICIPE. 64% of the respondents felt that the forest is well managed; proving good forest management, 41% of the respondents cited presence of security guards and forest patrols within the forest, 12% cited presence of indigenous trees in the forest, 3% cited reduction in charcoal and timber trafficking and 3% cited tree planting.

Of the respondents interviewed, 33% felt that the forest was not well managed. While the gender of respondents who thought the forest was well managed were equal, (19 men and 20 women), the number of people that felt the forest was not well managed was quite significant between the two sexes, though this could be as a result of more female respondents comprising the sample. More research might need to be conducted in future to explain the higher number of females at 41% and only 20% of the male respondents that felt the forest was not well managed.

Table 7: Areas of the Forest that are thought to be managed well

Areas managed well	Freq.	%
Those managed by the Forest Department	32	53.3
Those managed by KWS	1	1.7
Those managed by NGOs	2	3.3
Other	5	8.3
Not applicable	20	33.3
Total	60	100

Of the respondents who said that the forest was not well managed, 12% stated that trees were cut and not replanted, 7% attributed this to increasing charcoal amounts in the area while 5% stated the decreasing number of indigenous trees. 5% stated that forest guards accept bribes and let offenders go free. Lack of community involvement was only mentioned by 3% of the respondents.

Considering prior information that the forest has been reducing in size, women seem to be more concerned, more critical and more knowledgeable regarding the forest's status compared to men. This is in line with past research/studies that have shown that it is mostly women who interact with the forest, going to the forest to collect products for their families. Indeed the products that the community claimed to use from the forest are mainly collected by womdf. These include firewood which comprises dead wood material, grass for thatching houses, building ropes and food. Women thus present an opportunity for monitoring the forest.

Only 36% of the people interviewed participated in different conservation efforts. Participation by men is higher at 44% of the males interviewed compared to 32% of the females interviewed. 23% of the respondents said they assisted conservation groups in their conservation efforts while 12% participated in tree planting exercises. 64% of the

respondents don't participate in any forest conservation activities. 39% of the respondents attributed lack of participation in conservation efforts to the government not involving the community.

Table 8: Participation in Conservation as affected by Distance from the Forest

Participate in forest conservation	Less than 5 Km	6-10 Km	Total
Yes	18	4	**22**
No	30	8	**38**
Total	**48**	**12**	**60**

Thirty eight percent of the people that didn't participate in forest conservation efforts felt that the forest was well managed. Participation in forest conservation seems to be influenced by the distance one lives from the forest; compared to 60% of the respondents who live less than 5km away from the forest and engaged in conservation activities, only 33% of those who lived 6-10km from the forest engaged in forest conservation activities.

Given a chance 87% of the respondents would like to participate in forest conservation efforts. Interestingly, when asked if they would like to be involved in the forest's management, 87% said yes. 54% said they would like to participate in management because they felt the forest belonged to the community while 21% felt they had the relevant knowledge.

For those who did not want to be involved, they mostly cited lack of time as the reason. Most of the respondents who said they were not engaged in any conservation activity and who cited lack of government involvement as the reason, said that they would like to be involved in forest management. This might not necessarily mean that the community

wants to participate in the day to day running activities but would like to be consulted and made aware of any major decisions being implemented as affects the forest.

Table 9: Participation in Forest Conservation and Management

Why not involved in conservation?	Yes	No	DK	Total
Government has not involved the community	23	**1**	**0**	**24**
Don't have the time	**4**	**0**	**0**	**4**
The forest is a long distance away	2	2	**0**	**4**
Discouraged because we were stopped from farming	**1**	**0**	**0**	**1**
Not interested	**1**	**1**	**0**	**2**
There are no incentives for participation	**0**	**0**	**1**	**1**
Not applicable	22	2	**0**	**24**
Total	**53**	**6**	**1**	**60**

From the information emerging from the analysis of data in this section, the local community seems to recognize and appreciate that the government is better placed to manage the forest and does a good job about it. There is however a sense of being left out which poses a threat to the forest. The community does not necessarily want to involve itself in the daily running of the forest but seem to want information concerning the forest thus posing a challenge to the institutions managing the forest on how to disburse and collect it from the community.

4.2,6 Challenges facing Institutions that Manage Forests

There is a high rate of transfer among the forest staff; for instance at the time of the interview, the K.WS Warden had been in the Kakamega office for only eight months while the District Forest Officer had been there for the last two years. Forest officials are rotated frequently, only staying for an average of 1-2 years after-which they are transferred to a different station. Accompanying the high forest staff transfer rates are the

declining resources in terms of staff and finances especially in the forestry sector. Gibbon et. al. (2005) records that total staff in Kenya in the forestry sector reduced to 5,524 in 2003 from 10,246 people in 1993. Gibbon et.al. (2005) notes that, the same period saw the value of the departmental budget decline by 26% in real value. The reducing resources both monetary and human pose a big challenge in the management of the forests.

The District Forest Officer observes that it is difficult to guard a forest when the demand for its resources is high. He notes that the Forest Department is currently using about 90% of its resources for protection only. On whether the forest had been utilized adequately, both the KWS Warden and the District Forest Officer felt that it had not. The KWS Warden thought that the forest had not been fully exploited and attributed this to lack of power for felling down trees and that the extent of charcoal burning is less compared to Mt. Kenya.

The DFO on the other hand felt that the forest could do with some exploitation such as; eco-tourism - that the forest has nice scenic views, bottling water from the forest, nice glades for camping sites (sjjiall places surrounded by dense forest). He asserts that there is need for enterprises, but investors and marketing of the forest lacks. The concerns raised by the DFO and the Warden regarding constraints to establishing enterprises within the forest also concur with Flynn (1998) who observes that building financially healthy enterprises in the middle of forests without running water or electricity, that are based on ecological sustainability, community empowerment and are linked to conservation is a fairly daunting task.

