

**FACTORS ASSOCIATED WITH TRADITIONAL KNOWLEDGE,
ATTITUDE AND PRACTICES TOWARDS WILDLIFE
CONSERVATION AMONG LOCAL COMMUNITIES IN ENKUSERO
SAMPU CONSERVANCY, KAJIADO COUNTY-KENYA**

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DECLARATION

This study report is my original work, and it has not been presented for award of degree in any other university.

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DEDICATION

Special dedication goes to my loving husband Dr. George Odwe, and my pretty Angels Tracy and Tiffany for their patience and understanding during the entire period of my studies. Thank you all for always being there when I needed you.

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ACRONYMS AND ABBREVIATIONS

CBD	Convention on Biological Diversity
ESC	Enkusero Sampu Conservancy
GoK	Government of Kenya
IUCN	International Union for Nature Conservation
KShs	Kenya Shillings
KWS	Kenya Wildlife Service
NGOs	Non-Governmental Organizations
PAs	Protected Areas
SORALO	Southern Rift Valley Association of Land Owners
TK	Traditional Knowledge
UNESCO	United Nations Educational Scientific and Cultural Organization
WWF	World Wildlife Fund

ABSTRACT

Globally, there is much attention on the inclusion of traditional knowledge and practices in wildlife conservation to foster peaceful co-existence between human and wildlife species. Local communities' traditional knowledge and practices are linked to wildlife conservation through taboos and sacred (sites and species), and have led to the conservation of some of the endangered species listed in the International Union for Conservation of Nature's red list. An understanding of local communities' attitude towards wildlife conservation is an important determinant for the success of wildlife conservation intervention. This study examined the traditional knowledge, attitude and practices towards wildlife conservation among local communities living in Enkusero Sampu Conservancy, in Kajiado County, Kenya. The research used a cross-sectional study design involving both quantitative and qualitative data collection techniques. Data collection was based on; head of household questionnaires, focus group discussions with the elders and the youth, and key informant interviews with community members, Kenya Wildlife Service staff, local leaders and conservancy staff. Quantitative data analysis involved descriptive analysis (frequencies distributions); bivariate analysis mainly cross tabulation with Chi-square test to determine statistically significant associations between depended and independent variables; and an estimation of a multivariate logistic regression model to assess the effect of predictor variables on the outcome variables. The result of the bivariate analysis indicates that demographic and socio economic variables had an association with local communities' traditional knowledge, attitudes and practices towards wildlife conservation. Gender, marital status, household size and main source of livelihood had a statistical significant association with awareness on traditional wildlife conservation ways at $p < 0.05$. In addition, gender, age, household size, past experience of livestock predation and awareness of traditional ways of wildlife conservation was associated with attitude towards wildlife conservation. The main sources of traditional knowledge were parents (97 %) and grandparents at 90 %. More than half (51%) of the respondents learnt the use of wildlife from the cultural practices. Multivariate analysis results showed that male respondents were more likely than female to be aware of traditional ways of wildlife conservation (OR 3.755; 95% CI=1.884 - 7.673 at $p < 0.001$). Age and main source of livelihood were also important predictors of traditional knowledge of wildlife conservation. The result showed that traditional knowledge was statistically significantly associated with attitude towards wildlife conservation—respondents with awareness of traditional ways of conserving wildlife were 2.4 times (95% CI =0.355 - 4.308 at $p = 0.003$)

more likely to have positive attitude towards wildlife conservation compared to those with no knowledge. In addition, respondents who had not experienced loss of livestock to predators were 1.8 times (95% CI=0.736-4.603; at $p<0.05$) more likely to support wildlife conservation compared to those who had experienced loss of livestock to predators. Furthermore, local communities' attitudes towards wildlife conservation influenced their conservation behavior, with positive attitudes likely to lead to pro-conservation behavior and negative attitude leading to anti-conservation behavior. Insights from qualitative data revealed taboos as the main traditional way of wildlife conservation. Some traditional and cultural practices among the Maasai community have led to destruction of certain species of plants and animals. For example, wild animals and plants were significantly used in cultural practices such as during the initiation and circumcision ceremonies. The study concludes that awareness of traditional knowledge in wildlife conservation results into positive attitude towards wildlife conservation and leads to pro-conservation practices, if local people have access to benefits from wildlife conservation. The finding of the study recommends the inclusion of best practice traditional knowledge into wildlife conservation policies and programmes. In addition, there is need to have community-based interventions aimed at promoting awareness and progressive attitudes towards wildlife conservation to ensure survival of wildlife species on community lands.

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CHAPTER ONE

BACKGROUND OF THE STUDY

1.0 Introduction

Globally, the link between traditional knowledge (defined as the knowledge, innovations and practices of the indigenous and local communities around the world) and sustainable development is widely acknowledged (Goldman, 2003; Twarog & Kapoor, 2004; Sutherland *et al.*, 2014). Traditional knowledge (TK) is acquired through practical experiences gained over the years by the local communities (Goldman, 2003). Studies show that TK is an important element in wildlife conservation (Kideghesho, 2008; Sutherland *et al.*, 2014).

In major parts of Africa, Asia, Australia, North America, Central and South America, TK has been used in wildlife conservation (Deisser & Njuguna, 2016). The utility of TK in wildlife conservation is mainly rooted in two main ways: 1) traditional use of resource derived from the complex biological, cultural and socio-economic systems; and 2) the local communities as custodians of wildlife conservation and management (Twarog & Kapoor, 2004; Drew, 2005; Kideghesho, 2008, 2009; Ceríaco *et al.*, 2011; Sifuna, 2012; Sutherland *et al.*, 2014; Diawuo & Issifu, 2015; Government of Kenya, 2016; Abugiche *et al.*, 2017).

In India, the traditional communities had remnants of pristine forests and other ecosystems strictly guarded by social norms and taboos (Gadgil & Guha, 1992). For example, the hunting and fishing indigenous people adhered to strict rules such as not killing expectant animals and their young ones, sub-adults, and restricting fishing and hunting during a specified period of time (Gadgil & Guha, 1992). In addition, many individual species were protected for their religious, social and economic importance (Kothari *et al.*, 1998). In sub-Saharan Africa, the Maasai community of East African, has been in the past known not to eat wild animal meat due to the religious link of wild animals as creation of “Enkai”, those eating game meat are considered unclean and poor (Woodburn, 1997; Goldman, 2003).

Attitudes towards wildlife conservation have shown to be associated with conservation practices. Negative attitude towards wildlife conservation can lead to anti-conservation practices, and a rejection of wildlife conservation projects (Schwartzman *et al.*, 2000; Jim & Xu, 2002; Weladji *et al.*, 2003; Adams *et al.*, 2007). On the one hand, individuals may develop negative attitudes towards wildlife conservation due to restrictive conservation strategies and resort to anti-conservation practices such as poaching, retaliatory killing of

predators and destruction of wildlife habitat (Studsørd & Wegge, 1995; Rao *et al.*, 2002). On the other hand, conservation policies that allows local communities to access wildlife resources often results into positive attitudes towards wildlife conservation (Terborgh, 2002; Woodroffe *et al.*, 2005; Allendorf *et al.*, 2006).

TK has gained interest by researchers and policymakers in wildlife conservation (Berkes *et al.*, 2000; Coombe, 2001) due to its implications on local communities' ecological understanding, conservation practices and resource management goals (Roué *et al.*, 2016). Article 8(j) of the Convention on Biological Diversity (CBD), which has also been domesticated in Kenya, acknowledges indigenous knowledge and local community involvement in wildlife conservation (Convention on Biological Diversity, 2005). The draft National Wildlife Conservation and Management Policy 2017 emphasizes the need for supplementing contemporary wildlife management with traditional knowledge (Government of Kenya, 2017). While the Kenyan Government has put in place a raft of measures to ensure wildlife conservation, many of these efforts are yet to lead to the wise use of biological resources (Twarog & Kapoor, 2004).

This study examined factors associated with traditional knowledge, attitudes, and practices towards wildlife conservation among the local community living in and around Enkusero Sampu Conservancy in Kajiado County, Kenya. Evaluating local communities' attitudes is considered as a major progress in ensuring success in the conservation initiatives (Struhsaker *et al.*, 2005; Kideghesho *et al.*, 2007). This is aimed at determining their compliance with wildlife conservation rules and guidelines, how they cope with financial losses incurred during wildlife damages, their view on the value of wildlife and the level at which they are able to tolerate wildlife on their land (Fulton *et al.*, 1996; Decker *et al.*, 2012). Furthermore, understanding factors influencing attitudes towards wildlife conservation is crucial for planning approaches targeted at eradicating or reducing human wildlife conflict in areas adjacent to PAs (Naughton-Treves & Treves, 2005).

1.1 Statement of the research problem

Kajiado County is ranked among the leading tourist destination in Kenya due to its magnificent landscapes and habitats that includes a wide range of wildlife species (Okello & Kiringe, 2004; Kioko & Okello, 2010). In the recent years, there has been a rise in human-wildlife conflicts in the larger Kajiado County mainly due to the rapid increase in human populations and urbanization. This has led to changes in traditional land tenure system from

communal to private land ownership with fences, hence increasing fragmentation of wildlife ranges. The Maasai communities who have been in the past known to live harmoniously with wildlife on their land, have turned to calling upon the government through Kenya Wildlife Service (KWS) to remove all the wild animals from their land. As a result, conservation of wildlife in the area has become a major challenge for the government.

Traditional knowledge and attitude towards wildlife conservation has been shown to be important for effective and sustainable wildlife conservation (Harmon, 2004; Kideghesho, 2008, 2009). However, research on the factors associated with traditional knowledge and practices towards wildlife conservation in Kajiado County is lacking. Studies conducted in other settings shows a number of factors which are associated with traditional knowledge and attitudes of local people towards wildlife conservation (Sekhar, 2003; Romanach *et al.*, 2007). Cultural practices regarding wildlife species and habitats are a major determinant of traditional knowledge and attitude (Kideghesho, 2008). For example, many members of the African rural society appreciate the medicinal, spiritual and aesthetic value of wildlife species (Harmon, 2004). However, cultural dilution and transformations may be a threat to wildlife conservation (McSweeney, 2005).

