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Community based conservation and ecotourism as an environmental management practice for climate change adaptation in Ewaso Nyiro arid land ecosystem, Samburu County Kenya

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Communities inhabiting the fragile Arid and Semi-Arid (ASALs) ecosystems of Northern Kenya are strongly impacted by climate variability and change. Their pastoral livelihoods are threatened. Community based approach to environmental resources conservation and ecotourism have provided an alternative source of livelihood worth considering. This study was conducted in two districts; Samburu and Laikipia, Northern Kenya in three community based conservancies of Namunyak, Naibung'a and Westgate. The study used quantitative and qualitative participatory research design. The findings indicated that community based conservation and ecotourism indeed was an appropriate practice for community adaptation to climate change impacts in the ASALs. It offered opportunities for livelihood diversification away from pastoralism that was resilient enough to climate change, and provided the community with a sense of ownership for their resources and created community cohesion which is an important asset for rural community social capital. The study concluded that community based conservation should be looked at as a strategy for climate change adaptation and community resource management.

Key words: Climate change, ecotourism, community conservation, conservancy, adaptation, livelihoods, samburu, laikipia.

INTRODUCTION

In East Africa, an estimated 70 percent of wildlife populations are dispersed outside protected areas (PAs) which overlaps with agricultural and community grazing land (Western and Gichohi 1993). The community way of life supports, to a larger extent, the thriving of wildlife in shared environment. As a way of adaptation to harsh impacts of climate change communities have inter alia focused on ecotourism and community conservation as a best practice of adaptation that in addition supports the conservation of their natural resources (Ogara and Ongoro, 2012). Community oriented approaches to wildlife conservation usually have a strong economic rationale typically based on the premise that if local people participate in wildlife management and economically benefit from this participation, then a "win win" situation arises whereby wildlife is conserved at the same time as community welfare improves and climate change impacts are managed at community level, (Emerton, 1998; Ogara and Ongoro, 2012).

The main concern therefore is not the total economic value of wildlife but rather the extent to which wildlife benefits actually reach the local residents in wildlife dispersal areas, (Murphree, 1993, 2001). Community based Ecotourism is a subset of community based tourism and relates to an experience in remote or natural areas that fosters an understanding and appreciation of

the need to conserve the natural environment in a way that sustains the resources, culture, the economy and the local community, (Prins, 1992).

The Ewaso Nyiro Basin is an area spanning over 30,000 km^2 with varying topography ranging from 200 to over 3000 m. Much of this landscape is semi-arid and two major physical features influence the climatic and drainage patterns within this landscape; the Aberdare ranges system to the south west that forms the source of Ewaso Nyiro River and Mt. Kenya to the east that provides many tributaries (Pratt and Gwyne, 1977). This ecosystem is highly impacted by climate variability and change, experiencing prolonged and severe droughts and flash floods that have through erosion depleted soils, pasture and dried natural water sources leading to high livestock mortalities. This in turn has affected the livelihoods of the communities that engage in pastoralism for socio-economic well being (Ongoro and Ogara, 2011). With increasing uncertain climatic conditions and different impacts across the region, the dry lands will need to be managed in a way that supports and promote land uses that are more resilient to climatic variability (Mortimore, 2008).

The Ewaso Nyiro ecosystem is primarily occupied by pastoralists of Samburu origin, the Borana, Pokot and Rendille communities whose main economic activity is livestock keeping. These communities also live with wildlife in the same environment, sharing the same natural resources with their livestock, (Oguge, 2005). Wildlife therefore lives side by side with pastoralists and their domestic herds and flocks. Competition for land and water resources is sometimes inevitable especially in the dry seasons. Worse still, wild animals carry and spread diseases that occasionally affect livestock (Wambwa, 2002) while livestock also potentially transmit diseases to wildlife in shared environments (Grootenhuis and Olubayo, 1993).Climate change is also another factor contributing to depletion of natural resources (IPCC, 2007). With the worsening impacts of climate change the communities have lost livestock in large numbers repeatedly hence losing their economic power and sources of livelihood, (Ongoro and Ogara, 2012). As a way of adapting to harsh impacts of climate change to achieve food security, the communities have turned into community based conservation and ecotourism (CBC) as one of the best ways to combat climate change, secure an alternative livelihood, at the same time conserving the natural resources (Olesarioyo et al., 2011).

