

A Review of Various Options for Alleviating Human-Wildlife Conflicts in Kenya

Wamuyu Lucy Muthui

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**THE KENYA INSTITUTE FOR PUBLIC POLICY
RESEARCH AND ANALYSIS (KIPPRA)**

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PROGRAMME**

A Review of Various Options for Alleviating Human-Wildlife Conflicts in Kenya

Wamuyu Lucy Muthui

Productive Sector Division
Kenya Institute for Public Policy
Research and Analysis

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Abstract

Human wildlife conflict is a severe and growing problem in today's world. Unlike other environmental issues, it involves impoverishment of human communities. It is also causing population declines and may lead to extinction of some wildlife. This study focuses on assessing the levels and types of Human Wildlife Conflict (HWC) in Kenya. Kenya's wildlife is a controversial, yet beneficial renewable natural resource. Human wildlife conflict data from Kenya Wildlife Service (KWS) was used to analyze the type and trends of HWC. To reduce these conflicts, there is need to have good resolution strategies that aim at changing people attitudes. This can be done through education and by ensuring that affected communities benefit from proper wildlife management. Harmonization of both wildlife management and human development goals can help resolve the conflict since it will involve bringing in the two groups together, to come up with a sustainable solution for wildlife and the people. Clear policies regarding wildlife management, compensation and land use can play a vital role in effecting more positive outcomes for HWC.

Abbreviations and Acronyms

AWF	African Wildlife Foundation
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
HWC	Human Wildlife Conflict
KER	Kenya Economic Report
KFS	Kenya Forest Service
KLA	Kenya Land Alliance
KWS	Kenya Wildlife Service
NGO	Non Governmental Organization
PAs	Protected Areas
WCMD	Wildlife Conservation and Management Department

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1. Introduction

1.1 Background

World Parks Congress (2003) defines human wildlife conflict (HWC) as a situation where the needs and behaviour of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife and as such, it is a very common global phenomenon “wildlife” is taken to mean wild animals and vegetation. However, in this study, it is restricted to wild animals meaning animals living in a natural undomesticated state.

Conflict arises from a range of direct and indirect negative interactions between humans and wildlife. HWC has been in existence for as long as landscapes and limited resources have been shared by people and wild animals (Kanga *et al.*, 2011). Conflict occurs in both developing and developed nations worldwide and is not restricted to any geographical location, making affected communities hostile to wildlife conservation initiatives (Kangwana, 1995). It exists in terrestrial, marine and freshwater environments (Distefano, 2005). These conflicts not only occur between humans and large mammals, but involve diverse group of animals with predators and mega fauna estimated to account for approximately equal amounts of human fatalities per year on a global basis (Blair, 2008; Johansson, 2008).

In many countries, studies have shown that the high human population close to protected areas has posed the greatest challenge. Areas where agriculture and livestock keeping are important, livelihoods tend to be in areas where conflict is intense (Distefano, 2005). Competition over natural resources between local communities and wild animals is more intense in developing countries, and locals are expected to meet the costs.

HWC is a major threat contributing to the loss in biological diversity resulting in the extinction or threat of extinction of many endangered species in the world. This is so for large and rare mammal species like the vulnerable African lion *Panthera leo* (Maclennan *et al.*, 2009), Snow leopard or *Uncia uncia* (Mishra, 1997) and natural areas which serve as their habitat. Species most exposed to conflict are more prone to extinction (Ogada *et al.*, 2003). This can either be caused by retaliatory shooting after an attack, poison or capture by humans. These human induced wildlife deaths not only affect the viability of the population

of the endangered species, but also have wider impact on ecosystem equilibrium and biodiversity preservation (Distefano, 2005). Human development and conservation do not seem to get along, resulting into human and biodiversity conflict, while humans try to improve their livelihood, biodiversity on the other hand tries to survive (FAO, 2009). The needs of the local people should be addressed by relevant wildlife authority in matters of HWC as a measure to reduce escalation of the conflict (Madden, 2008).

The high rate of human population growth and demand for more land has intensified conflicts worldwide (IUCN, 2003). Moreover, the effect of climate change exacerbates HWC (FAO, 2009). Changes in land use, especially transformation of major wildlife habitats such as forests, savannah and other ecosystems into agriculture areas or urban settlements, has decreased wildlife grazing areas, blocking migration thus elevating conflicts and declining wildlife population (Serneels and Lambin 2001; Thuiller *et al.*, 2006). According to Hazzah (2006), conflict has been known to occur in various situations: people moving into wildlife habitat such as in Shimba Hills, Kenya or when wildlife population move into human occupied lands. This conflict is known to affect the health and safety of humans. HWC takes various forms and causes large losses such as injury and killing of livestock (Ogada *et al.*, 2003; Nyhus and Tilson, 2004; Woodroffe, 2005), crop raid (Naughton, 1998), and death or injury of people (Saberwal *et al.*, 1994). Death and injury to persons is devastating to family and there are unbearable financial losses where agriculture loans are involved. Loss of human life and injuries are the most serious and inflict fear and resentments despite their rare occurrence. Other economic effects of HWC include damage to property, loss of domesticated animals to predators, damage to crops and competition for space (Obunde *et al.*, 2005).

Table 1.1: Forms of human wildlife conflict

Forms of HWC	Animal responsible
Death and injuries to human	Elephants, lions, hippos, crocodiles, snakes and buffalos
Crop damage	Elephants, hippos, baboons, wild pigs, porcupines, buffalos, zebras and birds
Livestock depredation	Lions, leopards, cheetahs, hyenas and crocodiles
Damage to property	Elephants
Injuries to wildlife	Communities as they retaliate

Source: Author's own

HWC is also caused by laws and policies measures particularly those involving wildlife management, since the same law and policies can help mitigate and prevent the problem. According to Anderson and Pariela (2005) unresolved conflict creates negative attitude towards the Government and any new wildlife related developments. The Government needs to understand the urgent need to reduce these levels of conflict to ensure that the people living with wildlife benefit more than they incur in terms of losses.

Human wildlife conflict is a severe and growing problem in today's world. Madden (2000) notes that HWC is aggravated by the rapid land use transformation, an increase in human activities such as settlements and farming in areas adjacent to the protected ones attracting conflict.

In Kenya, land fragmentation and farming in wildlife abundant areas such as Samburu and Kwale has intensified conflict (Kenya Wildlife Service, 1996). Pastoralists like the Maasai are slowly switching to agriculture which puts them in direct conflict with wildlife in the Amboseli ecosystem (Okello, 2006). The escalating conflict between the Asian lions and leopards on the periphery of Gir National park in India is due to land use changes, with large fields of sugarcane, groundnuts and millet creating favourable habitat for predators (Vijayan and Pati, 2002).

In Africa, Siex *et al.* (1999) notes that the rapid human population growth has led to encroachment of wildlife habitats and increasing competition with wild animals. The high population is associated with demand for more land, water and other natural resources, thus intensifying conflicts between people and wildlife worldwide (Kanga, 2011). In the state of British Colombia, human population growth is correlated proportionally with the number of wild animal encounters and serious incidents (Ministry of water, land and air protection, British Colombia, 2003).

Climatic change due to global warming has brought about prolonged drought and severe floods that have contributed to HWC (FAO, 2009). Seasonal change is correlated with livestock predation in Tsavo National Park (Patterson *et al.*, 2004); lions are more likely to attack during the rainy season. Kanga *et al.* (2011) note that the high human hippo conflict incidences recorded in 2001-2002 and 2007-2008 may have been influenced by the drought in 1999-2000 and land use changes that alter hippopotamus habitats.

