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## Assessment of Traditional Methods Used by the Samburu Pastoral Community in Human Wildlife Conflict Management

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### Abstract

*Pastoralists and agro-pastoralists living in rangeland areas of Kenya are often on the receiving end from consequences of wildlife interference. Populations of large mammals roam freely in these rangelands. This study was conducted to assess various approaches used by Samburu indigenous pastoral community to manage the human wildlife conflicts in Wamba Division of Samburu East District. The three conservation areas in the Division were taken to form the strata from which 72 respondents were subsequently selected and interviewed. Key Informant Interviews and Focused Group Discussions were also conducted to verify information from interviews. Findings indicate that the major causes of human wildlife conflicts in the area include destruction of crops, livestock predation, competition for grazing and water, increased risk of livestock diseases and direct threats to human life. To mitigate these problems, the Samburu community has adopted: intensified human vigilance, use of guard animals, fencing, use of deterrents and hunting down the problematic wild animals.*

**Key Words:** Human wildlife conflict, loss of biodiversity, indigenous knowledge, livestock predation, resource competition

### 1.0. Introduction

Human-wildlife conflict (HWC) is fast becoming a critical threat to survival of many globally endangered species, including the large and rare mammals (Nelson and Sillero-Zubiri, 2003; MEA, 2005). The conflict occurs when wildlife requirements overlap those of human populations, creating costs to residents and wild animals (Ogada, 2011). Prevalence rate is relatively more experienced where wildlife population density is higher and wild animals often stray into adjacent cultivated fields or grazing areas. Typical examples are reported for some regions in Africa where 80% of elephants ranges exist outside legally protected areas (Muruthi, 2005 & Ogada *et al.*, 2003).

Biodiversity conservationists argue that human-wildlife co-existence is not only achievable, but desirable because appropriate management and conservation of wildlife is a means to poverty reduction among the local communities. However, this raises one fundamental question: can wildlife coexist with humans despite the dangers it poses?

Traditional indigenous territories encompass up to 22 percent of the world's land surface that conspicuously coincide with areas that hold 80 percent of the planet's biodiversity (Sobrevila, 2008). This convergence of biodiversity significant areas and indigenous territories presents an enormous opportunity to expand efforts to conserve biodiversity beyond parks. However, conflicts have emerged from the fact that, in many cases, protected area management have not respected the rights of local populations (BSP, 1993), even though they are the carriers of ancestral knowledge and wisdom about these biodiversity. Indigenous communities' effective participation in wildlife conservation programmes just like experts could results into more comprehensive and cost effective conservation and management of biodiversity worldwide (IUCN, 2010). Nonetheless, most traditional communities such as the Samburu have continuously used their indigenous knowledge to mitigate the effects of HWC within their locality. Of concern is the uncertain status of the indigenous knowledge that reflects many generations of experience and problem-solving by thousands of ethnic groups across the globe (Ola Adams, 1998). Very little of this knowledge has been recorded, yet it represents an immensely valuable database that provides insights on how different communities continue to survive where wildlife, people, and livestock all interact and compete for the same natural resources therefore increasing the rate of conflicts (Verschuuren, 2006).

According to Hoare (2001), almost all wild animals species have the ability of causing property destruction or inflicting injury to people, even though the big ones are potentially dangerous species, those that gather round in large groups, and the ones that are most wide ranging are more likely to cause problems than smaller species with restricted ranges. This argument is echoed by Ogada and Ogada (2004) who conducted a study in Samburu District and documented the species of wildlife responsible for killing livestock. His findings indicated that deaths were due to: lions (35% of reported deaths), leopard (35%), hyena (18%), baboon (4%), elephants (3%), buffalo (2%), wild dog (2%) and cheetah (1%).

To mitigate the problems of HWC, wide range of different strategies have been applied worldwide including: prevention, mitigation and protection strategies most of which are site and species/genera specific measures. A prevention strategy endeavors to circumvent the conflict from occurring in the first place through taking action towards addressing its root causes. The stratagem includes eradication of the wild animals, managing the size of the population through killing or controlling reproduction, regulated harvesting or cropping, fertility control, use of physical barriers, fear provoking stimuli, guarding crops and livestock, application of chemical repellent, use of diversions, land use modification and voluntary human population resettlement. However, mitigation strategies attempt to reduce the level of impact and lessen the problem with the main difference between the two options being the moment at which the measure is implemented. On the other hand, protection strategy is implemented when the conflict is certain to happen or has already occurred. Examples include: Problem Animal Control (PAC), translocation of wildlife, incentive programmes, insurance programmes, compensation systems and community based natural resource management schemes (Ogada *et al.*, 2003; Stander, 1990).