4.3 Access and Utilization of the Forest

4.3.1 Access to the Forest

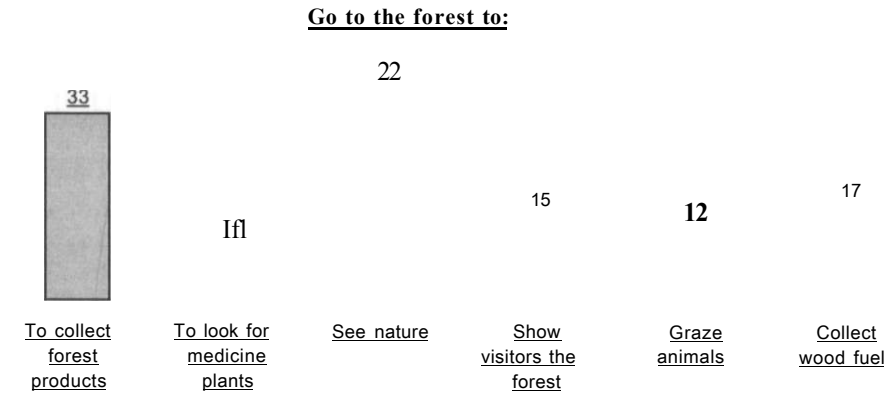
The community is allowed access to the forest with 90% of the respondents saying that they sometimes visited the forest. A relatively high number (38%) visits the forest to see nature presumably to enjoy the scenery, 33% visit to collect forest products, 10% to look for medicine, 13% to graze animals and 17% to collect fuel. Distance does not seem to affect visitation to the forest as there are more people living within 5km of the forest that don't visit the forest as opposed to those that live 6-10kms away but visit it. All who lived less than 5km from the forest used forest products except for one respondent.

Table 10: Does distance affect visitation to the forest?

If visit the forest	Less than 5 Km	6 Km -10 Km	Total
Yes	44	11	**55**
No	4	1	**5**
Total	**48**	**12**	**60**

Forty eight percent of the respondents agreed that there were times when they had been unable to access the forest while 43% answered negative. For those who said that they were not able to access the forest, 39% cited times when they had been stopped by the government, 3% said that it was during the rainy season while 2% said that they had carried one of the tools they have been told not to carry when going to the forest.

Chart 2: Reasons for going to the Forest



Of the reasons that the government had stopped the community from accessing the forest; 10% said that they had been cutting tees in the forest without replanting them, 15% said that they had carried the tools prohibited when accessing the forest while 13% said that the roads had been bad. There are a number of problems that those who seek to access the forest experience; 25% of the respondents who regularly visit the forest said that the licenses are expensive, while 20% said that they feared being attacked by animals. Harassment/fear of being arrested was mentioned by 7% of the respondents while the forest not being safe for women was mentioned by 7% of the respondents as well. Decreasing forest size was sited as a problem by 8% of the respondents.

4.3.2 Utilization of the Forest

Of the 60 respondents interviewed, all of them agreed that the forest was very important both to them as individuals and the entire community. Except for one respondent, all the other respondents together with their family members said that they used different products from the forest. The only respondent that said they didn't use products from the

forest was in the income bracket of Kshs 11,000 to 20,000 indicating that the family might be relatively well off and could afford not to depend on forest products. All the people with an income of less than Kshs 10,000 said they used products concurring with the debate that the poor entirely depend on the forest for their livelihood. Belcher (2005) asserts that NTFPs have very low (often zero) market value and accessible to the poor precisely because no one else wants them.

Table 11: Forest Products used by the Community

Forest products	% of respondents using them
Firewood	95
Fodder for animals	70
Grass for thatching houses	65
Medicinal Herbs	53
Charcoal	48
Timber/wood for furniture	43
Farming	31
Vegetables & Fruits	21
Food from wild animals	16
Building ropes	11
Tree seedlings	8
Honey	7

Firewood is the most commonly used forest product with 95% of the respondents claiming to use firewood from the forest. Firewood falls out of the category of NTFPs. With the high poverty levels experienced in the division, there are challenges of the community adopting alternative methods of energy especially if they need an initial investment. Solar and wind energy are definitely alternative means of energy that should be tried out and promoted in this division.

From the list of products used by the community from the forest, the following NTFPs were identified as those that are used by the community; fodder for animals, grass for

thatching houses, medicinal herbs, wild meat, fruits and vegetables, ropes and farming. Fodder for animals is the second most used forest product in the division though the first NTFP most commonly used. 70% of the people interviewed claimed that they use fodder from the forest for their animals. This is followed by grass for thatching houses with 65% of the respondents claiming they got it from the forest. 53% of the respondents claim to use medicinal herbs from the forest. Uses such as charcoal, timber/wood for furniture and fanning were cited by 48%, 43% and 31% of the respondents respectively. 11% obtained building ropes from the forest.

Sixteen percent of the respondents use wild animals for food from the forest. 13% obtain vegetables from the forest, 8% obtain fruits, and another 8% obtain tree seedlings from the forest. Of the people interviewed, only 7% claimed to use honey despite the forest having numerous species of honey producing bees. As Flynn (1998) notes, some NTFPs are of great interest to markets but are yet to be commercialized. This is the case for honey from Kakamega forest. Indeed the development report records that the potential for honey in this country is yet to be fully exploited. The people in the area seem not to be aware of this great potential, 5% of the respondents claimed to have been using honey from the forest for over the last tvypnty years while only 1 respondent claimed to have used it for the last ten years.

a) Number of Years Products have been used

Firewood is claimed to have been used by 77% of the respondents for over twenty years. 5% claimed to have been using firewood for the last 15 years, 3% in the last ten years and 10% in the last 5 years. Both fodder for animals and grass for thatching houses had been used by 54% of the respondents for the last twenty years. 5% had grazed their animals in

the forest for the last 15 years, 3% for the last 10 years and 8% for the last 5 years. 7% of the respondents had collected thatching grass for the last 15 years, 2% in the last 10 years, and 7% in the last 5 years. A few still have grass thatched houses but seems like the people are changing more towards tin-roofed houses.