An increase in livestock population also creates an overlap of diets with wildlife resulting in over grazing and decline of wild herbivore populations (Mishra *et al.*, 2003). In India, livestock has become an important source of prey for predators since the livestock graze in 73 per cent of wildlife sanctuaries and 39 per cent of protected areas (Mishra, 1997).

1.2 Problem Statement

The high rate of human wildlife conflict in the protected and unprotected areas in Kenya in the last few decades has been a matter of concern by the government and other stakeholders involved in conservation effort, due to the cost incurred by the communities living close to these areas in terms of human injury/death and loss of property. Conservation of wildlife has also been affected as people hunt these animals (that is poaching) for their economic gain as well as in retaliation, leading to near extinction of some of the species in the ecosystems. Of importance to note is that previous wildlife policies in Kenya did not take account of compensation where livestock was injured or killed by wild animals. The compensation offered is Ksh30,000 (US\$389) for each person killed (Shikwati, 2003). The emotional costs of these conflicts can be quite enormous. HWC requires comprehensive and innovative management approaches that promote the welfare of affected communities as well as conserve wildlife. There is need for a facilitative policy framework that can sustainably resolve these conflicts.

1.3 Objective of the Study

The main aim of this study is to examine the types and levels of conflicts in Kenya and how they have been resolved and/or managed. Specifically, the study seeks to:

- i. Examine conflict resolution strategies that have been adapted by the stakeholders in the study sites
- ii. Recommend ways for combating human wildlife conflict in Kenya

1.4 Motivation for the Study

It is undisputed that as human and wildlife populations increasingly overlap, so will the risks to and from wildlife (Berchielli *et al.*, 2003).

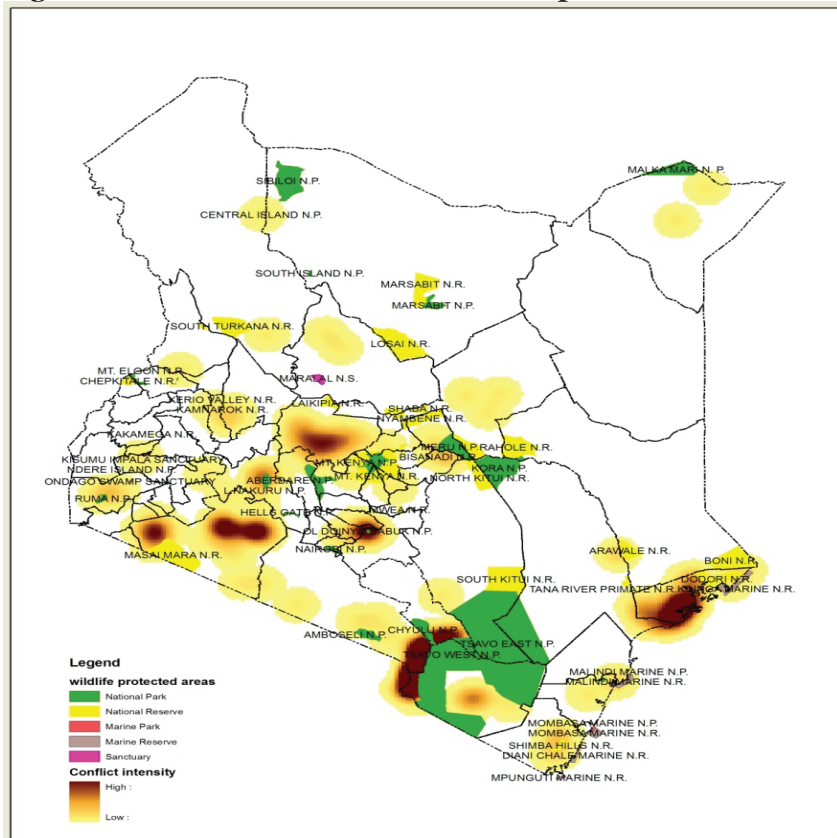
Therefore, there is urgent need to reduce human wildlife conflict. It is clear that existing wildlife policies in Kenya are inadequate. The absence of these policies or their inefficiency increases tension between wildlife authorities and local people. With associated losses, it is appropriate to have efficient policies, legal and institutional frameworks that address wildlife damage.

2. Literature Review

2.1 Human Wildlife Conflict in Kenya

Kenya's wildlife is a controversial yet beneficial renewable natural resource. The country is one of the richest with wildlife diversity in Africa. Several of its protected areas are internationally recognized and protected as World Heritage Sites. Wildlife is one of Kenya's greatest natural resource and is the foundation upon which nature-based tourism, one of the country's most important foreign exchange earners is based. Wildlife resources contribute directly and indirectly to the local and national economy through revenue generation and wealth creation, wildlife accounted for 70 per cent of the gross tourism earnings, 25 per cent of the Gross Domestic Product (GDP) and more than 10 per cent of total formal sector employment (Ministry of Tourism and Wildlife, 2007). In addition, wildlife resources provide important environmental goods and services for the livelihood of the people and productive sectors. The economic value of wildlife is realized through wildlife-based tourism, and that remains the primary justification for wildlife conservation in Kenya, with emphasis on popularizing wildlife management and conservation as a profitable land use form.

Wildlife in Kenya is owned and controlled by the government. Traditionally, human beings and wildlife share resources such as land, vegetation and water. Conflicts did not affect the survival of either people or wildlife because there was adequate land and this prevented confrontation. In 1898, the colonial government enacted the first Wildlife Legislation to control indiscriminate hunting. As a result, these alienated communities from managing a resource that they lived with (Kenya Lands Alliance, 2005). Forceful evictions to create room for national parks and reserves contributed greatly to the impoverished status of many communities, since it depicted people bordering wildlife areas as the greatest threat to the wildlife resource, totally ignoring the fact that such people had lived with and conserved wildlife for hundreds of years (Chiemelu, 2004). HWC is widespread and exists practically in all the districts with the following areas being the major hotspots: Laikipia, Narok, Tsavo ecosystem, Lamu, Imenti South and Amboseli (Figure 2.1).

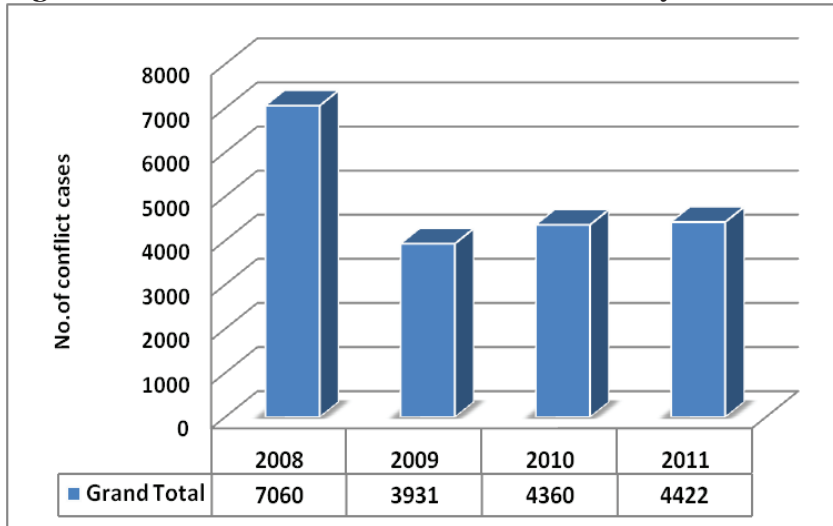
Figure 2.1: Human wildlife conflict hot spots

Source: Kenya Wildlife Service (KWS)

In Kenya, conservation boundaries are not so clear, creating the conflict between land use patterns close to wildlife habitats and their surrounding areas, which are normally used for human settlement, pasture land and farmlands. Human wildlife interface surrounding conservation sites in Kenya is characterized by frequent conflictive relationship between humans and their wildlife neighbours. Various wildlife conservation policies have been taken up with varying levels of success. The main problem occurs when wild animals invade farmlands, destroy crops, and injure or kill people who are unable to economically bear the cost.

