An Analysis of Land Use Options in Kitengela and its Effect on Conservation and Management of Nairobi National Park

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Abstract

Nairobi National Park is unable to incorporate the spatial and temporal dynamics of many migratory mammals that rely on the area as a dry season refuge because of its small size. This has been made even worse by human encroachment on the park area. During the wet season, wild animals must be able to migrate to the south into the Kitengela dispersal area. However, Kitengela is under private ownership and currently in a process of subdivision, fencing, and conversion of grasslands to croplands and settlements thus jeopardizing its capacity to contribute to the dispersion of wildlife and hence the viability of the park. This study analyzed land-use options in the Kitengela area and their effect on Nairobi National Park. Data was collected using questionnaires, interviews, discussions and observations. Data was analyzed using descriptive statistics, cross tabulations and chi-square (χ^2) test with the help of the Statistical Package for Social Scientists (SPSS). All data were tested at the 95% (0.05) level of significance. Results indicate that although wildlife conservation would give the highest income of a monthly average of Kshs 27,500, the Kitengela land-owners preferred to put their land under residential houses and commercial buildings which would give them an average monthly income of Kshs 24,286. The study recommends that policy should be formulated to regulate utilization of land in Kitengela area in order to create room to facilitate the dispersion of wild animals to and from Nairobi National Park.

Key Words*: Nairobi National Park, Land Use*

INTRODUCTION

The functional relationship between Kenyan parks and surrounding areas was not taken into account in the original parks design and consequently few parks have enough room for extension to include the dispersal areas needed for the seasonal movement of migratory large mammal species (Campbell *et al*., 2000; Serneels *et al*., 2001; Thompson and Homewood, 2002; Bengtsson *et al.*, 2003). Thus, many species disperse into the surrounding areas under human occupation for part of their seasonal cycles and over 70% of the wildlife lives outside protected areas on privately or communally owned land (Western & Pearl, 1989).Threats to dispersal areas and areas beyond park boundaries have significant implications for the environmental and economic sustainability of most parks in East Africa (Gichohi, 2000). The loss of dispersal areas caused by increased human settlements, fencing and conversion to croplands might affect the viability of parks thus reducing the flow of benefits provided by the parks and consequently affecting human welfare. However, the benefits generated by parks accrue mainly at the national and international levels, whilst most costs associated with maintaining the viability of such parks arise at the local level. Thus, in Kenya the economic benefits provided by wildlife within the parks has been estimated at US$ 400 - 500 million per year (Norton-Griffiths, 1998), but most of the costs to keep the dispersal areas that sustain these parks open are borne by local farmers who also suffer increased costs of competition between livestock and wildlife for water and forage, livestock losses through predation and wildlife-borne diseases, as well as damage in their croplands through herbivory (Gichohi, 2000; Nkedianye, 2004).

Nairobi National Park (NNP) is too small to permanently support viable populations of many of the migratory mammals that rely on the area during the dry season. In order to continue providing benefits, wildlife must be able to disperse to the south into the Kitengela area during the wet season. However, Kitengela area is under private ownership and currently in a process of subdivision, fencing, and conversion of grasslands to croplands thus jeopardizing its capacity to contribute to the dispersion of wildlife and the viability of the park. The main objective of this study was to analyse land-use options in Kitengela and its effect on Nairobi National Park.

MATERIALS AND METHODS

Study Area

The study area was Nairobi National Park (117 km²) and Kitengela area (450km²) to the southern part of the park (Figure 1). NNP was established in 1946 as Kenya's first National Park. The biodiversity of the Park is diverse and consists of a variety of flora, fauna and avifauna. The Park has diverse animal and bird life. Its animal life includes Rhinos, Lions, Leopards, Hyenas, Cheetahs, Buffaloes, Wildebeest, Zebra and Hippos. The Kitengela area consists of open grassland with scattered trees and croplands that are under subsistence crops such as maize, beans, sorghum and millet. The study was however conducted in only two sub-locations of Kitengela area namely Kitenkela and Oloosirikon.

