ROOT CAUSES OF HUMAN-WILDLIFE CONFLICT AND ALTERNATIVE DISPUTE RESOLUTION METHODS: THE CASE OF ARABUKOSOKOKE FOREST, KENYA

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ABSTRACT

It is imperative to note that there exists a set of global trends which contributes to the exacerbation of human-wildlife conflict. These are categorized as human population growth, distance from households to forest boundary, land use and cover transformation, species' habitat loss, habitat degradation, forest fragmentation, road networks, infrastructure development, increasing interest in access to nature reserves and ecotourism. The overall objective of the study was to investigate the root causes of human wildlife conflicts. Most studies on conflict resolution; Transformation, management and reconciliation have been based on human-human basis. No much research has been carried out on the impact of alternative dispute resolution methods in managing human wildlife conflict for sustainable development. Since attaining independence, Kenya had not documented its policy on the said thematic area until 2005 when it promulgated its Kenya forest services Act. The same was followed up by the Kenya wildlife services Act (2011) and the National Environmental Act (2013). However, these enactments are general and do not postulate specific policies on human – wildlife conflict resolution aspects. The matter has been left to legal mechanisms which include litigation involving courts. Such mechanisms have not helped resolving conflicts between humans and the wildlife as cases continue to accelerate resulting into loss of both humans, wildlife and property. The study envisaged to answer the following research questions: What are the root causes of Human-Wildlife conflicts? The study adopts Natural Law and environmental democracy theory as promulgated by J.M.Finnis. The study postulated litigation methods were most suitable for the resolution of Human-wildlife conflicts: That inadequate Human- wildlife Resolution method are responsible for escalation of the conflicts and that Community Based Natural Resource Management Mechanisms (CBNRM) offer the most suitable ADR method for human- wildlife conflict resolution. The study employed the mixed method approach. Both primary and secondary data was collected and analyzed. Multistage sampling was used by the study. Data was collected based on 400 households, questionnaires, Key informants, interviews, Focus Group Discussions (FDGs) and researcher field observations. The study found that that logging has been rampant given that local communities use timber for building materials, use firewood for cooking, use logs for charcoal and also for woodcarvings. This is pointer to the fact that there is deforestation, which threatens forest degradation. This further threatens lack of carbon sequestration, which leads to climate change phenomena. The study further established that Poverty plays a very big role in driving human wildlife conflict at Arabuko Sosoke forest buffer zone. Poverty has cause and effect preposition in that it causes malnutrition, disease and despondency. Such despondency leads to deforestation, which further causes soil erosion which culminates into land degradation and drought. The study also concluded that causes were perceptions, cultural norms, beliefs and close proximity to the forest boundary. The study

recommends intensive local residents 'participation in human-wildlife conflict management. It further recommends use of non-destructive methods in managing the forest resource and equitable benefit sharing and compensation schemes to the local populations in a bid to enlist their support for conservation efforts.

Key Words: *human-wildlife conflict, alternative dispute resolution methods, Arabukosokoke forest, Kenya*

INTRODUCTION

The world has experienced rampant wars and conflicts which emanate from environmental amenities and services such as land, water and water related resources, oil discoveries, mining of precious minerals such as Gold, amongst others. Forests and forestry services have also been a source of conflict as human activities encroach them for economic benefits while the government on the other hand tries to mitigate against such activities in a bid to conserve and protect the natural ecosystem. Kenya is not an exemption to these challenges. The study looks into the root causes of human-wildlife conflicts, the resolution methods with their associated impact and also interrogates peace building strategies that non-state actors, through Track II Diplomatic methods like community based natural resources management mechanisms (CBNRM), can put in place to ensure environmental peace, conservation and sustainable development. According to Mark Fowler (2004), Environmental peace may be defined as the whole spectrum of peace initiatives covering political, economical, social, technological, educational and cultural aspects which touch on both living and non-living ecosystem in the biosphere. Where as in Kenya, the Constitution (CoK 2010)Articles 59 (2) (d) and 66 (2) provides for Community-Based Natural Resource Management Mechanisms (CBNRM).Policy and legal provisions remain inadequate since they are based on Track I State-Centric "Top- down "approaches.

