Influence of resource competition on human-wildlife conflicts among the community of Kithoka area in Meru County, Kenya

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Abstract: **Human wildlife conflict poses a great challenge to wildlife conservation and sources of income of people globally and is increasing as human migration from rural to urban areas increases, global climate changes, development expands and other human and environmental factors put wildlife and people in greater direct competition for a shrinking resource base. The study was influenced by the fact that human wildlife conflict cases are rampant in the region and no action has been taken despite the knowledge of this. The study was based on stakeholders and social conflict theories. Descriptive survey research design was used where the target population comprised of 1200 households from 4 villages around Kithoka forest and 30 Kenya Wildlife Service officers at the Meru station. Stratified random rampling was used to select a sample size of 10% of the households heads in each village strata, while a census survey was adopted for the KWS officers making a total of 148 respondents. Questionnaires and interview guides were used to collect data. Quantitative data was analyzed using descriptive statistics such as percentages, frequencies and means while data was presented using tables. Qualitative data generated from the interview guide was organized in themes and patterns, grouped through content analysis and then discussed. This study recommends that; The National government through the Ministries of Lands and Agriculture in conjunction with the Ministry of Tourism and Wildlife should establish coherent policies that will protect the environment and suitable use of natural resources. The Kenya Wildlife Service (KWS) should review its policy through enforcement of regulations and legislation on the safe distance that people should build their houses away from Kithoka forest for purposes of minimizing human wildlife conflict. This barricade bodies will help establish a human zone and wild zone and the KWS Meru station should consider reinforcing alarms on the fences to help in detection of any wild animals or people attempting illegal entry into the forest.**

Key words: **Resource Competition, Human-wildlife conflicts, Wildlife Conservation,**

I. INTRODUCTION

Human wildlife conflict has been in existence for as long as human beings have existed and wild animals together with people have shared the same landscapes and resources. Conflict occurs mainly in areas that have high population of wild animals mainly because of competition over resources e.g., food, water, land etc., human encroachment on wildlife corridors (socio-economic and patterns of land use) and the increase in human and livestock population (Machoka, 2017)

Wildlife conservation and sources of income of people globally is posed a great challenge by human wildlife conflict and is increasing as human population becomes more, establishment of infrastructure, climate modifications and other human environmental issues expose people and wildlife in more direct struggle for limited resources. Human wildlife conflict occurs worldwide one way or another (Mutanga, 2015)

In the kingdom of Bhutan which is a landlocked country in the eastern Himalayas bordered by china to the north and India to the east, south and west a predation activity examination by the tiger, common leopard, and snow leopard and Himalayan black bear was conducted. Data showed that one thousand three hundred and seventy five kills were documented, with leopards killing more livestock (70% of all kills), than tigers (19%), bears (8%) and snow leopards (2%). About 50% of livestock killing were cattle and about 33% were horses (Sangay & Vernes, 2008). People's perceptions of large carnivores are clearly negative in the High Andes of Argentina showing that pumas and foxes were mostly killed as retaliation for the real or imagined killing of domestic animals, or to prevent anticipated livestock predation (Mauro Lucherini & Maria Jose merino, 2008).

Human wildlife conflict are also evident all across Africa. In Botswana the black jackal *canis mesomelas* was blamed for 77% of all the reported livestock losses (M.Gusset et al., 2009). A questionnaire survey that was conducted in Tanzania of 1396 local people living adjacent to Arusha, Kilimanjaro, Tarangire, Lake Manyara and Mikumi national park and Selous Game reserve shows that 71% of local people reported problems with wildlife. 86% of the locals reported crop damage, while 10% reported the killing of livestock and poultry (Newmark, Manyanza, Sariko, & Gamassa, 2002)

Kenya is endowed with an enormous diversity of ecosystems and wildlife species. It is renowned for its diverse assemblage of large mammals like the elephant (*loxodanta Africana*), black rhino (*diceros bicornis*), leopard (*panther pardus*), buffalo (*syncerus cafer*) and the lion (*panthera leo*) and also numerous species of ungulates (Maurine, 2013). Maasai Mara National Reserve which is commonly known for its Africa's greatest wildlife reserve also is rampant with the conflicts between the communities surrounding the protected areas and the wildlife. The world conservation union (African Wildlife