Methods

The study population consisted of the 12,648 homesteads in the two sub-locations (District Annual Report, 2007; CBS Report, 2001). Out of these, 50 homesteads were randomly selected. Questionnaires were then administered to the heads of the selected homesteads. Others interviewed included three employees of NNP (Heads of Research, Tourism and Community), four village elders and three provincial administration staff (Chief and Assistant Chiefs). In total 60 respondents were interviewed. Data was collected using questionnaires, interviews, discussions and observations. Data was analyzed using descriptive statistics, cross tabulations and chi-square (χ^2) test with the help of the Statistical Package for Social Scientists (SPSS). All data were tested at the 95% (0.05) level of significance.

RESULTS AND DISCUSSION

Ways of Land Utilization in Kitengela

Results showed that 46.9% of the land-owners utilize their land by building houses which they live in (Figure 2). The other major way of utilizing land in Kitengela was by the land-owners renting houses or commercial buildings. Wildlife conservation and pastrolism were the least popular way of utilizing land (4.1%).

The Survival of Kenya's wildlife is essentially a land use issue. It is clear that a significant fraction of NNP's dispersal area has been lost to human settlements, urbanization, agricultural activities and even industrialization. There is immense and growing pressure on the 8 % of the Kenyan land that is gazetted for wildlife conservation due to a rapidly growing human population and the ever increasing diverse needs of a stressed economy.

Kitengela's nearness to Nairobi has attracted both industrialists and settlers. It now hosts three towns, Athi River, Kitengela and Isinya. The combined effects of a rapidly expanding urban population, construction of roads, development of horticulture farms, quarries, agricultural plots and individual homes make the area totally unsuitable for wildlife habitation or use as migratory corridor. The initially expansive tract of rangeland is now highly dissected and increasingly dotted with human dominated features. Wildlife movement to and from the Nairobi National Park is interfered with. Consequently, the three main wildlife migratory routes (Athi Kapiti Migratory Route Corridor; Sosian Migratory Route and Maasai Lodge migratory route) are no longer fully functional. This has necessitated the intervention of innovative mechanisms that now persuade the settlers to allow migratory animals to pass through their land at an annual fee.

Livestock keeping has been the main land-use in the area (KWS Management Plan, 2005). There is a notable switch from nomadic pastoralism to more sedentary paddock grazing which necessitates fencing. There is also an increase in the livestock numbers and densities in the area (Khisa, 2001). Crop farming as a system of land use in Kitengela is under restriction as it is a new phenomenon that is being brought in by immigrants. Food crops such as maize are currently grown within some homesteads of the Maasai who are copying the behaviour of the immigrant populations. It is highly probable that crop cultivation will increase, and with it will come a strong propensity for fencing. This is a trend that has increased a great deal for the last three decades. Reasons underlying fencing include a declaration of property ownership and protection from marauding wildlife. In addition, urban development has influenced other land uses in

the area. The Athi River Town, Kajiado and Isinya centres have tremendously expanded in both development and size over the past decade. In this regard ownership and related issues raise a lot of concerns in context of mobilizing communities for involvement in wildlife conservation and management.

Average Monthly Income from the Land-Use Options in Kitengela

Figure 3 shows that wildlife conservation produced the highest income of Kshs 27,500 while living in it (residential) the least.

Wildlife is a major resource in Kenya particularly in the tourism sector, which contributes significantly to the country's economy. The wildlife resources are unique and spectacular and constitute a major factor that attracts tourists to Kenya. Kenya is one of the habitats where vast herds of animals roam in the open savannah grasslands and transverse land under different tenure and use (Khisa, 2001). However, all wild animals are state owned and only about 8% of the country is gazetted as wildlife protected areas. This implies that most wild animals are found outside the protected areas for most of the year and that local communities whose land they use bear the cost of maintaining them through opportunity cost and damage caused by wildlife to property and human injury or death.