Traditional knowledge and attitude towards wildlife conservation has also been linked to the direct benefits derived from wildlife resources such as food, pasture, water and socio-cultural values. Local communities that have access to these benefits tend to portray a positive attitude towards wildlife conservation (Sekhar, 2003; Ogutu *et al.*, 2014). Various demographic factors such as age, gender, marital status, the size of the household are also associated with traditional knowledge and attitude towards wildlife conservation. Socio-economic factors including level of education, occupation, wealth, land and livestock ownership, have been shown to be related to TK and attitudes and behavior towards wildlife conservation (Kideghesho, 2008; Darr *et al.*, 2009; Kideghesho, 2009; Sifuna, 2012; Gómez-Baggethun *et al.*, 2013; Diawuo & Issifu, 2015; Abugiche *et al.*, 2017). Other factors associated with traditional knowledge and attitude towards wildlife conservation include past experience with wild animals (Rao *et al.*, 2002; Suryawanshi *et al.*, 2013; Mir *et al.*, 2015). Despite this research, little is known about factors associated with traditional knowledge, attitudes, and practices towards wildlife conservation in Kenya. This study examined factors associated with traditional knowledge, attitudes, and practices towards wildlife conservation among local communities in Enkusero Sampu Conservancy (ESC) in Kajiado County.

1.2 Research questions

The study was based on the following research questions.

- 1 What is the level of awareness on traditional knowledge of wildlife conservation among local communities in Enkusero Sampu conservancy, Kajiado County?
- 2 What are the attitudes and practice(s) of local communities towards wildlife conservation Enkusero Sampu conservancy, Kajiado County?
- 3 Which socio-demographic factors are associated with traditional knowledge, attitude and practices towards wildlife conservation among local communities in Enkusero Sampu conservancy, Kajiado County?

1.3 Study objectives

The general objective of the study was to examine factors associated with the local communities' traditional knowledge, attitude and practices towards wildlife conservation in Enkusero Sampu conservancy, Kajiado County.

The specific objectives were:

1. To examine the level of awareness on traditional knowledge of wildlife conservation among local communities in Enkusero Sampu conservancy, Kajiado County.
2. To examine the attitudes and practice(s) of local communities towards wildlife conservation in Enkusero Sampu conservancy, Kajiado County.
3. To examine socio-demographic factors associated with traditional knowledge, attitude and practices towards wildlife conservation among local communities in Enkusero Sampu conservancy, Kajiado County.

1.4 Study hypotheses

The following hypotheses were tested:-

1. H₀- There is no association between traditional knowledge, attitude and practices of local communities towards wildlife conservation and heads of households' socio-demographic and economic background (age, gender, marital status, household size, awareness of traditional ways of wildlife conservation, and level of education).
H₁- There is association between traditional knowledge, attitudes and practices of local communities towards wildlife conservation and heads of households' socio-demographic and economic background (age, gender, marital status, household size, awareness of traditional ways of wildlife conservation, and level of education).

2. Ho- There is no association between attitudes towards wildlife conservation and past experience of livestock loss due to predation.

H₁- There is association between attitudes towards wildlife conservation and past experience of livestock loss due to predation.

1.5 Significance of the study

The future of wildlife population outside protected areas (PAs) critically relies on the good will, acceptance and attitudes towards conservation, by local communities who constantly bear the massive cost of living with wildlife (Campbell *et al.*, 2000). In Kenya, the linkage between local communities traditional way of life and wise use of wildlife resources has been left out in many wildlife conservation programs (Diawuo & Issifu, 2015). To the best of my knowledge, there is no research linking factors associated with traditional knowledge, attitudes and practices towards wildlife conservation in Enkusero Sampu Conservancy within Kajiado County.

The findings of this study will address the gap in the role of traditional knowledge, attitudes, and practices as a complementary to the current conservation strategies aimed at addressing conservation challenges. The study will help in achieving the goal of Aichi biodiversity targets that requires every signatory member state to have at least 17% of the terrestrial and inland waters set aside as PAs by 2020. The findings are also expected to guide policymakers, managers, planners and decision makers in the wildlife sector in Kenya. Conservation programs should aim at inclusion of best practice of traditional knowledge and practices in wildlife conservation and management. Ultimately sustainable wildlife conservation and support of local communities will be achieved through participatory decision making in matters relating to wildlife and efficient benefit sharing mechanism from proceeds of wildlife conservation in indigenous community lands.

1.6 Justification of the study

Since the mid-1990s, there has been increased attention on the need to understand the local communities' traditional knowledge, attitudes and practices towards sustainable wildlife conservation (Kideghesho *et al.*, 2007). This has been brought about by the realization that local communities have a major role to play in the success of any wildlife conservation programme (Baldus *et al.*, 2003; Dressler *et al.*, 2010; Kieti *et al.*, 2013). Local communities are a prerequisite for any conservation action (Ebua *et al.*, 2011). The attitude of the local people towards conservation is also important for the success of wildlife conservation.

Researches on local community's attitude and behavior towards conservation are often used to guide conservation management approaches (Infield, 1988; Parry & Campbell, 1992; Gillingham & Lee, 1999; Songorwa, 1999; Holmes, 2003; Karanth *et al.*, 2008).

In Kenya, the role of local and indigenous communities in wildlife conservation, protection, and management is prioritized through support to the establishment of community conservancies and provision of incentives to local communities. Kenya needs to adapt the best practices that relate to traditional knowledge of wildlife conservation in policy documents and programmes that relates to wildlife conservation and follow through to its effective implementation at the grassroots levels.

This study was able to disclose factors associated with traditional knowledge, attitudes, and practices of local communities towards wildlife conservation. This is important for providing an insight for PA managers and policymakers involved in wildlife conservation. In addition, the findings will address the gap in the Kenyan Wildlife Conservation and Management Act 2013, which has restrictions on the ownership and user right of wildlife resources by the local community land owners and lacks clear guidelines in the compensation procedure (Government of Kenya, 2013b).

The results from the study will also be useful toward the achievement of Aichi biodiversity target 5 aimed to ensure that *“by 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced”*, and target 18 aimed at ensuring that *“by 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels”*¹.

¹ Strategic Action Plan for Biodiversity 2011-2020 <https://www.cbd.int/sp/targets/>

1.7 Scope of the study

The study was conducted in Enkusero Sampu Conservancy, Kajiado West constituency in Kajiado County, Kenya. The main focus was on issues pertaining to traditional knowledge, attitude, and practices towards wildlife conservation of local communities living within and around (ESC). The study area was chosen to be the Conservancy as it forms critical areas that are vital for wild animals' migration as well as alternative source of habitats of wild animals (Duffy, 2006). It also forms part of the Sothern Rift Valley Association of Land Owners (SORALO) which is mainly concerned with wildlife conservation and protection outside PAs, by addressing human-wildlife conflict through support of compatible land use approaches. ESC was purposively chosen amongst the 13 conservancies within SORALO due its proximity to Nairobi National Park, this was because it has a potential to provide refuge for species from Nairobi National Park. The sampling unit of the study was the Maasai head of the households living within or around ESC boundary, so as to unravel the unique traditional knowledge and practices of the Maasai community as they interact with wildlife. Information collected mainly focused on; traditional knowledge and its use in wildlife conservation, views on wildlife and wildlife conservation, conflicts faced due to the presence of wildlife in the area, conservation values of the conservancy and community attitudes towards conservation.

1.8 Limitations of the study

The study was carried out in a remote area inhabited mainly by pastoralists. Sometimes, it was challenging to get a good representative of gender as most men were out guarding livestock. Family unions were mainly polygamous involving three to four women. Language barrier was encountered because the area is largely inhabited by the Maa speaking community, with very few people able to communicate in Swahili, which is a national language in Kenya. As a result, some of the probing data may have been lost due to translation break down. Some of the sampled heads of household declined to participate in the questionnaire survey due to the negative impact of human-wildlife conflict. It was also difficult to get respondents on market day Thursdays and Sundays. The study was conducted during the high rainy season where we experienced massive flooding making some areas inaccessible.

1.9 Operational definitions

Attitude: defined as decision made by reasoning to influence feeling and act in a certain way and is the main determinant of human value towards an object (wildlife).

Attitude towards wildlife conservation: refers to an individual opinion and feelings that may be either favorable or unfavorable toward wildlife conservation.

Benefit(s): these are the profits individuals or community members gain from having wildlife on their land, they include both tangible (food, timber, firewood, and pasture for livestock grazing, non-timber forest products) and intangible services (nutrient cycling, source of rainfall, air purification, pest and disease control, religious and cultural beliefs).

Community: refers to a group of people originating from the same geographical area, who identifies themselves as belonging to the same group. The people in a community may be related by language, blood, marriage and may follow the same norms, culture and beliefs.

Conservancy: mean a designated area of land allocated by community members or private landowners, group of owners or cooperate bodies to allow compatible human land use activities, without compromising the free movement and survival of wild animals and existences of wild plants.

Conservation: it refers to the wise use and preservation of wildlife species from threats to enhance sustainability

Protected Area: refers to clearly defined geographical space of land /seascape recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values (Dudley, 2008).

Traditional knowledge (TK): means any knowledge originating from an individual, local or traditional community, which is the result of intellectual activity and insight in traditional contexts including know-how, skills, innovations, practices, and learning embodied in the traditional lifestyle of a community. Or it can refer to knowledge contained in the codified knowledge systems passed on from one generation to another including agriculture, environmental or medical knowledge , associated with genetic resources or other components of biological diversity (Government of Kenya, 2016)

Wildlife: refers to undomesticated plants and animals that live in their natural habitats

Wildlife conservation: means the art and science of managing and protecting wild plants and animals for the benefit of present and future human well-being. The goal of wildlife conservation is to ensure that natural resource will be available for future generations to enjoy and also to recognize the importance of wildlife and wilderness for humans and other species.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section presents literature review on indigenous/traditional knowledge, attitude and practices towards wildlife conservation. The section begins by discussing; the role of indigenous/traditional knowledge of local communities towards wildlife conservation; the concept of attitude towards wildlife conservation; the local communities' attitude and practices towards wildlife conservation; factors associated with local the communities' attitude and practices towards wildlife conservation; theoretical framework and conceptual framework.

2.1 Traditional knowledge about wildlife conservation

Traditional Knowledge (TK) is the knowledge that involves innovation, skills, practices and experiences of the local community with their natural ecosystems. There are many ways through traditional knowledge is transmitted from generation to generation. These include: stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language and agricultural practices including the development of plant species and animal breeds (Kideghesho, 2008; Sutherland *et al.*, 2014). The main mode of learning is through practical or through observation in daily life experiences (Twarog & Kapoor, 2004; Sutherland *et al.*, 2014; Roué *et al.*, 2016).

Among the Maasai community, TK was transmitted during herding and circumcision times for boys and during firewood and water fetching escapades for girls (Roué *et al.*, 2016). TK involves the knowledge on medicinal plants, animals and wise use of biological resources as well as traditional agricultural practices. The custodians of TK are known to be elders in the community, each age set within the community has its own traditional chief, and the duty of an elders is to ensure that the TK is passed from one generation to the other (Scott, 1998).