Foundation, 2003) reported that conflict takes place when wildlife necessities overlay with human inhabitants, therefore leading to losses to people and wild animals. As the contact increases, wildlife despoliation of livestock and crops, injuries or death of humans, causing infections to domesticated animals and competition of grazing areas and grazing water increases (Machoka, 2017)

Residents of Kithoka in Meru want the government to compensate them for losses incurred after elephants invaded their farms and destroyed their crops altogether. The farmers say that they have not had a decent harvest in a longtime as the stray elephants have been frequent visitors and have blamed the KWS for not acting fast enough when they raise complaints (Daily Nation, 2018)

Statement of the Problem

Human populations interact with wildlife in numerous ways and our species has directly exploited wild animals for food and furs for millennia and now more recently for sporting or cultural reasons. Humans have greatly modified habitats and landscapes through agriculture and other extractive industries with far-reaching and typically negative impacts on wildlife populations (Thirgood et al., 2005). Our interactions with wildlife are often positive since we end up gaining material benefits from harvesting species for food or other animal products. However, in other situations, human interactions with wildlife are negative since they may eat our livestock and damage our crops, they may compete with us for wild prey populations since we are also hunters and may even injure or kill us as a result.

In a scenario where wildlife induced damages to human property and life are neither controlled nor compensated, negative local attitudes towards conservation and wildlife resources become entrenched which is the case in kithoka area. Meru County is currently among the human-wildlife conflict county where elephants are the most knotty wildlife species. According to a report that the Governor Kiraitu Murungi gave during the International Day of elephants at the ASK showground on 11th august it was noted that the Kenya Wildlife service (KWS) owed residents nearly sh220 million for destruction of life and property mainly by elephants (Ndung'u, 2018). If the compensation is dispensed, co-existence between the people and animals will be enhanced. Despite all this, the KWS has implemented a comprehensive strategy with an aim of reducing HWC by reinforcing the law, helping in improving wildlife business governance and retaining ecological veracity. The KWS together with the county government helped place an electric fence that helps reduce instances of HWC.

With the above stated problems in communities living in Kithoka area, and the efforts that the Kenya Wildlife service have put in combating the issue with no full success of eradicating the problem, the study research will therefore focus on the factors that influence human- wildlife in communities living in kithoka area.

Aim and Objectives of the Study

The aim of this study was to assess how resource competition influences human and wildlife conflicts in communities around Kithoka area, in Meru County, Kenya.
In order to achieve this, the following were the specific objectives:

1. To examine socio-demographic characteristics of the residents and stakeholders of Kithoka area, Meru County, Kenya
2. To find out the extent to which land, water and pasture influences human -wildlife conflicts in communities around Kithoka area, in Meru County, Kenya.
3. To assess how sharing of resources influence human-wildlife conflicts in communities around Kithoka area, in Meru County, Kenya.
4. To establish the extent of elements of human-wildlife conflicts in communities around Kithoka area, in Meru County, Kenya.

The Study Area Geographical Location and Extent

Kithoka area, is a rich agricultural area with about 1200 households based on the Kenya Population Census of 2019 (KNBS, 2019).These households account to a population of close to 10,000 people (WellAwareWorld.org, 2019).

Kithoka area has four main villages. The area has a Kenya Wildlife Service outstation that holds about 30 servicemen and community wildlife scouts that manage wildlife and human interactions.