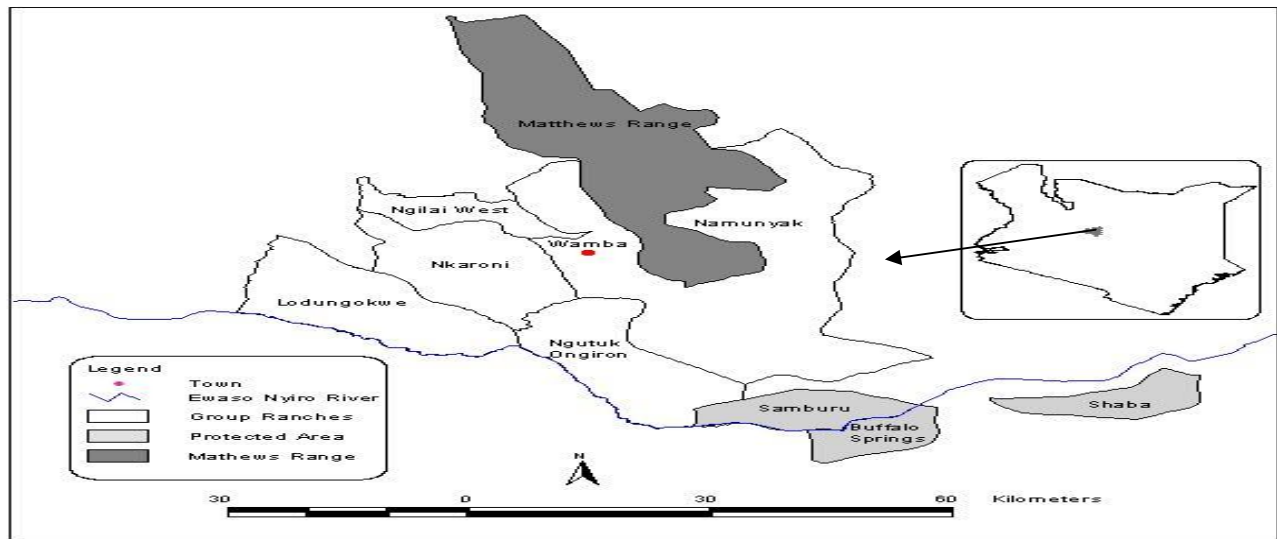
Different traditional communities have fostered belief systems as well as social norms that encouraged or even enforced limits to exploitation. This is ensured because of dependence of the people on biological resources for economic and cultural purposes. To this effect, several indigenous human wildlife conflict management methods have been adopted by most aboriginal communities. The purpose of our study is to assess the effectiveness of these methods among the Samburu community. The tribe is among the traditional community in Kenya whose culture is characterized with rich knowledge and belief system often bolstered in the management of wildlife resources. The HWC management methods considered in the study includes; intensifying human vigilance; use of guard animals; fencing; use of deterrents and killing of the problematic animal.

## **2.0. Material and Methods**

### **2.1. Study Area**

The study was carried out in Rift Valley Province, Samburu District in Wamba Division. Data was collected within three community wildlife conservation units including Ngutuk Ongironi, Lodungokwe and Nkaroni (Figure 1). The district is characterized with arid and semi-arid climatic conditions. The district receives low and unreliable rainfall. The mean annual rainfall is about 500mm falling in two rainy seasons. The long rainy season occurs during March – May period, while the short rainy season is experienced between October and November. Frequent and persistent drought lasting several months is a key feature of the study area. In addition, the study area suffers from scarce surface water resources.

Ewaso Nyiro River, which drains along the southern end of the district boundary, is the only permanent water source in the area. Against high rate of evapo-transpiration and limited technological capability, the low and unreliable rainfall seriously limits livelihood options in the area. In terms of ecosystem richness, the area has rich faunal biodiversity including 51 species of large and medium sized mammals, 153 species of birds, 22 herpetofaunal species (4 amphibians and 17 reptiles) with lizards (14 species) (De Jong & Butynski, 2010). Most of these animals are threatened species like the wild dog (*Lycaon pictus*), African elephant (*Loxodonta africana*) and Grevy's zebra (*Equus grevyi* Oustalet) (Williams, 2002).



**Figure 1: Map of research area. Right: Map of Kenya illustrating the geographical position of Samburu East District. Left: Samburu East District indicating the wildlife conservancy boundaries (Adopted from Mariita et al., 2010).**

## 2.2. Cultural Background

Samburu is a Nilotic speaking tribe that inhabits Kenya's northern plains. They are nomadic pastoralists, moving from one place to other following patterns of rainfall in search of fresh pasture and water for their cattle, camels, goats and sheep. The communities are the original breeders of indigenous livestock such as East African Zebu Cattle and Maasai Sheep. The animals are particularly suited to local conditions because of adaptation to genetic development through natural selection process and are reared through indigenous rangeland management. Their huts are made of dung supported using branches from trees and surrounded by a fence of thorny bushes from the acacia tree and other types of thorny bushes. Women are responsible for making the huts, milking cows, gathering firewood, fetching water and general maintenance of the homestead. The men take care of the animals. They also wear multi-beaded necklaces, bracelets and earrings some which are made from the wildlife products. Samburu warriors (*morans*) paste their hair with red ochre to create a visor to shield their eyes from the sun. They also have many traditional ceremonies where wildlife products are used for different cultural meanings.