Globally, rural dwellers or local communities mainly depend on the natural resources for their livelihoods in terms of source of food, fuel wood, timber, cultural and spiritual practices, aesthetic and recreational purposes (Millennium Assessment, 2005). TK on the use and presence of biological resources can provide a platform for understanding the local people's customs, traditions, production beliefs and rituals as well as patterns of thought. Cultural

factors can influence local peoples behaviors towards wildlife species and their habitat, and therefore a vital aspect in the drivers of environmental changes (Kideghesho, 2008, 2009).

2.1.1. Cultural beliefs and practices detrimental to wildlife conservation

The role traditional cultural practices in wildlife conservation has been widely recognized in literature (Kideghesho, 2009). Cultural practices blend well with wildlife co-management strategies, for example, through land ownership and user rights, empowerment, and active participation of local communities (Berkes, 2003). Traditional knowledge is useful in wildlife conservation if the impacts does not negatively affect species survival (Agrawal, 2002). Conversely, traditional cultural practices may conflict conventional conservation practices when the species in question is linked to a bad omen.

For example, in Portugal, the nationally vulnerable Mediterranean House gecko (*Chemidactylus turcicus*) is being killed due to the folklore connection with a skin disease if one gets in contact. People believe that if one get into contact with the it, he/she will develop high fever and “cobro²” blistered sore which may be fatal (Ceríaco *et al.*, 2011). In Madagascar, the near threatened aye aye (*Daubentonia madagascariensis*) is persecuted because it is considered to bring death (Simons & Meyers, 2001).

In West and South Africa vultures are continuously being hunted for traditional medicine and rituals, parts of the bird are valued to be effective in curing of various bodily and mental ailments, improved ability to foresee things and increase in intelligence in children while its foot is believed to bring good luck (Muiruri & Maundu, 2010; McKean *et al.*, 2013; Ogada *et al.*, 2016). In Eastern South Africa 160 vultures are consumed annually with 59,000 of vulture parts consumption incidents. This has resulted into a massive decline in the vulture population which is estimated to become extinct in the next 15-30 years (McKean *et al.*, 2013).

In Kenya, many communities have cultural practices that require use of wild animal parts. For example, in the past, the Maasai moran wore the African lions (*Panthera leo*) mane as a head dress during traditional ceremonies (Sifuna, 2012). The killing of the African lions (*Panthera leo*) by the Maasai moran³ was traditionally seen an indication of bravery when the

² Skin inflammation caused by contact with geckos and spiders which manifest it in undefined manner.

³ Maasai warrior, whose duty is to defend and protect people and their property in the homestead against destruction by wild animals,.

moran brought the head of the lion home (Kameri-Mbote, 2002). Killing the lion was also associated with an elevation of the social status in the community (Dickman *et al.*, 2015).

2.1.2 Taboos and their implication to wildlife conservation

Taboos are the various prohibitions or warnings exercised on plant and animal species or their habitats. Many traditional societies use taboos to restrict and control exploitation of certain species and access of valued resources in a given place. For example, some communities have areas considered as sacred sites, which are closely monitored for any human activities that threatens the survival of plants and animals and their ranges (Kideghesho, 2009). Taboos have been shown to be very effective in influencing the behaviors of community dwellers towards wildlife resource utilization. Community members are expected to abide by the provisions of the taboo, thus promoting conservation works. The driving factor to support conservation is the fear of experiencing a misfortune if one breaks the taboo (Kideghesho, 2008).

In India, it is a taboo to kill the Black Buck (*Antelope cervicapra*) in the Bishnoi Community in Rajasthan. This taboo has enhanced the conservation of the endemic antelope by enforcing a prohibition on killing of animals and felling of plants especially the Khejdi tree (*Prosopis cineraria*), which is an economically valuable tree in the desert (Gadgil & Vartak, 1976; Gadgil & Guha, 1992; Kothari *et al.*, 1998). In rural Nepal, the Snow leopard (*Panthera uncia*), which usually attacks livestock, have been reported to live harmoniously with people as the local Buddhist have faith that the animals are related with the “Mountain god” and killing them is a sin, thus their conservation instead of retaliatory killing (Ale, 1998).

In some parts of Africa, Hamerkop (*Scopus umbretta*) and African Owls are linked with witchcraft. Therefore, it is a taboo to cause any injury or death to them as they are harbors of misfortune (Muiruri & Maundu, 2010). In a study conducted in Northern Benin, sighting of nocturnal species during the day is a misfortune; hence all of the species that portrays nocturnal behavior are not hunted during the day. The species that are not to be hunted at night include; Striped polecat (*ictonyx striatus*), Honey badger (*Mellivora capensis*), African Pouched rat (*Cricetomys emini*) and Gambian Pouched rat (*cricketomys gambiancus*) (Djagoun *et al.*, 2009).

Similar prohibitions have been reported in some other studies conducted in Africa, for example in a study conducted within Mount Cameroon national park Buea, all the

respondents indicated that it is a taboo to kill the African Elephant or consume its meat or use its body parts for whatever reasons by the Bakweri clan (Abugiche *et al.*, 2017). In East Usambara region of the Republic of Tanzania, the Samabaa tribe believe that consuming Bohr reedbuck (*Redunca redunca*) and Bushbuck (*Tragelaphus scriptus*) will lead to skin disease, hence, a reduction in the persecution of these two species (Kideghesho, 2008). In the Kaya forest of the Kenyan Coast, there is a taboo prohibiting the cutting of trees in the forest or vegetation around the forest (Kibet, 2011), similar restriction are enforced by the Tiriki community in on Tiriki forest of Khamisi in Western Kenya which has since remained pristine as compared to the surrounding ecosystems (Darr *et al.*, 2009).

In the global context, the application of traditional African cultural practices has been effective in conserving species listed in the IUCN red list of threatened species (Kideghesho, 2008). A study conducted by Colding and Folke (2001) found that, 21 out of the 70 taboo species listed in the African Culture are found in the IUCN red list. In the Kaya forest of the Kenyan Coast ,4 out of 9 flora and fauna species are recorded in the IUCN red list due to their restricted range (Metcalf *et al.*, 2010).

2.1.3 Importance of sacred sites in wildlife conservation

Globally, sacred sites have been used successfully to ensure restriction and control in the access and utilization of habitat resources. Traditionally, sacred sites are believed to be the reservoirs of power and holy places as well as homes of gods and the departed ancestral souls (Kideghesho, 2009). Sacred sites are mostly found in groves, hills, streams, forests or any other water body. They are currently becoming of great concern in wildlife conservation due to their links with taboos (Gadgil & Vartak, 1976).

In the global society, sacred sites are highly valued as sites that promote in-situ biodiversity conservation for their pristine nature. Some of the sites have global recognition, for example, the Kaya forest at the Coast region is listed by UNESCO as one of the world Heritage sites (Mgumia & Oba, 2003), and Mount Kenya which is listed in the man and biosphere reserve (Dudley *et al.*, 2009). Similarly, the sacred grooves of Oshogbo, and the Yoroba of Ara Nigeria (Dudley *et al.*, 2009), Malshegu groove Ghana, and the Western Rajasthan (Colding & Folke, 2001) as well as the Meso and South America, the Kuna of Panama (Chapin, 1991) have special traditional regulations that control and prohibit resource utilization (Colding & Folke, 2001).

2.1.4 Totemic species in wildlife conservation

Totemic or sacred species (flora and fauna) have been effectively used for species conservation many parts of the world (Colding & Folke, 2001; Jones *et al.*, 2008; Abugiche *et al.*, 2017). For example, the Bodhi/Peepal tree (*Ficus religiosa*) is sacred to the Buddhist as they believe that it is the tree that provided a house for the Buddha to attain enlightenment. The Hindus also use the sacred fig tree for meditation during worship (Ramakrishnan *et al.*, 1998).

In the African culture, totemic species are of great significance and are referred to in the folklore, narratives, and songs as well as the naming of people. They signify the role of the species in the community. In most occasions, the totemic species are less subjected to threats caused by human faults and desires (Kideghesho, 2009; Sifuna, 2012). In Kenya, many tribes have totemic animals such as, the leopard (*Panthera pardus*), monkey, fox, antelope, elephant (*Loxodonta africana*), buffalo (*Syncerus caffer*), crocodile, tortoise, and some snake species, for example, cobra, puff adder and python (Sifuna, 2012). The Maasai have a saying that associates nature with livestock “*cows grow trees elephants grow grass*” this shows how traditionally the Maasai community valued wildlife and was able to co-exist with wild animals on their land (Western, 2001).

In the traditional Maasai culture, the elephant was highly respected and valued; they believed that it had a soul as well as two breasts similar to that of human. By a way of appeasing the dead elephant, green branches or grass was always placed on top of the carcass (Kangwana, 1993; Kuriyan, 2002; Kioko, 2004). It was also believed that when a Maasai herder finds an elephant placenta in the grazing fields, it was a sign of fortune or good luck (Chadwick, 1992; Kangwana, 1993; Sitati, 2003; Kioko, 2004). This is evident by having the herder construct a temporary boma and spending a night there with his livestock, he will in the near future own a lot of livestock as a cultural believe (Chadwick, 1992; Kangwana, 1993; Sitati, 2003; Kioko, 2004). Possession of a lot of livestock in the pastoralists community for example the Maasai is often associated with being wealthy (Flintan *et al.*, 2008).

Among the pastoralist communities (the Maasai, Samburu and Turkana) of Kenya, Oxpecker *Buphagus* species is highly valued for their feeding habits on the parasites on the livestock's skin. The presence of cattle egret (*Bulbucus ibis*) is an indicator of drought or prolonged dry spell therefore used as an indicator for migration of the pastoralist to areas with abundant pasture for their livestock (Muiruri & Maundu, 2010). During cattle rustling and prolonged

periods of drought, the vultures have been used by the pastoralists to detect the carcass of their dead fighters and livestock (Reson, 2012).

In the Maasai community, certain plant species are used for medicinal purposes to treat various human and livestock ailments (Ole-Miaron, 2003). Equally important is the knowledge on the location of the species depending the geographical boundary (Roué *et al.*, 2016). In the extraction of the medicinal derivatives, different plant parts, for example, are obtained depending on the nature of the ailment, (Kokwaro, 2009). The Maasai use plants in traditional occasions such as blessings rites of passage and during circumcision. In such occasions, goats are slaughtered and the medicinal plant is brewed into a soup and consumed (Burford *et al.*, 2001).

2.2 The concept of attitude towards wildlife conservation

The concept of attitude towards wildlife conservation was first used by Thomas and Znaniecki (1918) in the study of Polish peasants. In this study, value of environment and the influence of social element on attitude were defined as the “state of mind of the individual towards a value”. The word attitude has been used to express positive or negative responses towards one or more stimuli, but it can also relate to the possible conduct and behavior which is favorable support and unfavorable support towards an object (wildlife) (Murphy *et al.*, 1991; Karanth *et al.*, 2008).

