

## **THE SOCIO-ECONOMIC BENEFITS OF KAKAMEGA FOREST TO THE RESIDENT COMMUNITIES**

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### **Abstract**

Kakamega forest is one of the major tourist attractions in Kenya because of its richness in biodiversity. Socio-economic studies done in Kakamega forest have shown that there is high dependence on the forest by the local communities. The study therefore sought: i) To determine the socio-economic characteristics of the households around Kakamega forest ii) To determine how the resident communities use the forest in meeting their economic needs. The target population comprised the adults who lived near the forest and headed a household. Out of the estimated 800 households a 10% population was chosen to form the study sample. Questionnaires were administered to collect data and thereafter the quantitative information obtained was analysed using mean, frequency and percentages. The data collected through personal communication were analysed by qualitative analysis or value judgment. Both descriptive and quantitative analyses were used. The results showed that communities living around the forest were highly depended on the Kakamega forest in several ways. The study recommends the need to establish forest plantations to supply the requirements of local communities for wood fuel, charcoal, poles and timber much of which is presently obtained from the indigenous forest of Kakamega. The study will finally help scholars undertake studies and make recommendations to environmental conservation stakeholders on the need to consider the mutual benefit between forests as ecosystems and the people who live within or around the forests.

**Keywords:** Kakamega Forest, Socio-economic characteristics, resident Communities, biodiversity

## 1 INTRODUCTION

The importance of forests need not be overemphasised. Forests play a vital role in environmental conservation, protect the underlying soil from the direct impacts of rainfall and increase the amount of humus in the soil (Soares-Filho *et al.*, 2014). The presence of organic material, which is an important binding agent of the soil, makes it resistant to both wetting and water drop impact. Forests play an important role as part of the human life-support systems by regulating local climates and nutrient cycles. In addition, forests play an environmentally critical role in regulating stream flow regimes in addition to acting as habitat for wild animals, which may face extinction if their habitats are depleted.

Forestland accounts for 21% of the earth's total surface area, while the African continent accounts for 9% of the world's forestland (Isiket *et al.*, 1997). Scientific evidence suggests that the world's forest area has declined by one-fifth from about 5 to 4 billion ha from pre-agricultural times to the present. Temperate forests have suffered the greatest cumulative losses, 32-35% subtropical woody savannahs and deciduous forests, 24-25% and tropical climate forests, 15-20% (Repetto & Malcolm, 1988). The total area gazetted as forest in Kenya was 1.7 million ha in 1991. Kenya's remaining indigenous closed forests cover is 1.2 million ha. Half of Kenya's threatened bird species are found within forests.

Farwiget *et al.*, (2008) asserts that there is a rapid decline in Kenya's forests due to increasing demands for land and resources aggravated by a rapidly escalating population growth, under-resourced institutions, for example the forest department, inadequate legislation and policy among others. There are more threatened large mammal species in forests than in the savannah (KIFCON, 1992). In Kenya large-scale exploitation of forests started soon after the construction of the railway (Onyango, 1995). Initially, the exploitation of the forests was intended to supply fuel wood for the railway steam engines. The land use changes such as agricultural activities; urbanization and industrialization have also played a vital role in the exploitation of these forests.

Tsingalia, (1990) observes that the importance of Kakamega forest includes; its economic value (forest products and tourism); scenic, natural value (bio-diversity, unique flora and fauna); traditional value (cultural uses; prayers, circumcision among others), and environmental value (erosion protection, water regulation and carbon sink). To the resident communities around Kakamega forest, the forest provides food, fuel wood, charcoal, timber and herbal medicine, a grazing area for animals, employment and act as venues for cultural practices. Kakamega forest, which is a major tourist attraction because of its richness in biodiversity, is being depleted at a high rate. The forest is being turned into other land use such as settlement and farming among others.