A number of policies such as the Forest Act 2005, Forest policy (2007), the Water policy (1999) and the Kenya Wildlife Services Act (2011) acknowledge the need for Community involvement in resources management. However, none of these policies currently outlines the principles and practice for using community based natural resources management mechanisms (CBNRM) in Human Wildlife conflicts Resolution. The Arabuko- Sokoke Forest Reserve forms the focus of the study. Arabuko-Sokoke Forest Reserve, which covers a total area of 420 Square Kilometers, is the largest natural forest within the East African coast with a wide range of rare and unique species of mammals, birds, butterflies and plants. The forest ecosystem is home to 20% of Kenya's bird species, 30 percent butterfly species and a minimum of twenty four endemic bird, mammal and butterfly species. It has since been designated as a UNESCO Important Bird Area (IBA). www.kenyaforestservice.org accessed on 20th July, 2015 (Ongugo et al., 2008). The Kenya Forest Act 2005 provides for participatory forest management aimed at sustainable development and improvement of the living standards of the adjacent forest communities in line with the Rio Declaration of 1992 (FA 2005; Rio Declaration,1992).

Although the Wildlife Act (2011) advocates for community participation and confers user rights for those in registered Community Forest Associations, human-wildlife conflicts have continued in the said area. Fencing of the forests' perimeter (Mungai et al, 2011) among other lethal control measures have not been able to fully mitigate against the Human-Wildlife conflict. Rather, it has been exacerbated, resulting into loss of both human life and wildlife including ecosystem biodiversity loss. Litigation settlement legal methods have not been able to offer sustainable outcomes to the menace. There is, therefore, an urgent need to investigate the Resolution Methods used in the management of Human-Wildlife Conflict in the area under study in a bid to foster sustainable development. The study is also expected to promote forest management policies and laws that benefit rural populations in affording economic sustainability without unduly degrading forest ecosystem and biodiversity. It is expected to inform global, regional, sub-regional, National, county and local governance cadre on sustainable resolution methods of managing human- wildlife conflict for peaceful coexistence and sustainable development.

THEORETICAL FRAMEWORK

The study adopted environmental democracy approach to conflict resolution. Environmental democracy is used to connote the right of an individual in taking part in the governance of the environment (Susan Hazen, 2009). The study also borrows from the Deep Rooted Conflict Theory by Vern Redekop (2002) which analyses conflict into three levels with their corresponding processes used to address them as disputes, addressed through Settlement, Underlying Conflicts addressed through Resolution and Identity-Based Deep Rooted Conflicts which are addressed through Reconciliation. This is in tandem with the principle of equal rights for each individual. It includes public entities, community workers, lawyers, industrialists, trade unions, academia, government leaders and other cadre of experts involved in environmental governance. Environmental democracy gives an opportunity to every individual whose life is affected by the quality of the environment to participate in environmental decision-making as freely as they do in other public interest matters like health care, education, finance and government. This offers a chance for the local communities to have a stake and ownership of the Natural Resource and to benefit from the proceeds as per the Rio Declaration (1992).

Root Causes of Human-Wildlife Conflict in Arabuko Sosoke Forest- Kenya

The root causes of human-wildlife conflict within the Arabuko Sosoke buffer zone are here under discussed. It is imperative to note that there exists a set of global trends which contributes to the exacerbation of human-wildlife conflict. These are categorized as human population growth, distance from households to forest boundary, land use and cover transformation, species' habitat loss, habitat degradation, forest fragmentation, road networks, infrastructure development, increasing interest in access to nature reserves and ecotourism. Other trends include competitive exclusion of wild herbivores, increasing livestock numbers, increasing wildlife population as a result of conservation programmes, abundance and distribution of wild prey, stochastic events and climatic factors as a result of traditional human practices. Additional

drivers of conflict include unemployment, poverty, influx of people, ignorance, inequality, illiteracy, cultural beliefs, lack of professionalism and high propensity to unskilled jobs. The study posits that these drivers of human-wildlife conflict have a higher velocity when the Natural Law Theory propounded by Finnis (2002) is not adhered to. Further when environmental democracy as advocated by Susan Hazen (2009) is violated the said drivers move at a higher velocity resulting into escalation of human-wildlife conflicts.