Individual attitudes are acquired in the course of constant interaction with the object or situation and maintaining them when they are reinforced (Nzuve, 1997). Attitudes are learned and not inherited, and can be acquired through three main different ways. First, attitude can be acquired through direct experience with the object which results from an individual's decision to reward or punish an experience encountered with the object. Second, attitudes can be acquired through an association with an object; this is achieved by relating that object with another object which had previously led to the formation of an attitude. The third way of acquiring attitude is through learning from others, by developing an attitude from what one is taught or told by others about the object (Nzuve, 1997).

Attitude has three components, namely: an affect (a feeling), cognition (a thought or belief), and behavior (an action). Attitudes help us define how we see situations, feel towards the object as well as define how we behave toward the situation or object (Nzuve, 1997).

Attitudes acquired through personal experience tend to be more resistant to change than those learned from associations with objects (Nzuve, 1997).

Attitudes are formed, in part, by local communities, or by an individual's perception and experiences, and it can change their values and thoughts and improve their overall welfare (Infield and Namara, 2001). According to Kellert and Westervelt (1983), there are nine distinct categories of attitudes in relation to wild animals conservation: naturalistic, ecologicistic, humanistic, moralistic, scientistic, aesthetic, utilitarian, dominionistic, and negativistic. According to Kellert's terminology, attitudes toward wildlife that are naturalistic, ecologicistic, aesthetic, and moralistic must explicitly be conspicuous; while negativistic, neutralistic, dominionistic and utilitarian values must diminish (Gibbs & Hunter Jr, 2007).

Research on human attitudes towards wildlife conservation is centered on local communities' proactive or reactive behavior towards wildlife conservation policies and regulations. The main aim is to provide evidence on efficient decision-making regarding resource allocation and utilization on wildlife conservation issues (Fiallo & Jacobson, 1995). Hence, knowledge of attitude towards wildlife conservation aids in the design of conservation policies and programmes. It also provides opportunities for participatory implementation and management of wildlife conservation projects by incorporating a bottom-up approach in decision making and management of wildlife resources (Parry & Campbell, 1992).

2.3 Attitudes and practices towards wildlife conservation

Attitude predicts behavior, hence, to promote wildlife conservation outside PAs, it is imperative to understand local communities' attitudes and beliefs as they impinge on conservation practices (St John *et al.*, 2011). The effect of attitude on conservation behavior is mediated by some perceived behavioral control such as behavioral characteristics of the species as it interacts with humans, cultural practices such as traditional taboos and norms in relation to wildlife resource utilization (Martín-López *et al.*, 2007). Many factors affect conservation attitudes either positively or negatively (Kideghesho *et al.*, 2007; Martín-López *et al.*, 2007). Factors that results into positive conservation attitudes are likely to result into support to wildlife conservation. However, those that accelerate negative attitudes may lead to unsupportive or anti-conservation behavior (Oli *et al.*, 1994; Kideghesho *et al.*, 2007).

To achieve sustainable wildlife conservation programs, the needs and views of the local communities must be put into consideration (Wilshusen *et al.*, 2002). In addition, to make people have pro-conservation attitudes and behavior(s), there is need to focus on capacity building through formal and informal on environmental education (Kahan & Ali, 2015). A study by Nsonsi *et al.* (2017) reported that some of the local communities had inadequate and often imprecise knowledge of the conservation actors in the area and believed that PA was created by or for the benefit of the white man. Such negative attitudes were attributed to lack of information about the role of each actor in conservation, and the effect of historical injustices of forceful eviction of local communities to create land for national park establishment.

A study on the attitudes of local communities towards conservation of mangrove forest in East Coast of India, indicated that local communities derive consumptive benefits from the mangrove ecosystems in terms of food, beverages, timber, fuel wood, thatch, charcoal, tannins and dyes (Badola *et al.*, 2012). Irrespective of these benefits, the destruction of mangrove ecosystems was still on the rise, due to lack of awareness among local dwellers on the importance of sustainable use of the mangrove ecosystems on their livelihoods (Badola *et al.*, 2012).

Other studies conducted in Africa have shown that receiving benefits from conservation proceeds results into improved development, and change towards positive attitudes; but, has less success in pro-conservation behavior of local communities (Brandon & Wells, 1992; Abbot *et al.*, 2001; Infield & Namara, 2001; Campbell & Vainio-Mattila, 2003). Scarcity of traditional knowledge regarding conservation issues and PAs management practices is a major factor contributing to less pro-conservation behavior which is detrimental for wildlife conservation efforts (Wilshusen *et al.*, 2002).

2.4 Factors associated with the local communities' attitudes and practices towards wildlife conservation

The variation of the local people's attitudes towards wildlife conservation is due to a number of factors including gender, age, race, marital status, knowledge(traditional and modern) on wildlife conservation, number of livestock owned, past experience of wildlife destruction, size of the household, level of education (formal or informal), main source of livelihood and protected area policy (Sitati, 2003; Naughton-Treves & Treves, 2005; Lee *et al.*, 2009).

2.4.1 Association between crop destruction and livestock predation with attitudes towards wildlife conservation

The cost of wildlife conservation is always more expensive to the local communities than the benefits they receive having wildlife on their land (Norton-Griffiths & Southey, 1995; Balmford & Whitten, 2003; Nyhus *et al.*, 2005). The damages associated with conservation incurred by the local communities such as; crop damages (de Boer & Baquete, 1998; Rao *et al.*, 2002; Naughton-Treves & Treves, 2005; Shrestha & Alavalapati, 2006), livestock predation and transmission of diseases have negative effect on the local communities attitudes towards wildlife conservation (Oli *et al.*, 1994; Archabald & Naughton-Treves, 2001; Walpole & Goodwin, 2001; Rao *et al.*, 2002; Walpole & Thouless, 2005; Bagchi & Mishra, 2006; Wang & Macdonald, 2006; Romanach *et al.*, 2007; Suryawanshi *et al.*, 2013). The major causes to negative attitude towards wildlife conservation are livestock loses together with crop damage, hence hindering efforts towards successful wildlife conservation actions and policy implementation (Weladji *et al.*, 2003; Wang & Macdonald, 2006).

A recent study by Nsonsi *et al.* (2017) showed that past experience with human elephant conflict was associated with communities' attitudes towards Elephant conservation in Nouabalé-Ndoki national park (NNNP) in northern Congo. Respondents in this study cited killing of the elephant as a long term approach to end HWC. In addition, it was found that conservationist 'the Europeans' are more concerned with the survival of elephants at the expense of local community. This is accelerated by lack of compensation for damages incurred by wildlife (Naughton- Treves, 1997; Gadd, 2005). A study conducted in Amboseli national park, in Kenya, it is reported that local communities viewed that "*conservationists and the government are more concerned about wildlife than about human well-being*" (de Lima Roque, 2009).

In a study conducted on attitudes of local people towards wildlife conservation in the Kashmir Valley in India, there was a significantly high unfavorable attitude towards wildlife conservation among respondents who had past experience of crop destruction and livestock killings by wildlife (Mir *et al.*, 2015). Similarly, in the high Andes of Argentina, a study of local residents' perceptions revealed that the majority of the respondents had negative perception towards larger carnivores conservation (Lucherini & Merino, 2008).

In Kenya, a study on predator-proof bomas as a tool in mitigating human- predator conflict in Loitokitok Sub county Amboseli Region, found that loss of livestock as a result of predatory

attacks led to negative attitudes among the pastoralists community, with hyena being cited as the main (68%) predator to livestock in the study area (Manoa & Mwaura, 2016). The loss of livestock negatively affects the community by a reduction in socio-economic status of affected individuals; hence it is recommended that the future conservation projects should aim at reducing human wildlife conflicts and promoting alternative livelihood projects to enhance income of the local community (Manoa & Mwaura, 2016).

2.4.2 Association between wildlife conservation benefits and attitudes towards wildlife conservation.

Receiving benefits from conservation may have a positive output for the support of a conservation programme (Nyhus *et al.*, 2005; Kansky *et al.*, 2014). People's attitudes are associated with to the instrumental value attached to wildlife resources often supported by the utility value (Kellert & Berry, 1980). Moreover, favorable support towards wildlife conservation has been reported in areas where residents gain financial benefits from a conservation program/ project. The success of conservation has been shown to be high in areas where equitable sharing of benefits (goods and services) accruing from the conservation is observed (Newmark *et al.*, 1993; Infield & Namara, 2001; Ogutu *et al.*, 2014; Nsonsi *et al.*, 2017).

In the Nouabalé-Ndoki National Park (NNNP) study in northern Congo, there were more overall positive attitudes towards elephant conservation and more positive answers in the village where a conservation project was implemented Nsonsi *et al.* (2017). The study further noted that those who had been employed in the conservation project expressed positive attitude (supported conservation activities) than those employed in other sectors.

Similarly, a study carried out around Lake Mburo National Park, Uganda, showed that local community who were receiving benefits had more positive attitude towards the park and wildlife than local communities that did not (Infield & Namara, 2001). Another study in central Kenya reported that local communities were more likely to have positive attitudes towards predators if ecotourism activities would provide additional income to their household (Romanach *et al.*, 2007).

However, failure to receive benefits from wildlife conservation reduces the likelihood of local communities support for wildlife conservation activities (Gadd, 2005). Unfavorable attitudes towards wildlife is a major drawback on conservation efforts as it often leads to

retaliatory killings of wild animals in case of human property destruction (Oli *et al.*, 1994; Williams *et al.*, 2002; Bagchi & Mishra, 2006). To ensure that support for conservation is not compromised, the cost of wildlife conservation should always be lower than the benefits to the local community (Campbell & Vainio-Mattila, 2003).

In some instances, when local communities are restricted from accessing wildlife resources (e.g., pasture, timber, firewood, bush meat and honey) in PAs, they tend to portray long-term resistant to rules and regulations. This is due to the long-term cultural practices and traditions in utilizing the resource (Bekure, 1991; Kangwana, 1993; Browne-Nunez, 2010; Goldman *et al.*, 2010). For example, in Uganda, Bwindi Impenetrable Forest, after the gazzetment as a national park, local communities deliberately set fires in retaliation which consumed 5 % of the forest (Hamilton *et al.*, 2000). In South Africa's Tsitsikamma national park, local communities are engaged in anti-conservation activities such as illegal fishing in the marine reserve that is not permitted by law as a way of resistance to compliance of conservation policies "no take" (Watts & Faasen, 2009).

2.4.3 Association between household size and attitudes towards wildlife conservation

The effect of household size which is usually defined as the number of individuals who depend on the support of the household head for the basic needs (food, shelter and clothing as well as education) (Kideghesho *et al.*, 2007) has featured in most attitudinal studies in developing countries (Bragagnolo *et al.*, 2016). Household size has been used as an explanatory variable in 36 tests out of which it has shown significant effect on attitude towards conservation in only 9 studies (Bragagnolo *et al.*, 2016). The influence of household size had no significant influence on attitudes of local communities towards conservation (de Boer & Baquete, 1998; Kideghesho *et al.*, 2007).