This study was carried out in Samburu and Laikipia district covering three community conservancies namely Westgate, Namunyak and Naibung'a. This study analyzed the extent to which these pastoral communities were involved in community- based conservation and ecotourism as an adaptation measure to climate change, and additionally examined the benefits and challenges of community based conservation and ecotourism to the communities in Ewaso Nyiro Ecosystem. The Intergovernmental Panel on Climate Change (IPCC) refers to climate change as any change in climate over time, whether due to natural variability or as a result of human activities. IPCC 2007 further informs that Africa is one of the most vulnerable continents to climate change and climate variability.

This is as result of the interaction of multiple stresses including land degradation and desertification, declining run-off from water catchments, high dependence on subsistence agriculture, HIV/AIDS prevalence, inadequate government mechanisms and rapid population growth occurring at various levels, and low adaptive capacity due to factors such as extreme poverty, frequent natural disasters like floods and droughts and dependence on rain fed agriculture, (IPCC, 2007). The pastoral communities of Samburu are impacted by the effects of climate change because they inhabit dry land environments which exhibit wide variations in rainfall amounts from year to year.

The droughts are recurrent hazards, as are outbreaks of diseases which affect livestock. Survival in these communities depends upon the ability of these communities to adapt to strategies which mitigate the effects of recurrent droughts, reduction of resource-base conflicts and improvement of natural resources (Waithaka, 2002). Resource- based conflicts are triggered by various factors including inequitable access to natural resources, continuous failure for development programmes concerning natural resources management, and misuse of natural resources (overgrazing and over cultivation in marginal areas which are not capable of biological productivity). All of these lead to more pressure on resources and more marginalized areas less of biological productivity (Wadi, et al., 2005). Deforestation is another factor that may contribute to conflict dynamics for instance loss of tree cover where trees are cut for food, charcoal and firewood and regeneration is slow because of the semi-arid climate, which exacerbates desertification and loss of grazing for livestock (Mohamed, 2010).

METHODOLOGY OF THE STUDY

Study area

The study was conducted in Laikipia and Samburu Districts in the Rift Valley Province of Kenya. Laikipia district is situated between longitudes 36°5´ and 37°55´ East and latitudes 1°10´ and 3°10´ south. Samburu district borders Laikipia to the south and lies between latitudes 0° 36´ and 20°40´ north and longitudes 36°20´ and 38° 10´ east.

The climate of both districts is arid and semi arid characterized by a low annual rainfall average of 400mm. The main vegetation types are acacia bush land and scattered open grasslands. Samburu district is inhabited

by a mix of people from wide range of social and cultural settings. Tribes in Samburu include the Samburu, Laikipia Maasai, Turkana, Rendile, Boran, Somali, Meru and Kikuyu. Livestock rearing is the most dominant form of land use though the area is now embracing transition to other mixed production systems.

The emerging forms of land use include wildlife management and tourism amongst others.The 9,500km² Laikipia District is located to the north west of snow-capped Mount Kenya, in Kenya's Rift Valley Province. It neighbours Samburu Dirstict to the North, Isiolo and Meru to the East and Baringo to the West. The means annual temperatures of the district range between 16°C and 26°C. The average duration of sunshine is between six and eight hours daily while the western and southern parts of the district have cooler temperatures, the coolest month in the district is June and the hottest month is February.