Over the last three decades the Kakamega forest has decreased in areal extend and quality because of large destructions. These destructions include the clearing of forest areas for cultivation or commercial use without replanting and destruction through unsustainable use by local people such as overgrazing, felling of indigenous trees, pit-sawing and charcoal burning. Great pressure is being placed on the indigenous forest resources and their utilization appears to be unsustainable. The unplanned felling of forest trees might eventually leave the land

susceptible to erosion which may result in the silting of water bodies and this could lead to environmental degradation and subsequent shortage of wood and food. Kakamega forest is threatened with degradation and its impressive biodiversity is endangered (KIFCON, 1992). Clearing an indigenous forest is the final step in losing all its rich biodiversity forever. It cannot be replaced. This indeed provides a genuine need for research in this area of forestry.

Kakamega forest is the easternmost relic of the equatorial forest that once stretched across the Zaire Basin from the Atlantic coast. It is related to the Equatorial rainforest of West Africa, Zaire and Uganda but has a cooler and less humid climate. It is a living remnant from the pleistocene period (15000 years ago) when climatic changes occurred throughout the world (KIFCON/KWS/FF, 1994; White, 1983; Kokwaro, 1988). It is located in western Kenya at the foot of the Nandi escarpment and covers an area of close to 24000 ha in both Kakamega and Vihiga districts. Kakamega forest occupies a high potential agricultural area in one of the densely populated areas in Kenya and contains a large number of indigenous trees.

Kisaka (2005) estimates the contribution of non-timber forest products collected from the Kakamega forest to household income, and demonstrates that sustainable use and management of non-timber forest products is an economically viable option that benefits both the local and national economy. Non-timber forest products have also been found to make a significant contribution to household income. A study done by Mukhwana, (1999) on the proximate factors that influence the distribution patterns of butterflies in Kakamega forest has revealed that some species occurred exclusively in the maturing forest phase. This suggests that previous clear-felling of trees adversely affect the population dynamics of butterflies, showing that clear felling of trees lowers species diversity.

In summary, Kakamega forest like the forested land in the world is under threat due to pressure on forest resources from forest adjacent communities to supplement their economic and farming systems (Bleher, B., Uster, D., & Bergsdorf, T. (2006). Apart from the extraction of forest products there is also the pressure to convert forestland to other land uses (KIFCON/KWS/FF, 1994). This poses a serious problem in Kakamega forest and should be addressed. This paper therefore provides insight into the need to conserve the forest resource and other natural resources for the community living around the forest and other interested parties.

The study therefore attempted to meet the following objectives:

- i) To determine the socio-economic characteristics of the households around Kakamega forest
- ii) To determine how the resident communities use the forest in meeting their economic needs

## **2. MATERIALS AND METHODS**

The target population comprised the adults who lived near the forest and headed a household. The total population was estimated to be 800 households. Out of the estimated 800, households 10% was chosen to form the study sample. The administrative locations adjacent to the forest were identified and a purposeful sampling approach was used in selecting five locations. From each selected location, two sub-locations were selected randomly. Systematic sampling was then used to identify sample units (households) where every 10<sup>th</sup> household was selected. The head of

the household was expected to respond to the questions. Questionnaires were preferred for data collection because they standardise the stimulus presented to the respondent. Reconnaissance was done to familiarise the author together with the enumerators with the study area.

The questionnaires sought information on: Economic and social values of the forest to the local community; traditional ways of forest utilization and conservation; the contribution of the locals to the depletion of the forest; the changes on the forest that have been observed by the community over a period of time; the activities that contribute most to forest degradation; the species of trees that were being cut down more than others and the views of the local community on forest conservation. All the quantitative information obtained from the structured questionnaires was checked for any errors, coded, and stored in Excel. The data was then analysed using simple statistical tools such as mean, frequency and percentages. The data collected through personal communication were analysed by qualitative analysis.

### 3. RESULTS AND DISCUSSION

#### i) The Socio-economic Characteristics of Households around Kakamega forest

The population sample interviewed comprised 45 males (56.25%) and 35 females (47.75%) which was a total of 80. The survey revealed that the majority of the respondents underwent formal education. However, half of the respondents had only been to primary and most of them dropped out of the primary school before completing. Formal education, which widens one's scope of acquiring knowledge and new ideas and at times eases acquisition of new skills, plays a great role in the conservation of forests by creating awareness on the importance of forest conservation.