A study conducted in Nepal, found a significant relationship between household size and attitude (Shrestha & Alavalapati, 2006). Larger families showed a negative attitude towards wildlife conservation than small size families. The effect of household size was more pronounce among those with lower education, lack of adequate incentives to conservation and limited access to natural resources for livelihood income (Shrestha & Alavalapati, 2006). on the contrary, a study among Manja community in Ethiopia showed that larger households held a positive attitude towards conservation measures by engaging in conducive forest conservation practices such as planting of more trees than those in smaller households (Wuletaw, 2008). This was because forest depletion affected their livelihood, as many

household relied on forest resources for fuel wood and charcoal which they sold to urban dwellers (Wuletaw, 2008).

2.4.4 Association between duration of stay in an area and attitudes towards wildlife conservation

The effect of duration of stay / length of residence has also been used as an explanatory variable in few attitudinal studies in developing countries. Out of a survey of 123 attitudinal studies from third world countries, 15 studies have tested the significant relationship between length of residency and attitudes towards PA and park staff and the association have proven to be statistically significant in 9 studies (Bragagnolo *et al.*, 2016). The length of residency has always been used to prove the effect of age on attitude towards conservation (Waylen *et al.*, 2009).

Indigenous people or individuals with longer periods of residency have been shown to express favorable attitudes to the existence of PA and its conservation programmes (Ferreira & Freire, 2009; Lee *et al.*, 2009; Vodouhê *et al.*, 2010). On the contrary, indigenous people may sometimes portray unfavorable attitudes towards PA staff due to restricted access to wildlife resources (Newmark *et al.*, 1993; Arjunan *et al.*, 2006). The negative attitudes is always as a result of linking the PA workers with the restricted and prohibited access to natural resource use and grazing rights (Heinen & Shrivastava, 2009), being persecuted in non-compliance with the protected area laws and regulations (Infield & Namara, 2001) and for the fear of being evicted from their traditional land (Allendorf, 2007). A case study in Tanzania, showed that increased land ownership and shorter duration of stay resulted into higher likelihood of supporting degazettement of Katavi National Park by the farming communities (Holmes, 2003).

2.4.5 Association between gender and age with attitudes towards wildlife conservation

Gender and age have been shown to be associated with individuals' attitudes in a positive or negative way (Ajzen & Fishbein, 1980; Martín-López *et al.*, 2007). The association of these two variables (gender and age) with attitude towards conservation depends on cultural practices and past experiences with wildlife and may also vary hand in hand with traditional knowledge of wildlife conservation (Bragagnolo *et al.*, 2016).

In a study conducted in South Africa's Kruger national park, revealed that younger people had more positive attitude towards the PA attributed to the lack of experience to historical

injustices and the presence of numerous educational activities organized by the park (Anthony, 2007). Similarly, in Kenya, a study in Maasai-land, found that youth whose parents were engaged in tourism-related activities had more favorable attitudes towards wildlife and environmental conservation, with a third (34%), of the youth citing wildlife as a source of foreign exchange (Kioko & Kiringe, 2010). In the same study, majority (62.7%) of younger male had more favorable attitudes towards presence of wild animal (elephant) within their land than their female counterparts.

On the contrary, elders living in rural areas that border four PAs in Ethiopia were found to portray more favorable attitudes of the parks than their younger people. This is due to the personal experience on the negative effects of environmental degradation which made them appreciate the significant role of PAs in wildlife conservation (Tessema *et al.*, 2010). An exploratory survey on communities attitudes on the Amboseli elephants in Kenya showed that older male had positive attitudes towards elephant conservation than women and younger individuals (Kangwana, 1993). In line with the common Maasai saying “*cows grow trees elephants grow grass*”, older persons appear to be more awareness on the important role of the elephant in opening up grasslands from the forest and bush land ecosystems than younger generations (Western, 2001). A different study in Kenya Amboseli area reported that male respondents were more likely than female participants to vote in support of elephant to live in community land (Browne-Nunez, 2010). The variation in attitude by age and gender is reinforced by age set and gender norms among the Maasai community (Browne-Nunez, 2010).

Studies have shown that women were less aware about wildlife conservation and PA management (Xu *et al.*, 2006; Olomí-Solà *et al.*, 2012), hence making majority of women to lack knowledge on wildlife and environmental issues (Nyhus & Tilson, 2003; Bitanyi *et al.*, 2012). It evident that globally, most nations still experience gender discrepancy in terms of access to opportunities for education and involvement into decision making on conservation issues that involves the utilization and management of wildlife resources. It is important to note that the relationships between attitudes and gender may be defined by the influencing effects of gender and awareness. For example having awareness on hunting is more likely to be defined by gender in areas where hunting is practiced by both sexes, unlike the direct influence of gender on attitudes (Xu *et al.*, 2006).

Kellert (1994) found that women, older people, people with lower education level, people working in the natural resource dependent profession or people living in rural area within a carnivore distribution range tend to have more negative attitudes. Women are largely affected by the restrictions imposed on wildlife resource use, are often left out of formal information systems / structures and tend to have negative attitude towards policing type conservation practices (Chandola *et al.*, 2007; Ogra, 2009). For example, a study conducted in India Kashmir Valley, found a significant relationship between gender and attitudes towards wildlife conservation. Male respondents had favorable support towards wildlife conservation than female respondents (Mir *et al.*, 2015). This relationship could arise due to the typical fear of women to carnivores (Kaltenborn & Bjerke, 2002; Røskft *et al.*, 2003) and the occasional less interaction of women with wild animal as men are the ones who mostly defend the family and property from wild animals attack (Røskft *et al.*, 2003; Goldman *et al.*, 2010). On the contrary, in a study conducted by Arjunan *et al.* (2006) they found that women had more positive attitude towards forest than men did.

However, some studies have reported insignificant relationship between gender and attitude towards wildlife conservation. Gandiwa (2012) found that gender had no significant influence on local community's perception about conservation in areas adjacent to 4 national parks in Zimbabwe. Kideghesho *et al.* (2007) in a study in Western Serengeti Tanzania also found that gender had no significant effect on attitudes towards wildlife conservation.

2.4.6 Association between wealth and attitudes towards wildlife conservation

Wealth has been widely used to define socio-economic status (Pullin *et al.*, 2013). Individuals employed in wildlife conservation projects have portrayed favorable support towards wildlife conservation (Archabald & Naughton-Treves, 2001; Walpole & Goodwin, 2001; Anthony, 2007; Kioko & Kiringe, 2010; Snyman, 2012; Nsonsi *et al.*, 2017).

The number of livestock owned has been shown to have a significant association with attitudes towards wildlife conservation, local people who owns a lot of livestock are more likely to indicate lack of support to wildlife conservation programmes (Suryawanshi *et al.*, 2013). For example, a study conducted in Upper Spiti, Himalayan India reported that villages with higher livestock (yaks and horses) perceived the snow leopard to be a greater threat (Suryawanshi *et al.*, 2013). An evaluation of the conservation attitudes of local villagers towards tiger conservation in Kalakad- Mundanthurai Tiger reserve in Southern India found that poor residents who were receiving benefits or not, all had favorable attitude in support of

tiger conservation. The presence of tigers did not affect their livelihood in any way. The study further noted that rich families who had experienced crop damage on their farms and were obstructed from hunting had a negative attitude unlike the poor who were not affected by the loss (Arjunan *et al.*, 2006).

Persons from poor households or those whose source livelihood mainly rely on the consumptive utilization of natural resources are in most cases associated with negative attitudes towards PAs (Hamilton *et al.*, 2000; Jim & Xu, 2002; Fu *et al.*, 2004; Dolisca *et al.*, 2006; Anthony, 2007; Ferreira & Freire, 2009). The negative attitude is due to limited or restricted access to resource utilization, which is a common phenomenon in most of the PAs “Fence and fines Approach” or protectionist approach (Jim & Xu, 2002; Brown, 2003).

2.4.7 Association between education (formal and informal) and attitudes towards wildlife conservation

Formal or non-formal education defines awareness and learning process hence it has a directional influence on attitudes towards wildlife conservation (Bragagnolo *et al.*, 2016). Education is a major determinant of the local communities support towards wildlife conservation, because it influences and improves attitudes of local communities towards wildlife conservation (Mehta & Heinen, 2001). Hence, formal education has been effective in promoting success in conservation activities and efficient implementation of policy that relates to wildlife (Kellert, 1994; Woodroffe *et al.*, 2005; Ebua *et al.*, 2011). Educating people can lead to increased tolerance to wild animals especially carnivores (Woodroffe *et al.*, 2005). On the same note, it could be cumbersome to educate individuals with unfavorable support towards large carnivores (Kaczensky *et al.*, 2004; Majić & Bath, 2010). The effect of formal education when tailored towards conservation have shown to correlate with favorable attitudes (Infield, 1988). It is evident that bachelor students trained in conservation biology may contribute their opinion in reference to the training on environmental matters (Caro *et al.*, 1994).

Local support in the conservation villages is further enhanced through decades of environmental education and community outreach programmes that have helped raise people’s knowledge and foster support to wildlife (Infield, 1988; Newmark *et al.*, 1993; Holmes, 2003; Breuer & Mavinga, 2010; Nsonsi *et al.*, 2017). Having a formal education on conservation have been reported to lead to pro-conservation behaviors such as involvement in monitoring of wildlife against poaching, venturing into ecotourism activities as well as active

involvement in tree growing programmes (Vodouhê *et al.*, 2010). In a study on manatee (*Trichechus manatus latirostris*) conservation, results show that greater awareness of the manatees was positively correlated with support for manatee protection (Aipanjiguly *et al.*, 2003).

However, educated individuals may sometimes portray a negative attitude towards conservation (Bragagnolo *et al.*, 2016). In Kenya, Guthiga *et al.* (2008) on comparing the levels of community satisfaction with three distinct forest management approaches, found out that educated households were more dissatisfied with the protectionist approaches despite its effectiveness in ecological preservation (Guthiga *et al.*, 2008). Education level might have no significant relationship with knowledge and attitude towards species conservation though it might have a directional influence (de Boer & Baquete, 1998; Aipanjiguly *et al.*, 2003). In a study conducted in Florida Tampa Bay on manatee (*Trichechus manatus latirostris*) conservation, education level was not significantly associated with level of knowledge about manatees (Aipanjiguly *et al.*, 2003). A study by de Boer and Baquete (1998) in Mozambique found that education level had no significant association with attitude of local people towards Maputo Elephant Reserve.