Forty percent of the respondents had used medicinal herbs for over the last twenty years, 2% in the last 10 years and 13% in the last five years. 20% of the respondents had farmed in the forest for over 20 years, 2% in 15 years, 5% in the last 10 years and 3% in the last 5 years. Timber/wood for furniture had been used by 28% of the respondents for the last 20 years. Among the items that were used for food in the last twenty years, wild animals were cited by 13% of the respondent while fruits were cited by 6% of the respondents and vegetables by 12% of the respondents.

Services such as tour guiding were not mentioned by any of the people interviewed; however, this was mentioned from the in depths conducted with the CBO representatives. Members of the two CBOS have learnt about the plants and animals in the forest and are able to act as knowledgeable and well informed tour guides for people who visit the forest at a fee. y,

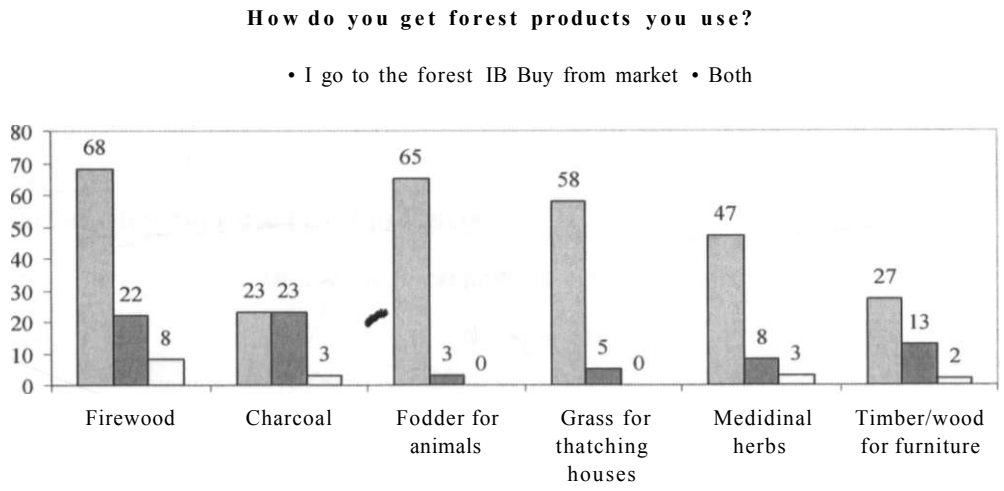
Kakamega forest has been identified as a habitat for different honey producing bees. The results imply challenges of either the knowledge or initial cost of setting up a honey producing enterprise. In an interview with an ICIPE representative who educates the local community on honey production, he said that one needs a minimum of Kshs 3,500 to buy a standard recommended bee hive for clean honey production i.e. honey that can be sold on the market at a good price. For a long time the market has been characterized

by adulterated honey so maybe consumers are skeptical of the honey in the market. ICIPE is in the process of setting up a honey factory in Kakamega; this should encourage the people to invest in bee-keeping and honey ventures.

b) How the Local Community gains Forest Products

When asked how they got the forest products they used, majority said that they went to the forest themselves. Charcoal however had half the number of its users stating that they went to the forest while half of them bought it. Considering the high poverty levels in the division, it is no wonder that for all the forest products less than 10% of the respondents bought them from the market. The table below shows the number of people who use forest products and how they obtain them.

Chart 3: How the Community gets the Forest Products



Cross tabulation of this question was done by income levels and we found that the number of people going into the forest to collect the products they use significantly changes across the different income groups. In the category of people who earned less than Kshs 10,000, 32 respondents went to the forest to collect the firewood while only 6

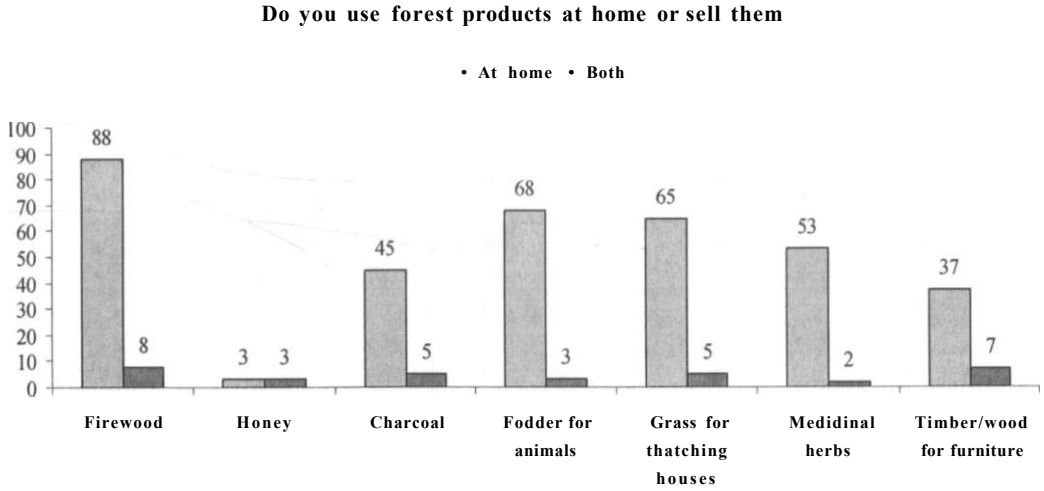
of them bought firewood from the market. In the income category of Kshs 11,000 - 20,000, of the 11 respondents who use firewood, 6 went to the forest to get the firewood while 5 of them bought it.

