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Challenges of Community-Based Management of Protected Areas: Contested Trade-offs Between Livelihood and Conservation Interests in Chyulu Hills National Park, Kenya

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Abstract

This was a formative study whose main aim was to obtain useful information for designing co-management interventions of Chyulu Hills National Park (CHNP) and other protected ecosystems in Kenya. Among the specific objectives that we have covered in this article were to; (1) examine the competing livelihood interests of communities living within the catchment of CHNP. (2) to assess the challenges that undermined community support towards co-management of the ecosystem. The findings showed that communities were highly dependent on park resources for both direct and indirect livelihood services. This over-dependence on the resources by local communities made it difficult for management agencies to control access to the protected area leading to illegal encroachment. There were gaps that required urgent attention to to ensure suatainable management of CHNP. First, communities were not engaged effectively when mangement decisions were being made but only received information on decisions that have already been made elsewhere and were required to abide by them. Secondly, incidences of human-wildlife conflicts jeopardized cooperation between communities and wildlife management agency. Thirdly, in spite of the protected area being in their neighbourhoods, community members felt entitled to the ecosystem resources and therefore they perceived it unfair that the authories kept them off from the National park. In conclusion, there was no balanced tradeoff between the livelihood interests of local communities and conservation interests of the National Park. To promote collaboration between the communities and wildlife management agencies in management of the park there was an urgent need to address the livelihood interests of the local communities.

Keywords: chyulu ecosystem, competing interests, community livelihoods, co-management, protected area

1. Introduction

Natural landscapes are perceived as a product of interactions between people and natural ecosystems. It is through these interactions that communities develop identities, meet their livelihood needs, build their history and derive their memories (Adams, 1996; Pretty et al., 2009). Through the interactions, activities of local people have the potential to undermine or promote conservation of natural resources. As it has been demonstrated in a number of studies resources that were once considered pristine have been decimated through natural resource dependent human activities and scholars have pointed out the need of engaging communities in moulding natural landscapes (Callicot & Nelson, 1998; Berks, 2008; Borrini-Feyerabend et al., 2004), since this promotes survival of societies and their landscapes (Callicot & Nelson, 1998). Stakeholders in natural resource management are therefore recognizing the role of communities in protecting natural resources especially where government-imposed management regimes have borne little or no success (Posey, 1984; Veltayalli, 1997; Pretty et al., 2009). Pretty at al., (2007) called the arrangement of involving communities in natural resource management 'Community Based Conservation' (CBC) and the sites managed by communities as Community Conserved Areas (CCAs). Etiegni et al. (2019) used the term co-management when referring to the approach of engaging stakeholders in management of natural resources with a degree of decentralization of rights, powers benefits and roles to different stakeholders. Co-management of natural resources which is also popularly known as collaborative management is an approach that integrates community of resource users with government agencies and other stakeholder to manage resources

in an area. The approach has gained momentum since it being considered as more effective when stakeholders are motivated to participate in management of resources. Specifically, communities close to natural resources have a major stake in their management due to their reliance on the resources for daily livelihood needs. It is therefore crucial to recognize and involve them as co-managers in management processes. Co-management approach, if used effectively, enhances inclusion and empowerment of resources users and achievement of goals that are considered crucial for sustainable management of natural resources (Etiegni et al., 2019; Ann Zanetell & Knuth, 2004; Armitage, 2005; Ingles et al., 1999).

Although community participation is not new in management of natural resources in Kenya, there has been little success that has been achieved in the adoption of the approach in management of wildlife resources. Considerable successes have been documented in management of other resources including forests, fisheries, wetlands and water (Raburu et al, 2012; Etiegni et al., 2019; Ming'ate, 2017; Ming'te & Bollig, 2016; Koech et al., 2009), through formal arrangements like Community Forest Associations (CFAs), Water Resource Users Associations (WRUAs), Beach Management Units (BMUs). As a relatively new approach, in management of state controlled natural resources, community-based approach has also been practised with a number of challenges especially due to lack of proper policy regulations and where provided in polices, by lack of proper mechanisms of implementation. For instance, despite community participation in wildlife management being provided by Kenya National Wildlife Policies and Regulations (KWS, 2013) there are still notable challenges in blending community interested with those of protecting wildlife resources. This is evidenced by a series of conflicts between communities and government agencies frequently experienced around major wildlife ecosystems. This research therefore sought to generate knowledge that will improve the potential for community-based approaches of managing wildlife resources. The study sought to assess the missing link for community participation in management of Chyulu ecosystem. Our first research question focused on understanding the level of dependence of local communities on ecosystem resources; the second question explored the level in which communities are engaged by management agencies in management of the ecosystem and; finally we assessed the gaps that need to be addressed in order to adequately bring the local communities on board in management processes.