## 2.3. Methods

This study made use of both secondary and primary data. Primary data was collected through administration of questionnaires to the head of the household and interviews with key informants within the three community wildlife conservation areas (Ngutuk Ongiron, Nkaroni and Lodungokwe). Samburu pastoralists live in manyattas (a large fenced homestead) comprising several households. Manyattas were first identified and enumerated. Stratified – simple – random sampling was used to identify households for the study. The three conservation areas formed the strata for sampling. From each stratum a sample size of 24 households was taken. A total of 72 heads of household were interviewed, six Key Informant Interviews (KIIs) conducted and three Focused Group Discussions (FGDs) were conducted. The FGDs was conducted in each stratum to consolidate information collected from other sources. The people participating in KIIs were selected based on knowledge, attitudes and practices (KAP) survey with the help of local conservancy management.

They included local elderly people, opinion leaders, community wildlife conservancy personnel and the local administrators. These interviews were conducted in vernacular (Samburu) translated by local field assistants between July 2011 and August 2012

### **3.0. Results and Discussions**

#### **3.1. Indigenous Importance of Wildlife Animals**

The importance of wildlife to Samburu pastoral community can be categorized into different groups. These include the use of body parts, cultural values, nutritional values and medicinal values. Starting with traditional uses of body parts; different body parts of various wildlife species are used by the community in their daily activities. These include the use animal skin / hide for bedding or clothing and horn of the Greater kudu for communication during communal activities or alerting others. Animal bones were also used as weapons while piece of hide (from eland and buffalo) cut into strings and used for tethering livestock or currying firewood. The warriors, *morans* also made ivory earplugs from the elephant tusks. Nevertheless, many warriors fear arrest for being in possession of ivory by Kenya Wildlife Service personnel or the police in towns hence no longer use the earplugs. The Samburu ritual leaders (*Launoni*) also wore an ivory finger ring to signify their importance and status in the tribe. Before the *Kishili* age set, all spiritual leaders wore elephant tail tips, *lenyau*, on their chest. But the colonial government and the new government outlawed the practice (Kahindi, 2001).

The communities also have different cultural beliefs on wildlife existence that has enable them to live alongside the animals harmoniously. This includes the myths, legendary and cultural beneficial attachment they have with different wildlife species. For example, some animal are regarded as having totemic importance hence treated with caution to avoid the bad curses (*ndarunoto*) from the animal e.g. baboon and elephant, while others helps in prediction of different weather conditions by producing certain sounds e.g. zebra predicting rainfall . Another aspect of cultural belief in the community is use of the elephant dung in making of the “white house” (*Ngajinaibor*) for the newly wedded wife. The young elephant’s dry dung (*modei Itome*) is also used during the marriage ceremony to make the first fires as a symbol of unity. The dung must be from a young calve that has not committed any “crime” of killing somebody or livestock.

In terms of nutritional values, community being semi-nomadic pastoralists, they are extremely dependent on their livestock for survival and source of livelihood. Their diet consists mostly of milk, meat and sometimes blood from their cows. Nonetheless, during drought seasons when animals were away from the homestead, the community diverged to the wildlife and hunt for bush meat. Interviews with different key informants indicated that Samburu people hunted only some kinds of wild animals for food, especially those that resemble livestock. Such as giraffes, antelopes (eland, gerenuk, grants gazelles, Oryx, dik dik except the kudu) and buffalo. Moreover, no Samburu social segment ate pig-like animals like warthogs or bush pigs; reptiles and amphibians, insects (except honey from bees) or donkey-like animals. The rhino, which became extinct from the Samburu landscape in 1989 is also said to be a special source of food for the elders belonging to *Lngiro* clan particularly to the *Lmarikon* and *Lkileku* age sets.

On the other hand, the community also derives ethno-medicine and ethno-veterinary medicine from the wildlife products. Animals with medicinal values include giraffe, whose skin is roasted into ashes then diluted with water then used as medicine to cure chest pains; the other is dik dik from which the soup of its meat is given to children to cure respiratory problems while body fat of a lion was used to treat very chronic illnesses in the community.