Human Population Growth

Direct interaction between humans and wildlife is inevitable because of demographic and social changes. As human population grows, human settlements stretch into and near protected areas (IUCN, World Park Congress 2003). This trend is not only experienced in rural areas but also in cities and other cosmopolitan areas. In Africa, growth in human population has resulted in encroachment by human beings into wildlife habitats, confining wildlife species into marginal forest patches thereby escalating direct competition with local communities (Siexet al., 1999). In Columbia, Canada, conflicts do not take place in nature reserves and rural setup but is often experienced in urban conglomerates as well. Contemporarily, human population density is positively correlated with encounters with cougar, grizzly bears and black bears and has become a daily occurrence (Ministry of land, water and air population, British Columbia, 2003). According to the Kenya National Bureau of statistics (KNBS 2013) the population of Arabuko Sosoke Forest buffer zone stood at 48,720 while the total population in Kilifi County stood at 456,297 with a population density of 116 persons in every square kilometre. This high population density leads to more frequent interactions between the human beings and the wildlife, resulting into a ripe environment for conflict.

Proximity to Forest Boundary

The mean distance from the local communities' households to the forest boundary has a bearing on driving human wildlife conflicts. With reference to table 3.1 the main distance from the Arabuko Sosoke forest boundary to the residents' houses stood at 6.49 km. The closest homestead to Arabuko forest boundary stood at 0.1 km while the furthest was 25 km. Most homesteads ranged between one and three kilometers from the Arabuko Sosoke boundary, while 20% of the homesteads were built less than one kilometer from the boundary. This close proximity of the adjacent communities' households to the boundary has posed as a major cause of conflict.

Table 1. Mean Distance from Homesteads to the ASF Boundary

Distance in KM	Mild point x	Frequency	Fx	Percentage %
0 ≤3	1.5	80	120	20
3 ≤5	4	100	400	25
5 ≤7	6	90	540	22.5
7≤9	8	40	320	10.0

Distance in KM	Mild point x	Frequency	Fx	Percentage %
$9 \leq 11$	10	50	500	12.5
$11 \leq 13$	12	4	48	1.0
$13 \leq 15$	14	4	56	1.0
$15 \leq 17$	16	2	32	0.5
$17 \leq 19$	18	10	180	2.5
19 and above	20	20	400	5.0
Total		$\Sigma f = N = 400$	$\Sigma fx = 2596$	100.0

$$\bar{x} = \frac{\Sigma fx}{\Sigma f}$$

$$\frac{2596}{400}$$

Mean $= 6.49km$

Land use Transformation

This root core driver of human wildlife conflict is a close relative of human population growth. High population densities have escalated human activities. The said human activities have led to transforming savannah, forests and other ecosystems to urban cities or agrarian areas. This is a direct consequence of increase in demand for food production, land raw materials and energy. For instance, in Gujarat India, on the edge of Gir National sanctuary, exuberating conflicts with leopards and lions (Panthera pardus) are as a result of rapid extensive change in land use related to the conversion of millet and groundnut fields into mango and sugarcane plantation cultivation. The said crops create conducive environment for predators 'survival thereby playing a leading role in influencing natural distribution and abundance of animal colonies (Vijayan & Pati, 2002).

In the Kenyan front, a number of counties endowed with much wildlife like Trans-Mara, Samburu, Taita, Kwale and Kilifi County, conflict is aggravated by small scale agricultural developments and land use fragmentation. As a matter of truth, state farms like the Agricultural Development Corporation (ADC) have been subdivided and corruptly sold on small holdings with cultivation based on commercial horticultural crops(Kenya Wildlife Service,1996).The Arabuko Sokoke buffer zone has witnessed a major transformation of the land in terms of illegal logging for timber for sale and building materials, pasture and quest for mining.

RESEARCH METHODOLOGY

Research Design

Research design is a plan or road map for carrying out a research. The study adopts descriptive design which uses words, sentences and explanations. Descriptive survey is mainly concerned with description of present conditions in details. The survey gathers data at a particular instance with a view of identifying the standards against which existing conditions may be compared with

past conditions as well as determining the relationship that exist between specific events. The method helps the researcher to gather both quantitative data and qualitative data.