1.1 Significance of Community Participation in Management of Wildlife Resources

Co-management approach is increasingly being embraced as a mitigation of resultant failures of top-down government approaches of natural resource management (Etiegni et al., 2019; Berkes, 2009; Ayers & Kittinger, 2014). Such top-down management approaches have been associated with failure to include resource users in decision making leading to failure to abide to set management rules and subsequent failure of ecological sustainability in management of natural resources (Chuenpajdee & Jentoft, 2009; Ratner et al., 2012). Kiringe and Okello (2007) partly attribute the challenges of natural resource management to the 'protectionism' approach by the state; an approach that has alienated local communities by failing to consider their rights and interests (Kameri, 2002; Kiringe & Okello, 2007; Beresford & Phillips, 2000). Due to the importance of wildlife ecosystems in sustaining community livelihoods and provision of habitats to the wildlife species, it is important to maintain the integrity of these resources while considering the two competing interests. However, as has been observed in major ecosystems in Africa, this integrity has been threatened by a myriad of anthropogenic commercial and livelihood activities such as livestock incursions; competition for water resources; poaching; habitat fragmentation; and activities that block migratory route and dispersal areas of wildlife (Muriuki et al., 2011; wildlife Works, 2014; Kiringe et al., 2016; Kiringe & Okello 2007; Pringle & Quayle, 2014). On the other hand, exclusion of local communities in management arrangements erodes their responsibility and compromises their roles as immediate stewards of the ecosystems. As it has been noted in other studies, it has become inevitable in Africa to involve communities in management of natural resources if at all this management has to succeed (Lamprey & Reid, 2004; IIED, 1994; Mcneely, 1995). With this backdrop there in need to enhance community-based management approaches with the aim of creating goodwill among community members and to build their capacity to participate in management processes. Where used properly community-based approaches have empowered communities, ensured sustainability of natural resources and provided myriad of other benefits to the communities.

For a long time, management of Chyulu ecosystem has been threatened by inappropriate anthropogenic commercial and livelihood activities, prompting us to undertake this study. The management of the ecosystem has also been characterised by un-ending feuds between local communities and management authorities. These conflicts date back in 1983 when Kenyan government gazetted the major part of the ecosystem as Chyulu Hills National Park (Kamau & Medley, 2014). After gazettement, in 1988, management of the park was automatically placed in the hands of Kenya Wildlife Service (KWS), a government agency mandated with management of wildlife resources in Kenya. This institutional change happened rapidly and without the approval of local residents who were subsequently required to leave the area to pave way for conservation (Mosse, 2003). The evictions that

followed led to massive loss of property without compensation with the inhabitants being forcefully resettled on lands that were less productive away from the protected area (Muriuki et al., 2011; Kamau & Medley, 2014). Besides relocation, residents were restricted from accessing resources from the newly gazetted area, Chyulu Hills National Park, thereby interfering with their usual livelihood behaviors (Muriuki et al., 2014; Campbell et al., 2003; Kamau & Medley 2014). To date, the situation of insecure livelihoods has been aggravated by climate change (Parry et al., 2007). Conservation of the park has consequently been met by opposition by the local communities who in defiance and contempt of rules have continued to illegally access the protected area for livelihood resources (Okello & Tome, 2007; Kamau & Medley, 2014). All along there have repeated cases of sporadic conflict events over resource extraction within Chyulu hills national park; a situation that has compromised attainment of sustainable management goals of the larger ecosystem.

1.2 Description of the Study Area

Chyulu ecosystem is composed of a series of volcanic hills situated in Southern Kenya about 190 Km Southeast of Nairobi City (Kamau & Medley, 2014). The hills cover an area of nearly 200,000 hectares with a length of about 80Km and width of approximately of 30Km. Chyulu hills national park is located within this larger ecosystem with an area of 73,295 hectares and surrounded by Mbirikani Group Ranch, Kuku Group Ranch, Kibwezi Forest Reserve and Tsavo West National Park to form the larger Chyulu ecosystem. All the areas surrounding the national park are semi-arid region (Burgess et al., 2004) receiving an average annual precipitation of about 400-500mm (Kamau & Medley, 2014). However, the park area receives higher rainfall (~ 1000 mm) that supports growth of montage evergreen forest (Pocs & Luke, 2007). The lower reaches of the hills within the park is made up of grassland and bushes but higher reaches of above 1800 metres the catchment is dominated by forest consists of different species of trees including; Neoboutonia macrocalyx, *Tabernaemontana stapfiana*, *Prunus africana*, *Strombosia scheffleri*, *Cassipourea malonsana*, *Olea capensis*, *Ilex mitis*, *Erythrina abyssinica*. Lower parts of the forest are dominated either by *Juniperus procera* and *Commiphora baluensi*. There is also wild khat (*Catha edulis* locally known as miraa) that grow on some part of the hills. The ecosystem also serves as a major dry land catchment playing a major hydrological function of recharging various freshwater springs which are found at the foot slopes on the south, eastern and south eastern sectors (Grossman, 2008). Due to presence of heterogeneous vegetation that consist of bush land, grassland, and woodlands Chyulu hills national park also serves as a habitat for wild animals (Pringle & Quayle, 2014; Wildlife Works, 2014; Kiringe et al., 2015). The park hosts a number of species of large mammals some of which are of conservation concern including black rhino, African elephant, leopard, lion and cheetah. It is also a habitat for different species of reptiles and birds (KWS et al., unpublished).