For honey, two of the respondent went to the forest to collect it and 2 bought it from the market. When it came to the fodder for animals and grass for thatching houses, none of the people in the income category of Kshs 10,000 and below bought from the market, all of those who used them claimed to go to the forest to collect it. Only 2 out of the 23 respondents that used medicinal herbs, in the income category of Kshs 10,000 and below bought it, while 21 respondents went to the forest to collect the herbs themselves.

c) Ways the Community uses Forest Products

The respondents were further asked how they used the products they collected. The chart below states the percent of respondents that used different products at home and those that sold as well.

Chart 4: How they use forest products



As per the chart above, most of the people interviewed use forest products at home with few of them saying that they sell as well as use them home. Contribution to livelihoods is therefore mostly indirect contributing directly to people's health, daily house requirements such as fuel, and food for their animals as opposed to direct financial gain which makes id difficult to measure the worth of the forest products collected. Due to such uses, households do not spend money on expenditures such as buying fuel, animal fodder, construction material or wood for furniture. Within the category of NTFPs, most products are consumed directly or traded in small quantities.

As discussed in the literature section, this is characteristic of the difficulty in measuring the value of NTFPs as the value is not translated into money and even then it is not measured. We are thus unable to establish what percentage of the household budget is covered by the NTFPs. For the respondents who sold forest products, a high number makes less than Kshs 10,000 from their sale. Except for those who sold wood and timber, only one respondent made over Kshs 20,000 from the sale of honey. Cross tabulation of this question was done against gender and education and the two didn't seem to impact on the incomes. The table below presents the findings;

Table 12: Earnings from Sale of Forest Products by Gender

	Kshs 1		**11,000**		**21,000**		**31,000**	
	10,000		**20,000**		**30,000**		**40,000**	
	Male	Fem	Male	Fem	Male	Fem	Male	Fem
Firewood	0	2	0	0	0	0	**1**	1
Honey	0	1	0	0	1	0	0	0
Charcoal	1	1	0	1	0	0	0	0
Fodder for animals	1	**1**	0	0	0	0	0	0
Grass for thatching	2	**1**	0	0	0	0	0	0
Medicinal herbs	1	0	0	0	0	0	0	0
Timber	0	1	1	**1**	1	1	0	0
Total	**5**	**7**	**1**	**2**	**2**	**1**	**1**	**1**

There is little differentiation in earnings in terms of gender. These results are in line with the literature of weak markets for NTFPs and also lack of access in terms of information, technology, small volumes of product and poor prices for the products. However more research needs to be conducted to find out the key constraint to commercialization of the products collected. We suspect that the amounts collected are too little and the methods used too basic resulting in minimal amounts that are not sufficient to be traded for any meaningful gain. As Flynn (1998) suggests, there is need for the collection of NTFPs to first be collected in surplus, processed and then sold.

There exists opportunities for products to be marketed and sold earning the community an income. Only 8% of the respondents said that they used firewood both at home and sold it, 4 respondents said they use honey from the forest with only 2 of them selling it while others used it at home. Asked how else they wanted to use the forest, 59% mentioned tourism, 82% agriculture, 5 % research, 51% medicinal source, 70% grazing, 38% Non-Timber Forest Products and fuel/firewood mentioned by 66%. Enterprises that will offer employment were mentioned by 1%, while planting trees on their own farms to substitute the forest was mentioned by only 3%. The results imply a strong dependence on the forest which poses grea^danger to the forest's survival. Though the community would be best suited to protect the forest; there is need for other economic options to be developed for them if the forest is to be conserved.

4.4 Hypothesis Testing

This study had two hypotheses. Due to the nature of the data collected the best way to test the hypothesis was through running correlations as the data was not nominal nor did

it involve ranking. Correlations were run using SPSS for different variables representing forest management, access to the forest's products and services and use of the same;

Access was determined by questions 9, 10, 16, 19 and 26 on the questionnaire appended.

Management was determined by questions 31, 34, and 41 which asked respondents the definition of forest management, reasons for thinking that the forest is well managed and if the respondents would want to be involved in the forest's management.

Use was determined by questions 3 on the questionnaire.

Livelihood was determined by questions 18, 15, on how the forest is currently used and the amount of money the community makes from selling forest products / services.

Hypothesis 1

The poor livelihoods of local communities around Kakamega forest are a function of the State's controlled forest management that limit use of resources.

*

For the relationship between livelihoods and management of the forest, there is a positive though weak relationship that was not significant for all of the products that were used from the forest. The stronger relationships was with grass for thatching at 0.175, followed by firewood at 0.16 and charcoal and fodder each at 0.15. The others were all below these figures. Of the respondents interviewed, only one claimed to go to the forest to search for work while one said they used the forest to earn an income through providing tour guide services to the tourists who visit the area. Also when asked what the

forest could be used for only one person cited that enterprises could be developed within the forest to provide employment to locals. The number of respondents here are thus negligible for correlations to be run however, this implies that the community needs to be sensitized on the fact that they can derive a livelihood from the forest.

This hypothesis borrows from the first two hypotheses and from the discussions; it is true that the management of the forest impacts negatively on the livelihood of the local community. This research however recognises the budgetary challenges involved to be able to give the community the relevant information and knowledge regarding the forest and how to beneficially use it and thus suggests that strong partnerships with donor organizations, NGOs and development partners would go a great way in reversing this trend.

Hypothesis 2

Limited community participation in resource conservation is a function of a felt sense of exclusion in utilization of the resource.

Different respondents said that they go to the forest for different reasons such as to see nature, collect forest products such as food, medicines, fodder for animals amongst other uses. The relationship between those that go to the forest to see nature, and would like to be involved in the forest's management, is slightly strong as compared to other relationships but negative though significant. However since the relationship is less than 0.5, thus not strong by the standards, it is important for forest authorities as it is not only negative but also significant.