Target Population

The target population will be Kilifi County in the Republic of Kenya and to be precise, Arabuko-Sokoke forest Reserve. Whereas there are many adjacent villages to the forest the researcher wishes to zero down to Mida which is in Mida sub-location Gede location Malindi sub-county within the periphery of the forest with a population of 6535 comprising of 850 households (KNBS, 2010).The households will then be randomly selected using the following scientific formula: Booth et al., (2008), to determine the sample size.

$$\text{n}=\frac{(z^2\ x\ p\ x\ qx\ N)}{e^2\ (N-1)+(z^2\ X\ p\ X\ q);}$$

$$\text{n}=\frac{(1.96)^2\ x0.05(1-0.05)\ x850}{(0.05)^2\,(850-1)+(1.96)^2\ x\,0.05x\,(1-0.05)}$$

$$n=\frac{850}{0.0025\,(849)}\ n=\frac{850}{2.1225}\ n=400$$

Where: n = Sample size (being determined); N= Population size (Number of households which is known); p=Sample proportion (assumed to be 0.05, if not given); q= 1 – p, e= 0.05 (since the acceptable error level of significance) should be 5%) and z=Standard deviation at a given CI(z = 1.96 at 95% Cl) Cl Connotes confidence level.

Applying Booth formula stated above on 850 households (Mida) yields a sample size of 400 within margin of error of 5 percent. 400 household's heads shall be interviewed by use of questionnaires. The Arabuko-Sokoke Forest adjacent Dwellers Association (ASFADA) officials, village Development Forest Conservation Committee officials (VDFCC), the county wildlife conservation and the County Wildlife compensation committee (CWCCC) in groups of 100 representatives based on the research sample will be interviewed on Focus Group Discussion (FGD) bases. Primary data will be collected through a survey among 400 households specifically targeting the human-wildlife hot spots and the three mentioned associations above.

Data Collection Procedures

The study set off with a review of the existing literature on causes of environmental conflicts in Sub-Saharan Africa, Kenya, and Kilifi County (Arabuko- Sokoke Forest Reserve). Questionnaire and interviews with key informants were used to collect data. Questionnaires containing both structured and un-structured questions with open ended questions to allow well thought

responses from interviewees. Questionnaires are suitable for research because the responses given are anonymous and chances of getting true answers are high. The study also employed use of focus group discussions (FGDS) especially where it was deemed appropriate to interview resourceful individuals likely to give detailed information. In this case the researcher will interview the County Director of environment, Chief Forest Waden at Arabuko-Sokoke forest reserve, the Arabuko-Sokoke Forest adjacent Dwellers Association (ASFADA) officials, village Development Forest Conservation Committee officials (VDFCC). Community Forest Association officials based at Sokoke, Gede, Mida, Kenya Medical Research Institute (KEMRI) and most importantly representatives of the non-organized people living adjacent to the forest. Other stakeholders interviewed included representatives from National Museum of Kenya (NMK) officials managing the Butterfly (Kipepeo) Farm at Arabuko forest, Birdlife International officials working under UNESCO important Bird area (IBA) sight where 20% of the Kenyan birds are found KWS, KFS, KEFRI, the county wildlife conservation and compensation committee (CWCCC) and the county Environmental chief officer. Secondary sources of data included text books, journals, the internet and on-line e-libraries, the forest Act 2005, the wildlife conservation and management Act (WCMA 2013) CAP 376 amended in 1989 and 2010, conference papers, Newspapers and other media reports. The importance of secondary sources of data is anchored on the fact that they give insight into efficiency, challenges and opportunities in Resolution of Human-wildlife conflicts internationally and emerging issues in environmental conflict management.

Data Analysis and Presentation Methods

Data will be collected, coded, cleaned and analyzed using a statistical package. Descriptive statistics will be used to analyze the data. Tables of frequency distribution percentages, pie charts, graphs and pictograms will be used to represent the data. The impact of the alternative dispute resolution methods in managing human wildlife conflicts will be measured through pictorially and graphically presentation of data. Relevant interpretation, discussion and recommendations will be inferred from the analyzed data after which results will be published in thesis and scientific journals.

