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## RESEARCH ARTICLE

### PERCEPTION OF FORESTS AND FOREST COVER: IMPACTS ON STATUS OF FORESTS IN NANDI HILLS FORESTS, NANDI COUNTY, WESTERN KENYA

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#### ABSTRACT

Forest Communities (about 28% of Kenya's population) represent a critical section of Kenya's overall population. Many of these people interact on a daily basis with forest resources around them. The knowledge about their perceptions and attitudes pertaining to forest resources may make it possible to contextualize their influences on sustainable management of forest resources. The missing link in this paradigm could be the inadequate or little levels of incorporation of community based forest management strategies in planning for sustainable utilization of forest resources. The incorporation of local community's perception in forest management could therefore be fundamental in reversing the downward trends of forest loss. It is assumed that people are a product of their environment, therefore it can be insinuated that the *perception* of forest utilization by the forest communities is based on their interactions, traditions, values and attitudes. This paper therefore examines the perceptions of the Kalenjin community living around Nandi Hills Forests (NHF's) and how their perceptions have influenced the utilization practices of NHF's. The study investigates cultural constructs that have had a bearing on the perception and use of these forests and the role of traditional and religious practices.

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#### INTRODUCTION

According to FAO (2006), in Africa, there has been a continued, rapid loss of forest area – the largest of any region and this is particularly disconcerting. Kenya, being part thereof, is not an exception to forest area losses. The forest cover in Kenya is estimated to cover 1.24 million hectares, which is just about 2% of the country's land area (FAO, 2001). Recent estimates, based on remote sensing satellite data indicate that Kenya's forest cover stands at a critical 1.7 per cent of Kenya's total land area (UNEP, 2007) which is still below the recommended 10% of the total country's land mass. The forest cover of Nandi hills forest (NHF's) has sustained severe deforestation and degradation through heavy exploitation resulting from an escalating demand for fuel wood, land for cropping, grazing and other human activities that are increasing threats to this critical ecosystem.

Studies on forest ecosystem change drivers with a bias to community perceptions in south eastern Ethiopia by Lisanework and Mesfin (1989) exhibited similar trends. Even with the unmet needs in required minimum forest cover recommendations, NHF's still face multitude of anthropogenic threats. Singh (1991) argues that many of the developing countries of the tropical and subtropical regions have lost substantial portions of their forest covers due to conversion of the forested land into agricultural land in order to feed the teeming millions. It is therefore clear that the main challenge for the Nandi Hills is the human folk residing within it and its

environs. The population of Nandi Hills has been increasing fast such that by the year 2009, the population had increased to 752,965 people (KNBS, 2010) in comparison to what it was forty years earlier in 1969 of about 209,068 people. Inadequate focus on sustainable management it seems, could lead to continued indiscriminate destruction of Nandi Hills forests and other natural resources – the backbone of human livelihood. Evidently, the rising human population incrementally changes the structure and characteristics of downstream hydrological balance, jeopardizing the ability of the Lake Victoria watershed to meet the growing societal needs, as well as the capacity to support the large variety of terrestrial and aquatic life forms. Studies in other continents have shown that as a basic principle of community based natural resource management in relation to forests; forest community's perceptions and values are therefore critical when managing forests (Lee and Kant, 2003). Sound forest management practices, backed by updated forest legislation and policy, and strong institutional arrangements are necessary in order to turn round the sad state of Nandi Hills forests.

#### METHODOLOGY

A mixed methodological approach was embraced during this study, utilizing both qualitative and quantitative methods of research. Various methods were used in establishing the research needs and postulating the research findings. The three districts of Nandi Hills, Nandi south and Nandi North were purposively sampled from a total of 4 districts in the Nandi County (formerly the greater Nandi District), mainly on the basis of their accessibility in a manner described by Blanche *et*

*al.*, (2006). In each district, six representative administrative locations, peasant associations were randomly selected, and from each of these, 17 households were randomly selected for a detailed house-to-house survey, giving a total of 102 respondents in each district. This study identified 18 locations in the three districts. There was one FGD per location in the 18 locations covered, which were Kaptumo South, Kaptumo North, Chebarus, Chemomi, Ndurio, Kaboi, Kamarich, Kosoiywo, Ketbarak, Keteng', Kipsigak, Kapkoiyo, Koringin, Mosine, Nandi Hills, Samoei, Sinendet and Tururo. A total of 18 Focus Group Discussions (FGDs), one in every administrative location of about 12 members each were conducted among NHF's communities. There were a total of 10 key informant interviews (KII) conducted within local stakeholder institutions involved in forest management at the study site.