This implies that for the people that go to the forest for the sole purpose of seeing nature, then management of the forest in whichever form will not impact on their using the forest in this way. This category of people then becomes important for the forest authority as it means that they would be keen on protecting and conserving the forest. If this kind of people can be identified from the community, they would be an important channel for the conservation message and would be important on the forest committees that are to be formed as the Kenya Forest Service works on its plans of incorporating the local community into its management.

A notable finding is that there is also a slightly strong negative relationship between those that would like to be involved in the forest's management and those that go to the forest to see nature. There is also a slightly strong negative relationship between those that would like to be involved in the forest's management and also think that the forest can be used for grazing and this relationship is strongly significant. The relationship between those that would like to be involved in forest management with those who use seedlings from the forest is also a slightly strong but negative relationship at 0.254. The relationship with all other uses is weak and negative, implying that management of the forest does not necessarily determine the community using it, but this relationship is insignificant which implies that the community can be controlled when it comes to using the forest especially with regards to extraction of different products from the forest.

An interesting finding is that there is a slightly strong positive relationship between those that would like to be involved in the forest's management and also think that the forest can also be used for cultural activities at 0.417. This relationship is also strongly significant. The implication of this relationship would be more research on the kind of

cultural activities that the community think the forest can be used for and how this would benefit the community. This relationship could also imply a possible longing for the forest to be used for cultural activities as was done in the past. This would be an interesting hypothesis to further investigate as it has been over 50 years since the forest was used for any cultural activity with the knowledge and approval of the Forest Department.

The relationship between those who would like to be involved in the management of the forest and those who use fodder is a bit stronger than the rest at 0.316 and the relationship quite significant. This finding implies that those who use fodder from the forest know and realize using fodder from the forest will solely depend on the management of the forest and if they are involved in the management then there is a strong possibility that they could influence management to let them use the fodder in the forest. This is a valid reason considering that there is grass growing wildly in the forest. However control of such usage to ensure that other important plants are not destroyed or a threat to the eco system does not take place remains a challenge and a question that needs to be addressed.

The relationship between those who would like to be involved in forest management and r use of the forest resources is a weak and negative relationship implying that the forest's management might not influence their use of forest resources. We can therefore conclude that the current utilization of the forest and forest management have a very weak relationship be it negative or positive. The results imply that forest management does not necessarily influence the use of forest products. Due to the fact that the community was only allowed to access the forest without any cutting equipment, we agree with this hypothesis that indeed limited community participation in resource conservation is a function of a felt sense of exclusion in utilization of the resource.

Summary on Hypothesis Testing

There is access to the forest by the local communities though the level of access is limited. The relationship between management of the Kakamega forest and its use and access by the community IS not strong, none of the relationships be their positive or negative, were found to be above 0.5 and most of them were not significant. This suggests an indifference of the community to the forest's management. This provides an opportunity for the Forest Department to work closely with the community as opposed to if the relationship had been found to be hostile.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

This study was inspired by curiosity into the continual reduction of the size of Kenya's forest cover and the potential consequences this has on the livelihoods of communities living next to the forests despite the various management systems that have been implemented since independence. The study focused on Shinyalu division of Kakamega district bordering Kakamega forest for the key reason that the poverty levels which depend on individuals livelihood options in the division have continued to rise over the last ten years.

The overriding argument in this paper is that while the forest adjacent communities might not depend entirely on the forest for their livelihood, but the forest presents a key livelihood option that if exploited can easily impact on the poverty levels in the area. Kaimowitz (2003) asserts that one might expect poor rural households to live better if they have secure access to forest resources and if they have effective and efficient social mechanisms to regulate forest use, manage their forests and distribute the benefits.

At the beginning of the study we hypothesized that the poor existing forest management system limited access to the forest and its resources, in turn limiting the community's use of forest resources, thus the high poverty levels in the division. The study examined the forest management system over the last ten years and how the management had impacted on communities' access and use the forest resources. The study attempted an evaluation

at how different aspects of the forest's management impacted on the community's access and use of the forest's resources.

While we discovered that some aspects of the forest's management could be limiting the community's realization of the forest's potential in benefiting their livelihood, we also discovered that the community had distanced itself from the forest's management and that both the government and the community needed to work together for the realization and maximization of the forest's benefits towards the community's livelihood options.

5.2. Conclusion

Kakamega forest like all other public forests in Kenya is owned by the government through the Forest Department and co-managed by KWS. The Forest Department has rules and regulations pertaining to the use and access of the forest by any interested party. Local communities are allowed to access and use products from the forests under set rules and regulations; however these rules are not always adhered to. The Forest Department and KWS therefore rely on strict supervision and monitoring of the forest accompanied by punitive measures for offenders. This poses numerous challenges due to the relatively minimal number of staff available to the organizations compared to the vast forest area and a somewhat indifferent community.

The government has realized the challenges of protecting the vast forest area with minimal resources and the exclusion of the local community and is in the process of incorporating local communities into its management (an on-going process that was happening during this study period). Indeed on January 26th, 2007, five months after the collection of data for this project paper, the Forests Act, 2005 was enforced. The Act

establishes the Kenya Forest Service whose functions among others is to promote forestry education and training, collaborate with individuals and institutions in identifying research needs and applying research findings, and provides forest extension services to associations in the sustainable management of forests. The Act is however not clear on whether the community members will participate in key decisions that affect the forest and does not give concrete incentives for the communities to participate in the forest's management and conservation.

The research revealed that the community is interested and willing to participate in the forest's management. The challenge therefore will be implementation of the management processes involving community members. Of key concern will be the processes used to identify community members that will be considered legitimate and accepted by the community to represent it in the management, the timeframes community members can serve on the management committees and the authority and power accorded to each person on the management committee. At the time of the study, members of the local community were organising themselves into associations in response to the Act, however they did not seem to have all information pertaining to the Act and it seemed like it was a few member convincing other community members to register an association without particularly explaining the roles they were expected to play in its implementation nor how they would in turn benefit.