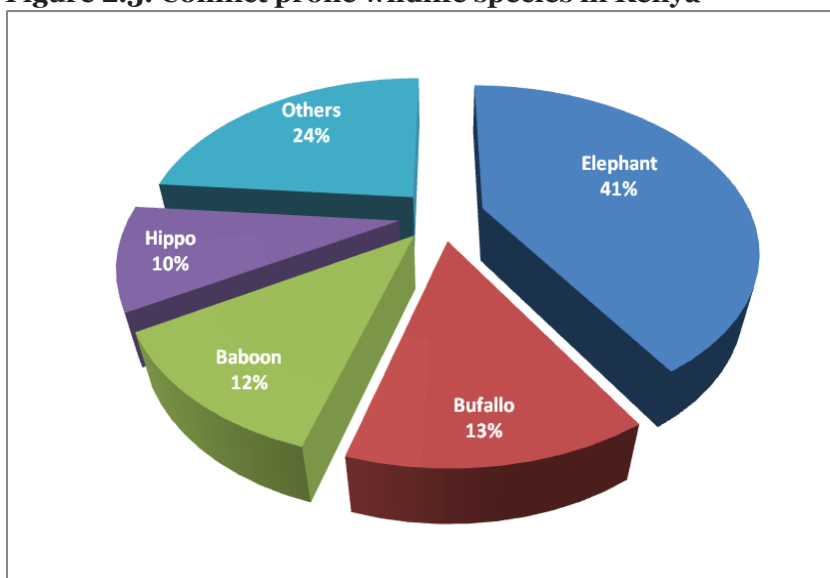
The inadequate wildlife policies that compensate for costs relating only to human death and injury, leaving out other losses such as predation and property destruction, have worsened the situation. Lack of benefits from wildlife tourism has contributed to lack of interests by

Figure 2.2: Human wildlife conflict cases in Kenya



local communities to support wildlife conservation initiatives. Wildlife policy and legislation tends to favour wildlife over local communities (Obunde *et al.*, 2005). Most of the conflict occurs in lands that border protected areas. These areas are crucial since they are dispersal and migratory corridors for wild animals; for example, Shimba Hill in Kwale and Kitengela which are dispersal areas for wild animals in Nairobi National Park. HWC could evolve into a major crisis if a clear solution is not immediately found (Ogodo, 2003). Approximately 70-90 per cent of the wildlife in Kenya lives and roams freely outside protected areas (PAs) on to private people's land (Chiemelu, 2004; Kenya Economic Report, 2010). Since some wild animals rely on other animals as their source of food, this brings conflict with humans. This is common in areas where wildlife has been replaced with livestock (Ramakrishnan *et al.*, 1999; Saberwal *et al.*, 1994). When carnivores attack humans and livestock, campaigns to eradicate them are inevitable (Woodroffe, 2000). In response to the conflict, humans clear out the wildlife habitat as well as perceived threats (Treves & Naughton-Treves, 2005; Woodroffe & Frank, 2005).

HWC is partly to blame for poor living conditions of the people living close to the wildlife due to poor resource management. Management methods often do not take into account the local people living with the animals, since in most cases, they do not cooperate with the wildlife and conservation authorities. This is so because most management methods do not account for the needs of the local people that live close

Figure 2.3: Conflict prone wildlife species in Kenya

Source: Kenya Wildlife Service (KWS)

to the animals. Local people need to benefit from tourism earnings gained from game viewing. These are the people who interact with the wild animals and if they can generate income from wildlife, this might create some conservation interest and, to some extent, reduce conflict. Aldrich-Moodie and Kwong (1997) states that poor communities of the world must make a living from their natural surroundings or else they will have little incentive to conserve them, including wildlife. If local communities living around PAs made money from wild animals, these animals would become assets and there would be reasons for conservation.

Wildlife is valuable to some people in Kenya, but not to the subsistence farmers whose crops are destroyed, livestock predated upon and human life lost. As HWC intensifies, the local communities view wildlife as liabilities that occupy land (and other natural resources) that could otherwise be used for more beneficial activities, while conservationists and hotel industry value wildlife due to their contribution to tourist attraction, employment creation and revenue, and would want to jealously conserve it (Obunde *et al.*, 2005). Otieno (2003) notes that the Maasai community has become a victim of wildlife despite having co-existed with animals for years and not benefiting directly from tourism earnings. Lack of compensation for wildlife damages is therefore likely to modify their opinions on wildlife and conservation. With the decrease

in wildlife grazing areas and migration corridors being modified and lost, the conflict intensifies (Thuiller *et al.* 2006). To effectively address HWC, it is necessary to consider both the effects of damage caused by wildlife as well as the impacts of mitigating actions on the conservation status of target species.

Kenya wildlife laws and policies

The first comprehensive policy on wildlife management in Kenya is in Sessional Paper No. 3 of 1975. It recognized the value of wildlife both inside and outside protected areas. It also identified the primary goal of wildlife conservation for returns such as aesthetic, cultural, scientific and economic gains. Economic gains were specifically derived from tourism and consumptive uses of wildlife. Compatible land use was an integral part of the policy along with fair distribution of benefits derived from wildlife. Minimization of depredations on agricultural land by wildlife was underscored. The policy recognized that wildlife needed space outside the protected areas, if it was to survive without intensive management. Additional space would be secured from land owners that were willing to accommodate wildlife. Wildlife Conservation and Management Department (WCMD) was to facilitate, advise, assess and work with land owners and residents in wildlife range areas countrywide.

In 1990, the government revised the Wildlife Act (Conservation and Management Act) Cap. 376 to create Kenya Wildlife Service, a semi-autonomous parastatal to replace WCMD. The word “service” was deliberately used to convey expectations that the body could contribute to the welfare of local communities. The main task of KWS was to ensure the sustainable use of wildlife for economic development and for the benefit of the people living in wildlife areas. KWS was vested the powers of management and control of protecting wildlife in Kenya. The law provided for four types of wildlife protected areas namely; national parks, national reserves, local sanctuaries and game reserves. No human activities were allowed in the national parks (Mbote, 2005).

Responding to increased HWC, compensation was provided to landowners who supported wildlife in their land and for human death caused wild animals. The treasury, a bureaucratic arm of the government, was responsible for paying the compensation and not KWS, and alienating compensation from wildlife management. The amounts of compensation were fixed arbitrarily and did not reflect real costs (Mbote, 2005). KWS further implemented a scheme for revenue

sharing of park entrance fee with the local communities, but it did not function efficiently.

In 1996, KWS attempted to review the Wildlife Act to recognize and include local communities' beneficial participation in wildlife management. The Bill was never presented to parliament (Kenya Lands Alliance, 2005).

In 2004, a private members bill was set to amend the Wildlife Act to fix land tenure prohibiting use of community land without consulting the rights of local communities.

In the Wildlife bill 2011, there is the compensation fund meant to fix the compensation levels for damage caused by wildlife, raising the figure from Ksh 30,000 to not more than Ksh 1 million. Currently, compensation is paid by the government and the rates, assessment and payment of claims are determined by the District Wildlife Compensation Committees¹. The current bill states the need to form "the county wildlife conservation committee" whose function shall be to develop and implement, in collaboration with community wildlife associations, mechanisms for mitigation of human-wildlife conflicts, and review and recommend claims for payment of compensation resulting from wildlife damage. The committee shall also be responsible for verifying the claim and make recommendations as appropriate, submitting them to managing trustees of the Compensation Fund for award and payment (Ministry of Forestry and Wildlife, 2011).