The KII interviews with the stakeholder institutions and forest management practitioners were on the other hand conducted by the researcher alone because of the sensitivity of the information related to forest and the levels of technicality in content and language. Physical visits to the NHFs were undertaken. The FGD sessions were moderated and guided by well selected and trained field research assistants from the local communities in those areas. The FGDs conducted for the local communities were structured such that they laid more emphasis on the community perceptions in relation to forest utilization. Aspects of formal and informal forest resources utilization were also explored in great details. The NHFs cover three Districts, which are Nandi North, Nandi South and Nandi Hills Districts (Figure 1).

The KII for the stakeholder institutions was done under the auspice of the Nandi Environmental Forum (NEF), which brought together international partners, government agencies, private sector and the Community Based Conservation Groups (CBCGs). The results of these discussions were later triangulated and used in the preparation of results of this paper.

## RESULTS

The local people's perception of the status of the forest cover in the three districts is presented in Table 1. It shows that over half of the 306 respondents representing about 56% of the respondents felt that forest resources were rapidly declining while about 13% of the respondents indicated that the forests have remained the same as before. Only about 4.1% of the respondents believed that forest resources had increased and this was majorly attributed to plantation forest for commercial purposes in the study area. From the above analysis, it can be noted that the majority of households (89.4%) find forests useful to them while a smaller percentage (10.6%) find it contrary to the majority. When prompted further to list how useful forest were to them, it emerged that all households had varied responses. There were those households that agreed that forests were useful (Yes response choice) and those that indicated that forest were not useful to them (No response choice). On the other hand a total of 271 respondents representing 89.4% of the respondents indicated forest were indeed useful to them by indicating a 'Yes' response. A total of 32 respondents said that forest were not useful to them by indicating a 'No' response, representing 10.6% of households interviewed (Table 2).

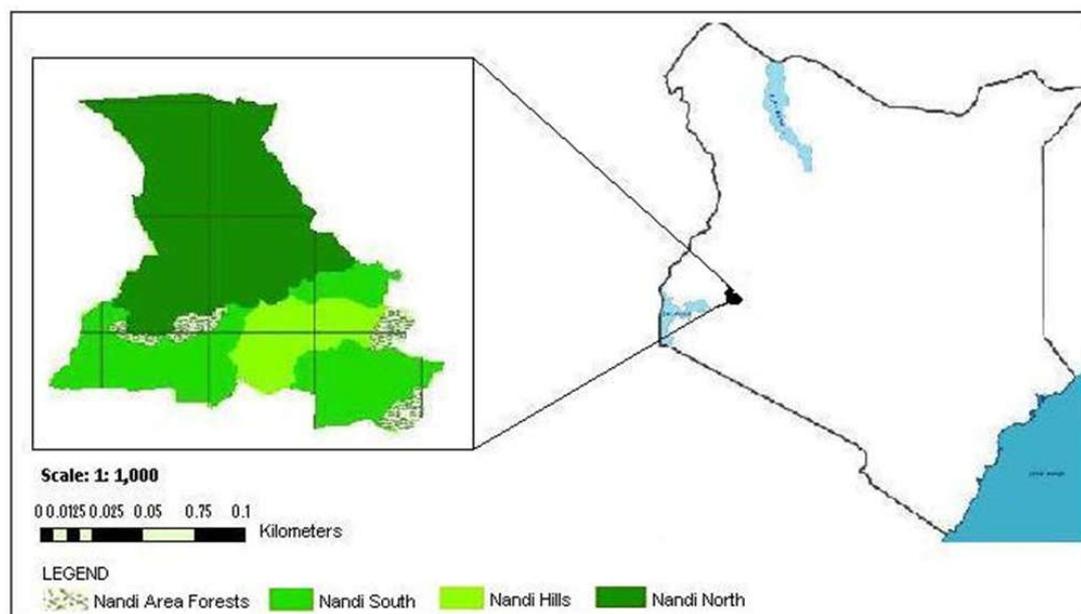


Figure 1. Map of the Study Area, Nandi Hills and Nandi Forests

Table 1. Respondents' perception of the status of forest cover in Nandi Hills Forest over the past 15 to 20 years

District	Number of respondents	Percentage of responses				
		Same as before	Gradually declining	Rapidly declining	Increasing	No opinion
Nandi South	102	13.1	26.7	51.3	5.8	3.1
Nandi Hills	102	26.1	23.9	43.8	5.2	1
Nandi North	102	2	21.7	73.1	1.2	2
TOTAL	306	13.7	21.4	56.07	4.1	2.0

**Table 2. Respondents perceptions about usefulness of forest resources forests**

Responses	Frequency	Percent
Yes	271	89.0%
No	32	10.0%
None response	3	1.0%
Total	306	100%

The following is a summary of responses mentioned by households:

**a) Households that agreed that forests were useful argued that forests:**

- Provide dry season pasture for livestock;
- Increase the aesthetic value of the environment;
- Source of medicinal plants;
- Are water catchments that attract rainfall and store water for rivers;
- Provide religio-cultural significance especially rites of passage;
- Are a source of timber and firewood for domestic and industrial uses;
- Act as purifiers of water and air thus ensuring ecosystems balance;
- Are habitats for an array of biodiversity including plants, birds, reptiles and other wild animals;
- Are tourists' attraction sites that benefit the government and the local communities through revenues generation

**b) Households that indicated forests were not useful to them**

- Are hideouts for thieves;
- Are havens for wild and dangerous animals;
- Are only important to the governments;
- Are barriers to extension of farmlands yet if one destroys them the government arrests him/her.

The results revealed that a significantly large proportion of the respondents perceived the forest cover in these areas as rapidly declining. The primary drivers of this trend were noted as intensification of agriculture and the need of more land for food production to feed the teeming populations (See plate 1 below).



**Figure 1.**

Photo showing the extent of intensification of agriculture on formerly forest land. The study also shows that farmers are very interested in tree planting and were in favour of private

ownership of trees and forests (farm and/or plantation forestry). Tree planting and forestry at the household level was seen to have the capacity to supplement household incomes. This could be achieved through planting of fruit trees, fodder trees and beekeeping for small scale commercial purposes. Protection of natural regeneration is also recognized as an important complement to tree planting in the rehabilitation of degraded forest landscapes. The majority of households sampled indicated that the forest cover of Nandi hills forest has suffered severe deforestation and degradation through heavy exploitation resulting from an escalating demand for timber and fuel wood, land for cropping and grazing. They further purported that the depletion and degradation of the Nandi hills forest are a threat to ecosystem diversity and a fundamental influence on the declining standard of living of many households. The decline in forest resources – and a subsequent decline in land productivity and lack of forage and fodder as well as other tree products and services – was perceived by the farming communities in almost all the locations in the study site. The farmers' responses suggested that the forest cover and wetlands under the jurisdiction of the local government had been more severely affected.

This is because the forests and wetlands were perceived as government property of some sort. The perception was evidenced with great extremity during the Post Election Violence (PEV) in Kenya after the 2007 general elections. The most severely affected areas were found around Koyo wetland and Kimondi forest in Nandi South District. The forest community indicated that, tea farming, maize production, horticulture farming and livestock rearing are the major agricultural activities in these districts. Consequently, more forest land has been cleared or interfered with to support these activities with a serious loss to biodiversity and ecosystem services provisioning. The community reported that planting of trees for water conservation would prevent the drying up of streams that supply domestic water. A tree called *Sesigium* in the local language was perceived specifically to help in water purification. Further it was widely suggested that this tree species be planted along the riparian areas and in wetland for water conservation.

Tree planting and forestry at the household level was seen to have the capacity to supplement household incomes. This would be achieved through planting of fruit trees, fodder trees and beekeeping for small scale commercial purposes. Culturally forests were perceived to have a religio-cultural significance. Among the Kalenjin groups forest trees and products that were used during circumcision and marriage ceremonies. The forest also acted as a home for initiates during the rites of passage of male members of the community up to the time they fully recovered to rejoin the community. In terms of livelihood support for the households, forests provided dry season grazing relief, honey, wild berries and fruits, wild edible roots and undergrowths that supplemented peoples' diets. It was also noted that the local *Kalenjin* Community borrowed a lot of forest conservation practices from the *Ogiek*, the aboriginal community of Nandi Hills area. A section of the households also reported that the forest modified the climate by attracting rain and creating a micro-climate that favoured the production of tea and other agricultural crops. This was very significant in defining household socioeconomic power. Many households were able to link forests with values such as

water conservation, income generation, flood control, rainfall, food and medicine, grazing lands during the dry season, tourism development and biodiversity conservation. Their awareness ensured that public utilities and environmentally crucial resources would not be exploited irresponsibly.

## DISCUSSION

The people's perception that forests are critical to their livelihoods is vital if they are to become involved in fighting for the conservation of their habitat. Many households were able to link forests with values such as water conservation, income generation, flood control, rainfall, food and medicine, grazing lands during the dry season, tourism development and biodiversity conservation. Their awareness on these aspects corroborates the assertions of White and Martin (2002) who have postulated that if indigenous and other local communities have been increasingly acknowledged for being important stewards of forest estates, they would ensure that forest utilities and environmentally crucial resources are exploited sustainably. The findings of the study indicate that a significant portion of the local community (89.4%) believe that forests and forest resources are useful to them. These data, and the fact that the Kenya Forest Act of 2005 (Government of Kenya, 2005) empowers local communities in forest management through the Community Forest Management mechanism; suggest that there is hope for the sustainable management of the Nandi Forests. As pointed out by the respondents, the forests are crucial since they act as water catchments, are a source of timber and firewood, are habitats for an array of floral and faunal biodiversity and are major tourist attraction sites that benefit the government and the local communities through revenues generation. The few (10.6%) who did not see the significance of these forests were not able to build a strong case. Their reservations were informed by issues such as: the forests being hideouts for thieves, havens for wild and dangerous animals and barriers to extension of farmlands.