2. Methods

2.1 Sampling Method

The study targeted the population living around CHNP protected area with and aim of collecting data on their dependence on park resources; level of their participation in management of park resources and; identification of gaps for community participation in management of the park. We used a multi stage sampling method to select households for in-depth interviews. In the first stage we used remote sensing and GIS techniques to delineate a buffer zone around the park which we considered our area of interest (see figure 1). According to IUCN a conservation buffer is supposed to be a deliberately created area peripheral to a conservation area and with legal or customary restrictions that are meant to enhance conservation value of that area. Since there was predetermined buffer zone around CHNP we created a buffer area of 10 km around the park for our study with an assumption that residents within this area had more direct interactions with the park. In the second stage we selected five sub locations (Muthingini, Kaunguni, Utithi, Mulili and Mbirikani) from the buffer area. We finally identified areas that we considered hotspots (table 1) from each sub location based on information obtained from KWS officials (agency mandated to coordinate conservation of wildlife in Kenya). Hotspots were areas where major conflicts were experienced between conservation agencies local residents or areas whose residents were largely associated with encroachment of park resources. Choice of hotspot areas was also was based on areas that had reported higher cases of human wildlife conflict. In the last stage, we randomly selected 262 households from the identified hotspots to participate in in-depth interviews. In addition, we randomly selected 72 additional households for participants of focused discussion groups (FDGs). In total we conducted 10 discussions (2 from each sub-location). Key informants were purposively selected in-depth interviews from among local leadership and representatives of conservation agencies.

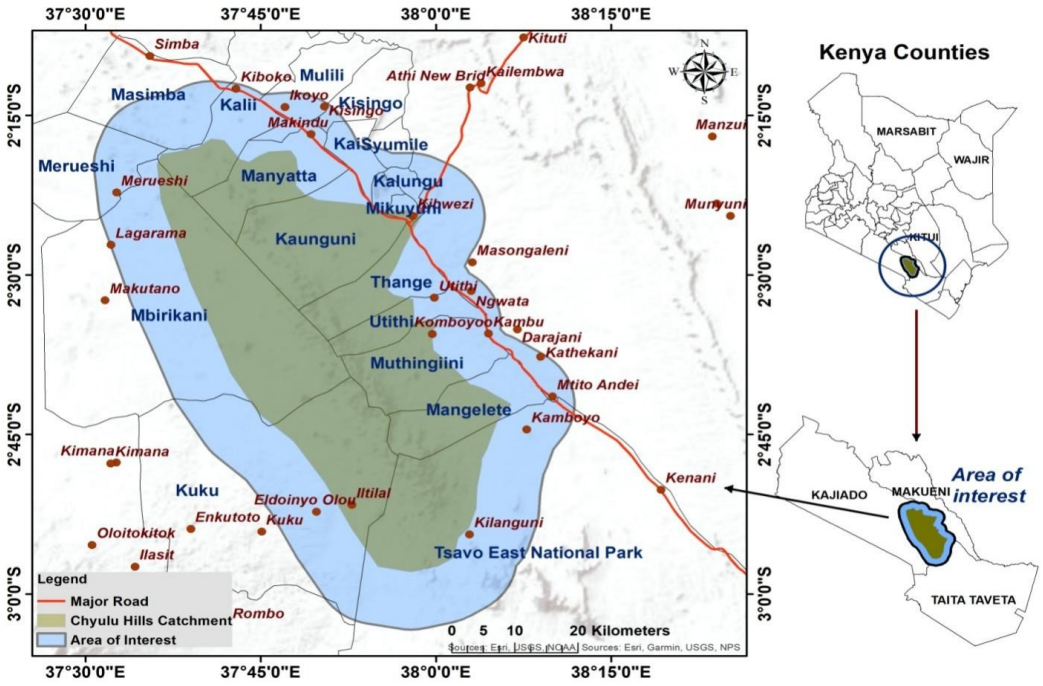

Figure 1. Location of Chyulu Hills Catchment Showing Our Area of Interest

Table 1. Sampling and Sample Size

Sub-location	Hotspot area	number of respondents
Muthingini	Utu	50
Kaunguni	Wikiamba and Mathaayoni	50
Utithi	Metava and Kikunduku	50
Mulili	Kimoini	50
Mbirikani	Nasipa, Oingosua and Oiti	62
Total		262

2.2 Data Collection

We took a period of a period of 4 months to acquit ourselves to the area and with the locals before data collection. During this period, we made visits and informally interacted with locals on different sites upon introduction by our local guides and local elders. During these visits we also emphasized our mission of being there and the purpose of our research. Prior information from Kenya Wildlife Service agency officials had warned that communities around the park are highly suspicious of researchers always wary of any information they gave to anyone. This had led to rejection of researchers by locals in the past or lack cooperation during interviews. We therefore had to take this precaution into consideration. Data was collected using semi structured interviews and unstructured FGD guides that gave interviewees enough leeway to freely generate their own answers from the questions without certain restrictions (Ming'ate & Bollig, 2016). Adequate time was also given to the respondent to respond to the question on interview schedules while audio records were taken for the entire interview.