Recently, stakeholders reviewed the Wildlife bill 2011 but there was a misunderstanding over some components of the bill, mainly by the private sector and the local communities.

2.2 Types of Human Wildlife Conflict

2.2.1 Human death, injuries and threats

Human deaths and injuries are less common but are the most severe manifestation of HWC. Large carnivores (lions) and herbivores (elephants and hippos) are responsible for numerous fatal attacks on humans every year. In most cases, humans are attacked as they try to protect their crops, or when they come into contact with wild animals. Elephants and hippopotamuses will rarely deliberately attack humans,

¹[http://www.tourism.go.ke/ministry.nsf/doc/DRAFT_WILDLIFE_POLICY.pdf/\\$file/DRAFT_WILDLIFE_POLICY.pdf](http://www.tourism.go.ke/ministry.nsf/doc/DRAFT_WILDLIFE_POLICY.pdf/$file/DRAFT_WILDLIFE_POLICY.pdf)

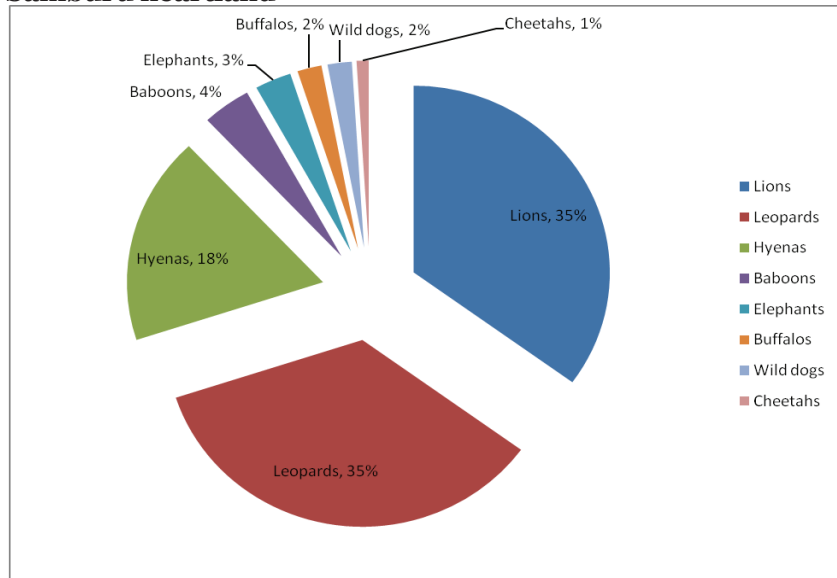
in most cases, deaths occur while people are protecting their crops against raiding animals (usually at night); when people accidentally come into close contact with the animals; and, when people encounter injured animals whose normal sense of caution is impaired. Between January 1989 to June 1994, 230 people were killed by wild animals and 218 injured; more than 200 people were killed by elephants alone between 2000 and 2007 (WWF, 2007a).

Shikwati (2003) had earlier noted 15 people are killed by wild animals each year, 75 per cent being caused by elephants, but current information shows that around 50 people are killed yearly by wild animals in Kenya. Three people were recently killed by elephants in Narok².

2.2.2 Predation on domestic animals and crop damage

According to Woodroffe *et al.* (2005), livestock depredation is probably the most common cause of human wildlife conflict on a global basis. The number and type of domestic animals killed by wildlife varies according to the species, the time of year, and the availability of natural prey (FAO, 2009). Livestock attacks are common in areas where pastoralism is the

Figure 2.4: Domestic animals killed by wild predators in Samburu heartland



Source: Ogada and Ogada, 2004

² The Standard, 11 June 2011.

main source of livelihood. The losses may not be significant nationally but to an individual farmer, they can be catastrophic. Patterson *et al.* (2004) analyzed 312 attacks claiming 433 heads of livestock over a four-year period on two neighbouring arid land ranches adjoining Tsavo East National Park in Kenya. Lions were responsible for 86 per cent of the attacks, while the rest were carried out by hyenas and cheetahs. Lions and hyenas mainly attacked cattle at night, whereas cheetahs attacked smaller sheep and goats. Other smaller carnivores are also responsible for attacks on livestock. Ogada and Ogada (2004) documented in Samburu the wildlife species responsible for killing livestock (Figure 2.4): lions (35% of reported deaths), leopards (35%), hyenas (18%), baboons (4%), elephants (3%), buffalos (2%), wild dogs (2%) and cheetahs (1%).

Livestock depredation by lions, spotted hyenas and cheetahs on two commercial ranches adjoining Tsavo East National Park loss, on average, was 2.4 per cent of the total herd per annum, which represented 2.6 per cent of their economic value amounting to US\$8,749 (Patterson *et al.* 2004). Four hundred and seventy eight goats, 48 sheep and 50 cattle have been killed by crocodiles over 5 years representing an economic value of US\$16,958 in Kibwezi, Kenya (Wanjau, 2000). Due to prolonged drought, lions stray from Nairobi National Park and prey on livestock. In 2003, over 26 cows, 14 goats and 10 sheep were killed by the lions in the Kitengela area alone. This was caused by migration of their prey (Chiemelu, 2004). Due to their small population size and large distribution area, carnivores are vulnerable to declines even when they are not persecuted (Gittleman, 1993).

2.2.3 Wildlife mortality

Human wildlife conflict has adverse impacts on wildlife as well. Between 1974 and 1990, one third of elephant mortalities (141 of 437 deaths) in the Amboseli ecosystem were caused by people, for example through spearing (Kangwana, 1993). Kenya lost 47 elephants to poaching alone in 2007. In 2008, 145 elephants were killed, 271 in 2009, 187 in 2010 and 278 in 2011. The elephant population of many African countries was being decimated until a global ban on the ivory trade was implemented in 1989. Since then, the elephant population in Kenya was estimated to have grown to 37,000 this year, from 16,000 in 1989. The increased

Table 2.1: Known lion killings in Amboseli ecosystem 2001-2006

Year	No. of lions killed
2001*	20.5
2002*	20.5
2003	11
2004	19
2005	17
2006	42

Frank et al., Unpublished data

number is still lower than the estimated 167,000 elephants that roamed Kenya in 1973³.

Reliance on other animals as a source of food is bringing carnivores into conflict with humans. This is common in areas where wildlife has been replaced with livestock (Ramakrishnan *et al.*, 1999; Saberwal *et al.*, 1994). When carnivores attack humans and livestock, campaigns to eradicate them are inevitable (Woodroffe, 2000). In Amboseli ecosystem, the maasai community kills lions whenever they attack their livestock. This has contributed to the rapid decline of lions in Kenya. In

January 2012, three lions were killed by the local people in Kitengela who claimed that KWS was ignoring their complaints about lion predation on livestock⁴.

2.3 Theoretical Literature

Local people often want reimbursement or interventions against HWC, not research. This calls for interdisciplinary collaborations while most managers of HWC are trained in ecological sciences (Treves *et al.*, 2006).