The Laikipia plains which stretch from the Great Rift Valley to the magnificent escarpments which descend into Kenya's wild Northern rangelands form part of the vast 50,000km² Ewaso ecosystems. The plains are physically diverse and scenically spectacular, covered by open grasslands, basalt hills, lonely kopjes and dense cedar forests, fed by the Ewaso Nyiro and Ewaso Narok rivers.Laikipia is home to ethnically diverse communities, including the Mukogodo Maasai, Kikuyu, and Meru, who live side by side with Europeans, Turkana, Samburu and Pokot. Approximately 700,000 people reside in Laikipia. Cattle-rearing on large commercial ranches and community owned rangelands has for many years been the life-blood of the community. As so much of Laikipia has traditionally been used for low intensity grazing it has become a cherished haven for big game.

This study was carried out in three conservancies within the two districts; Naibung'a conservancy in Laikipia District and Namunyak and Westgate wildlife conservancies in Samburu East. Naibung'a conservancy is found within Mukogodo division of Laikipia north district and composed of nine group ranches, a part of the large Mukogodo pastoral system and include Tietmut, Kijabe, Koija, Ilmotiok, Musul, Ilkilorit, Moropusi, Il-polei and Munishoi. Namnyak conservancy is located in the Ngilai west location of Wamba division of Samburu East district in the rift valley province. The conservancy covers an area of 100,000 acres and encompasses the Peak of the Mathews range, and Ololokwe the southernmost hill of the range. Westgate conservancy is located at Lodungkwe in Waso, covers an area of 35000 hectares of land and deals with conservation of Grevy zebras, buffalos, elephants and gerenuks.

Study design

A pilot survey and a main survey were conducted using quantitative and qualitative participatory methods and observations to assess the appropriateness and timing of quantitative and qualitative participatory methods and observations to assess the appropriateness and timing of the questions. Key indicators considered in the field study include land tenure and land use, ecotourism, socio-economic utilization and conservation of wildlife and public health implications of wildlife conservation. These were considered to constitute the key issues including problems, causes and opportunities examined in interrogating CBC undertakings

The sample size was calculated according to D U Pfeiffer, (2002):

$$\text{Sample size: } n = \frac{[Z\alpha/_2]^2\, p(1-p)}{L^2}$$

$$Z\alpha/_2 = \frac{Z_{0.05 = 1.96}}{2}$$

The value of Zα required for 95% confidence interval
R = a prioi estimate of the proportion with attributes of interest
L= the precision of the estimate (allowable error)
The sample size calculation approach ensured representativeness of the study population and was used to provide the results of the quantitative study as well as descriptive statistics.

Data collection methods

Data was collected using a mix of methods and tools. Semi-structured Questionnaires were used to collect data from the 138 randomly selected households while guiding questions were used to collect qualitative data by conducting key informant interviews, focus group discussions, and sketch-maps, transect walks, observations and photography.

Both local Samburu language and Swahili, widely spoken by the study population in both districts were used for more clarification, understanding and achievement of the research objective and desired results. One hundred and eight (108) households were sampled in Koija, Tiemamut, Kijabe, Kijabe group ranches in Naibung'a group ranches in Laikipia, and 30 households in Sapache Group Ranch in Namunyak in Samburu East.

Enumerators drawn from the communities, with previous experience in conducting pastoralists' household surveys were trained, to acquire the standard expected of them by the researchers prior to administering the questionnaires. The enumerators worked closely with the researchers for effectiveness of the study.

For the focus group discussions members of the communities in the conservancies were selected using gender and age as criteria so as to generate detailed

information on key themes on pastoralism, climate change, and community based conservation and ecotourism. The Focus Group Discussion (FGDs) were used to assess benefits accrued from the practices of group ranches, and to assess and to discuss the existing best natural resource management practices as well as the opportunities for improving these practices for peaceful coexistence of livestock, wildlife and humans and management of impacts of climate change at community level.

Key persons in the community were identified on the basis of their type and levels of responsibilities in the communities for more in depth interrogation of the study themes. Those interviewed and key informants included the managers of the three conservancies, the chiefs of the communities, the village committee representatives and headmasters of schools which surrounded the conservancies.