The highest number, 63.75% (51), of the population in the study area were involved in farming. Twenty percent (16) of the respondents were involved in timber related businesses; these include fire wood/ charcoal selling, carpentry among others. The rest, 16.25% (13) were teachers, clerks, provincial administrators, social workers, tea pickers, pastors or were unemployed. In the study area most people practice farming by crop cultivation, livestock keeping or both. These activities require a lot of land and thus the community is forced to clear some forest so as to carry out farming activities. The community believes that the forestland is more fertile and gives them higher yields as compared to their own pieces of land, which is true because the land has been left fallow for a long time. Those who keep livestock use the forest as a source of pasture for their animals thus interfering with the forest ecosystem. The local communities surrounding Kakamega forest are generally poor and use of the forest to supplement their meagre incomes is tempting because subsistence crops on which they depend are never enough to meet the local demand.

**Table 1** shows that majority (86%) of the people in the study area owning small pieces of land, that is, less than 1.5 acres. The average land holding is 0.9 acres per household.

**Table 1: Land Size Distribution in the Study area (n= 80)**

Farm size (acres)	Frequency	Percent
<0.5	38	47.5
0.5-1.5	31	38.5
1.6-5	4	5

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>5	4	5
No response	3	4
Total	80	100

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*Source: Researcher (2001)*

Since most of these people are farmers, the small pieces of land are inadequate and therefore need extra land to supplement. Most of the respondents, 65% (52), did their farming on forestland, 10% acquired more land for farming through lease and the rest did not find it necessary to supplement. They also use the forestland as a source of pasture for their livestock while those who trade in wood products get them from the government forest. The glades that are very important in that they allow forest trees to grow in them are being degraded at a high rate. They are under heavy grazing, collection of thatch and frequent fires. Glades as defined by (Muriuki, 1994) are open sites that differ from openings in the canopy since the plant community in glades does not resemble those in an open canopy.

**ii) How the resident communities use the Kakamega forest in meeting their economic needs**

The highest number of the respondents, 77.5% (62), used fire wood for cooking in their homes, 18.75% (15) used charcoal, 3.75% (3) used kerosene while none of them use electricity or gas. A question on the source of the firewood and charcoal revealed that most of the respondents 72.5% (58) obtained them from the forest, 15% (12) purchased from the market, and 7.5% (6) got them from the homestead, while 5% (4) did not specify where they got them from. Socio-economic studies on Kakamega forest have shown that there is a high dependence on the forest by the local communities. Human disturbance, especially charcoal burning and logging, has become a serious problem and a major environmental threat to the survival of Kakamega forest.

The main source of energy in the villages adjacent to the forest as evident from above is firewood followed by charcoal and then kerosene. The first two are forest products and this causes forest degradation. There is need to establish forest plantations to supply the requirements of local communities for fuel wood, charcoal, poles and timber much of which is presently obtained from the indigenous forest (KIFCON, 1992). Along the Chavakali-Kapsabet road and the murram road linking Jeptulu with Shinyalu the brick industry is concentrated. A small proportion of brick makers illegally extract fuel wood from the forest both exotic species e.g. blue gum and indigenous species. Although the brick makers were aware of the need to plant their own woodlots, land pressure and the small size of farms were considered to be limiting factors (KIFCON, 1992). In the developing countries, generally, shortage of fuel wood is an increasingly serious cause of deforestation. For example, India's urban poor have been forced to turn to fuel wood for cooking by sharp increases in the price of kerosene, coal and charcoal over the years (Repetto&Malcom, 1988).