2.3 Data Analysis

Before analysis we scrutinised the data to ascertain that it was sufficient to address all our objectives after which we arranged the data into various themes associated with our objectives. During analysis households were segregated for the communities representing different cultural groups, i.e 'kamba' who have settled along the Eastern flank of the park and 'maa' (popularly known as 'maasai') who live along the western edge due to their difference in terms of livelihood activities, utilization of catchment resources and ethnographic characteristics. All these factors were considered to have an influence how they interacted with park resources and management authorities (majorly KWS).

Recorded audio data was transcribed and translated to English. During transcription, audio records were coded manually for all participants of in-depth interviews, FGDs and key informant interviews. The code 'II' was adopted

for in-depth interviews followed by a letter indicating participant's cultural group and the number of the transcript. For instance, a record of a first participant from 'Kamba' community was given the code 'IIK001' and for a first participant from 'Maa' cultural group 'IIM001'. The code FGD derived from focused group discussion was used that was followed by number that was assigned for each group and the number that was assigned to each participant in the group. For instance, a participant in the first group and was first to speak was assigned a code FGD101. Similarly, a participant in group 12 and was assigned number 5 was coded as FGD1205. The code KI derived from words 'key informant' was used for key informant interviews, followed by number of the transcript. For instance, the first transcript was assigned a code KI001, the second transcript code KI002…and the last transcript code KI050. Qualitative data obtained from the transcripts was indexed and rearranged according to the appropriate part of thematic framework which it relates. This was done to generate or develop analytical categories and theoretical explanations

The quantitative data obtained from structured questions was coded and entered into a statistical package for a social scientist (SPSS) which was used to analyze the data. Descriptive statistics and theoretical explanations were used to summarize the findings of the study. Chi-square test (χ^2) was also used to test the level of significance of interrelationship between variables and make inferences about the findings.

3. Results and Discussion

3.1 Description of Communities within the Study Area

The study focused on two major cultural groups of people, i.e. the *kamba* and *maasai*, who have inhabited the Chyulu catchment area and who have often had vested interests in the CHNP resources. Along the Western edge of the park is the *masaai* community who live in two ranches; Mbirikani and Kuku Group Ranches with a combined area of approximately 603,000 acres (KWS et al., 2011; Maasai Wilderness Conservation Trust, 2016). Traditionally the Masaai people are connected to their land through their pastoral mode of livelihoods. The Masaai utilize their natural resources communally and access or use is regulated by customary regulations that are enforced through council of elders (Seno & Tome, 2013). Communal ownership of resources, especially land is perceived to be important for in enhancing organized movement of livestock without restrictions. They extensively move with their cattle in search of pasture and water, a phenomenon that is dictated by climate conditions. Normally when climatic conditions are favourable and when there is enough pasture movement is restricted within the ranch boundaries but in periods of inadequate pasture which is frequently occasioned by drought stresses masaai herders' move beyond the boundaries. To manage pasture land, the masaai historically practice controlled burning of pasture to keep off pests and diseases. This is also perceived to enhance regeneration of fresh pastures for their livestock. Masaai community is also historically recognized for its peaceful coexistence with wild animals although this harmony is increasingly being threatened by conflicts over competition for resources (Walpole et al., 2003). Historically, harmony between people and wildlife was valued since it was perceived to encourage integration of browsers and grazers of both wildlife and livestock a nexus that enriched pasture composition and variety by allowing nutrient exchange. In the two ranches, we observed that the Masaai relied on community rangelands for grazing but with frequent encroachment of the protected areas during droughts. The Masaai community is marginally associated with deforestation and destruction of natural vegetation since they restrain themselves in extraction of such resources which they only do for subsistence. Extraction of the resources is supported by local knowledge that in guided by cultural norms and local regulations. Despite enhanced co-existence the masaai are reported to experience repeated conflicts with wild animals which either attack them or their livestock. Such incidences are followed by attacks on the wildlife in retaliation.