2.4.8 Association between culture and attitudes towards wildlife conservation

In situations where the traditional cultural practices on natural resource use are applied in the conventional conservation strategy, the notion of local community that nature conservation is a white man's business will be cleared (Murphree, 1993). Benefits accrued to local communities which are non- monetary but cultural based are efficient in winning support of people to wildlife conservation (Infield & Namara, 2001). Traditional user rights to forest resources and cultural practices were important influencers of attitudes in the past and present as a result of effective traditional knowledge transmission to from one generation to another (Kideghesho *et al.*, 2007). For example the older generation who had past experience in the direct consumptive utilization of the forest resources such as r grazing of livestock and access to bush meat developed negative attitudes towards modern conservation "fences and fines" than the younger individuals, this was as a result of the prohibition of the access to forest resources (Anthony, 2007; Badola *et al.*, 2012).

Social norms and taboos if well taught and adhered to, has been successful in governing the systems of natural resource exploitation in the traditional societies (Berkes *et al.*, 2000). The use of norms and taboos that prohibits certain acts against the species in question has played a

great role in biodiversity conservation and management. This has been achieved through fear of being punished or stricken by bad omen hence wise use of resources. For example, in Mount Elgon Uganda, the act of killing young or pregnant animal is not permitted and also the harvesting excess bamboo or fuel wood than can be carried is a taboo, this is because the acts are considered an annoyance to the ancestral spirits (Scott, 1998). In addition to the norms and taboos, there are traditional institutions that have the obligation to watch over all activities that are associated to natural resource use. The institutions are composed of a set of rulers who set, oversee and enforce tribal rules/regulations. The institutions have high respect from community members who always abide by the guidelines of the set rules with the fear of being attacked by bad luck such as death, poverty, chronic disease, drought, loss of life (Kideghesho, 2008).

2.5 Research Gaps

In Africa due to the increased human population growth, there has been increased encroachment into protected areas coupled with changes from the past peaceful coexistence of Africans with wildlife (Browne-Núñez & Jonker, 2008). Human-wildlife conflict has been noted to be on the rise due to the encroachment into wildlife habitats (Omondi, 1994; Conover, 2001; Sitati, 2003; Nyhus *et al.*, 2005; Woodroffe *et al.*, 2005; Treves *et al.*, 2006; Western *et al.*, 2015). In Kenya, the Maasai community was known to peacefully co-exist with wildlife in the past, for example, they used ask God to give them more cows to feed their children themselves and the carnivores in their daily prayers. However, many Maasai families now resort to lethal measures to keep off wild animals from their land and from destroying their property (Reson, 2012). The commercialization of livestock keeping from the past traditional venture to meet the consumer demand, and inequitable benefit sharing of proceeds from wildlife conservation on their land has led to heighten human-wildlife conflicts.

Human-wildlife conflict is contributing to the massive decline of the wildlife populations in sub Saharan Africa (Sitati, 2003; Balme *et al.*, 2010; Okello & Kioko, 2011; Western *et al.*, 2015). In Kenya, over 65-75% of wildlife populations reside outside PAs on local community land (Norton-Griffiths & Said, 2010; Okello & Kioko, 2010; Okello & Kioko, 2011). Therefore, there is need to provide research-based evidence to unravel the main factors associated with traditional knowledge, attitudes and practices towards wildlife conservation by local communities.

From the review of literature, a number of studies done on attitudes towards wildlife conservation have shown several gaps of which the study aimed to fulfill. Some of the studies that have been done on attitudes towards conservation have failed to investigate predictors of behavior in a coherent and understandable manner in terms of target, action, coherent and time scale and by failing to collect qualitative data on the subjective norms, presence of facilitating factors and moral obligation in addition to data on attitude (Browne-Núñez & Jonker, 2008; St John *et al.*, 2011). Studies on human behavior which has a major role in the success of any conservation have rarely been studied using the psychological models. Majority of the studies have employed attitudinal studies based on the general attitudes towards conservation, rather than specific defined behavior that the conservationists are interested in supporting or eliminating such as poaching and retaliatory killing of wild animals (Browne-Núñez & Jonker, 2008; St John *et al.*, 2011).

The attitudinal studies that have been published since 2000, most (73%) of the studies used state PAs (national parks and national reserves) as case studies with national parks being the mostly used at 53% (Bragagnolo *et al.*, 2016). This study aimed at using community conservancy as a case study site, as it is evident that over 60-80% of wildlife population in Kenya is found outside PAs. Out of 123 studies conducted on attitudes towards PA or wildlife conservation in the third world countries, 80% lacked theoretical framework (Browne-Núñez & Jonker, 2008; St John *et al.*, 2011; Bragagnolo *et al.*, 2016). Theoretical framework is a critical component for model building approaches.

In addition, most of the attitudinal studies in Africa did not define the concept of attitude and how it relates to the conservation behavior (Browne-Núñez & Jonker, 2008). This study aimed to investigate the activities that are needed to foster positive attitudes towards wildlife conservation in indigenous communities' areas around protected areas.

The effect of knowledge to predict attitudes is low in most attitudinal studies done in the developing countries. There has been no study that investigated the potential influence of traditional knowledge on behavior. The influence of traditional knowledge which has a major impact on local /indigenous communities way of interaction with nature has been marginally been considered (Bragagnolo *et al.*, 2016). This study aimed to test the association of awareness of traditional knowledge on attitude and the influencing effect of formal education as a predictor of a favorable attitude towards wildlife conservation. According to the best of my knowledge there is no similar study in Kenya that has linked traditional knowledge,

attitudes and practices of local communities towards wildlife conservation in Enkusero Sampu Conservancy.

2.6 Theoretical framework

The study was based on the Theory of Planned Behavior.

2.6.1 The theory of planned behavior

As an extension of Theory of Reasoned Action, the Theory of Planned Behavior (TPB), and its associated attitude-behavior framework, has been developed with the aim to understand human behavior (Fishbein & Ajzen, 1975), it is currently the most widely adopted social psychological model (Hardeman *et al.*, 2002). Reviewed studies that have adopted the TPB, 67% of the case studies have reported some behavioral changes in the desired direction after intervention (Hardeman *et al.*, 2002). Attitude and norms influence behavioral intentions which is reported to be directly linked to the actual behavior (Browne-Núñez & Jonker, 2008).

The theory of TPB predicts that planned behaviors are determined by behavioral intentions which are largely influenced by an individual's attitude towards behavior, the subjective norms and the individuals' perception of their control over the behavior (Ajzen, 2002). Attitude refers to "persistent psychological tendency to feel and behave in a particular way towards some objects" (Albarracín *et al.*, 2005). In order for an individual to conduct a conservation behavior, three factors have to contribute to it and they include; attitudes (which are either positive or negative) subjective norms (decision to perform or not to perform the behavior) and perceived behavioral control (Ajzen, 2002). Perceived behavioral control is a function of the interactions between behavioral beliefs, normative beliefs and control beliefs that will facilitate the performing of behavior (Ajzen, 1985, 1991). According to Bateman and Willis (2001) belief is defined as personal view/judgment in relation to the object and the resultant magnitude it impacts on the object.

In the view of Conner and Sparks (2008) in studies of attitude, it is important to factor in the target action, content and timescale of the behavior. Many attitudinal studies have focused on general attitudes towards conservation rather than focusing on the specific behavior of concern to conservation for example reduced poaching, predator killing, and habitat destruction. To successfully influence human behavior there is need to properly define the

determinants of behavior (Vlek & Steg, 2007). It has been affirmed that attitude alone is not a predictor of a conservation behavior (Infield & Namara, 2001; Waylen *et al.*, 2009).

The Theory of Planned Behavior is based on two assumptions; first, it assumes that people evaluate a behavior before deciding to engage or not to engage in it and second, people make quite rational decisions on the basis of systematic evaluation of information available to them(be it correct or not) (Ajzen & Fishbein, 1980). The application of TPB may be applied in conservation-based attitudinal studies on comments by Jacobson and Johnson (2006) who noted that, an intention held by an individual is grounded by his attitude in favor or disfavor in regard to the object, perception of social pressure to conduct the action, and knowledge that one is capable of doing the act within a specified period of time (Howe, 2009; López-Mosquera *et al.*, 2014; Adamu *et al.*, 2017).

Willingness to Pay (WTP) towards wildlife conservation can be used as a measure of behavioral intention (Howe, 2009). WTP is the amount an individual(s) is /are willing to pay to achieve some goods or services (Heywood & Watson, 1995). Previous studies show that WTP questions can be indirectly used to measure behavioral intention which would further help in understanding attitudes (Howe, 2009; Bhandari & Heshmati, 2010). Further WTP approach is best evaluated for goods and services that have economic socio-cultural and political importance to individuals, hence it can be easier to determine their behavioral intention toward the conservation (Howe, 2009; Adamu *et al.*, 2017).

2.7. Conceptual framework

The conceptual framework in Figure 2-1 shows the relationship between the independent, intervening and dependent variables. It provides a basis for showing the connection between factors associated with individuals' attitudes towards wildlife conservation and related "conservation behavior" which is referred to as the practice towards wildlife conservation in this study. In Figure 2-1, it is indicated that attitude towards wildlife conservation is influenced by heterogeneous factors to result in a conservation behavior.

The independent variables are hypothesized to have a direct association with the dependent variables influenced by the intervening variables. The independent variables were i) socio-demographic factors which include; gender (male or female), age (young or old) marital status (in union or not in union), household size and duration of stay in the area, and 2) socio-economic factors such as; wealth (no of livestock owned, occupation, main source of

livelihood, and level of education) may be linked to either positive or negative attitudes towards wildlife conservation. The intervening variables (Socio-cultural practices, willingness to pay for the lion conservation project, and policies towards wildlife conservation on incentives and compensation), believed to have a causal relationship between the independent and dependent variables could not be measured in the study.

The wealth-related variable such as income and occupation level strongly affects human desires and wellbeing. The attitudes of the wealthy individuals and poor will vary depending on the interaction they have towards the wildlife resources. Age and gender of the individuals tend to have an influence on awareness of traditional knowledge and attitude, while socio-cultural practices is highly likely to influence awareness of traditional knowledge towards wildlife conservation as a subjective norm.