#### **3.2. Causes of Human Wildlife Conflict in Samburu**

In Kenya, HWC has been escalating due to human population growth, land use transformation, species habitat loss, degradation and fragmentation, growing interest in ecotourism and increasing access to nature reserves, increasing livestock populations and competitive exclusion of wild herbivores, abundance and distribution of wild prey, increasing wildlife population as a result of conservation programmes, climatic factors and stochastic events (Muruthi, 2005; Ogada *et al.*, 2003 & KWS, 1996). More than half of the wildlife habitat in the country is outside protected areas (PA) in communal grazing lands and group ranches, where wildlife, people, and livestock all interact and compete for the same natural resources therefore increasing the rate of conflicts (Kameri-Mbote, 2005).

The existing conservation policies also tend to ignore the needs of the local communities by attaching a higher premium on wildlife over human needs hence the changing perception towards conservation (Hackel, 1999). HWC also arise from a range of direct and indirect negative interactions between humans and wildlife. These can culminate into potential harm to all involved, and lead to negative human attitudes, with a decrease in human appreciation of wildlife and potentially severe detrimental effects for conservation (Nyhus *et al.*, 2000). The respondents identified a number of negative impacts from human wildlife interaction, these include; disease transmission, competition over pasture and water, livestock predation, human injury / death and cultural change due to influence of western culture from the tourists. The findings were similar to results by Mwele *et al.*, (2011) who conducted a disaggregated analysis of human wildlife conflict in Ngutuk Ongiron, Lodungukwe, Ngilai West, Nkaroni conservation areas and Namunyak Community Conservancy.

### 3.2.1 Livestock predation

Livestock is the mainstay of the economy in the Samburu society. It is also the major medium of exchange and food during social-cultural occasions including marriage, circumcision, religious sacrifices and cultural exchange or compensation. The number of livestock one hold indicates the wealth of a family. Livestock predation was the greatest concern of the community in Ngutuk Ongironi and Londungokwe areas. The main predators identified were; hyena, leopard, elephant, cheetah and lion (Plate 1). The hyena, leopard and cheetah had most impact because of high predation on shoats, while the lion concentrated on the cattle. The elephant also created conflict at the watering point in the community dam. Through FGD with resource persons from the local conservancies' management indicated that numerous reports of livestock predation had resulted into losses to the families affected.

According to Murithi (2005), compensation system in Kenya for domestic animals killed by wildlife predators as well as compensation scheme for loss of human life or injury has been in place quite some time. According to the policy, the family concerned is compensated with about US\$400 for loss of life (Wanjau, 2002). This is not even enough to meet funeral expenditure or treatment bills (Obunde, Omiti and Sirengo, 2005). Nor does the system take into account the impact of such occurrences on dependent children whose education is affected for lack school fees. Nevertheless according to Kenya Wildlife Service (KWS), the issue of compensation for losses caused by wildlife is a matter being taken seriously by the KWS management and has been clearly stipulated in the Wildlife Bill to be discussed and enacted by the Parliament.



*Plate 1: A man holding a young sheep attacked by the jackal in Westgate*

### 3.2.2. Competition over Pastures and Water

The survey indicates that most of respondents in Nkaroni and Londungukwe conservation areas considered competitions over these two critical resources as one of the ubiquitous problem of wildlife. However, they clarified that this occurred only during the dry season and the main competitor was the elephant. The respondents further elaborated that the competition from the elephant is not only limited to pasture, but also extends to the consumption and destruction of the acaciatrees, which livestock highly depend on during the dry season.

Some of the trees pulled down by the elephant also have ethno-medicinal and ethno-veterinary values such as; *Acacia mellifera*, *Acacia nilotica* and *Albizia anthelmithica* (Omondi, 2011). In terms of water resources, the competition is not much for the amount of water the wildlife consumes, but the state of water after the animal's use. The respondents explained that when the Grevy's zebra urinate on water point, livestock would not drink the water from the same contaminated point. The elephants also chased way community members from the water. This means that the people have to spend more time at the water point waiting for the elephant to move.

### **3.2 3.Disease Transmission**

Respondents identified wildlife to livestock disease transmission as the other impact from human-wildlife interaction. The numbers of responses were highest in Ngutuk Ongironi followed by Londungukwe then Nkaroni. These diseases include rinderpest (*lodwa*) from buffalo, *malignant catarrhal fever (poroto)* from primates, nagana disease (*saar*). These diseases mostly attack during the dry season. There is also reported anthrax outbreak that occurred between December 2005 and March 2006. The outbreak affected equids including the endangered Grevy's zebras (*Equus grevyi*), plain zebras (*Equis burchelli*) and donkeys (*Equus asinus*) (Muoria *et al.*, 2007) An outbreak of rinderpest in Kenya resulted in its transmission to wild grazers with death rates in the mid-1990s reaching 60% of buffalo and 90% of kudu in some areas (Osofsky *et al.*, 2005). Other identified impacts of HWC include human injury and death incidences; these however are not common occurrence. Besides there is cultural change because of increased interaction with people from different cultures especially the tourists.