II. LITERATURE REVIEW

1. Human wildlife conflict

Human wildlife conflict are defined as the interactions that exist between human and wildlife where negative consequences, whether perceived or real exists for one or both parties (Elsner, 2008). Normally, the impacts of these conflicts to humans can be categorized into economic, health, safety and psychological. HWC takes many forms which includes crop damage, damage to property, livestock predation and even attack to man. This burden to the shoulders mainly affects people living near protected areas and also those that live near arrears that have freely roaming animals (Hoffman, T & O'Riain,M, 2012)

Conflict between wild animals and people has increased in present years mostly in developing countries, which is attributed to increasing human livestock populations, the changing land use patterns and socio-economic status (Machoka, 2017) and the conflict is becoming a menace. Conflicts between wildlife and other competing land use forms and hostilities towards state policies in wildlife conservation have become a persistent problem and the under development in areas of high wildlife concentration has affected food security in these areas. Due to this, the basic human needs end up not being met and this compounds the

delicate interaction between wildlife and humans and complicates resolution of conflicts found in the wildlife sector (Njue, 2013)

Human wildlife conflict are prevalent in Africa where large numbers of big mammals such as elephants and lions till roam freely in marginal rangelands and protected areas. The increase in human population has resulted to encroachment into more marginal lands inhabited by wildlife, leading to fragmentation and conservation of land, for instance, to settle agriculture and other uses incompatible with wildlife (Makindi et al., 2014) .Wildlife deaths that would afterwards be caused by people end up contributing to a reduction in wildlife population and ends up having a bigger ecological effect on ecosystem stability and also conservation.

Human wildlife conflict is a recognized occurrence as a result of the relationship between wild animals and people and it negatively affects people and their property or wild animals and their habitation and has been in existence from the time people and wild animals started sharing some natural resources (Lamarque, 2009). The reason why conflicts persists is competition for power politics that always end up blinding people from seeing the opportunities for cooperation and reaching an understanding in the ensuring conflict (Njue, 2013). Njue (2013) also points out that it is necessary to ask ourselves if there is really wildlife related conflict system within Kenya and with its neighbors equally considering that all actors in the conflict are either affected or involved in the conflict. Since every conflict has several actors, it is advisable to involve all the actor's primary, audience, constituent or allies so that they or it can be resolved (Njue, 2013)

Wildlife refers to wild animals, native fauna and sometimes flora and fauna of an area. Wildlife in general plays an important economic role by providing revenue either locally, regionally and also to other parts of the world for example, in the year ending 30 June 2006, wildlife accounted for 70% of the gross tourism earnings, 25% of the Gross Domestic Product (GDP) and more than 10% of total formal sector employment. On the whole, Kenyan people are depending on wildlife for livelihood, shelter and for other ecosystem goods and services. Socially, they tend to bring locals together for leisure purposes and recreation which ends up providing a good ambiance foe interaction. Many animals are also considered symbolic by many cultures enhancing the culture of the different communities and the nation. Indeed, any adverse impacts on the ecosystem can dramatically alter human's capacity to survive.

2. *Influence of resources competition on human wildlife conflict*

One of the major threats facing Kenya is the loss of biological diversity, the land use changes favoring agriculture and rural and urban development have led to the reduction and modification of wild areas which end up resulting in the extinction of or threat of extinction to wildlife species and natural areas, which serve as their habitat (Okech, 2010).

Therefore, Kenya's great reservoir of wildlife is increasingly under threat and opportunities are lost for its contribution to the creation of growth, wealth and employment.

According to Madden 2008, the major source of HWC globally is the struggle amongst increasing people populations and the wildlife for the similar scarce natural resources that are present. The change of forests, grassland and other ecologies into agricultural fields or towns due to high ultimatum for food, land and raw materials, has ended up contributing to an intense reduction in wildlife habitation (Lamarque, 2009). The struggle for land, resources and the continuous decrease of habitation are the main factors contributing to reduction of wildlife.

Majority of residents in rural Africa rely on natural sources like rivers, lakes and springs for water for their household activities like laundry, cleaning utensils and taking baths. Patterson (2004) assets that during periods of famine, pastoralists take their livestock to the limited water sources available where their livestock are preyed on by wild animals but when rain fills the predators disperse back into their habitat and prey on easier targets. Majority of water bodies are habited mainly by crocodiles this increasing human-crocodile conflict.

(Buckles & Rusnak, 1999) analyzed the causes of environmental conflicts and have attempted to narrow them down to scarcity, interconnectedness of nature, different uses of the environmental resources by different people and unequal relations. The two scholars argue and highlight the relationship between natural resources conflict that cause environmental squabbles are catalyzed by overexploitation of natural resources to ensure food security foe the fast developing world. The duo agrees that conflicts are directly linked to contests over natural resources and access to them are tied into the forces that intensify competition. According to Buckles and Rusnak (1999), the environment is the cause of all social conflicts and the natural resources are portrayed as causes of competition and tension that can result in clashes when triggered by other factors.