Wildlife as a land use must have direct economic value to the local communities so as to enable it compete favourably with other land uses. Economic value in wildlife may be realized through creation of markets for its use. Economic appraisal of wildlife is an essential component of any sustainable wildlife management program. It reconciles competition between wildlife and alternative uses of land. Any economic model of wildlife had to embody a fundamental equation comprising the benefits of conservation, the costs of conservation and the benefits and costs of alternative uses of land.

Reasons why Kitengela Land-Owners are not Utilizing their Land for Conservation

Table 1 shows that the main reason why land in Kitengela was not being utilized for conservation of wildlife is availability of limited space (51.35%). However some Kitengela residents benefit from NNP through various programs and projects which are not necessarily initiated by NNP by sometimes leasing their land for conservation of wildlife. Most Kitengela land-owners engage in other forms of land-utilization apart from wildlife conservation because the other options seem more profitable.

Effects of land-Use Options in Kitengela on Management and Conservation of Nairobi National Park

Results showed that the effects of the various land-use options on management and conservation of NNP were as follows:

1. Decline in number of species in the park;
2. Increased cost of management due to taking active management approach;
3. Habitat loss;
4. Decline of species had negative impact on tourism;
5. Increased human-wildlife conflict;
6. Increased livestock-wildlife conflict.

Figure 4 shows that Land use change in some areas of Kitengela from semi-nomadic pastoralism to industrial/commercial uses like flower farming, quarrying, and small settlements has led to a decline in wildlife species (NNP Management Plan, 2005). The impact of decline of species affects tourism negatively.

Ways of Solving Kitengela Land Option Crisis

Educating Kitengela residents or land owners on the importance of Kitengela as a wildlife corridor is the best way of solving Kitengela land option crisis (Figure 5).

55.1% of land-owners investigated knew the importance of Kitengela as a corridor. However, they were sceptical about the importance of wildlife conservation in Kenya because they rarely receive direct benefits from the conservation.

41% of Kitengela land owners believe that getting more educated about Kitengela as wildlife corridor may be a stepping stone to solving the crisis of having incompatible land-use with wildlife conservation. However 31% noted that involvement of land-owners in management decisions was the way to go. These findings largely agree with Nkedianye (2004) who stated that local community involvement in wildlife conservation and management is considered pivotal in resolving human-wildlife conflict and sustainable wildlife management and conservation. This is due to the fact that wildlife shares much of the land with humans.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The study has shown that:

1. Majority of Kitengela land owners preferred to have residential and commercial buildings on their land.
2. Wildlife conservation yielded the most income.
3. Limited space was the main reason for Kitengela land owners not adopting wildlife conservation
4. Decline in wildlife species and loss of habitat are the major effects of the various forms of land utilization in Kitengela.
5. Educating Kitengela residents on the importance of Kitengela as a breeding area and corridor for dispersing wildlife would be the most preferred way of solving Kitengela land options crisis.

Recommendations

The study recommends that:

1. The relevant Kenyan Policies to be applied to regulate the developments of Kitengela Township, so that its existence does not compromise the ecosystem stability of Nairobi National Park.
2. Kitengela land owners need to be educated on the importance of Kitengela as wildlife corridor.
3. There is need to involve the Kitengela land owners in management of NNP.