### **3.3. Indigenous Human Wildlife Conflict Management Methods**

#### **3.3.1. Intensifying Human Vigilance**

Vigilance is an important component of crop or livestock protection and human wildlife conflict management used by the Samburu community. The fear of humans normally dissuades animals from committing damage. Guarding herds and taking steps to actively defend them are essential features of animal husbandry bestowed on the *Morrans*. They are effective and fearless in warding off predators, and are reported to challenge and scare away dangerous carnivores such as lions, hyenas and cheetahs with nothing more than simple weapons such as spears and knives. On the other hand, some species such as baboons show less fear, and simple vigilance therefore gives less effective results. Determined troops of baboons can intimidate guardians, particularly women, who are often chased away. Baboons will adapt rapidly to measures taken against them and are remarkably quick to find weaknesses in the guarding of crops.

From the survey 89% (n= 72) of the respondents felt that the use of human vigilance to mitigate HWC is effective. These respondents stated that the method is effective because, most predators such as the wild dog, hyena and the jackal avoid attacking the livestock in the presence of man. On the other hand, 11% of the people interviewed consider the method not fully effective because some predators such the lion and cheetah can still attack the animals in the presence of the herder.

#### **3.3.2. Use of Guard animals**

The Samburu uses guard animal to provide an alternative to a herder monitoring a flock, which is labor-intensive, time-consuming and costly. To be successful, a guard animal is usually bond with the animals they are to guard. This bonding, combined with the guard animal's natural aggression toward predators, makes a guard animal an effective protector (Stander, 1990). Among the Samburu, dogs used effectively in protecting homesteads and livestock from attack by predators. The dogs are trained to alert people on the presence of predators, rather than chasing predators. These dogs are raised from puppyhood with sheep or cattle and live with the herd full-time to create the bonding. From the survey, 95% (n= 72) of the respondents, said the use of dog is effective in controlling HWC. The reasons given included the fact that the dog usually chases the predator away like the hyena or alert people of its presence especially at night. Only 5% of the respondents consider the method not fully effective because the guard animal itself can be a prey to some of the wildlife like the leopard, hence the dog will instead run away from it. The affectivity of the dogs in controlling HWC also depends on how it has been trained by the owner as the "lazy" may not notice the predator when attacking livestock according the respondents.

#### **3.3.3. Fencing**

Fences are usually constructed using branches thorny acacia trees (Plate 2). The fences act as protection against wildlife on animal and people. The animal enclosures are usually made at the center of the *Manyatta* separate for the cattle and the shoats. According to the respondents, only 17% (n=72) were fully satisfied with fencing as a method of controlling HWC while 2% disagreed, 15% neither agreed nor disagreed, 54% agreed while 12% strongly disagreed (Figure 2). The respondents who were not fully satisfied with fencing as a method of controlling HWC gave various reasons for their answers. The explanation given included: some predators such as leopard and lion can jump over the fence and attack the livestock, the fence requires frequent repairs and it needs specific type of thorns to be effective. Some respondents even suggested that if fencing is done using chain-link wire, it will be very effective unlike the acacia thorns used by the Samburu community. This idea is also supported by the outcome of a project pioneered by AWF in the area.