Interventions to manage wildlife have been the main solution that has been commonly used to solving human wildlife conflict (Smith, Linnell, Odden and Swenson, 2000a and 2000b). However, this limits

³<http://www.iol.co.za/news/africa/suspected-poachers-killed-in-kenya-1.1265926>

⁴<http://fonnap.wordpress.com/2012/01/04/three-lions-killed-in-kitengela-over-conflict-kws-respond/>

wildlife managers to solve the conflict effectively, since there is the need to involve humans. It is suggested that participatory planning (PP) can help resolve HWC. Participatory planning is defined as a set of processes through which diverse groups with similar interests engage so as to reach a consensus on a plan and its implementation. It is more than just public participation rather than a process involving engagement and negotiation⁵. Of importance, since HWC involves stakeholders (government, local communities and private institutions), should partner to co-manage wildlife. Co-management can generate ideas that one party alone might not have envisioned and in the long run, secure local support and involvement needed to achieve conservation. Communicating roles and responsibilities clearly between stakeholders with joint objectives that aim at protecting human welfare and reducing threats to wildlife can be successful.

According to Baruch-Mordo *et al.* (2011), most of the conservation tools used to resolve human-wildlife conflict traditionally target removal and translocation of the problem with animals, which have short term success (Linnell *et al.*, 1997; Shivik, 2006). Conservation biologists and wildlife managers recognize that long term solutions should be taken up and include altering human behaviour (Spencer *et al.*, 2007; Baruch-Mordo *et al.*, 2009). Fall and Jackson (2002) state that the most problematic animals are those created by humans and to solve this, humans need to modify their own behaviour. Enforcement of wildlife laws and educating the public are two methods that can change human behaviour. Education has been frequently recommended as a conflict resolution and management tool (Treves and Karanth, 2003), for example studies on how effective education can focus primarily on changing attitudes, behaviour intents and knowledge towards wildlife and conflicts (Dunn *et al.*, 2008).

Wildlife policies and laws are viewed as an important tool in wildlife management and conflict resolution that are set to alter human behaviour and reduce human-wildlife conflict (McCleery, 2009). Jachmann (2008) states that the efficiency of wildlife law has focused mainly on overfishing in Europe and North America or on illegal poaching of wildlife in Africa.

⁵<http://www.rtpi.org.uk/download/1542/Participatory-Planning.pdf>

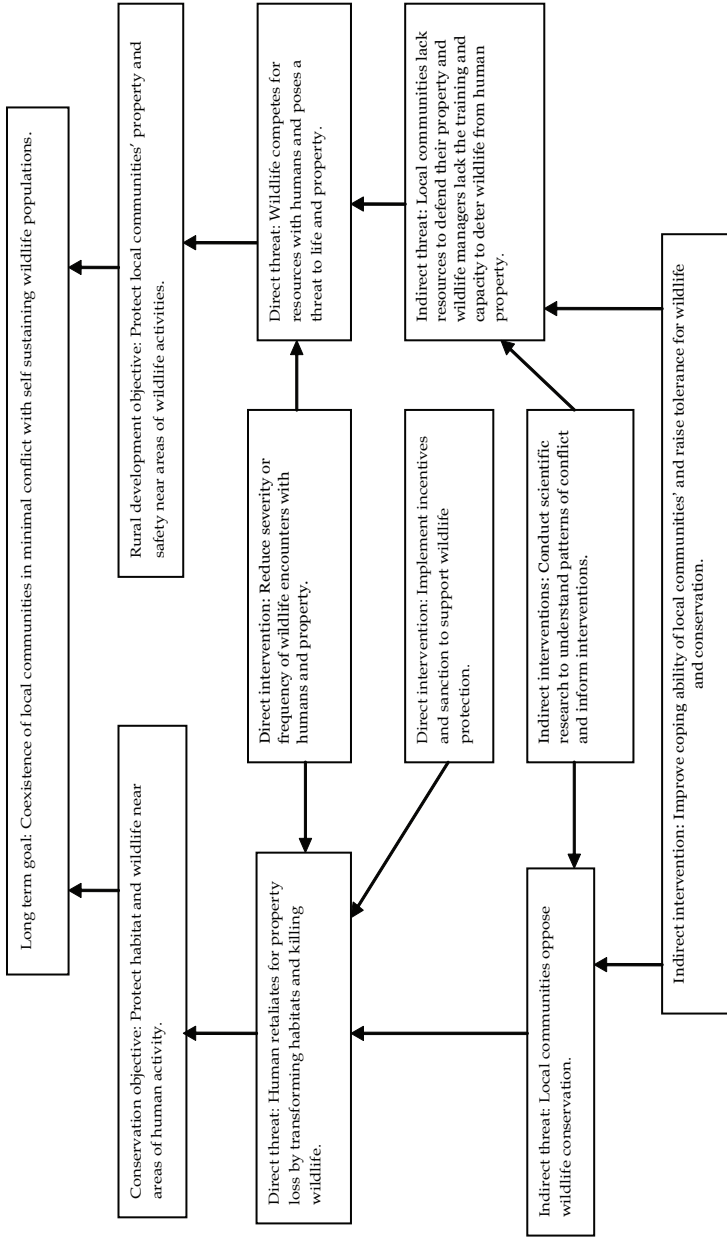
3. Methodology

3.1. Conceptual Framework

Sustainable solutions to HWC must protect or improve the welfare of rural communities, as well as conserve wildlife. However, one common problem of projects/programmes that aim to improve livelihoods at the same time as they conserve wildlife is failing to make a clear expressed and formulated link between development interventions and wildlife conservation (Brandon *et al.*, 2005).

The study sets out to assess the types and levels of human wildlife conflict, and to know how many people and wild animals die from the conflict. The study used secondary data for the period 2005 to 2011 sourced from Kenya Wildlife Service (KWS). An official “Occurrence Book” is kept which keeps a daily log of the reported incidents and the action taken by the KWS officers. The data sets were analyzed to come up with graphs that show the different levels and types of conflict in the country.

Figure 3.1: A framework for shared objectives of wildlife conservation and human welfare



Source: Borrowed from Treves et al., 2006

4. Results

4.1 Types and Levels of Human Wildlife Conflict in Kenya

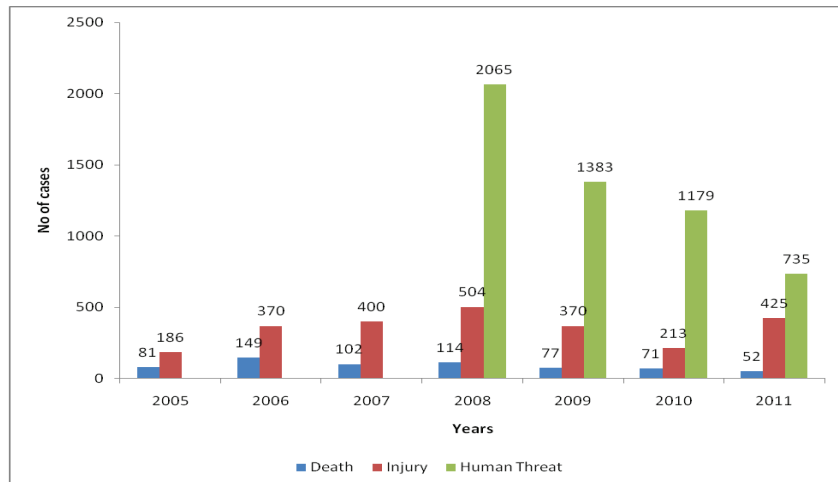
4.1.1 Human death, injuries and threats

Human deaths and injuries are less common but are the most severe manifestation of HWC. In most cases, humans are attacked as they try to protect their crops, or when they come into contact with elephants and hippopotamuses (they will rarely attack humans deliberately). In most cases, deaths occur while people are protecting their crops against raiding animals (usually at night); when people accidentally come into close contact with the animals, especially on paths near water at night; or when people encounter injured animals whose normal sense of caution is impaired.