An important aspect of management has to do with record keeping of all aspects of the forest including financial records. The fact that the researcher was not able to view the financial records raises questions concerning accountability and transparency of the forest especially in future. Availing such records to the entire community is a way of enhancing

community responsiveness towards a positive attitude to the forest's management and sustainable use of the forest.

The research also found that although local communities access and use resources from the forest, they barely engage in trade with these products. This research was not able to pinpoint the reason for this; could it be the low amounts of NTFPs collected, lack of markets or lack or knowledge on the various NTFPs that can be exploited from the forest. It however emerged that the forest was underexploited despite it's potential opportunities to contribute positively to the local communities' livelihood such as tourism, camping, bird watching some of which were mentioned by the District Forest Officer during the interview.

Many households make some part of their living from NTFPs, with very few of them turning them into trade commodities. But the producers are at a disadvantage, with unstable markets, poor infrastructure and market access, amid low bargaining power (Flynn, 1998). There is therefore need for the government particularly and other stakeholders to think of ways that NTFPs can be turned into a cashflow source for the community. Shackleton Shackleton (2002) observe that within any given community, there is significant socio-economic differentiation arising from a multitude of factors such as levels of employment, education, relationship to elites and age. They thus suggest that when considering policy and management interventions to support rural livelihoods and promote sustainable resource use it is important to examine such differentiation as it is plausible that different socio-economic groups will perceive and use NTFPs differently.

Flynn (1998) opines that creating strong markets for NTFPs involves work along the entire length of the value chain from the forest to the end user. There are many products not yet commercialized that are of great interest to the marketplace. She thus advices that there is need to look for real value and this can be done by beginning with the existing products then looking for new ones to be offered to the market. This she asserts can be done by looking for by-products, and looking for competitive advantage of the products, that is products should compete in the market based on their functionality, price and quality.

While it is important for the government, local communities and other stakeholders to identify and explore ways of exploring NTFPs and services from the forest that will impact significantly on their livelihoods, it is important that these should not interfere with the forest's eco-system as in the long run; the very source of livelihood can be destroyed without careful management. Accompanying this should be the identification of markets, relevant products for such markets and the marketing/advertising that is needed. Entrepreneurship needs to be nurtured along the whole value chain of the different products and services that present opportunities for the community to benefit from the forest along with^elevant training of personnel to ensure that the services and products meet market demands.

5.3. Recommendations

As the government plans to incorporate the local community into the forest's management, it is important for the government to note that local people can only be encouraged to cooperate and participate in the forest's management if they are given secure and exclusive user rights; hunting, fishing, collection of Non Timber Forest

Products, some wood harvesting. They should also be given a significant share in the royalties received from other users, such as logging concessionaires. The certainty of such long term sources of income will present a significant benefit and an incentive to adhere to agreed use plans (Cleaver & Schreiber, 1994). The local people should also be given incentives to conserve the resource endowment of the protected area through the confirmation of exclusive hunting and gathering rights, the provision of employment opportunities in the various support services required to manage protected areas, and a share of any user fees that are collected from outside.

The user fees do not necessarily have to be given to the local communities; fees could be invested in services such as infrastructure for instance a tarmacked road to the forest, electricity in the area, piped water and dispensaries. The user fees could also be used for purchase of goods that will be deemed to benefit the local community for instance purchase of desks, textbooks for the local schools, and provision of facilities such as laboratories. This could be done in partnership with the local CBOs that are already registered and which make some income from the forest. For instance KEEP when it receives visitors, a percentage of the visitor fee paid could be remitted to the Forest Department and this in turj^invested in facilities that will benefit the local community. However there is need for the community to list what they need and rank these needs in terms of their priority to avoid providing services that they could deem not necessary or not impacting on them as it should to propel them into caring for the forest and what happens to it.

Entrepreneurs should be given incentives and encouraged to explore the forest's possibility to support businesses as this will lead to employment. In employing people,

such businesses should give first priority to the local community members as this will provide them with an income in turn positively impacting on their livelihood and indirectly developing a positive relation of the people to the forest as they become more and more able to relate the relevance of the forest to their daily needs that they meet through employment gained from a forest related business. Businesses that could be run without threatening the forest include camping, forest product factories to be located at the trading centre; such products would include honey and maybe medicinal herbs. A good example is the factory that has been set up by KEEP in collaboration with ICIPE for the processing of *Mondia Whytei root* (Mgomero).

Knowledge is important in sharing benefits that accrue from the forest especially if these benefits are not so clear, for instance fees collected from the forest and invested into infrastructural development in the village. Effort should therefore be put into ensuring that the local community knows and can identify the infrastructural services developed with funds from the forest's use. At a practical and actionable level, such knowledge will translate into the villagers being keen about and caring for the forest. Infrastructure development will also translate into positive benefits and a replicating effect for the livelihoods of the local community as transport problems are eased and the area is opened up to more visitors and more people who will in turn invest in the transport business.

Vital information needs to be available to interested parties and ways of getting feedback from the public established to measure and monitor changes in the community's perception towards the forest and it's management. Regular release of information on new developments about any aspect of the forest to the community through pamphlets, or community gatherings can be used to give information while surveys could be used to get

feedback from the community. Ways of solving conflicts fairly, openly and transparently should accompany the process of incorporating the community to guard against distrust and buy into the community's commitment and participation to the forest's sustainable management.

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APPENDICES

1. Questionnaire

My name is Milcah Asamba, a postgraduate student at the Institute for Development Studies, University of Nairobi. As part of my studies, I am carrying out research to assess the impact of forest management systems on local communities living around Kakamega forest. My aim is to learn from you how the different management systems have impacted on the livelihoods of the communities. I'll appreciate your willingness to participate by answering this questionnaire, which will take about 30 minutes.