Elephant destruction of farms is rampant in Kithoka and Nkunga which neighbors the lower and upper Imenti forest and Mbeu and Nkomo in Tigania West. Farmers here grow French beans, bananas and cereals under irrigation but have not been able to reap from the produce due to invasion by elephants (Ndung'u, 2018). Such cases are unavoidable due to the increased human population and the animals try to access the left limited resources. It is evident that when wildlife and people live together, they will always compete therefore giving rise to conflict and there are challenges in managing it with an aim of reducing it.

According to the KWS, erecting barriers on wildlife conservation zones has led to struggle for food, water and habitats for both humans and wildlife thus resulting in a conflict for survival. In order to understand conflicts, there is need for consideration of the economic costs (for instance

crop damages) and gains (tourism) of land management. Both of these in relation to the degree in which the gains and costs affect the affected parties (Machoka, 2017). The study will seek to investigate whether resources competition influence HWC in communities living in Kithoka area.
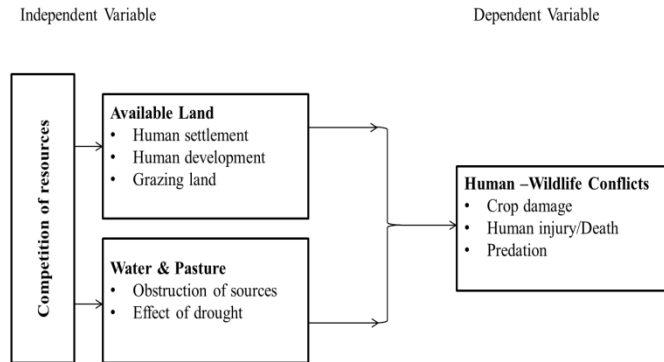
2. Conceptual Framework

Independent Variable   Dependent Variable

Fig. 1 : Conceptual Framework, Source: Author, (2019)

III. MATERIALS AND METHODS

This study applied social survey and descriptive research design because these designs are normally structured and precisely intended to gauge the features outlined in a research question. The researcher chose the design because it tends to focus on data instead of theory. This involved field cross-examination of the targeted respondents through well-structured questionnaire and oral interviews using the

Likert – type five–point rating scale of Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D) and Strongly Disagree (SD) in analyzing responses from the respondents to effectively capture the participants views on the subject matter.

The study targeted a population of literate adult inhabitants of 1200 households from the 4 villages in Kithoka and 30 KWS officers at the Meru KWS station as represented in the table 1 below .

Table 1 Target population

Target Villages	Target population
Gakurine	505
Gieto	314
Themba	246
Rwanguene	135
KWS officers	30
Total	1230

Source: KWS, 2019 & (KNBS, 2019)

A sample size of between 10-30% is a good representation of the target population (Mugenda, O. M. & Mugenda, A. G., 2003). The study therefore selected a sample size of 10% of the households heads in the village strata as a sample size for research based on the central tendency theory of 30 items or

respondents to be adequate for making inference. The researcher also adopted a census survey for the KWS officers. This is represented in the Table 2 below.

Table 2 Sample size

Target villages	Target population	Sample size	Percentage
Gakurine	505	50	10%
Gieto	314	31	10%
Themba	246	24	10%
Rwanguene	135	13	10%
KWS officers	30	30	100%
Total	1230	148	-

Source: Researcher, 2019

For the study, the researcher used questionnaires and an interview guide as the tool for data collection. The respondent's questionnaires used in this study were divided into four parts. Section A covering background information, section B the respondents' perceptions on influence of competition of resources, section C covered the indicators of human wildlife conflict. Later, the personal interview collected information on background information, the influence of competition for resources, human invasion and conservation measures on human wildlife conflict.