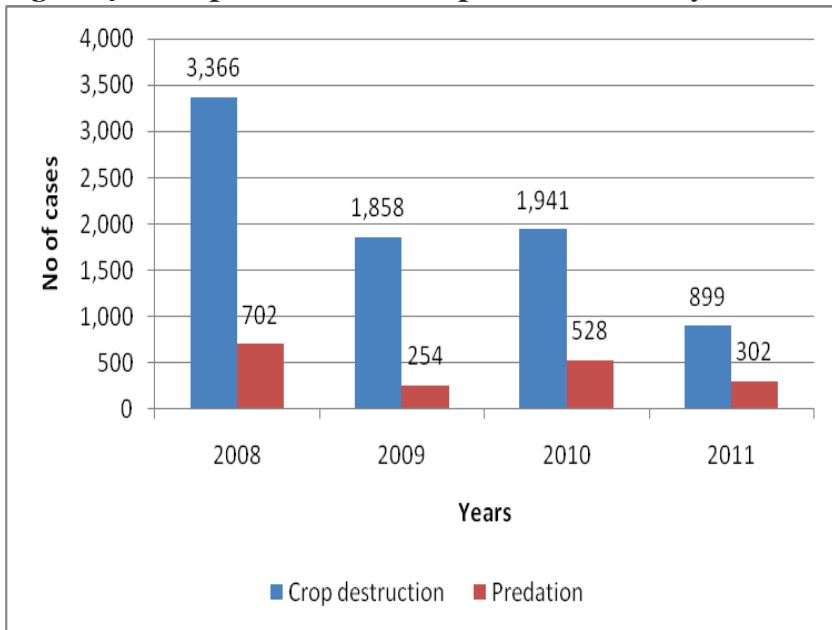
4.1.2 Predation on domestic animals and crop damage

Wild animals involved in crop damage include elephants, baboons, hippos and buffalos. Elephants can destroy a whole farm in a single night and considered the greatest threat to African farmers (Parker *et al.*, 2007). Areas close to lakes and rivers are also affected by hippopotamuses when feeding at night. In Lamu, buffalos and baboons have been damaging crops. In Laikipia, human elephant conflict is common focusing mainly on crop-raiding incidents on cultivated smallholder farms.

Figure 4.1: Human death, injury and threats in Kenya



Source: Kenya Wildlife Service (KWS)

Figure 4.2: Crop destruction and predation in Kenya

Source: Kenya Wildlife Service (KWS)

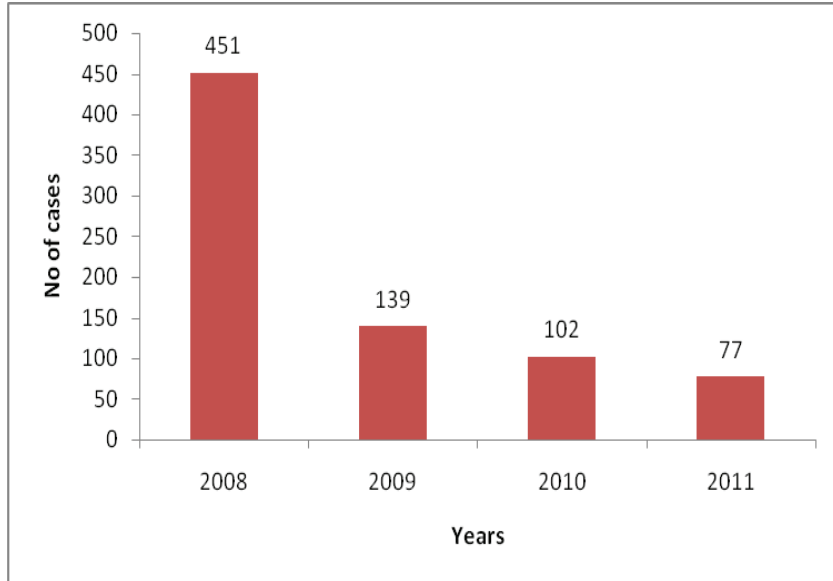
4.1.3 Wildlife mortality

Wildlife mortality in Kenya is caused by several reasons, in retaliation, the maasai community kill any (wild) animal that attacks them or their properties, and in this case, the African lion has suffered, thus declined population. To some extent, KWS is called upon to kill the wild animal involved, if it becomes a nuisance.

Due to fragmentation and land use changes, a lot of wild animals are killed, for example the Nairobi-Mombasa highways that divide the Tsavo ecosystem into two (Tsavo East and Tsavo West). The KWS considers special conditions in the event that a wild animal has to be killed.

The damage caused by wildlife varies with the most serious being death to human and crop destruction. Wild animals actually commit destruction of property such as houses, food stores, granaries and infrastructure. Elephants are reported to be the most destructive.

Figure 4.3: Wildlife mortality in Kenya



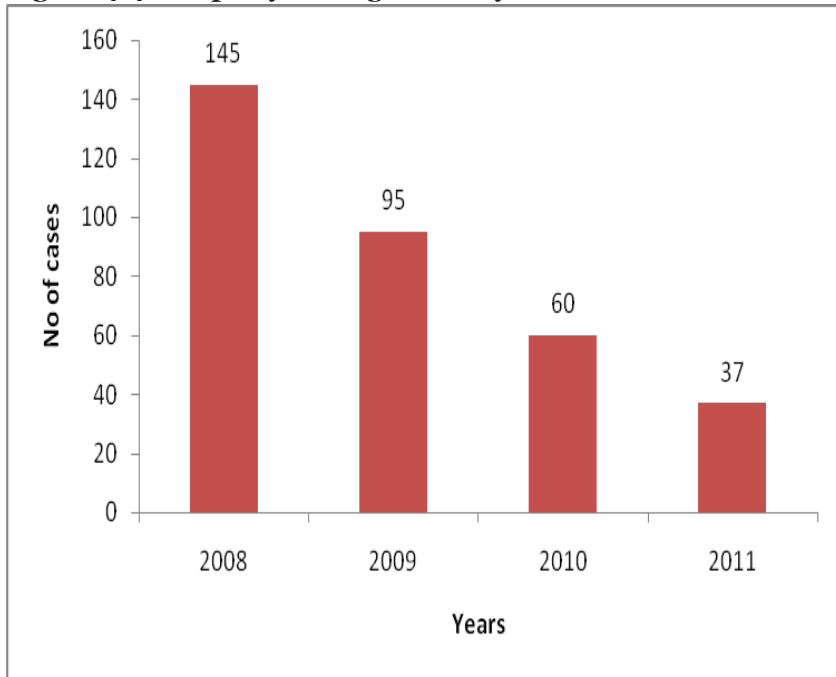
Source: Kenya Wildlife Service (KWS)

4.2 Conflict Resolution Strategies

4.2.1 Physical barriers

As a way of reducing HWC, Kenya Wildlife Service has set up physical barriers such as electric fences and stone walls, which control the movement of wild animals to protect livestock, crops and humans. It is noted that if fences are properly designed, constructed and maintained, they can be completely effective in preventing conflict between people and wild animals since they confine wild animals within designated areas. The main challenges with electric fencing are that they are expensive to maintain, have environmental issues with the surrounding areas where installed, and the local communities (stakeholders) have very high expectations.

Electric fences mainly use solar energy power stepped up through an energizer. The low impedance pulse released through the wire, when touched by an animal, gives a sharp, short but safe shock. The power fence does not need to have physical strength because it seldom comes under pressure. It must be well designed and constructed to absorb impact of animals.

Figure 4.4: Property damage in Kenya

Source: Kenya Wildlife Service (KWS)

KWS has constructed and maintained a total of 1,225kms of electrical fences nationally with 888kms within protected areas and 337kms outside protected areas. The cost for construction of 1km electric fence is approximately US\$15,000. Fencing is also used to reduce the impact of human-wildlife conflicts⁶.