The eastern edge of the park is inhabited by the Kamba community whose way of life sharply contrasts that of the Masaai community. Kamba people are traditionally recognised for woodcarving, trade, hunting, herding cattle and weaving among the women. However, this has changed with time and Kamba community has today embraced crop farming. Adjacent to the park the community undertakes agro-pastoralism, where they have embraced growth of cereals and legumes that include; sorghum, millet, pigeon peas, beans and maize; as well as fruits including mangoes and paw paws (Kamau & Medley, 2014). Through their livelihood activities, the Kamba interacted more with the the protected area. Specifically, the community relied heavily on woody vegetation to obtain firewood, charcoal and for carvings (Kamau & Medley, 2014); wild animals for game meat and trophies and land for cultivation. The community is sedentary and therefore own land privately by subdividing and allocating portions to individuals for settlement and cultivation. This happened before the government took full charge in the management of the national park and therefore upon take over by government there were subsequent evictions. Some of the residents who were evicted settled on the edges of the park as squatters where they live to date while others have instituted claims of the land through court cases that are yet to be concluded. During the study it was noted that the community is still dependent on park resources although encroachment was being reduced by a

perimeter fence whose erection was underway. Activities that are still being carried out within the park included burning of charcoal; grazing of livestock; firewood extraction; harvest of tree products construction and carvings materials; harvesting of miraa (*Khata edulis*) leaves; and hunting for game meat, although this was minimal.

3.2 Livelihood Interests of Communities Living within CHNP Catchment

Livelihood interests influenced how local communities interacted with the park ecosystem. It was through interactions either to harvest resources, farming and to graze their livestock that households changed the natural integrity of the park. Dependence on Chyulu catchment resources was affirmed by respondents through a response to a question if they still relied on the catchment for survival. This response was significantly related to the cultural group of the respondents with an overwhelming majority (96.8%) of household among the Masai affirming their direct dependence on the catchment for livelihoods against 30.2% of households among kamba households. The researchers associated these responses to; (a) the means of livelihoods in each county; (b) level of enforcement of rules on the two sides; (c) fencing that is in progress and; (d) the cultures of the two communities on either side. The Masai being pastoralists were mobile and occasionally moved with their livestock in and out of the catchment for pasture. Reportedly, this was practised more during droughts when pasture in the communal ranches was scarce. This has been occasioned more in the recent years by increasing frequency of droughts that have caused decimation of pastures leaving herders with no alternative but move with their livestock into the protected zones of the park for grazing. Results from interviews with household representatives and local leaders indicated that the park had for long been very crucial in supplying livelihood necessities to local communities. Importance of the park ecosystem was therefore perceived differently depending on livelihood interests between the Kamba and Masai communities. While among the Kamba the ecosystem was crucial in supplying pasture, firewood and charcoal, among the maasai the ecosystem was solely crucial in supplying pasture to livestock.

Table 2. Livelihood Interests of Communities around CHNP

Livelihoods means	% of households	
	Eastern side (Kamba)	Western side (Masai)
Pasture	73.0	85.5
Fuel wood	25.0	24.2
Charcoal	23.0	0.0
Buiding materials	9.5	3.2
Medicinal herbs	6.2	1.6
Land for farming	2.0	1.6

On the other hand the Akamba community relied heavily on the catchment for farming and extraction of various resources that included firewood, building materials, game meat, *miraa* and wood to make carvings (table 2). Although restriction of access to the protected area has managed to control entry, there are still illegal cases of resource extraction from within the park. However, management authorities found it easier to control all other unauthorised activities compared to illegal grazing. This was particularly the case on the Western edge that is dominated by the Masai where enforcement agencies faced a lot of resistance when enforcing the rules. This was reportedly characterised by violent clashes with between KWS personnel and the community. On the Eastern side however success of control in encroachment was attributed to presence of that had partially been installed. The fence had immensely contributed to decline in illegal activities in the protected area and containment of human-wildlife conflicts. Despite this affirmation, the idea of erecting an electric fence was strongly opposed by the Masai herders who vowed not to allow fencing on their side since according to them it was one way of denying them access to pasture within the park especially during drought seasons.

3.3 Management Regime of CHNP

Chyulu Hills National Park being a public park is managed by Kenya Wildlife Service as a lead government agency. Although the catchment hosts different resources, most predominantly Kenya Wildlife Service (KWS) assumes a leading role in management by coordinating other agencies, besides being the main enforcement agency. Other government body that takes part in management of the park is Kenya Forest Service (KFS) although its involvement was highly minimal. During the study the official of KFS placed management responsibility on KWS despite a fact that the park area hosts different species of trees and other plants. It was notable during the research that there was a poor working relationship between the two agencies. The researchers identified this as a major challenge to co-management of park that invilving various sectors and interests. Without proper harmonisation

and integration of management policies and other interventions there was a likelihood of conflicting interests among different management agencies, a factor that negatively affected sustainability.