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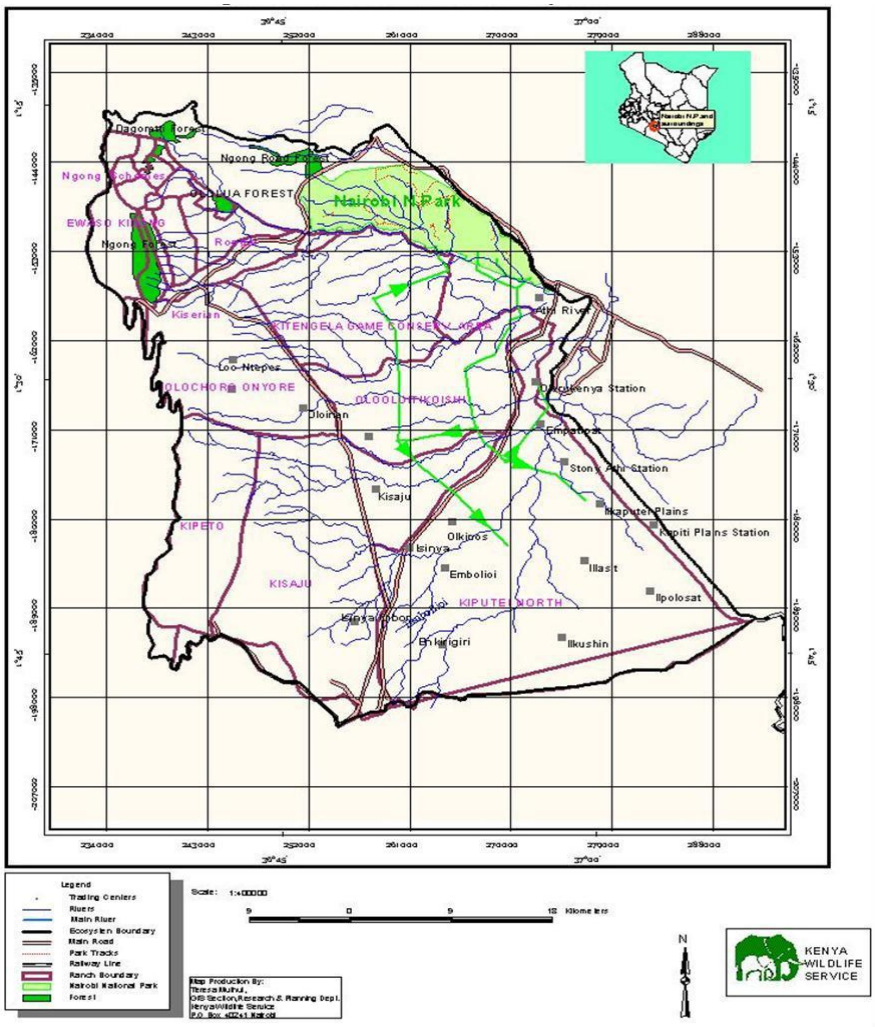