In Kunene Region of Namibia, electric fences have been successful in deterring elephants from entering specific areas, but they end up failing due to institutional reasons. Since the fences were erected by a Non Governmental Organization, the conservancies that benefit from the fences do not take ownership/responsibility of the fence. Due to the conservancy not taking responsibility, maintenance and repairs of equipments are poorly managed.

These fences may have unfavourable effects of wild animals by changing the way of life of wildlife through interfering with their dispersal and breeding behaviour. At the same time, these fences deny local communities access to natural resources in the protected areas.

⁶Executive interview with KWS official

4.2.2 Compensation

Significant economic costs are associated with HWC. To alleviate this conflict, humans are compensated for the losses. Compensation systems mainly rely on giving monetary payments. Monetary compensation has always been a contentious issue in Kenya, due to its inefficiency and low rate of reimbursement (Obunde *et al.*, 2005). Most victims, especially farmers, fail in compensation schemes due to bureaucratic inadequacies, cheating, corruption and cost and time involved to generate a compensation claim. This often leads to delayed decisions, inadequate payments or rejection of compensation claims. Since 1986, compensation for wildlife damage exceeded the government's ability to pay besides its awesome administration burden.

Compensation rates were set at low rates that they could not address social opportunity costs borne by people who were affected by wildlife. In 2004, a private members bill was set to amend the Wildlife Act to fix the compensation levels for damage caused by wildlife. The new Wildlife bill 2011 has raised the figure from Ksh 30,000 to Ksh 1 million. Currently, KWS has set aside Ksh 20,250,000/US\$250,000 for compensation for the year 2012 (Table 4.1).

4.2.3 Translocation

Translocation is commonly carried out in Kenya to move those animals responsible for conflict from one area to another. Those affected more by HWC in Kenya, farmers and pastoralists, seem to favour relocation of wildlife as a desirable measure of reducing human-wildlife conflicts. KWS has taken up relocation, especially for elephants, to reduce conflict in agricultural areas⁷.

Table 4.1: Amount spent and budgeted for HWC

Year	Amount used and budgeted for HWC compensation in Ksh
2012	20,250,000.00
2011	66,570,000.00
2010	71,550,000.00
2009	43,100,000.00

⁷<https://wolfganghthome.wordpress.com/2011/10/06/kenya-conservation-news-elephant-relocation-from-narok-to-masai-mara-concludes-first-stage/>

Table 4.2: HWC wildlife translocation

Year	HWC wildlife translocation in Ksh
2012	4,150,000.00
2011	37,309,350.00
2010	
2009	7,400,000.00

Last year 2011, KWS used Ksh 37,309,350/US\$460,609 for translocation of problematic animals. Successful relocation of wild animals depends on availability of skilled personnel, capacity to locate and trap or dart target animals.

In other causes, it has been used to reduce population in specific areas with relatively large numbers (Muruthi, 2005). It is also common that translocated animals can return back to its original capture site.

5. Conclusion and Recommendations

5.1 Conclusion

Human-wildlife conflict is a significant problem in Kenya. The conflict has serious consequences on the local people, in terms of safety and well-being. With over 50 people being killed yearly by wild animals, there is need for urgent measures to control HWC. To enable co-existence and resource sharing, there should be a balance between conservation efforts and needs of the local people living with wild animals. Increasing tolerance levels of local communities for wildlife and adapting the human landscape are essential goals. However, they will always be the most difficult. It is clear that HWC will not be eradicated in the near future considering the rapid human population growth rate, demand for natural resources and the growing pressure for access to land.

5.2 Policy Recommendations

In order for the two groups to co-exist peacefully, a balance must be struck to ensure the plight of the people who are in direct conflict with the wild animals. It is therefore important that conflict prevention and mitigation measures are taken up, as well as having a proper legal framework on human wildlife conflict reduction and compensation. Ensure that there is involvement of all stakeholders such as the government authorities, NGOs and the local people. Efforts to prevent and reduce conflicts need to be fully integrated into government and development programmes throughout the region. This requires a systematic and the development of appropriate and effective stakeholder partnerships on outreach interventions to prevent or reduce HWC (Schusler and Siemer, 2004).

The local people should be fully involved in the development and implementation of HWC policies. This can be creative since local solutions can be implemented as well as secure local support in conservation.

There is need to ensure that communities neighbouring wildlife conservation areas or PAs are well informed, educated and clearly understood. This involves explaining why it is important to play part in conservation and the benefits that come with it. This can be done by having professionals facilitate deliverance of this information or at least oversee its delivery to ensure only the right information trickles down

to the grassroots. There are many people who talk about conservation daily, but they do not fully understand how things work. This should ensure that indigenous knowledge is included.

Local people should be encouraged to do land zoning where they set aside areas that can be important for multiple uses, such as conservation and grazing as well as agriculture. Wildlife management authorities should try and lease land that is adjacent to PAs from the local people and use it for conservation. This should be long term and sustainable as long as there is commitment from the local people. Wildlife habitat improvement and restoration in the protected areas is also an important solution that can help solve conflict. The government should ban any illegal activities that degrade wildlife habitats and dispersal areas such as charcoal burning and logging in Kitengela.

Increased and clearly defined benefits accrued from wildlife by the local communities: benefits from tourism should be equitably shared with the local communities. These are the people who interact with the wild animals and if they can generate some income from it (such as through establishment of wildlife enterprises), this might create some conservation interest and, to some extent, reduce conflict.

With the rapid population growth in the country, it is best if wildlife authorities allow local communities to benefit from natural resources (goods and services). They can issue licences that allow people to collect firewood, timber, controlled hunting and other plants that can be used as fodder for domestic animals.

5.3 Limitations of the Study and Areas

The main problem encountered during the study was the inconsistency in the data availability for the whole country. Due to sensitivity of the study, attaining the data was difficult. Despite the shortcomings, the objective of the study to show the trends in HWC in Kenya was achieved.

References

- Anderson, J. and Pariela, F. (2005), *Strategies to Mitigate Human-Conflict in Moçambique*, Mozambique National Directorate of Forests and Wildlife.
- Amelia, J. D. (2008), *Key Determinants of Conflict between People and Wildlife, Particular Large Carnivores around Ruaha National Park, Tanzania*, Phd Thesis, University College London (UCL) and Institute of Zoology, Zoological Society of London.
- Baruch-Mordo, S., Breck, S.W., Wilson, K.R. and Broderick, J. (2009), “A Tool Box Half Full: How Social Science Can Help Solve Human-Wildlife Conflict”, *Hum Dimens Wildlife* 14: 219–223.
- Berchielli, L. T., Dente, C. and Renar, E. (2003), *New York Status Report*, 17th Eastern Black Bear Workshop, New Jersey: Mt Olive.
- Blair, A. (2008), *Human Wildlife Conflict in Laikipia North, Kenya, Comparing Official Reports with the Experiences of Maasai Pastoralists*.
- Chiemelu, N. (2004), *At Whose Expense?: Policy Formation in Wildlife Conservation and Human Conflict in Kenya*.
- Distefano, E. (2005), “Human-Wildlife Conflict Worldwide: Collection of Case Studies”, *Analysis of Management Strategies and Good Practices*.
- Dunn, W.C., Elwell, J.H. and Tunberg, G. (2008), “Safety Education in Bear Country: Are People Getting the Message?”, *Ursus* 19: 43–52.
- Fall, M.W. and Jackson, W.B. (2002), “The Tools and Techniques of Wildlife Damage Management—Changing Needs: An Introduction”, *International Biodeterioration and Biodegradation* 49: 87–91.
- FAO (2009), “Human Wildlife Conflict in Africa: Causes, Consequences and Strategies”, Food and Agriculture Organization of the United Nations Rome Forestry Paper 157.
- IUCN (2003), *World Conservation Union—Red List of Threatened Species*, Available at <http://www.redlist.org/>