On the Western side of the park, KWS has partnered with a number of Non Government actors that also contributed to the management of Chyulu national park ecosystem. One of the main concerns that was being addressed by the NGOs was human-wildlife conflict as was the case with Big Life Enterprise through its enhanced footprint in conservation of the wildlife. The organisation works with the Masaai community to solve human-wildlife conflicts through a mechanism of compensating locals who suffered loss from wildlife attacks including personal injuries and killing of livestock. As it was cited by an elder in oiti village;-

> "*...this organisation of big life has helped us so much...whenever a cow is killed by a lion...they give the owner twenty five thousand Kenya shillings (approximately 250USD) as compensation...*"

Big life Enterprise also supported management of the catchment through programmes that offered in-kind support to the local community. Each year, with support from other donors the enterprise has organised local marathon dubbed "Masaai Olympics" where young men compete in different sports for prizes. Ostensibly this was cited as a good strategy of engaging the men (morans) in sport activities and keep them off from killing lions and other animals that were perceived as a threat to livestock. To shape the perception of locals concerning the organisation and wildlife, the organisation also offers bursary to local children who perform well in school as one young man narrated during the interview:-

> "*I am a beneficiary of a bursary scheme through big life enterprise...they started paying my fees when I was in Kimana primary school...through to secondary school... and now I am a first year student at the university...*they *are still paying for my fees and whenever I am on vacation I come back here for internship .....*"

Big Life Enterprise has also offered conservation related employment opportunities to the locals with most jobs done within the organisation and in the park being done by members from among the Masai community. The organisation has specifically trained and deployed game rangers into the park, from among the community, to monitor and offer surveillance on interaction between human and wildlife.

Another dominant player that was involved in management of CHNP is David Shedrick Wildlife Trust. The trust worked closely with KWS to complement conservation, preservation and protection of wildlife. This was achieved through anti-poaching initiatives, safeguarding natural environment and enhancing community awareness besides providing care and veterinary assistance to needy animals.

3.4 Community Participation in Management of the Catchment

Table 3. Levels of Community Participation in Management CHNP

Do you personally participate management of the catchment?	Kamba	Masai	χ^2	p-value
Yes	66.5	17.7	45.454	<0.001
No	33.5	82.3		
How do you participate in the management of the catchment?				
By being informed on what is happening	34.0	3.2	71.493	<0.001
By giving information	28.0	3.2		
I am consulted before decisions are made	2.0	1.6		
Am given material incentives	1.0	0.0		
Through a community group	0.0	4.8		
By interacting with external facilitators	0.0	1.6		
Through my own initiatives	3.5	3.2		
I do not participate in any way	31.5	82.3		
Are you aware of the rules that govern the use of resources?				
Yes	96.0	27.4	137.944	<0.001
No	4.0	72.6		

Community participation in management of Chyulu ecosystem was more passive since majority of community members affirmed that they were either informed of management decision that were made by authorities or were required to give information for decisions to be made elsewhere. It was notable that community members were not accorded an opportunity to participate in decision making and did not have control of the decisions that were being made. Level of community engagement was was also significantly related to the ethnic community the respondent

belonged to ($\chi^2 = 45.454$, $p < 0.001$) with 65% of respondents from the Eastern side (Kamba community) reporting to have been involved compared to only 17.7% of respondents from the Western side (Maasai community). However, even though majority of respondents from among the Akamba reported to have participated in managing the catchment, they only did this by providing information (28.0%) or by being informed, through community forums, about decisions that had already been made. Only 2% of respondents reported that they had been consulted before decisions were made (table 3). Active community participation is very essential for sustainable management of natural resources. When communities are effectively engaged in management, the processes gain credibility and local acceptance besides the advantage of tapping into local knowledge. Through participation there is likelihood that local concerns and livelihood interests will be amicably addressed. Lack of proper engagement in management of Chyulu ecosystem resulted into frequent disputes between government management officials (KWS) and communities as the officials tried to enforce management rules. There were also numerous reported incidences of illegal encroachment into the protected area, ostensibly due to failure by authorities to address livelihood interests of the locals especially after disruption of livelihoods due to evictions.

It was also notable that despite majority of respondents (96.0%) from among the Kamba community being aware of rules governing access of resources they regarded the rules to be highly punitive and only obeyed them due to fear of authorities. Respondents cited heavy fines imposed when offenders were taken to court and thorough corporal punishment that is meted by government officers to those found tress-passing the park area. In spite of this, the respondents were concerned about the approach used by enforcers which they regarded to be hostile. Majority of respondents from the Masai Community disregarded protection of the park and the rules barring access. They vowed not to allow any 'conservation' efforts to be undertaken in the area since this will deny them access into the protected area to graze their cattle as one young man responded:-

> "*...we* are *hearing about conservation of Chyulu...we don't want any conservation here...when you go back tell KWS we don't want that conservation...and if they install a fence the way they are doing on the other side we will pull it down..."*

Ostensibly, the respondent was referring to an electric fence that was being put up to keep off wild animals from people's farms. Assertions of community isolation in management were further ascertained by a local chief of Utithi sub-location who argued that despite local people facing a lot of suffering due to wildlife intrusion KWS official did not engage them when coming up with policies or other management interventions. The chief retorted:-

> *"...our people are suffering due to their crop being destroyed by elephants but KWS officials don't care about our interests...they just come up with ideas without involving the local community...for example we just heard from distant sources that a fence is being installed around the park. This is the reason why people were initially opposed to the* idea*...I think if people were well prepared, they could not have opposed the project...people have now started to appreciate the fence since incidences of invasion by elephants into our farms have gone down…"*