Figure 1. The study area

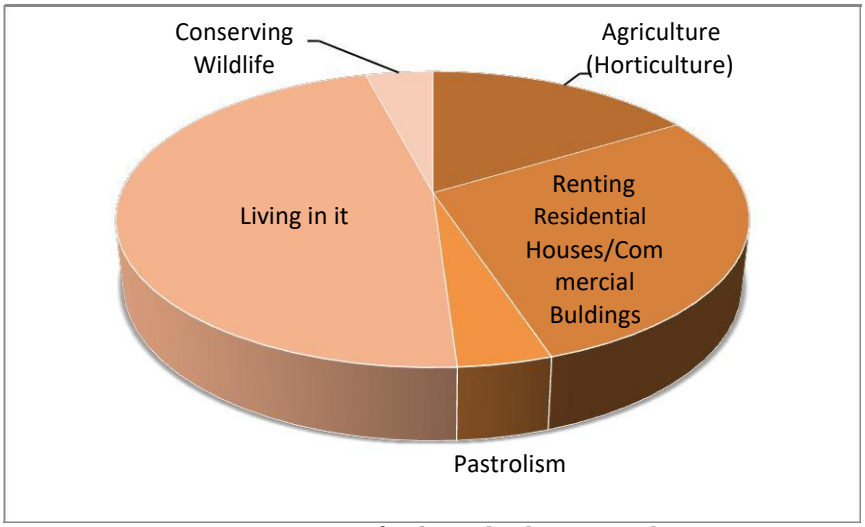

Figure 2. Ways of utilizing land in Kitengela

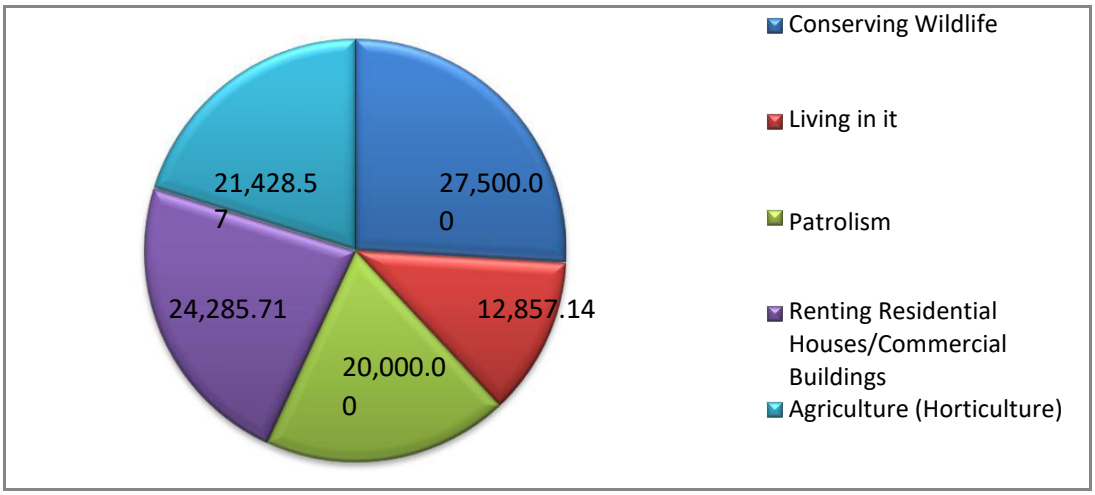

Figure 3. The Average Monthly Income from the various Land-use Options in Kitengela in Kshs.