Quantitative data was analyzed using descriptive statistics using the statistical package for social sciences (SPSS) and data presented in form of percentages, means, standard deviations and frequencies. Data obtained was presented by the use of tables. Qualitative data generated from the interview guide was organized in themes and patterns, grouped through content analysis and then tabulated.

IV. RESULTS AND INTERPRETATIONS

1. Response rate

The respondents involved were the residents of Kithoka area and KWS officers stationed in Meru. They returned the questionnaires and responded to the interviews as tabled in Table 3

Table 3. Questionnaire return rate

Respondents	Sample size	Actual Response	Response Rate (%)
Residents	118	90	76.3
KWS Officers	30	26	86.7
Total	148	116	-

Source: Researcher, (2019)

The Table 3 above indicates that the average questionnaires return rate was well above 70 percent while the interview response rate was 86.7%, hence making the study adequate for analysis.

3. Demographic information

The background information of residents of the residents concentered on their age, gender and period of living in Kithoka area. The background information of the KWS staff concentrated on their gender, age, period of working in the Meru station and highest level of training related to wildlife.

Table 4. Respondents' gender

Gender	Category	Frequency	Percentage
Residents	Male	50	55.6
	Female	40	44.4
KWS officers	Male	15	57.7
	Female	11	42.3
Total		116	100.0

Source: Researcher, (2019)

The findings in table 4 above indicate that (55.6%) of the residents were male and (57.7%) of the KWS officers were male. This therefore implies that both genders were well represented in the study which indicate that KWS as a public entity has fulfilled the one third gender rule.

Table 5. Respondents' age

Age	Category	Frequency	Percentage
Residents	Below 20 years	10	11.1
	20-29 years	20	22.2
	30-39 years	39	43.4
	40-49 years	21	23.3
KWS Officers	20-29 years	9	34.6
	30-39 years	12	46.2
	40-49 years	5	19.2
Total		116	100.0

Source: Researcher, (2019)

The findings in table 5 show that (43.4%) of the residents were aged between 30-39 years and (46.2%) of the officers were aged between 30-39 years. This shows that majority of the respondents were household heads and the KWS officers were young and energetic to work in a protected area.

Table 6. Respondents' period of living and working

Period of working in Meru station/Living in Kithoka	Category	Frequency	Percentage
Residents	1-10 years	66	6.7
	11-20 years	22	24.4
	21-30 years	54	60.0
	over 30 years	8	8.9
KWS officers	Less than 1 year	2	7.8
	1-2 years	4	15.4
	3-4 years	14	53.8
	over 5 years	6	23.0
Total		26	100.0

Source: Researcher, (2019)

The results in table 6 show that (60%) of the residents have lived in the area between 21-30 years and (53.8%) of the KWS officers have worked in the Meru station between 3-4 years. This results show that the residents have lived in the area for a considerable number of years to understand factor influencing HWS in the area as well as the KWS officers familiar with the factors affecting HWC in communities around Kithoka area.

Table 7. KWS Officers' level of education:

Level of Education	Frequency	Percentage
Certificate	13	50.0
Diploma	9	34.6
Degree	4	15.4
Total	26	100.0

Source: Researcher, (2019)

Results in the table above show that (50%) of the KWS officers had attained a certificate in studies that are wildlife related hence are in a good position to protect the Twajai/Kithoka forest by implementing measures aimed at reducing human wildlife conflict.

> " ...much of our work is related to animal protection which is more of technical field training and not paperwork" -Officer Code 13

As evidently indicated in the work organisation, most of the low rank officers have a paramilitary training and few have academic qualifications of up to Diploma. However, senior officers may hold up to Degree level qualifications. These were found to be in-charge of sections within the station.

3. Resources competition and HWC

In order to assess resources competition influence on HWC in communities in Kithoka area; the researcher first established whether sharing resources between wildlife and communities in Kithoka area influences HWC. The findings are presented in the table 8 below:

Responses	Frequency	Percentage
Yes	72	80.0
No	18	20.0
Total	90	100.0

Source: Researcher, (2019)

The findings in the Table 8 above shows that (80%) of the residents felt that sharing resources with wildlife led and influenced HWC. This indicates that humans and wildlife compete for the limited land, water sources and food which

creates conflict. The findings concurs that struggle for space, resources and continuous decrease of habitation could be the main factors that contribute to reduction in wildlife.