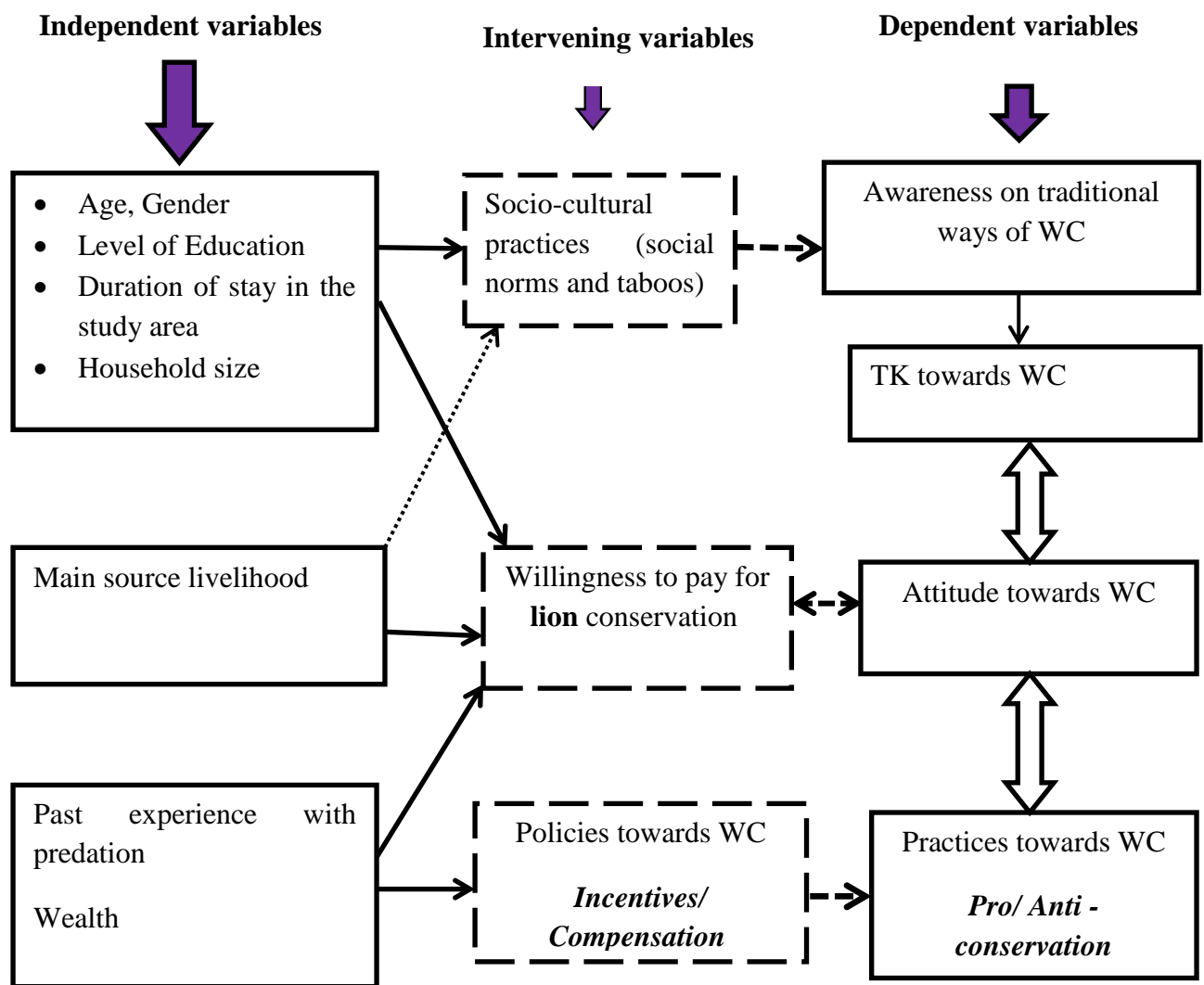


Figure 2- 1: Conceptual framework for factors associated with traditional knowledge, attitudes and practices towards wildlife conservation.

Source: Author (2018)

Intervening variables influencing the dependent variables are: socio cultural practices (social norms and taboos), policies towards wildlife conservation and the presence of an incentive to conserve wildlife or compensation to losses incurred. Willingness to pay towards lion conservation project has been used to determine the individuals' behavioral intention to support conservation initiatives. Willingness to pay and attitudes towards wildlife conservation have a direct inverse relationship.

The dependent variables for the study were; traditional knowledge, attitudes and practices towards wildlife conservation. All the dependent variables had an association, such that the effect of one dependent variable had an impact on the other two dependent variables. The influence of knowledge (traditional, local, indigenous or formal) and attitude towards wildlife conservation have a two-way relationship. It is assumed that if an individual has awareness of wildlife conservation he/she will have positive attitudes towards wildlife conservation. This assumption holds if all other possible factors influencing attitudes are held constant.

Similarly, individuals with a positive attitude towards wildlife conservation will in most cases be more willing to have knowledge on matters that pertain to conservation; hence resulting into a conservation behavior (pro-conservation or anti-conservation). The conservation behavior results into practices of individuals towards wildlife conservation which is dependent on an individual's values which is an inherent characteristic. The values could be based on anthropocentric views (conserving nature for monetary gains) or biocentric view of nature (conserving nature for the intrinsic value) (Figure 2-1).

CHAPTER THREE

METHODOLOGY

3.0 Study Area

The study was conducted in Enkusero Sampu Conservancy (ESC) in Kajiado West Constituency, Kajiado County. The area is located at the right Eastern border of South Rift Association of Land Owners (SORALO) area and on the Southwestern side of Nairobi national park between latitude $01^{\circ} 30'0''$ – $12^{\circ}5' 0''$ S and longitude $36^{\circ} 40'0''$ E as illustrated in Figure 3-1. ESC covers an area of 4046 Ha and forms part of the greater SORALO ecosystem which is composed of 13 community conservancies, covering a total area of 124,084 Ha. SORALO covers a critical area connected to the Mara Ecosystem, through the Loitas, and towards the Amboseli Ecosystem. The SORALO ecosystem has a major ecological role in preserving cross-border linkages for pastoral and wildlife movements from Kenya to Tanzania (King *et al.*, 2015).

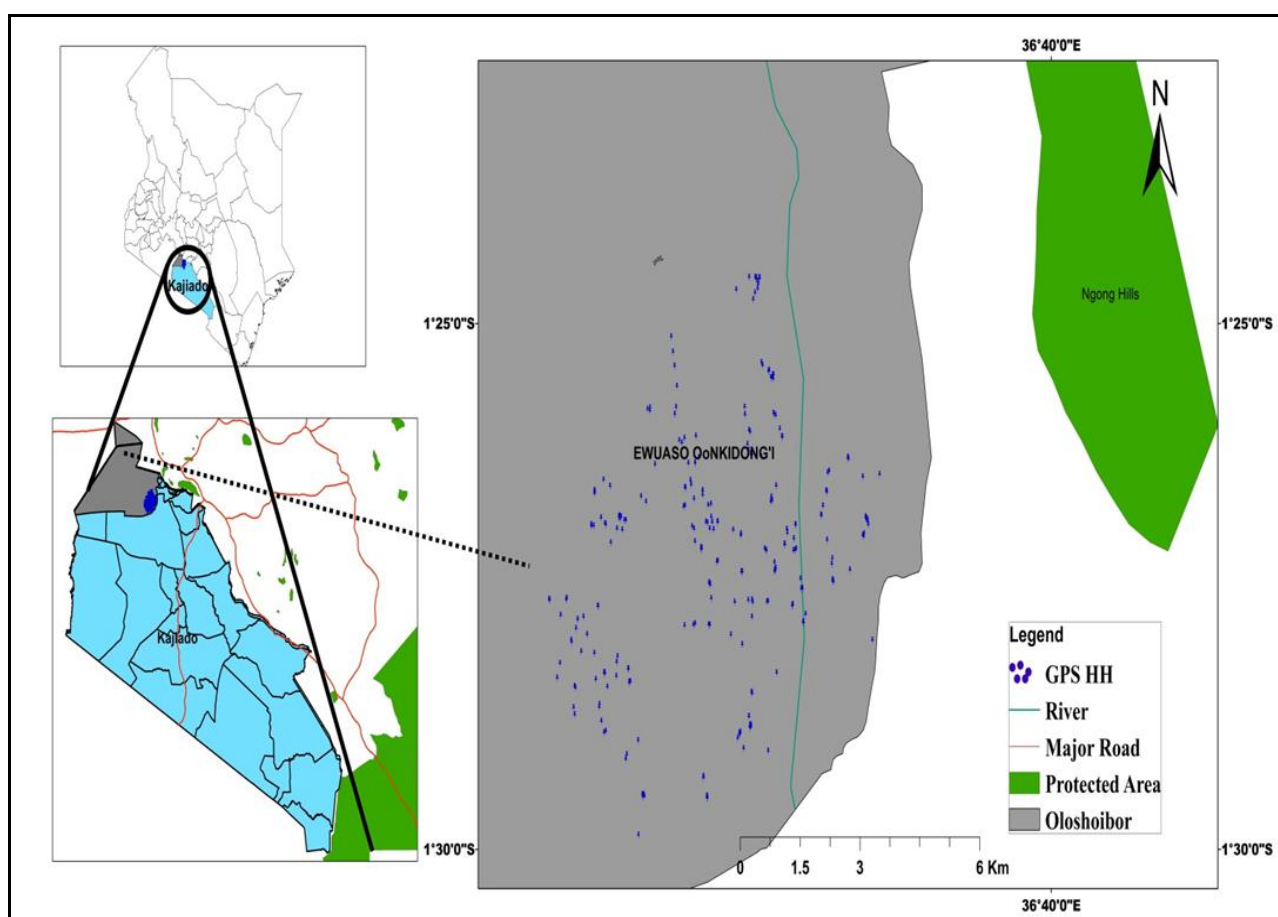


Figure 3- 1: Map of ESC and household survey points

Source: Researcher, 2018

3.1 Description of the parameters of the area of study

3.1.1 Demographic characteristics of the study area

According to the national population census of 2009, Kajiado West Constituency had a population of 106,933 persons with a projected annual growth rate of 5.5 %. It has a lowest density of 14 persons per Km² in the entire Kajiado County due to its vast area. The area is sparsely populated due to harsh climatic conditions unfavorable for farming and settlement (Government of Kenya, 2013a).

3.1.2 Climate conditions of the study area

The study area has a bi-modal rainfall pattern, with short rains falling between October and December while the long rains fall between March and May. There is a general rainfall gradient that increases with altitude (Government of Kenya, 2013a). SORALO ecosystem rainfall amount ranges from as low as 300mm in the Amboseli basin to as high as 1250mm in the Ngong Hills and the slopes of Mt. Kilimanjaro. Enkusero Sampu Conservancy specifically receives an average of 600mm annually. The rainfall distribution varies gradually from East to West across Kajiado County (Bekure, 1991).

Temperatures vary both with altitude and season; the highest temperatures of about 34°C are recorded around Lake Magadi while the lowest of 10°C is experienced at Loitokitok on the eastern slopes of Mt. Kilimanjaro and Ngong Hills. The coolest period is between July and August, while the hottest months are from November to April. Larger part of the year is characterized by long seasons of drought (Government of Kenya, 2013a).