Plate 2: A Fence enclosure to protect livestock in the Samburu community

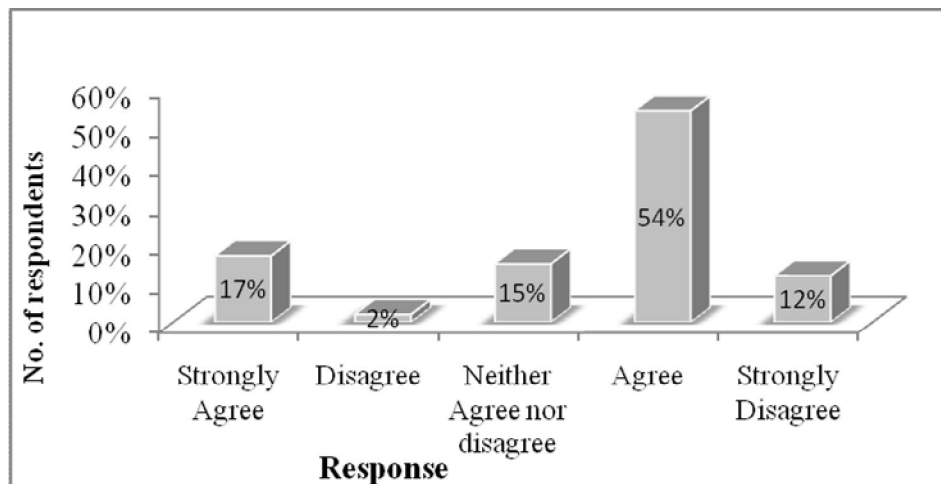


Figure2: Evaluation of fencing controlling HWC method

**3.3.4. Deterrents**

Deterrent methods are designed to repel animals from the targeted resource. They can be grouped into several categories according to the sense they target: hearing, sight, smell, taste and touch. Acoustic deterrents are those that shock wildlife away by emitting an unexpected loud noise or specific sounds known to scare wildlife. Among the Samburu, traditional acoustic methods that are widely used by agropastoralists throughout, mainly against elephants includes beating drums, tins and trees; using whips in addition to shouting, yelling and whistling.

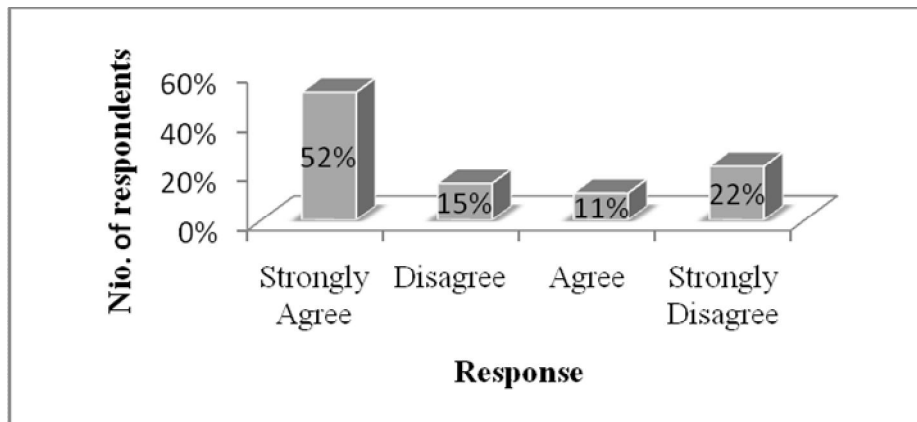
Whereas visual deterrents are the traditional methods involving use of brightly colored cloths and plastic hanged from a simple fence at the edge of fields such as scarecrows (Plate 3).



The other visual deterrent used by the community is the use of flames and smoke of fires lit on the fields by the *morrans* at night to scare away the carnivorous animals from attacking the livestock. Fires at field boundaries or at elephant entry points to fields also serve as a short-term deterrent; however fire lighting is considered unsustainable for any length of time without large tracts of forest being cut down or even lit over.

On the other hand, contact deterrents are the methods that target the sense of touch. For example agropastoralists throw rocks, burning sticks and, occasionally, spears at crop-raiding elephants, zebras and baboons. While deterrent techniques are widely used, they are not effective in the long term. Some animals learn that they pose no real threat and then ignore them. This therefore calls for application of both modern and traditional methods of HWC management to become effective (Muruthi, 2005). From the survey, 52% (n= 72) of the respondents fully agreed that the use of different deterrents are effective in controlling HWC while 15% disagreed, 11% agreed with 22% strongly opposing the method (Figure 3). Those who strongly feel that the method is effective in controlling HWC said that most animals are scared away by the visual deterrents such as scarecrows and open fires. But those not fully satisfied with the method said that most animals such as hyenas usually get used to the scarecrows and neglects its presence and attack the livestock.

According to a study conducted by Hillman-Smith *et al.*, (1995), local communities surrounding Garamba National Park in the Democratic Republic of Congo have been using other materials to increase the deterrent effect of fire. They add capsicum seeds to fires to make it more effective on wildlife, while in Zimbabwe ‘brickettes’ of elephant dung mixed with ground chillies are used (Hoare, 2001).