In order to establish the extent to which land, water and pasture influence HWC, the researcher asked the residents to tick the extent to which each parameters lead to HWC. The findings are represented in table 9 below:

Table 9 Extent to which resources influence human wildlife conflict

Resources	Very great Extent		Great extent		Moderate extent		Low Extent	
	F	%	F	%	F	%	F	%
Land	71	79.0	11	5	5	5.5	3	3.3
Water	75	83.3	8	7	7	7.8	0	0
Food	78	86.7	8	8.9	4	4.4	0	0
N=90								

Source: Researcher, (2019)

Results in table 9 show that (79.0%) of the residents indicated that sharing of land influences conflict to a very great extent, (83.3%) indicated that sharing water influences HWC to a very great extent and (86.7%) of the residents indicated that sharing of food influence HWC to a very great extent.

92% of the KWS officers indicated that the residents graze their livestock at the boundaries of the forest and the rivers where there is fodder and water hence they risk being attacked by wild animals.

"...This indicates that the scarcity of land leads them to sharing it with the wildlife, sharing water sources like rivers and springs and the sharing of fodder between the livestock and wildlife which lead to HWC..." - Officer Code 3

These finding agree to the fact that major sources of HWC globally is the struggle amongst increasing human populations and wildlife for similar scarce natural resources.

In order for the researcher to assess how sharing of resources influence human wildlife conflict. Residents were asked their agreement level on influence of resources competition oh HWC. Findings are presented in table 10:

Table 10: Residents level of agreement on influence of sharing resources

Statements	5		4		3		2		Mean	Std. Devi
	F	%	F	%	F	%	F	%		
Obstruction of water for domestic purposes and no water streaming into protected areas for wildlife	17	19.0	49	54.4	14	15.5	10	11.1	2.19	0.873
Natural factors like drought that push animals to human habitations for pastures and water	5	55.5	25	27.8	8	8.9	7	7.8	1.69	0.932
Need for land for human development	31	34.4	47	52.3	12	13.3	31	34.4	1.87	0.962

N=90 Key: 5- strongly agree, 4- agree, 3-Neutral, 2-Disagree, 1-Strongly disagree

Source: Researcher, (2019)

The table 10 above indicates that; (54.4%) of the residents agreed that community members obstruct water for domestic purposes thus there is not water streaming into protected areas which lead to wild animals invading the community in search of water;(55.5%) strongly agreed that natural factors for instance drought pushed wild animals to human habitations for pastures and hence creating conflicts and (52.3%) of the residents agreed that the needs for human development like road and homestead expansions has led to sharing land with wildlife which contributes to HWC. This shows that increase on the demand for land, changing climatic conditions which contribute to drying of some water sources and drought has contributed to sharing of the natural resources that are scarce leading to conflict. The finding concurs that during famine, farmers take their livestock to the limited water sources where their livestock are simply preyed on by wild animals.

4. Indicators of human wildlife conflict

The research sought to establish the frequency to which human-wildlife cases were generally reported at KWS station. The following were the results.

Table 11. Occurrence of HWC

Extent	Frequency	Percentage
Daily	8	8.9
Weekly	40	44.4
Monthly	27	30.0
Total	90	100.0

Source: Researcher, (2019)

The table above shows that HWC occurrence in villages around Kithoka area is very frequent and rampant, as reported by the Senior Officers at the KWS Station.

"…. although some of the villages only experience the conflict during drought periods. This is an indication that cases of crop damage, predation of domestic animals, death and injuries to both people and animals occur very frequently in the areas around the forest…" -Officer Code 1

This confirms a report from the chief around the area which showed that there are many cases of wildlife attacks on people's farms and livestock.