RESULTS AND DISCUSSION

Research findings indicated that logging, cultural beliefs and perceptions and poverty were the major root causes of human-wildlife conflict in Arabuko Sosoke forest in Kenya.

Logging

Of late, there has been rampant logging at Arabuko Sososke Forest. Here, logging is done both on small and large scale basis. Small scale logging is done by the local communities who access the forest to acquire building materials for their houses. Research findings indicated that local communities use timber (100%) for building their houses. Further, statistics generated from field data figure 3.1 depicts that 70% of respondents interviewed answered “Yes” to using firewood

from Arabuko Sososke Forest. It is evident from the field data that logging has been rampant given that local communities use timber for building materials, use firewood for cooking, use logs for charcoal and also for wood carvings. This is pointer to the fact that there is deforestation which threatens forest degradation. This further threatens lack of carbon sequestration which leads to climate change phenomena. This further point to global warming which is a major concern for the global community in the 21st century.

Cultural Beliefs and Perceptions

Cultural beliefs and value systems are major drivers of human-wildlife conflict not only in Arabuko Sosoke forest but globally. Every society or cultural group has its own beliefs and perceptions regarding certain wild animals. For instance, as already seen in chapter two, in Norway and France, many farmers suspected that special breed of wolves were reared in secret places and brought into their farms (Skogen et al., 2008). At Kibale National Park in Uganda empirical literature indicated that even though domestic animals caused double crop damage compared to wild animals, the local people resented the wild animals much more because they perceived the wild animals to be owned by the state and imposed upon them by outsiders rather than voluntarily co-existing with them on voluntary bases (Naugton-Treves & Treves, 2005). Further, cultural attitudes towards certain animals can cause human-wildlife conflict. For example, in North Eastern Madagascar, the mythology that the aye aye Daubentonia Madagascarensis is a harbinger of doom compels people to kill it whenever they see it. They actually believe that if it is seen moving around a village the whole village must be burnt down and left desolate as a matter of cleansing it with its dwellers (Kremen et al, 2008). For instance, in China, Rhinos are quite endangered because of the belief that rhino horns are medicinal and increase libido on men. This belief has made the rhino trade in China to blossom such that a kilo of rhino horns costs U$ 6250.This revelation has intensified poaching for the rhino species thereby threatening their extinction. This myth may not have been scientifically proven but because the people believe in it, the wild animal is endangered (Kivisi, 2015). At Arabuko Sosoke forest, there has been the cultural belief that baboons are most notorious in destroying crops and small livestock such as goats, sheep and chicken. As a result of this belief baboons are naturally hated by the local communities who endeavor to kill them and use the meat as relish. At Arabuko Sosoke forest buffer zone the local communities interviewed vouched for killing animals and using their meat as relish. Since 55% of the locals did not know what to do regarding the baboons crop and livestock menace, it follows that majority (30%) wanted the baboons killed because of their natural hatred towards them.

Poverty

Poverty plays a very big role in driving human wildlife conflict at Arabuko Sosoke forest buffer zone. Poverty has cause and effect preposition in that it causes malnutrition, disease and despondency. Such despondency leads to deforestation which further causes soil erosion which culminates into land degradation and drought. Drought causes wild animals to migrate in search

of pasture and water and in the process carnivores such as lions, leopards and tigers predate on livestock. In the process human wildlife conflict ensue whose result is injury or death from both ends. Poverty increases vulnerability of local residents' crops and livestock destruction by wildlife. Local residents that depend on a single livelihood source are more antagonistic to invading dangerous animals. This is because the latent consequences in destruction of resources are aggravated by absence of alternative income sources. An individual endowed with much wealth, alternative income sources and in good social standing in the community will be less vulnerable to the predators' attacks than people who are poor (Naughton-Treves and Treves, 2005). An analysis of research interview responses revealed that there were a number of key causes of human wildlife conflict at Arabuko Sokoke buffer zone. Respondents mentioned some of these causes as poverty from humans and wildlife, energy issues such as quest for cooking firewood from the forest, building materials, economic reasons such as greed from rich elite and unemployment among other causes. Research data and Focused Group Discussion (FGD) revealed that among the other causes were perceptions, cultural norms, beliefs and close proximity to the forest boundary. According to the responses adduced from the respondents, the chief driver of human wildlife conflict in the buffer zone under study is poverty. This poverty is in the form of hunger evident from both humans and wildlife at 75%.this is followed by human settlement and activities at 12.5% .Economic reasons follow at greed and unemployment at 5%.the study can deduce from this statistics that poverty id rampant at the area under study and is a case which needs to be looked into without eradicating poverty human wildlife conflict will continue. The result will be chaos, anarchy wholesome destruction of property and infrastructure.