**Figure 3: Evaluation of the use of deterrents in controlling HWC**

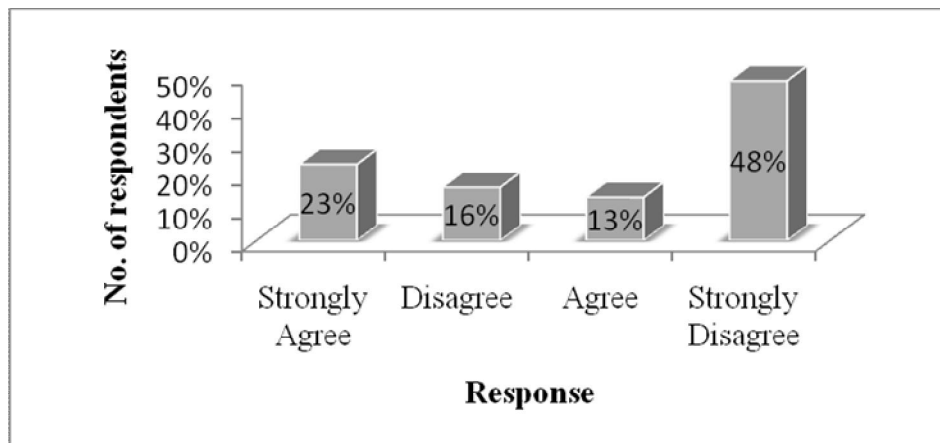


**Plate3: Example of Scarecrow put a within Samburu Manyatta**

### 3.3.5. Killing the Animal

Killing the problematic animals has been, and still is, widely used as a quick-fix solution to human wildlife conflicts. It allows the locals to demonstrate a show of force to appease the affected people. The communities generally believe it will provide a lasting solution, as well as being an obvious act of retribution. Killing is also legally allowed under the Problem Animal Control (PAC) through which a managed shooting is normally carried out by trained wildlife personnel operating as problem animal control teams. On a PAC program, attempts are made to identify a 'culprit' animal that is a known and persistent crop raider, livestock predator or has caused a human fatality. When properly managed, every animal shot is recorded and reported to the correct authorities. Unlike commercial hunting, there is normally no quota or limit set for PAC (Nelson *et al.*, 2003).

From the survey, 23% (n= 72) of the respondents said that they are fully satisfied with killing as method of controlling HWC, while 16% disagreed, 13% agreed and 48% strongly disagreed (Figure 4). Most respondents who disagreed with the method were against it because it's an illegal activity and due to the misidentification of the specific culprit by the locals. The respondents also elaborated that killing leads to extinction of different wildlife species from the area. This would impact negatively on the tourism activities from which the community has seen several infrastructural developments such as schools and hospitals. On the hand the respondents who were fully satisfied with the method said that killing is beneficial especially when some predators became extremely disturbing an example of an old weakened lion that is unable to prey on the wildlife and has turn to preying on man and livestock as the only source of food needs to be killed.



**Figure4: Evaluation of the use of killing as a method of controlling HWC**

According to Hoare (2001), killing has the advantage that it does have some effect (even if short-term), it is relatively cheap and quick, and it has good public relations value in the affected community. However, shooting 'problem' animals often has only a short term effect and it is difficult to identify the culprit animals. PAC also has little or no effect on other animals at the same time; the method requires skilled personnel as it can be dangerous to execute.

### 4.0 Conclusion

Protected areas and the presence of wild animal populations inflict costs on local indigenous communities and can wear down community support and tolerance. In turn, indigenous people (the locals) can develop a negative attitude towards reserves and wildlife, exacerbating the conflict and undermining conservation efforts. In order to break this cycle, there is a need to protect rural livelihoods, reduce their vulnerability, and counterbalance losses with benefits and foster community-based conservation. Both people and wildlife suffer tangible consequences and different stakeholders involved should commit themselves to tackle and resolve the conflict in the near future.

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## References

- Biodiversity Support Program (1993). African Biodiversity: Foundation for the Future; Framework for Integrating Biodiversity Conservation and Sustainable Development. Professional Printing, Inc., Beltsville, Maryland.
- De Jong, Y. & Butynski, T. (2010). Assessment of the primates, large mammals and birds of the Mathews Range Forest Reserve, central Kenya, (Unpublished report to The Nature Conservancy, Washington D.C.).
- Hoare, R.E. (2001). A decision support system for managing human-elephant conflict situations in Africa. Pages 1-110. IUCN African Elephant Specialist Group Report.
- Hackel, J. D. (1999). Community Conservation and the future of Africa's Wildlife. *Conservation Biology*. 13(4): 726-734.
- Hillman-Smith, A.K.K., de Merode, E., Nicholas, A., Buls, B. & Ndey, A. (1995). Factors affecting elephant distribution at Garamba National Park and surrounding reserves, Zaire, with a focus on human-elephant conflict. *Pachyderm*, 19: 39- 48.
- IUCN (2010). Indigenous Peoples in the IUCN Programme. Submission of the International Union for Conservation of Nature (IUCN) to the 9th Session of the UNPFII New York City, 19-30 April 2010.
- Kahindi, O. (2001). *Cultural perceptions of elephants by the Samburu people in northern Kenya*. MSc Dissertation, (Strathclyde, UK).
- Kameri-Mbote, P. (2005). Land Tenure, Land Use and Sustainability in Kenya: Towards Innovative Use of Property Rights in Wildlife Management, (IELRC Working Paper, Geneva Switzerland), 14-18.
- Kenya Wildlife Service (1996). Wildlife-human conflicts, Sources, Solutions and Issues. [www document] Available at: <http://www.safariweb.com/kwild/wildlife.htm>.
- Mariita, R. M., Ogot, C.K.P.O., Oguge, N.O. & Okemo, P. O. (2010). Methanol extract of three medicinal plants from Samburu in northern Kenya show significant antimycobacterial, antibacterial and antifungal properties. *Res. J. med. Plant* 2-10.
- Millennium Ecosystem Assessment, (2005). *Ecosystems and Human Well-being: A framework for assessment*. A report of the Conceptual Framework Working Group of the Millennium Ecosystem Assessment. 2005, 236.
- Muoria, P.K., Muruthi, P., Kariuki, W., Boru, H., Mijele, D., and Oguge, N. (2007) Anthrax outbreak among Grevy's zebra (*Equus grevyi*) in Samburu, Kenya. Blackwell Publishing Ltd, Afr. J. Ecol.
- Muruthi, P. (2005) Human Wildlife Conflict: Lessons Learned From AWF's African Heartlands. Unpublished report to AWF. AWF, Nairobi.
- Mwele, E., C. Mireri & N. Oguge (2011) The Socio- Economic Impacts of Community Based Wildlife Conservation in Samburu District, Kenya. Hekima Journal of Humanity and Social Sciences. Volume V, Number 1, 2011. Page 81-94.
- Nelson, A. Bidwell, P. and Sillero-Zubiri, C. (2003). A review of humane elephant conflict management strategies. People and Wildlife Initiative. Wildlife Conservation Research Unit, Oxford University.
- [www.peopleandwildlife.org.uk/crmanuals/HumanElephantConflictP&WManul](http://www.peopleandwildlife.org.uk/crmanuals/HumanElephantConflictP&WManul)