Brief Description of the Research Area

Name of Village:

Name of Sub-location

Name of Location

Name of Chief

Name of nearest physical descriptor e.g. school, market, hospital, chiefs camp etc:

Distance of respondent's house from the forest

a. Less than 5km
b. 6km-10 km
c. Over 10km

Description of respondent's house

a. Permanent
b. Semi-permanent
c. Mud-house

Are there trees in the respondent's compound?

a. Yes
b. No

Time Interview began.....Time interview ended

Date:

Use of the forest resources

1. How important is the forest and its resources to you?
   a. Very important
   b. Important
   c. Not important
   d. Don't know

2. How important is the forest and its resources to the community?
   a. Very important
   b. Important
   c. Not important
   d. Don't know

3. Do you use products from the forest?
   a. Yes
   b. No

4. Does any member of your family use products from the forest?
   a. Yes
   b. No

(If answers no go to Q.14)

5. What products/services do you or your family use from the forest? *(Tick all that are mentioned)*

Products	You	Family
a. Firewood		
b. Honey		
c. Charcoal		
d. Fodder for animals		
e. Grass for thatching houses		
f. Medicinal herbs		
g. For farming		
h. Timber/Wood for furniture		
i. Wild animals		
j. Building ropes		
k. Fruits 1. Vegetables m. Fish n. Tree seedlings o. Tourism/Employment ** p. Flowers q. Mushrooms		

6. For how long have you/family used the above products/services?

Products	Last 5 years	Last 10 years	Last 15 years	Over 20 years
a. Firewood				
b. Honey				
c. Charcoal				
d. Fodder for animals				
e. Grass for thatching houses				
f. Medicinal herbs				
g. Farming				
h. Timber/Wood for furniture				

i. Wild animals				
j. Building ropes				
k. Fruits				
1. Vegetables				
m. Fish				
n. Tree seedlings				
o. Tourism/Employment				
p. Flowers				
q. Mushrooms				

7. For each of the products mentioned above, do you use them at home or do you sell them?

Products	At home	For sale	Both	Other (specify)
a. Firewood				
b. Honey				
c. Charcoal				
d. Fodder for animals				
e. Grass for thatching houses				
f. Medicinal herbs				
g. Farming				
h. Timber/Wood for furniture				
i. Wild animals				
j. Building ropes				
k. Fruits				
1. Vegetables				
m. Fish				
n. Tree seedlings				
o. Tourism/Employment				
p. Flowers				
q. Mushrooms				

(If answer use at home skip to Q.10)

8. How much money do you make from the sale of these products in a year?

Products	Less than Kshs 10000	10000-20,000	20,000-30,000	30,001-40,000	Over 40000
a. Firewood					
b. Honey					
c. Charcoal					
d. Fodder for animals					
e. Grass for thatching houses					
f. Medicinal herbs					
g. Farming					
h. Timber/wood for furniture					
i. Other please specify					
k.					

9. How do you get the forest products that you have mentioned above?

Products	I go to the forest	Buy from market	Both	Other (specify)
a. Firewood				
b. Honey				
c. Charcoal				
d. Fodder for animals				
e. Grass for thatching houses				
f. Medicinal herbs				
g. Farming				
h. Timber/wood for furniture				
i. Wild animals				
j. Building ropes				
k. Fruits 1. Vegetables m. Fish n. Tree seedlings o. Tourism/Employment p. Flowers q. Mushrooms				

10. Do you experience any difficulties in trying to get the forest products you mentioned above?
    a. Yes b. No
    (If answer no skips to Q. 15)

11. If yes, what are the three most important difficulties that you encounter?

Problems	I^s* response	2nd Response	3rd Response
a. Roads are poor			
b. Cost of transporting products is expensive			
c. Diminishing quantity of products			
d. Competition from increased users			
e. Competition/destruction by wild animals			
f. Corrupt officials who require bribes			
g. Sometimes we are arrested			
h. Must have licences			
i. Not allowed to farm			
j. Allowed to only collect dead wood			
k. Must seek permission from forest office			
1. Wild animals are destructive and dangerous			
m. Difficult to use forest during rainy season			
n. Community conflicts			
o. Roads not clearly o get lost in forest			
p. Not safe for women			

12. For how long have you been experiencing these difficulties?

13. What do you think can be done to solve the difficulties you have mentioned above?

(Skip to Q. 15)

14. Why don't you or any member of your family use products from the forest?

a. We are not allowed to access the forest
b. Cannot afford the license
c. Forest products are expensive
d. 1 don't have use for forest products
e. Fear being victims of blame

15. In what other ways do you think the forest can be used?

a. Tourism
b. Agriculture
c. Research purposes
d. Medicine
e. Grazing
f. Non Timber Forest Products
g. Climatic conditions
h. Fuel (firewood and charcoal)
j. Cultural festivals
k. Other (Specify)

Access to forest resources

16. Do you sometimes visit the forest?

a. Yes b. No

(If answer no, sip to Q. 25)

17. How often do you go to the forest?

a. Everyday
b. Once a week
c. Twice a month
d. Once every month
e. Once every two months
f. Twice a year
g. Once a year

18. What do you go to do in ^jje forest? *(Tick all that arc mentioned)*

a. To collect forest products	
b. To look for medicine	
b. To see nature	
c. To show visitors the forest	
d. To graze animals	
e. To collect fuel	
f. Visit health centre (located within forest)	
g. Hunting h. Search for work i. collect tree seedlings i. Mud for construction	

19. Are there times when you have been unable to access the forest?
a. Yes b. No
(If answer no, skip to Q. 22)

20. If yes when was this?

21. What was the reason for you not being able to access the forest?

22. What are the three most fundamental problems you experience in trying to access the forest products/services?

Problems	1" response	2ml Response	3"' Response
a. Licenses are expensive			
b. Licenses are not available			
c. Roads are poor			
d. Cost of transporting products is expensive			
e. Loss of the forest			
f. Diminishing quantity of products			
g. Competition from increased users			
h. Wild animals			
i. Forest predation			
j. None			
k. Other (specify) l.			