3.5 Community Based Challenges/gaps in Management of CHNP

Chyulu Hills National Park ecosystem has recorded drastic degradation over time which has been reportedly associated with overexploitation of resources related to human invasion. Before the park was gazetted by government, it experienced *a de facto* open access regime, a situation the lead to uncontrolled access. People accessed the park area freely to extract different resources such as firewood, charcoal, building materials, carving material, game meat and pasture. People also cleared patches of land for cultivation owing to conducive climate and fertile soils within the park. These human activities contributed to rapid and massive degradation that raised concerns over the fate of wildlife that inhabited the area. From the fact that the main purpose of declaring the park a public resource was to protect wildlife, KWS took sole responsibility of management. This was followed by forced evictions, though with a lot of resistance from people who had settled in there. Majority of evictees were resettled elsewhere while others became squatters on the fridges of the protected area. Restriction of access was also enforced immediately. However, due to the vast nature of the area coupled with initial over-reliance on catchment resources for livelihood, people did not completely keep off protected area and it has since been experiencing a range of illegal human activities. This has contributed to its degradation and threats to its potential to support different ecosystem services. Notably, those that were evicted have remained with resentments and they still believe that this was done unfairly as one member from among the squatter settlers retorted:-

> "*...this park is no longer important to us...we used to sustain our livelihoods from this area...I had a farm uphill where I could support my* family*...look now I am a squatter after depending on the catchment for many years...how can they evict us to protect wild animals...what is more important between wildlife and human life...?"*

Without reliable source of livelihoods, the squatters illegally get into the protected area to harvest various resources. This was more rampart in the unfenced parts of the park although some respondents admitted to have improvised methods of getting through the electric fence into the park.

3.5.1 Lack of Awareness about Degradation of CHNP

Majority of respondents (97.5% from the Kamba community and 80.6% from the Masai community) were aware of the changes that were happening in the park area. However, a significant proportion of respondents (19.4%) from among the Masai believed that no change had had taken place to the the ecosystem. It was also notable that respondents from the two communities were significantly bothered differently about the changes to the quantity and quality of resources. While majority of respondents (81.0%) among the Kamba were concerned with decline in forest resources, those from the Masai community (87.1%) were deeply concerned about decline in pasture. This observation signified the values that each of these two communities placed on these resources and how the resources were important for their livelihoods. The Masai who are pastoralists relied on availability of pasture for survival of their livestock. They were therefore privy to any form of degradation that affected availability of pasture. On the other hand residents of the Kamba community who had heavily relied on forests for commercial wood fuel production; wood for carving; and building materials were alert and concerned when they could face difficulties in obtaining these resources due to decline of forest.

While 69.8% of respondents from among the Kamba believed their activities contributed to degradation of park resources, majority of respondents (82.3%) from the Masai community believed degradation was due to climate change. Respondents also cited poor management of the park and lack of awareness creation as reasons for continued degradation. A discussant in Kikunduku village retorted:-

> *"...if these people (referring to KWS officials) have been educating us about the park we could not be having issues...what they do is to harass us...while elephants are also destroying our farms...they should be organising events to* educate *people of the benefits of conserving the park...they can as well come up with events to sensitise the locals...."*

3.5.2 Negative Perception about Current Management Regime

There were mixed perceptions regarding current management arrangements among the two communities. While majority of respondents (69.3%) from among the Akamba regarded management to be highly effective, majority of respondents (41.7% and 51.7%) from the Masai community regarded the management as totally ineffective and moderately effective respectively. Perception about effectiveness of management regime was strongly shaped by strictness that was applied by management authorities in enforcing the rules rather than how effective the protected area was managed while addressing concerns of local communities. Respondents who perceived the regime as highly effective attributed this to heavy fines and punishments that worked to deter people from trespassing into the park. Others attributed this to an electric fence which was being erected around the park that had succeeded to keep people off the park area. Notably, enforcement was weak along the Western flank that was occupied by the Masai and therefore respondents did not perceive management regime to be effective since they could access the park without major hindrances.

There was also a disconnect between management authorities and local communities in management of the park since community member were just recipients of information and instructions. Majority of them (93.5% from among the Kamba and 85.5% from the Masai community) felt that their rights and interests were not being recognised by the government since they were not given any opportunity to contribute to decision making processes. Residents had many concerns that they would wish to be addressed through management. This included being allowed access to resources in the park; being protected from human-wildlife conflicts and stoppage of forceful eviction from the protected park area. These concerns were related to residence and ethnic group of the respondent. Majority (65.8%) of respondents from the Kamba community cited restriction of access to the protected area as a major challenge to them despite the resources being within their neighbourhood. On the other hand a bigger proportion (77.4%) of respondents from Western flank (Masai) cited human-wildlife conflicts as a major challenge they faced from the way the catchment was being managed. This was also cited by 27.6% of respondents from Eastern flank (Kamba). These responses were attributed to means of livelihoods of each community; degree of enforcement of access rules; and how each community utilised catchment resources. Generally livelihood of residents of the Kamba was dependent on extraction of park resources for subsistence and commercial purposes while the Masai relied on the catchment for grazing. Notably, enforcement of access rules was done more strictly along the Eastern flank compared to Western side as it was also admitted by a KWS official during the interview who retorted:-