- Johansson, T. (2008), *Beasts on Fields: Human Wildlife Conflicts in Nature-Culture Borderlands*.
- Jones, T. B. and Barnes, J. I. (2006), *Human Wildlife Conflict Study: Namibian Case Study*.
- Kanga, E. M., Ogutu, O. J., Piepho, H. P. and Oloff, H. (2011), *Human-Hippo Conflicts in Kenya During 1997-2008: Vulnerability of a Megaherbivore to Anthropogenic Land Use Changes*.
- Kangwana, K. (1995), "Human Wildlife Conflict: The Challenge Ahead", *Pachyderm*, 19:11-14.
- Kenya Institute for Public Policy Research and Analysis (2010), *Kenya Economic Report*, Nairobi.
- Kenya Land Alliance (2005), "Background to Human Wildlife Conflicts in Kenya", *Kenya Land Alliance Facts Sheets*, pp 1-9.
- MacLennan, S.D., Groom, R.J., Macdonald, D.W. and Frank, L.G. (2009), "Evaluation of a Compensation Scheme to Bring about Pastoralist Tolerance of Lions", *Biological Conservation*, 142 (11).
- Madden, F. (2004), "Creating Co-existence between Humans and Wildlife: Global Perspectives on Local Efforts to Address Human-Wildlife Conflict", *Human Dimensions Wildlife*, 247, 248- 249.
- Mbote, P. K. (2005), *Land Tenure, Land Use and Sustainability in Kenya: Towards Innovative Use of Property Rights in Wildlife Management*.
- Ministry of Tourism and Wildlife (2007), *Draft Wildlife Policy*.
- Mishra, C. (1997), "Livestock Depredation by Large Carnivores in the Indian Trans-Himalaya: Conflict Perceptions and Conservation Prospects", *Environmental Conservation* (24), 4: 338-343.
- Mishra, C., Allen, P., McCarthy, T., Madhusudan, M., Bayarjarkal, A. and Prins, H. (2003), "The Role of Incentive Programmes in Conserving the Snow Leopard", *Conservation Biology*, 17(6): 1512–1520.
- Muruthi, P. (2005), "Human Wildlife Conflict: Lessons from African Wildlife Federation's (AWF) African Heartlands", AWF Working Papers, July.

- Naughton-Treves, L. (1997), "Farming the Forest Edge: Vulnerable Places and People around Kibale National Park, Uganda", *Geographical Review* 87:27-46.
- Nyhus, P. and Tilson R. (2004), "Characterizing Human-Tiger Conflict in Sumatra, Indonesia: Implications for Conservation", *Oryx* 38:68-74.
- Obunde, P.O., Omiti, J. M. and Sirengo, A. N. (2005), "Policy Dimensions in Human Wildlife Conflicts in Kenya: Evidence from Laikipia and Nyandarua Districts", Institute of Policy Analysis and Research Policy Brief, Nairobi, Available at www.ipar.or.ke/dp65pb.pdf.
- Ogada, M. O., Woodroffe R., Oguge N. O. and Frank L. G. (2003), "Limiting Depredation by African Carnivores: The Role of Livestock Husbandry", *Conservation Biology* 17:1,521-1,530.
- Ogada, O. O. and Ogada, D.L. (2004), *Factors Influencing Levels of Carnivore-Livestock Conflicts in Samburu Heartland and Proposed Mitigation Measures*, Unpublished Consultancy Report for African Wildlife Foundation.
- Ogodo, O. (2003), "Resolving the Conflict Calls for a Tight Balancing Act-Legislator", *East African Standard Newspaper*, July 7, The Standard Limited.
- Otieno, A. (2003), "Why Locals are Turning against Animals," *East African Standard Newspaper*, July 7, The Standard Limited.
- Parker, G.E., Osborn, F.V., Hoare R.E. and Niskanen, L.S. (Eds) (2007), *Human Elephant Conflict Mitigation: A Training Course for Community-Based Approaches in Africa*, Participants Manual.
- Patterson, B. D., Kasiki, S. M., Selempo, E. and Kays R. W. (2004), "Livestock Predation by Lions (*Panthera leo*) and Other Carnivores on Ranches Neighbouring Tsavo National Park, Kenya," *Biological Conservation* 119: 507-516.
- Ramakrishnan, U., Coss, R.G. and Pelkey, N.W. (1999), "Tiger Decline Caused by the Reduction of Large Ungulate Prey: Evidence from a Study of Leopard Diets in Southern India", *Biological Conservation*, 89, 113-120.
- Saberwal, V. K., Gibbs J. P., Chellam R. and Johnsingh A. J. T. (1994), "Lion Human Conflict in the Gir Forest, India", *Conservation Biology* 8:501-507.

- Schusler, T. and Siemer, W.F. (2004), *Report on Stakeholder Input Groups for Black Bear Impact Management in the Lower Catskills, Upper Catskills and Western New York*, Cornell Cooperative Extension of Tompkins County, New York: Ithaca.
- Serneels, S. and Lambin, E.F. (2001), "Proximate Causes of Land Use Change in Narok District Kenya: A Spatial Statistical Model", *Ecosystem Environment*, 85(1-3): 65-81.
- Shikwati, J. (2003), *Human Wildlife Conflict: Which Way? Defenders of Property Rights*.
- Shivik, J. A. (2006), "Tools for the Edge: What's New for Conserving Carnivores", *BioScience* 56: 253–259.
- Siex, K.S. and Struhsaker, T.T. (1999), "Colobus Monkeys and Coconuts: A Study of Perceived Human–Wildlife Conflicts," *Journal of Applied Ecology*, 36(6): 1009-1020.
- Spencer, R.D., Beausoleil, R.A. and Martorello, D.A. (2007), "How Agencies Respond to Human-Black Bear Conflicts: A Survey of Wildlife Agencies in North America", *Ursus* 18: 217–229.
- Thuiller, W., Broennimann, O., Hughes, G. O., Alkemade, J. R. M., Midgley, G.F. and Corsi, F. (2006a), "Vulnerability of Mammals to Anthropogenic Climate Change under Conservative Land Transformation Assumptions", *Global Change Biol.* 12, 424–440.
- Treves, A. and Karanth, K.U. (2003), "Human-Carnivore Conflict and Perspectives on Carnivore Management Worldwide", *Conserv Biol* 17: 1491–1499.
- Treves, A. and Naughton-Treves, L. (2005), "Evaluating Lethal Control in the Management of Human-Wildlife Conflict", in Woodroffe R., Thirgood S., and Rabinowitz A. 9 (Eds), *People and Wildlife: Conflict or Coexistence? Cambridge: Cambridge University Press*.
- Wanjau, M. W. (2000), *Resolving Conflicts between People and Crocodiles: A Case Study of Athi River, Kibwezi, Tsavo Ecosystem*, Report to Kenya Wildlife Services.
- Woodroffe, R. (2000), "Predators and People: Using Human Densities to Interpret Declines of Large Carnivores", *Animal Conservation* 3: 165-173.

World Parks Congress (2003), Preventing and Mitigating Human Wildlife Conflicts, International Union for Conservation of Nature.

WWF (2007a), Human Animal Conflict, Available at [//www.panda.org/about_wwf/what_we_do/species/problems/human_animal_conflict/index.cfm](http://www.panda.org/about_wwf/what_we_do/species/problems/human_animal_conflict/index.cfm).

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