RESULTS AND DISCUSSION

The findings from the study revealed that the two communities of Samburu East district and Laikipia North had lost huge numbers of livestock to the droughts and floods. It was clearly becoming difficult for these pastoral communities to practice livestock production with persistent droughts which had depleted the pasture and dried up natural water sources for both livestock and domestic consumption. Results from the study as shown on figure 1 illustrate how specific factors were responsible for poor livestock production. The major challenge attributed to climate change was drought and lack of water and this had severely impacted on both human and livestock. However when the community members engaged in ecotourism and community based conservation they were able to cope better and at the same time create an alternative livelihood. There were mitigation measures such as boreholes and shallow water pans put in place. Community members near the conservancies watered their livestock and fetched water for domestic consumption saving on time spent looking for water to other more viable activities.

The study showed that specific factors including drought, lack of water and lack of market were obstacles to livestock production and that explains why the conservancy idea came in handy for the community to enhance their livelihoods irrespective of the harsh climate variability and change impacts. These problems were further paired for impact assessment and the results showed that in a descending order the felt impacts were as follows: drought and lack of water (51.73%), drought and lack of markets (33.33%), drought and predation (8.05), drought and diseases (5.17%). Without drought as major problem ingredient in the pastoral livelihoods single factor such as lack of markets and crop diseases on their own were not significant. Community based conservation addressed drought as a fundamental problem that was addressed in their strategies. Climate change induced droughts had affected community social harmony and well being; findings from focus group discussions especially from women and girls indicated that the families were in the brinks of poverty with virtually no safety nets to cushion them. Most of their livestock had been decimated by recurrent droughts hence propelling the communities to extreme poverty. At this point in time community based conservation provided an opportunity for an alternative source of livelihood to these communities. Extended droughts as observed inClimate change induced cases causes poverty to pastoralists because people died due to hunger and malnutrition especially the elderly and children.

A number of studies have shown a steady decline in pastoralist livestock numbers over the years resulting from periods of extended droughts and resultant factors. Ongoro et al. (2011) reviewed trends in livestock populations over a 30 years period and reported a decline in numbers by more than 50% every 10 years.

Pastoral community members keep livestock for their social cultural identity as well as livelihood attainment. They also kept donkeys which they used as beasts of burden when need arose especially in transporting luggage during their movements in search of water and pasture for their livestock. The community members confirmed in the interview that they were compelled to turn their focus onto alternative sources of livelihood and subsequently identified community based conservation and ecotourism to achieve this. One key informant; a school teacher said":

"Our communities members are benefiting greatly from this conservancy, gone are the days I sent children home for school fees and uniforms. We get bursaries for needy students and this keeps them in school. The parents get income from selling of items in the conservancies and with that they buy those uniforms and books".

Though the community clearly indicated great loss of livestock to the droughts they did not tell how much wildlife losses had taken place, they only identified reduction in some specific wild animals types and species like elephants, zebras and dik dik but the fact that the number of tourists increased in the conservancies could imply that the wild animals adapted better to the droughts and floods and survived more than livestock, therefore, the community members were able to sustain their livelihood from wildlife over the period their livestock was wiped out by droughts. Study results indicated that the community members greatly benefited from ecotourism, especially as an alternative source of livelihood, during and after the droughts. Results from the respondents interviewed in Naibunga (70%) and Namnyak's (71%) supported this observation. Some of the ways that the communities benefited was through