> "*...you know on this side where we have the Kamba people we are very strict since they are more destructive*

*than Masai people...*Kamba *people encroach the park to do all manner of things unlike the Masai whose only interest is pasture for livestock....the Masaai do not touch anything else when they get into the park"*

Local communities also faulted how KWS handled Human-Wildlife cases. As it was also ascertained there were frequent incidences of human-wildlife conflicts that placed the livelihoods and lives of locals at risk. On the Eastern side of the park there were repeated incidences of crop destruction by wildlife that went uncompensated. It was ironical to residents how government officials were keen to protect 'wildlife from people' and 'not people from wildlife' as was expressed by a victim whose fruit orchard had been destroyed by elephants in Kikunduku area:-

"...this park is a menace to us....my fruit trees were destroyed by elephants two years ago...they just invaded in one knight and destroyed *everything...in fact, I stopped fruit farming since that day...what KWS did was just an assessment of the damage which they estimated to almost two hundred thousand shillings (equivalent to 2000 USD) but since then I have not heard anything from them...even after a follow up several times in their offices...let me tell you they are very keen to protect wildlife from us than to protect us from wildlife...we are left wondering who is important between human beings and animals..."*

These repeated cases of elephant invasion into people's farms and destroying crops ruined the relationship between the community and wildlife management officials. Similarly, Residents of the Western side of the park (Masai) complained of attacks of their livestock by lions and other big cats and human injuries related to elephant attacks.

3.5.3 Loss of Livelihoods and Perceived Lack of Benefit form the Park

Although majority of community members were aware of the consequences of their activities on the park ecosystem, they still believed that its existence was crucial to their survival. They however expressed concern over lost livelihoods due to denial of access by enforcement agencies. As such they wished to be allowed to access different resources, though they were keen to state that this could be done in a controlled manner. Their (52.5% of respondents on the Eastern side and 87.1% of respondents on the Western side) major interest was for their livestock to be allowed to graze in the park. They believed that this was one way they could benefit from the resource without causing major destructions. Significant proportions of respondents also wished that they could be granted controlled access to the protected area to fetch firewood and cultivate in protected area. To them the catchment was not of any importance being in their neighbourhood if it couldn't help them sort their immediate needs and as such they couldn't waste their time in protecting it. This was affirmed by an elderly woman in Utu village who responded as follows, when asked how she would like to participate in management of the catchment:-

"...how can I participate and yet I don't benefit in any way from Chyulu...that is the work of KWS to protect their animals...in fact since they evicted us from the area we have suffered so much since we can't fetch firewood or even obtain pasture for our cows... people today are not even able to raise money to educate their children...if they want us to help them (referring to KWS officers) they should come with an arrangement that will enable people to benefit in one way or the other"

Suggestions by respondents to safeguard their livelihoods included; creation of employment opportunities for the youth in the area while others recommended fencing the park area to regulate access and extraction of resources. However, despite respondents having these opinions for management they expressed their reservations in presenting them to management authorities citing lack of recognition of their opinions; lack of proper platforms to air their views; fear of management authority and failure of their leaders to follow up on community issues.

4. Conclusion

The constitution of Kenya (2010) and Wildlife Conservation and Management Act (2013) recognises the importance of sustainable management of natural resources with equitable sharing of benefit with the local communities. To achieve this, the constitution advocates for public participation in management, protection and conservation of environmental resources (Republic of Kenya, 2010). In line with this recognition, there is a need to identify approaches to increase participation of local communities in management of catchment resources and to ensure increased benefits to them from the arrangement. Despite these provisions, the study found out that local communities marginally participated in management of the Chyulu Hills National Park by being informed of management decisions or by being directed on what was expected of them. This led to lack of ownership of management decisions by community members since they were not engaged in making of those decisions.

Major gaps/challenges in participation by local communities in management of the park included lack of being involved; unresolved cases of human wildlife conflicts; lack of alternative to lost livelihoods and; lack of awareness creation. There was also hostility between communities and management agencies which greatly jeopardise collaborative management of the park. To ensure participation of local communities in management of

the catchment, there is need to increase awareness among community members on the importance of the protected area and their role in its management. Management agencies should organise sensitization and capacity building forums among the local people. The government should initiate capacity building among its agencies on community based approaches of managing natural resources. To address the losses incurred by local communities through human wildlife conflicts, the government should abide to its initial plan of compensation to those who suffer losses through wildlife invasions. This will boost the relationship between management agencies and local communities and thus provide a conducive environment for collaboration. Finally, there is need to motivate local communities to become caretakers of wildlife resources. This can only be achieved when communities are able to enjoy some benefits to cater for lost livelihoods when they are restricted access to park resources or through destruction by wildlife. This will enhance trade-offs between lost opportunities and protection of the park.

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