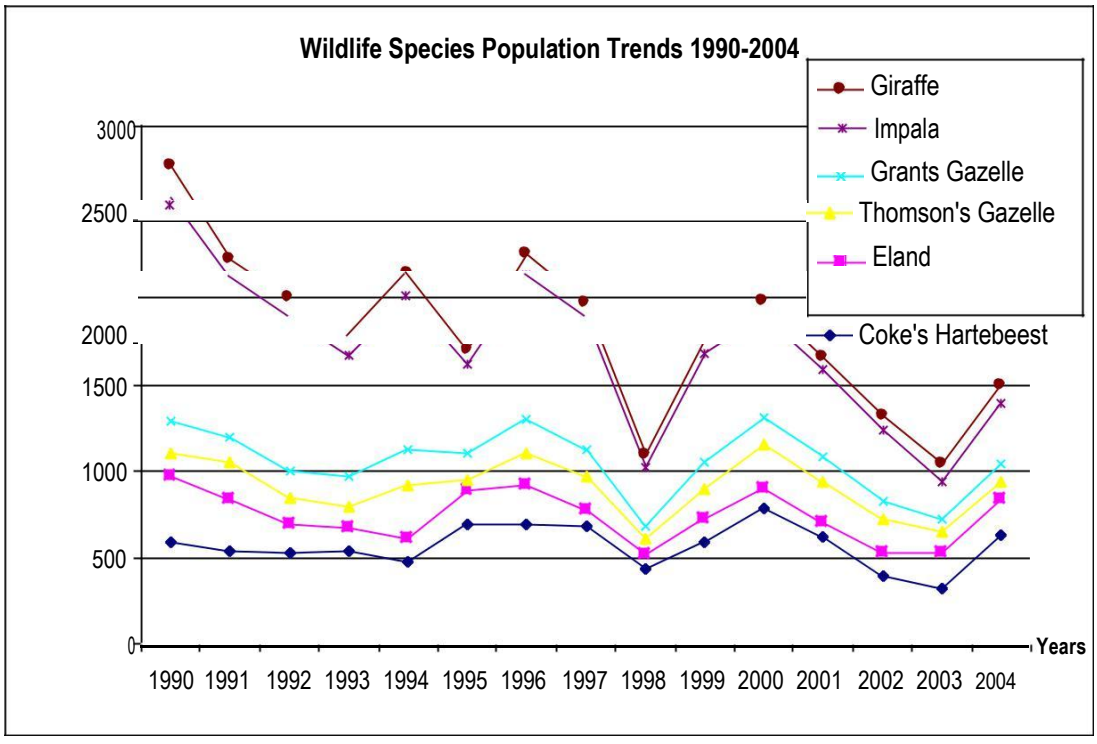

Figure 4. Wildlife species population trends (*Source:* KWS Database)

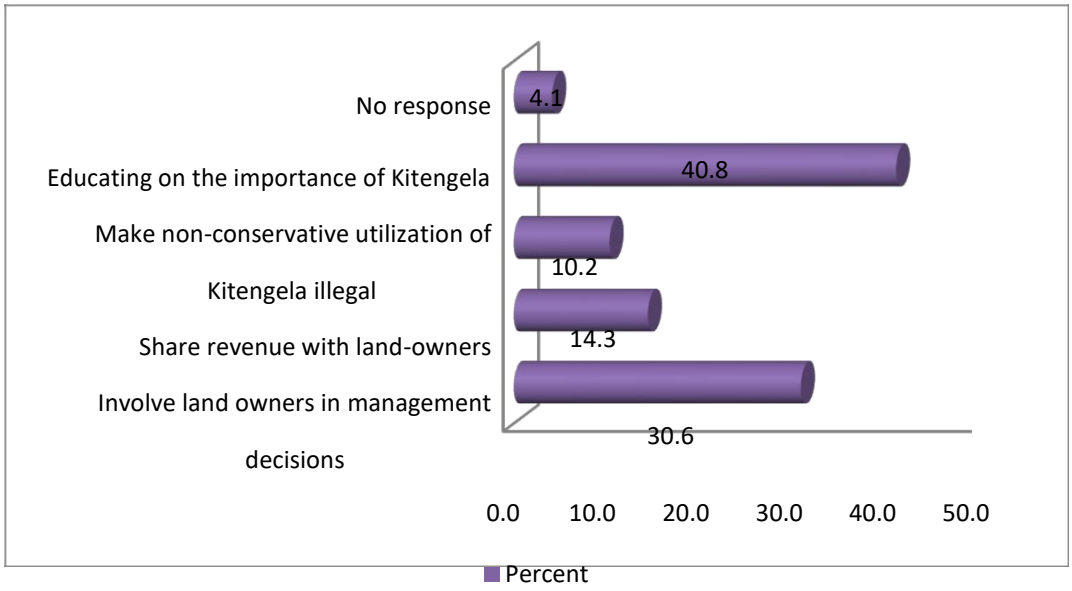

Figure 5: Ways of solving Kitengela crisis

Table 1. Reasons why Kitengela residents were not utilizing their land for conservation of wildlife

Reason	**Frequency**	**Percentage**
Limited space	19	51.35
Don‘t know what benefit to derive	5	13.51
Misunderstanding with KWS	1	2.70
High human population	3	8.11
Humans are important than wildlife	2	5.41
Fear of wild animals	1	2.70
Land not within corridor	3	8.11
Agriculture is more important	1	2.70
The land is planned for residential purpose	1	2.70
Aridity of the area	1	2.70
Total	37	100

BIO-DATA

Paul Okelo Odwori is a PhD holder in Agricultural Economics and Resource Management from Moi University. He is a Natural Resource Economist dealing with Economics of Wildlife resources, Forest resources & Agricultural resources. His professional objective is to pursue a career as a natural resource economist. He endeavours to contribute to natural resources sustainable utilization through proper accounting and valuations of natural resources. His research interest is therefore biased to economics, utilization and management of natural resources. Currently, He is a Senior Lecturer and Head, Department of Business Management, School of Business and Management Sciences, University of Eldoret.