- Nyhus, P. J., Tilson, R. & Sumianto. (2000). Croppraiding elephants and conservation implications.
- Obunde, P., Omiti, J., & Sirengo, A.N. (2005). Policy dimensions in human-wildlife conflict in Kenya: Evidence from Laikipia and Nyandarua District. Nairobi, Kenya : Institute of Policy Analysis and Research.
- Ogada M. (2011) A rapid survey on selected human-carnivore conflicts to assess impacts of drought and effects of a compensation scheme in Kenya. . A Consultancy Report to Panthera Corporation, NY.
- Ogada, O. O., R. Woodroffe, N. O. Oguge, L. G. Frank. (2003). Limiting depredation by African carnivores: the role of livestock husbandry. *Conservation Biology* 17(6): 1521-1530.
- Ogada, O.O. and D.L. Ogada, (2004). Factors influencing levels of carnivore-livestock conflicts in Samburu Heartland and proposed mitigation measures. Unpublished consultancy report to African Wildlife.
- Ola Adams, B.A. (1998). Traditional African knowledge and strategies for the conservation of biodiversity prospects and constraints, pp. 33-42, In: *Biodiversity Conservation: Traditional Knowledge and Modern Concepts*. D.S. Alalo, L.D. Atsiatorome and C. Fiati (Eds). Environmental Protection Agency, Accra, Ghana.
- Omondi, S. H. (2011). Conservation of Indigenous Medicinal Plants among the Samburu Pastoral Community in Kenya. Masters Research Project, Kenyatta University. Nairobi.
- Osofsky, S.A., S. Cleaveland, W.B. Karesh, M.D. Kock, P.J. Nyhus, L. Starr, and A. Yang. (Eds). (2005). Conservation and Development Interventions at the Wildlife/Livestock Interface: Implications for Wildlife, Livestock and Human Health. IUCN, Gland, Switzerland and Cambridge, UK. xxxiii + 220pp.
- Sobrevila, C. (2008). The Role of Indigenous Peoples in Biodiversity Conservation; The Natural But Often Forgotten Partners, (World Bank. Washington, DC).
- Treves, A. and Karanth, K.U. 2003. Human Carnivore conflict and perspectives on carnivore conflict: Local solutions with global applications. Introduction. *Conservation Biology* 17 (6): 1489-1490.
- Verschuuren, B. (2006) An Overview of Cultural and Spiritual Values In Ecosystem Management and Conservation Strategies (Foundation for Sustainable Development; Netherlands).
- Wanjau, M.W. (2002). People/crocodile conflicts in Kenya: policy changes required to effectively manage the conflicts. Report to Kenya Wildlife Services.
- Williams, S. (2002). Status and Action Plan for Grevy's Zebra (*Equus grevyi*). In *Equids: Zebras, Asses, and Horses: Status Survey and Conservation Action Plan* (Ed P.D. Moehlman), (IUCN/SSC Equid Specialist Group, Gland, Switzerland).
- World Park Congress, (2003) Recommendation for Prevention and Mitigating Human Worldlife Conflict: IUCN. Available at:  
<http://www.iucn.org/themes/wcpa/wpc2003/outputs/recommendations/approved/English/pdfs/r20.pdf>.