In order to assess the indicators of HWC, the researcher sought to find out the losses that the residents have incurred as a result of invasion by wild animals. Residents were asked to tick on the listed statements. The findings are represented in the Table 12 below;

Table 12: Indicators of Human wildlife conflict

Statements	5		4		3		2		Mean	Std. Devi
	F	%	F	%	F	%	F	%		
Dangerous wild animals have attacked and injured people in my community	44	48.9	30	33.3	5	5.6	3	3.3	1.80	0.985
Herbivorous wild animals destroy crops in my community	56	66.7	24	26.7	8	8.9	2	2.2	1.51	0.753
Some of my community have been killed by wild animals	48	53.3	30	33.3	9	10.0	4	4.4	1.64	0.825
Dangerous wild animals have killed livestock in my community	60	62.2	25	27.8	5	5.5	0	0	1.39	0.594
N=90										

Source: Researcher, (2019)

The findings in the table above show that the main indicators of HWC are injured people as indicated by (48.9%), crop destruction as indicated by (66.7%), people's death as indicated by (53.3%) and (62.2%) of the residents indicated that killing of livestock as an indicator of HWC. This implies that human wildlife conflict has a severe negative effect on people and their resources. The severity of the conflicts can be categorized from high to low, from crop damage by herbivorous animals, predation of domestic animals and injuries of people.

"…our community is entirely small-scale subsistence farmers. There is more of cultivation than animal rearing. Due to closeness to the forest, constant damages are reported especially caused by baboons and stray elephants.." -Officer Code 7

As explained by several Officers, despite having an electric fence around the populated area, residents access the forest for firewood and sometimes grazing cattle. On the other hand, baboons jump over the fence to dash into maize fields close to them. Many reported injury and death cases revolve around elephants-human conflicts.

V. DISCUSSION OF FINDINGS

The researcher attained a response rate above 70 percent which according to Mugenda A. and Mugenda O. (2008) is an adequate proportion and can be termed adequate for analysis. The data was presented in relation to the findings; both genders were represented in the study, majority of the respondents had lived in the area for more than 20 years as well as the KWS who had worked in the Meru station for more than 3 years. The KWS officers were also trained on wildlife conservation.

The findings established that sharing of resources with wildlife influence conflict between people and wildlife as indicated by 80% of the residents whereby they shared the natural resources like land, fodder and land with wild animals resulting to conflicts. Findings established that during drought, animals invade farms in search of fodder. The finding was in agreement with (F.Madden, 2008) that the major source of HWC globally is the struggle amongst increasing people populations and wildlife for similar scarce natural resources.

The findings also established that fetching firewood, agricultural practices, carrying out of subsistence poaching, grazing animals inside the forest and infrastructure were the main aspect of human invasion that contributed to HWC. This finding is in agreement with (Katerina Agelevska, 2012) that human activities such as fishing, livestock keeping, and framing, establishment of infrastructure and conservation measures can radically alter wildlife habitation.

VI. CONCLUSION

The researcher was able to achieve the study objectives whereby the factors that influence human wildlife conflict in communities surrounding protected areas were clearly identified as sharing of natural resources for instance land, water and pasture.

The finding concurs that a number of conflicts with wildlife and farmers causes crop damage and death of animals in search of pasture.

VII. RECOMMENDATIONS

Based on the findings, this study recommends that:

i. The National government through the ministries of lands and Agriculture in conjunction with the

Ministry of natural resources should establish coherent policies that will protect the environment and suitable use of natural resources.

ii. The Kenya wildlife service (KWS) should review its policy through enforcement of regulations and legislation on the safe distance that people should build their houses away from Kithoka forest for purposes of minimizing human wildlife conflict. This barricade bodies will help establish a human zone and wild zone.

iii. The KWS Meru station should consider reinforcing alarms on the fences to help in detection of any wild animals or people from illegal entry into the forest.

iv. Community education and awareness by the Kenya wildlife service should be implemented in the areas where human wildlife conflict is experienced.

v. Setting up bee-hive fences to prevent attacks from the elephants and using scarecrows to put the animals away from farm lands.

vi. The residents should ensure proper waste disposal methods to avoid luring the animals into human zones.

Suggestions for further study

The researcher gives the following recommendations:

i. A study on the role of government on human encroachment to protected areas.

ii. A study on the impacts of Geographic Information System (GIS) technology in the minimization of human wildlife conflict in Kithoka area should be considered in future research.

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