Most of the buildings in the study area were made of timber. Houses were generally made of traditional mud walls on a wooden frame with wooden doors and windows. Roofs are either thatched grass or iron sheets. Some houses are made of local bricks or cement blocks and even roofing tiles but these are exceptions. Compounds are generally fenced; common methods are wooden posts and barbed wire fence, completely wooden and live fence. This shows that timber is in high demand and the residents are unable to plant their own trees since they have small pieces of land and to some extent most of them enjoy using the forest trees because they are readily available. A few farmers were noticed to be practicing agro forestry in their small pieces

of land. They also believe that the forest is their property and should make use of it. They are not aware of the degradation they are causing to the forest and they cannot even imagine that if they continue using the forest resources at the rate at which they are doing it will all be cleared at one time and they will have nowhere to get the forest products from.

The residents have noticed land use changes such as encroachment into the forest, which means the indigenous forest has been cleared and turned into settlement, agriculture or grassland. On climatic changes, the respondents claim that they used to receive more rains before than is the case now, and that the rainfall seasons have changed over time. They attribute all these to the clearing of the indigenous forest and turning the forestland into other land uses. Most respondents 78% reported population increase as the main reason behind encroachment into the forest. In Kakamega, high population density around the forest is responsible for the serious encroachment pressure. Great pressure is placed on the indigenous forest resources and the utilisation appears to be unsustainable. Kakamega forest is threatened with degradation and its impressive biodiversity is endangered (KIFCON, 1992). Land degradation has in turn reduced agricultural productivity, the carrying capacity of grazing lands, water quantity and quality as well as wood fuel output. A question on the trees that have disappeared from the forest revealed that the most affected are the hardwoods such as Elgon teak and Meru oak.

From the survey it is quite apparent that the Luhya community who are the people living around Kakamega forest had their own traditional uses of the forest. The forest was in itself a source of food (meat from wild animals, fruits and vegetables), medicine for various diseases, (honey,, roots, barks, stems or leaves of certain trees or herbs were used as medicine for various diseases). The forest was also a source of rope and grass for thatching their houses, firewood, charcoal gold, sand, timber and poles. They also used the forest as a communal grazing ground for their cattle.

Some parts of the forest were kept as sacred sites for worship, prayers and offering sacrifices to their God. Other cultural activities such as the circumcision or initiation of the boys that still take place even today were carried out in particular parts of the forest. This activity normally takes place once in every five years. The places designated for this purpose are kept holy and no one is allowed to go there except during the initiation ceremonies. They also used the forest as a grazing area for their livestock and therefore the forest was of great importance to them and they had some taboos to curb the overexploitation of this precious resource. Most people living around the forest relied on collected wood products, many of them from the government forest. Farmers graze their livestock freely in the forest; obtain medicinal herbs keep beehives in the forest and house initiates during male initiation ceremonies. Most of these people do not buy the firewood and poles and do not even pay the monthly grazing fee.

The 'shamba' system was beneficial to the farmers in that it provides food and any surplus can be sold in the markets, earning household income that can be used to bridge financial obligations within households. It was hoped that farmers would learn about the importance of trees by virtue of their constant contact with seedling tending in the forest and therefore be encouraged to plant their own. Unfortunately, this was not the case. To the farmers wood materials are obtained at minimal costs from the forests and therefore they do not perceive the need to carry out agro forestry and soil conservation measures in their farms. The government has also played a role in the degradation of the forest. It was observed that because of the shortage of

arable land, some farmers were allocated land that was part of the gazetted forest. In the study area some landless people were allocated land or settled in the forestland.

The responses on the traditions and taboos that were used in the management of the forest resources are as follows: a part of the forest was reserved as a holy place used for cultural practices, some trees and some places in the forest, e.g. *Lusuhi* were treated as special and reserved for men's use for initiation, which were done after every five years, hives were kept in the forest to scare people away, it was a taboo to use some particular trees for building and as firewood and also using some grass for thatching was not allowed, some trees were kept for sacrificial purposes, ash from a home where twins were born were thrown into the forest and nobody was allowed to step there, the community living around the forest believed that their ancestors lived in the forest and if it was destroyed no family would survive, no one was allowed to step where the sacrificial ash was thrown.