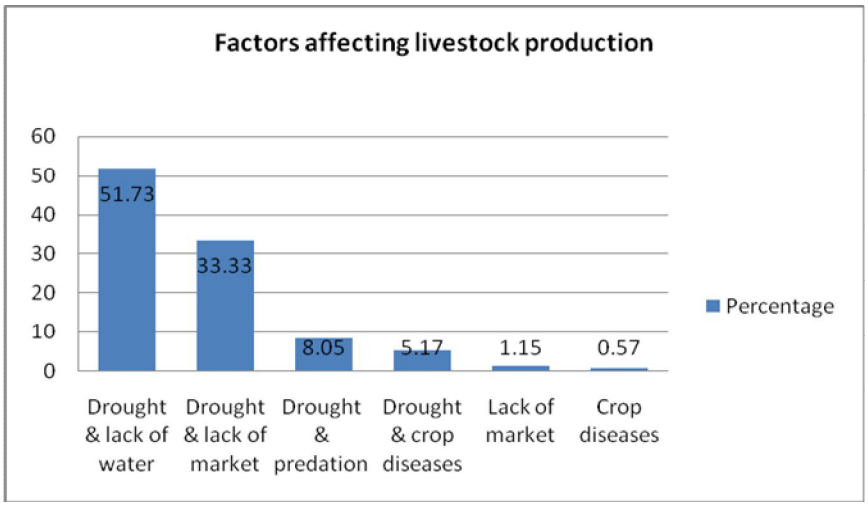

Figure 1: A graph showing factors affecting livestock production. Source: Ongoro Survey 2011

engagement in income generating activities within the conservancies like sale of beaded items in the lodges. Provision of social amenities like paying fees and collection of revenue were other benefits that went to community members directly. All these activities and engagements were geared towards well being of the community members and the enhancement of livelihoods. Other than monetary value, ecotourism also instilled good values in community members in good conservation practices by zoning land and regulating livestock numbers, sharing of water and pasture resources with the wildlife.

Given that these communities were facing persistent droughts due to climate change and these resources were limited, this arrangement was useful in averting human- wildlife conflicts and other types of conflicts that emanated from different land use practices within and amongst these communities. In the long run it became useful in natural resource management in the face of climate change. The community based conservation and ecotourism also provided a sense of hope by providing alternative source of livelihood to community members and restored the community social fabric that was running down at a fast rate due to disruption in livelihood provisions in households. Community social structures had been built once more and there was collective participation in search of livelihood; both men and women were engaged in different communal activities within the conservancies; the young men were employed as scouts to watch over the wildlife and the livestock to avert any human- wildlife conflicts or predation. This changed their attitude towards protection of both livestock and wildlife from the negative attitude of poaching.

The women were involved in pasture development and irrigation and men were involved in decision making regarding revenue sharing from the proceeds of the conservancies. This communal participation created a sense of ownership to the community conservation. Community based conservation was working as a tool to unite people and create community cohesion within and across the borders of these pastoral communities especially after long standing resource based conflicts.

Impacts of climate change had affected the vegetation and pasture. The pasture had dried up due to the drought and the vegetation had disappeared over time.

The findings indicated that over a period of thirty years the pasture land had reduced and could not sustain the livestock. With the dwindling pasture and vegetation the Samburu livelihoods too were affected. Pasture and vegetation played a significant role in the community livelihood provided fodder for their livestock while vegetation being rich in medicinal plants that were important in provision of basic health care for human and livestock diseases. The community based conservation brought back hope to the community by restoring their pasture through pasture development programmes, range management practices through land zoning, and controlled livestock numbers and livestock marketing. Health care needs were taken care of through mobile rural clinics and dispensaries and subsidized medical expenses for very needy families and the elderly

When respondents were asked their opinion on how the zoning strategies introduced in group ranches helped to promote sustainable use of natural resources, and wildlife conservation in Naibung'a 81% indicated that zoning actually helped in natural resource management They also indicated that they were able to regulate the number of livestock in the conserved areas, acquire training on good livestock management practices and as a result they were able to retain the grass biomass and this improved the vegetation for their medical purposes, it helped the livestock to thrive during the drought because

the conservancy acted as a grass bank during the drought. Other benefits that accrued from zoning include tourist visitations and grazing during the dry periods. Other incentives that community conservation brought to the community members was revenue sharing, compensation to losses, increased security for wildlife, and employment of community members.

Conclusion

Community based conservation and ecotourism constitute one of the best practices for climate change adaptation in the ASALs because it gives the communities a chance to appreciate their natural resources and share in restoration of these resources as it gives them power to achieve resilience to their livelihoods.

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