CONCLUSIONS

The research dealt with the impact of alternative resolution methods in managing human-wildlife conflicts. The study area was Arabuko-Sokoke Forest, specifically Mida village, in Kilifi County, Kenya. Human-wildlife conflicts interfere and adversely affect the livelihood of people. There is paramount need to resolve them so as to achieve sustainable development. Natural resources based conflicts occur where humans live and thus should be resolved instead of merely being settled. A number of alternative resolution methods on environmental conflicts (ADR) are, negotiation, mediation, conciliation and community based Natural Resource management mechanisms among others. Whereas formal litigation legal mechanism are track one state centric top-both M approaches, (ADR) CBNRN are people oriented informal track two diplomatic approaches which are participatory and bottom up approaches. Litigation methods are legally formal approaches which use force, coercion and balance of power strategies outcomes are formally arrived based on court rulings imposed on the parties involved whether they like it or not. This arrangement does not resolve the conflict but rather settles it. When balance of power shifts, there is every likelihood of the conflict to resurface. Further in the case of Human-Wildlife Conflict management it is not practicable to take an elephant or a baboon to a court of law incase it destroys crops or kills human beings. This complicates the use of the litigation method. On the other hand, CBNRM involves the local communities in participating and

decision making process in line with the constitution of Kenya 2010 Article 69 (1) (d) and 59 (2)(c) both of which advocate for public participation in management, protecting and conservation of the environment. Further the forest act 2005 equally advocates for adjacent forest communities participation and sharing in the benefits from forest resources as a mechanism to motivate them to conserve forest ecosystem and biodiversity. Resolution of Human–Wildlife Conflict looks into the root of the problem and addresses the psychological dimensions of the conflict at hand it is important to note that it is impossible to achieve sustainable development in an environmental of unresolved conflicts. Unresolved conflicts negatively impact on socio-economic development as well as the biosphere. It needs to be pointed out that there is no one "fix all" method of managing Human–Wildlife Conflict Even among the alternative methods of resolving the said conflicts, not one of them can suffice on a stand along basis. An integrated conflict management (ICM) approach would help in minimizing the human wildlife conflict menace. This entails marrying all the available approaches mentioned in chapter two and synchronizing them into "one whole" continuous research, monitoring of interventions and maintaining a robust feedback mechanism is the way to go.

RECOMMENDATIONS

Based on the data collected, key informant's literature and observations; the author has the following recommendations to make. The voice of the local communities needs to be heard. The livelihood of the local communities is at stake. Chronic poverty levels have impaired education standards since most of the local communities cannot afford even school uniform and basic primary school requirements let alone secondary and university level education. Rampant human-wildlife conflicts have aggravated the poverty levels. Baboons continue to play havoc on crops and livestock and interfere with the subsistence farming activities of the residents. It is hereby recommended that the wildlife conservation and management Act 2013 be amended to ensure compensation is given to victims of crop, property destruction and death caused primaries such as by baboons and vervet monkeys. The study recommends that once compensatory funds have been granted by the government priority should be given to the victims and not KWS as in the current practice under the WCMA 2013. When it comes to compensation rewards the process of claiming should be shortened, without much bureaucracy and should be made more transparent. Internal checks should be incorporated into the process to ensure justice is given to victims of wildlife damage to crops, property or even fatal injury and death. Current awards of Sh 3million for permanent incapacity and Sh 5 million for death should be revised to 5 million and10 million respectively. The study, therefore, recommends that in this regard both national assembly and senate should enact amendment to the wildlife conservation and management act (WCMA 2013) to effect these amendments. Capacity building and education to the local communities needs to be intensified. The study found out that most locals do not know their rights and how they can legally benefit from the forest resource and wildlife thereof.

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