The respondents were asked if they had observed any negative impact on the environment due to forest degradation and the majority, 99% (79), had observed while only 1% (1) were ignorant. Those who had observed some negative impacts posed by the destruction of the forest were asked to mention examples and 51.25% (41) mentioned the disappearance of some animal and plant species, 30% (24) indicated that there were some climatic changes, 10% (8) mentioned soil erosion and 8.75% (6) mentioned all the above as the main environmental problems posed by forest destruction. The respondents were asked to give suggestions on what should be done so as to curb forest degradation and 40% (32) suggested that the community should be educated, 26.25% (21) were for the encouragement of the tree planting programme; 20% (16) were of the opinion that the local community should be given the power to manage the forest; 8.75% (7) suggested that laws and regulations governing the management of forests should be adhered to; the remaining 5% (4) gave other solutions such as the encouragement of income generating activities within the local community so as to reduce pressure on the forest and promote community participation in forest management.

The responses on whether there is need to conserve the forest shows that most of the respondents 96.25% (77) gave their answer as yes while only 2.5% (2) gave no and 1.25% (1) gave no response. The respondents were then asked why there was need to conserve the forest and they gave the following reasons: it is a source of medicine, wood, employment and raw material for industries; forests attract rainfall, is a home for wild animals and check soil erosion; the trees act as windbreakers and promote tourism. Most respondents suggested that the community should be given the responsibility to manage the forest (43%), 26% were for the government management while 9% said the government should work together with the community and the rest 2% suggested the timber traders to be given the mandate to manage the forest.

#### **iv) CONCLUSION AND RECOMMENDATIONS**

From the Kenyan history perspective, studies of colonial land alienation have usually centred on issues and conflicts generated by European settlement. Large tracts of land were delineated by the colonial administration as set aside as 'Crown Forest'. By the late 1930s over 13000 km<sup>2</sup> had been designated as government forest reserves where the Kenya Forest Department was responsible for their management. Much of the forest had been occupied or otherwise utilized by the indigenous people, and its loss often resulted in bitter and protracted controversies similar to

those caused by alienation for white settlement. The forest was important to the people in that it was the frontier for the expansion for their agricultural and pastoral economy (Richards & Richards, 1988).

The relationship between the community living around Kakamega forest (the Luhya) and the forest can be explained by the uses they make of it. The cultural beliefs concerning the forest and certain species still do exist and are a part of the identity of the Luhya community. Traditionally the Luhya community had established ways of conserving the forest in general and certain species of trees in particular. This was done through the establishment of taboos and having elders who ensured strict adherence to the laws governing the forest. To the local people, conservation of the forest would enable it to provide herbal medicine, food through domesticated vegetables, fruits and nuts, fuel wood and timber.

The human population around Kakamega forest is quite high and the percentage of the people living below the poverty line is also high. Most of the people living in the area are unemployed and depend very much on farming. The average amount of land owned per household is less than one acre which is too small and is not enough for farming activities and therefore they are forced to encroach onto the forest for more land for both cultivation and cattle grazing. The level of education of most of the people is low, that is, most of them did not go beyond primary school. Due to their low education level, most of the people there are ignorant of the sustainable uses of the forest and hence its conservation. The households around Kakamega forest use firewood and charcoal for cooking and wood (timber and poles) for building and most of these are obtained from the government forest thus degrading it. Apart from the products above, forests also provide fodder, fruits medicine, sacred sites and employment to local communities.

The study therefore recommends the establishment of forest plantations to supply the requirements of local communities for fuel wood, charcoal, poles and timber much of which is presently obtained from the indigenous forest of Kakamega. Secondly, the community living around Kakamega forest and other forests in Kenya should be encouraged to practice agro forestry so that their farms can be an alternative source of the wood products that are currently obtained from the forest. Thirdly, the government should avoid allocating forest land to the landless people because this has been found to accelerate the destruction of the indigenous forest not only in Kakamega but in other Kenyan forests. Finally, the community should be encouraged through civil education to utilize the forest in a more sustainable way instead of being “chased” from the forest like thieves because this has angered them and has made them to destroy the forest at an alarming rate. They should be educated to appreciate the forest as their property which they need to utilize and at the same time care about the future generations who will definitely need the forest for various reasons.

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