The submission by Enger *et al.* (1992) that whenever a resource is exploited, the two major interests that are always in conflict are environmental and economic has been buttressed by the strong perception by the locals that the forest cover in the area had rapidly declined and suffered severe deforestation and degradation due to human exploitation. Based on the submissions of a majority of households sampled, forest cover of Nandi Forest has suffered severe deforestation and degradation through heavy exploitation resulting from an escalating demand for timber and fuel wood, land for cropping and grazing. They further noted that the depletion and degradation of the Nandi Forest are a threat to ecosystem diversity and a fundamental influence on the declining standard of living of many households. The decline in indigenous forest resources and a subsequent decline in land productivity and lack of forage and fodder as well as other tree products and services were perceived as threats by the farming communities in almost all the locations in the study site. Farmers' responses suggested that the forest and wetlands under the jurisdiction of the government had been more severely deforested and degraded compared to community and private owned ones. This is because the forests and wetlands were perceived as government property of some sort. The perception was evidenced with great extremity during the post election

violence in Kenya after the 2007 general elections, when the locals torched sections of forests to express their displeasure with the government. They also used some wetlands as burying sites for victims of the violence. The most affected areas were found around Koyo wetland and Kimondi forest in Nandi South District. However, the keen interest and involvement of farmers in tree planting and particularly agroforestry and plantation forestry is a sign of hope in boosting the general forest cover of the area. The willingness by the local community to play a part in enhancing the natural regeneration of the indigenous forests is based on the perception, amongst others, that further irresponsible forest exploitation would result in little or no rainfall in the area. Albeit most of them not understanding the push and pull factors that determine precipitation in the Nandi County, their appreciation of the forests' role in the hydrological cycle is valuable.

Data generated from the local community indicated that, tea farming, maize production, horticulture farming and livestock rearing are the major agricultural activities in these districts. Consequently, more forest land has been cleared or interfered with to support these activities, with a serious loss of biodiversity and ecosystem services provisioning. Community members stated that planting of trees for water conservation would prevent the drying up of streams that supply domestic water. A tree called *Sesigium* in the local language was perceived specifically to help in water purification. Further it was widely suggested that this tree species be planted along the riparian areas and in wetlands for water conservation. Tree planting and forestry at the household level was seen to have the capacity to supplement household incomes. This could be achieved through planting of fruit trees, fodder trees and beekeeping for small scale commercial purposes. The study reveals that there is also strong religious and cultural significance of forests. This is pegged on the perception that the forest is more of a sacred place compared to other areas that are dominated by other land uses.

For instance, the use of '*Sinendet*' (*Periploca linearifolia*), a creeper, as a symbolic plant during '*Tuluap Ng'etk*' (a place for circumcision ceremony) to signify successful completion of the circumcision process is an important ritual. The choice of the '*Sinendet*' by the community as the plant for this purpose is based on its fast regeneration. Albeit being able to regenerate fast, '*Sinendet*' is a forest interior specie that has been conserved as it is only harvested once a year during circumcision ceremonies. As noted earlier, if indigenous and other local communities are acknowledged for being important stewards of forest estates, they would better ensure that forest utilities and environmentally crucial resources are exploited sustainably (White & Martin, 2002). Part of the acknowledgement process is acknowledgement of their knowledge, perceptions and beliefs and, as such, any community environmental education intervention would probably be enhanced by making explicit and bringing into focus via discussion the issues that have been noted above.

## Conclusion

The perception held by many people whose cultures and livelihoods are strongly linked to the forest may be influenced by their desire to gather forest products for immediate household consumption, the protection provided to the hydrological functions of a catchment, spiritual, religious and

other cultural values attached to the forest, or the potential to attract tourists. It is therefore critical that the different perceptions of NHF communities' on forests are recognized and, to the extent possible, reconciled in forest management and utilization strategies. Choices between different values have to be made in response to local social, cultural and economic circumstances. Whatever management scheme is opted for, local communities and forest users should be fully incorporated into the decision-making processes through participatory resource use planning processes. They must therefore participate actively in resource planning to enhance community ownership and benefit sharing from improved forest resource management. This is in essence, vital in bridging the missing link in the current SFM regimes that are intended to enhance sustainability.

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