23. Since when did you begin experiencing
Problem 1

Problem 2

Problem 3

24. a. Do you associate these problems with any particular organization involved in the management of the forest?
a. Yes b. No

b. If yes, which organization?

c. What problem do you associate with the organization? *(Respondents can give multiple organizations; in such a case, each organization should be its corresponding problem)*

(Skip to Q. 26)

25. Why haven't you ever visited the forest yet you live near it?

a. I do not have any interest in the forest	
b. We are not allowed to go to the forest	
c. I do not have time to go to the forest	
d. The forest is dangerous	
e. Cheaper to buy products than go to forest	
f. Don't know	
g. Other (Specify)	
h.	

26. Do you get any information concerning the forest? (It could be on how to use the forest resources or conserve the forest or an update on the forest status?
    a. Yes b. No

27. What type of information do you get the forest?
    a. Importance of forest
    b. Forest status
    c. How to conserve the forest
    d. Warnings not to access the forest
    e. None
    f. How to use forest

28. From where do you get the above information?
    a. The government
    b. Forest officials'
    c. Forest Department
    d. Community Elders
    e. Other community members
    f. NGOs
    g. CBOs
    h. Individuals
    i. Other (specify)

29. What other type of information would you like to get concerning the forest?
    a. Forest status
    b. Conservation methods
    c. Forest employees'
    d. How to utilize the forest
    e. Revenue accruing from the forest
    f. How to use different forest herbs
    g. Identifying different types of trees
    h. How to plant tress

30. Whose responsibility is j^to make such information available to you?
    a. Institutions managing the forest
    b. Forest department
    c. Government
    d. NGOs
    e. CBOs
    f. Community elders (Chief, D.O, D.C)
    g. Universities
    h. Administration
    i. Member of Parliament
    j. Researchers
    k. Environmentalists
    1. Media

Management of the forest

31. How would you define good forest management?

32. Please tell me all the organizations that you know involved in the management of the forest?

33. Do you think Kakamega forest is managed well?
    a. Yes b. No
    (If answers no, skip to Q. 35)

34. Why do you think the forest is managed well?

35. Which areas of the forest would you say are managed well?

Management agent	**Tick all that apply**
a. Those managed by the forest department	
b. Those managed by KWS	
c. Those managed by NGOs	
e. Those managed by CBOs	
f. Other (specify)	
g-	

36. Why do you think the forest is not being managed well?

37. Do you currently participate in any efforts to conserve the forest?
    a. Yes b. No

38. If yes, what kind of forest conservation efforts do you participate in?

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39. If no, why don't you involve yourself in any forest conservation efforts?

40. Given a chance would you like to participate in efforts to conserve the forest?
    a. Yes b. No

41. Would you like to be involved in the management of the forest?
    a. Yes b. No

42. If yes, why would you like to be involved in the management of the forest?
    a. The forest belongs to the community
    b. I have the relevant knowledge

c. To be able to monitor the decisions made affecting the forest
d. To earn an income
e. To control deforestation
f. To deal with forest predation
g. The forest belongs to the community
h. Other (Specify)

43. If no, why wouldn't you like to be involved in the management of the forest?
a. It is of no use to me
b. I do not have the time
c. I do not have the knowledge
d. It would not benefit me
e. It is too political
f. Other (Specify)

44. Do you agree or disagree with the following statements?

Statements	Agree	Disagree
a. Good forest management should allow communities to access the forest and use its resources		
b. Good forest management should involve communities in planning and decision-making for the forest and its resources		
c. Good forest management should benefit communities living around the forest		
d. Good forest management should teach communities how to exploit the forest while conserving it		

Personal information

45. Gender
a. Male b. Female

46. What is your age bracket?

a. 20 - 25 years	
b. 26 - 30 years	
c. 31 - 35 years	
d. 36 - 40 years	
e. 41 - 45 years	
f. 46 - 50 years	
g. 51 - 54 years	
h. over 55 years	

47. What is the highest level of education that you have attained?

a. Some primary school	
b. Completed primary school	
c. Some secondary school	
d. Completed secondary school	
e. College/tertiary education (cert)	
f. College/tertiary education (dip)	
g. Some university education	
h. University degree	
i. Postgraduate	

48. What is your current occupation?

a. Subsistence farmer	
b. Commercial farmer	
c. Professional (Teacher, Nurse)	
d. Civil servant	
e. Business person	
f. NGO/CBO employee	
g. Artisan (Jua Kali)	
i. Other (specify)	

49. How long have you lived in this area?

50. What is the size of your land?

51. What is the land tenure system?

52. What is the total household income per month?

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2: Discussion Schedule for Key Informants

1. Management systems

a. What types of management systems have been practised in this forest in the last 20 years?

b. About each type of management system ask the following questions;

c. When was the management system initiated?

d. How was it initiated?

e. What was its strengths?

f. What were its weaknesses?

g. What do you think led to its success/failure of each?

h. What are some of the problems experienced in managing the forest?

i. What management system would you recommend for forests?

j. Why?

2. Stakeholders

a. Who are the various stakeholders involved in the forests' management?

b. what is the role of each stakeholder?

c. What rules or regulations ensures that each stakeholder fulfils their obligations

d. Are there any stakeholders who have been left out of the forests management?

e. Who have been left out?

f. Why have they been left out?

g. What are the consequences of leaving them out?

3. Involving local communities

a. Do you think communitie^ehould be involved in the management of the forest?

b. If no why? If yes, how?

c. Do people from the communities currently access and use the forest resources?

d. If yes how? If no why?

e. If yes, what are the products or services that they collect from the forest?

f. Is there any process for accessing the forest? If yes, please explain the process

g. Do you think the forest resources have been exploited well? Why?

h. How can communities' best benefit from the forest resources?

W