3.1.3 Bio-physical and topographic features in the study area

The main physical features of Kajiado West Constituency are; plains, valleys and occasional volcanic hills ranging from an altitude of 500 meters above sea level at Lake Magadi to 2500 meters above sea level in Ngong Hills. In ESC the Great Rift Valley (GRV) is a low depression on the western side of the conservancy running from North to South approximately 5060 Km in length. The GRV is made up of steep faults giving rise to plateau, scarps and structural plains rising into Oloruka Hills. The depression has important physical features such as Mount Suswa and Lake Magadi (Government of Kenya, 2013a).

The area is composed of quaternary volcanic and basement rock soils. Alluvial soils are also found in some areas. Basement system rocks which comprise various gneisses, cists, quartzite and crystalline limestone, are found mainly along the river valleys and some parts of the

plains (GoK, 2013a). The vegetation of the area is composed of woody species with the dominant species being *Acacia mellifera*, *Acacia tortilis*, *Acacia numbica*, *Acacia ancistroclada*, *Acacia nilotica*, *Commiphora riparia*, *Commiphora Africana*, and *Balanites aegyptica* (Bekure, 1991). Some parts of the ESC are characterized by stunted thorn bushes and scattered patches of grasses.

3.1.4 Natural features and heritage of Enkusero Sampu Conservancy

Sampu is a “maa” word means colorful site and Enkusero is a “maa” word which means table like plains. The word “Enkusero Sampu” symbolize the beauty and abundance of the Oloruka hills that runs through the conservancy creating an amphitheater with the numerous flora and fauna found within its boundary, and a habitat for migrating and visiting Elephants every year and supports a variety of wildlife throughout the year.

Enkusero Sampu Conservancy (ESC) is among the 13 wildlife conservancies comprising the SORALO, a Land Trust established in 2004. It was established in 2013, with the help of Kenya Wildlife Service donating 1214 Ha to support local communities. This was after a realization that communities were dividing their land into individual ownership from the traditional communal ownership trend that existed in past few decades, hence affecting wildlife distribution and population which is on the decline in most pastoralists land, inclusive of the SORALO ecosystem (Campbell *et al.*, 2000; Seno & Shaw, 2002; Thompson & Homewood, 2002). There was also an urgent need to protect the Maasai traditional culture from deterioration due to the influx of immigrants. The initiative employed at the initial stages was to convince and educate community members on the importance of biodiversity conservation so as to get majority of them donate parcels of their land towards the establishment of the wildlife conservancy. The management is solely through community members and community game scouts.

3.2 Study design

The study used a cross-sectional design and was conducted in from February 2nd to March 23rd 2018. A cross-sectional design is a type of observational study that uses data from a population, or a representative subset, at a specific point in time—that is, cross-sectional data. The study was based on a descriptive case study in order to understand the complex social phenomenon and the case study was used to enable the study retain a holistic and meaningful characteristics of real life events. Case studies has the unique ability to deal with full variety

of; evidence, documents, artifacts, interviews and observations (Blalock Jr, 1961; Cook & Campbell, 1979).

3.3 Target population

The target population were 998 men and women aged 18 years and above, who had the roles of household heads, and living in and around Enkusero Sampu Conservancy within the six villages that borders the conservancy, in Oloishoibor sub location.

3.4 Sampling technique and sample size determination

The sampling frame was based on the existing record of 2015 household survey by ESC. At the time of the survey, Oloishoibor sub location had a total of 998 households with a population of about 10000 persons (King *et al.*, 2015). The sampling frame consisted of all the households that were within Oloishoibor sub location, while the sampling unit was the head of the household within the six villages in Oloishoibor sub location. To achieve 95% confident interval of the sampled households, we identified the exact boundary of the ESC in relation to the administrative units (sub-locations) in the Kajiado West Sub-county using ground truthing in a transect walk and motorbike rides. To ensure that the data collected was random and a representative of the local communities' traditional knowledge, attitude, and practices towards wildlife conservation, all the six villages were included in the sampling frame. Then households were sampled based on systematic random sampling within the Maasai bomas (extended family dwelling unit).

Most of the households were within extended family dwellings, sparsely distributed within the village either on the left or right side along the footpath. In the selection of the household to be interviewed, the researcher sampled the first household on the left within an extended family dwelling and each of the subsequent third household on the same family dwelling sampled. The next family dwelling was selected as every third unit on either side of the footpath and the process continued in all the villages. The sampled number of households was defined based on the proportionate distribution of the number of households in each of the six villages.

3.4.1 Sample size computation

The sample size determination was based on the following formula by (Bernard, 2002);

$$n = z^2 * (P) * (Q) / (e)^2 \dots\dots\dots$$

Equation 3- 1

Where: n , is the sample size

Z = the number of standard error corresponding to 95% confidence interval which is 1.96.

Because we do not have prior estimate value of P and Q , we chose a value of 0.5 for both P and Q . This maximizes the size of the sample for any given confidence interval or confidence level.

e = the margin of error that the researcher tolerates which is 0.05,

we calculate: the value of n , using the formula in Equation 3-1, hence:

$$n = (1.96)^2 * (.5) * (.5) / (0.05)^2$$

$$n = 384.16$$

In situations where the samples are drawn from a relatively small population, and having established that the formula in Equation 3-1 calls for a sample that turns out to be 5% or more of the total population, we apply the finite population correction (Cochran, 1977) which is:

$$n' = \frac{n}{1 + (n-1)/N}$$

.....**Equation 3- 2**

Where: n = the sample size calculated from formula in Equation3-2,

n' (n -prime) = the sample size to be used for the study

N = the size of the total population from which n is being drawn.

Therefore basing our idea on the available number of household data in the study site N (total household units) was 998 from previously established .household listing in 2013.

$$n' = \frac{385}{1 + (385-1)/998}$$

$$n' = 278$$

The sampled households were proportionately distributed based on the number of household in each village for the purposes of precision as indicated in Table 3-1.

Table 3- 1: Proportionate distribution of the interviewed households by village

Village Name	Number of households	Contingency of percentage proportion	Proportion expected to be sampled	Sample size selected(n) in field survey
Eluai	120	12	33.3	34
Enkorienito	100	10	27.85	29
Enkusero Sampu	189	19	52.64	52
Iing'arooj	290	29	80.7	81
Olkudate	140	14	38.99	38
Oloshoibor	159	16	44.29	44
TOTAL	998	100	277.77	278

Source: Researcher, 2018

3.5 Data sources

The study used primary and secondary data sources to ensure that the research had relevance in addressing a societal problem and filling a knowledge gap to inform decisions

3.5.1 Primary data

The primary data included the use of 1) structured interviews using head of household questionnaire; and 2) semi-structured interviews including focus group discussions, key informant interviews. The study also used observation, photography, field notes, and Global Positioning System (GPS) in mapping.

3.5.2 Secondary data

The study relied on secondary data in the form of past videos, literature reviews on past studies that have been conducted on attitudinal studies towards wildlife conservation in developing countries, both in Africa, Asia and South America. The main search engine used was google scholar, science direct and Scopus this was to ensure that the information obtained was from published data in recognized journals. In addition, relevant unpublished Masters and Ph.D. thesis were used to support the study. Further reading was conducted on the policies that relate to biodiversity conservation, traditional and indigenous knowledge and the inclusion of local communities in wildlife conservation; Convention on biological diversity (CBD), Wildlife Conservation and Management Act 2013, Aichi Biodiversity target 2020, IUCN UNESCO, WWF and Community Wildlife Association websites were visited frequently to get literature on matters relating to wildlife conservation. It was from the various literature reviews that led to the development and success of this study.

3.6 Primary data collection procedure

Both qualitative and quantitative data was collected in relevance with the research objectives.

3.6.1 Reconnaissance

The primary data collection was preceded by a reconnaissance visit to the study site in September 2017; this was for the familiarization with the study site, and getting the easy entry points to conducting research in the area. The visit was driven by the need to understand the socio-political and ecological nature of the study site and earlier identification of the potential enumerators to be trained for data collection.

During the visit, I met with the ESC manager and an elder who had donated part of his communal land towards the establishment of the ESC. The main aim of the meeting was to understand the drive towards the establishment of the conservancy and the future projection of its existence by 2030. From the reconnaissance visit, a clear development of the study outline was developed.

3.6.2 Data collection

3.6.3 Training of enumerators

The second field visit was in March 2018 where 10 research assistants (RAs) (5 male and 5 female) and 2 supervisors (male and female) were recruited. Research assistants underwent four-days training including a pre-test of the survey tool. The questionnaire was pre-tested in 10 households in Kisamis village, which was not part of the sampled villages. During the pre-testing, few changes were made to the questionnaire to suit the study context. For example, it was realized that the Maasai age is defined by age sets; hence, the age sets were included as a separate template among other amendments (Appendix.4).

3.6.4 Questionnaire

The household questionnaire was programmed for use on mobile application k-MACHO data collection software using smartphones and tablets, which had the advantage of assigning GPS and photographic image. During data capture the enumerators translated the questions into a combination of Swahili and Maasai language; the household respondents were picked systematically randomly at every third household within the family dwelling unit.

The interviews were administered to either the female or male head of the household. In cases where the head of the household was not present at the time of the survey, the household was booked for a later time of the interview forcing us to conduct the interviews late in the

evenings. Where the respondents were indefinitely out of reach within the stipulated field period, the household was skipped and the next household unit considered for an interview.

3.6.5 Focus group discussion

Two focus group discussions comprising of 6 and 11 participants were conducted with youths (aged 25-35) and male elders (aged 55 and above) respectively. The selection of the FGD participants was equally distributed across the six villages that were part of ESC with each village having at least 1 participant. The choice of the FGD participants was facilitated by the help of the area chief with the assistance of a local research assistant who was very conversant with the traditional systems within the villages in Oloishoibor sub-location.

The youth were randomly chosen from each of the six villages based on their willingness to participate in the FGD discussion as well as knowledge of Swahili language. The interview was to elicit the views of the youth on the traditional knowledge towards wildlife conservation and their attitudes towards wildlife conservation. The main focus was on their practices in regard to wildlife conservation. I conducted the interview on my own as we were able to communicate in Swahili and at times English with the FGD participants. The interview took about 1 hour 40 minutes.

The elders were purposively chosen among other elders who were respected members of the Maasai community (locally known as Wazee wa mila) and had lived in the area since 1963 or more than 45 years. The relevance of the information they provided was reliable and was believed to be true; based on the fact that some of the elders had lived in the area for 50 years and above. The elders were assumed to have participated in numerous socio-cultural ceremonies. This assumption stands true as in the past it was a requirement for the Maasai Moran to be theoretically and practically be involved in the activities that are connected to their culture and their environment when knowledge transmission from one generation to another was still in existence.

The selected elders had in the past years participated in several initiation rites of passage and they had sufficient exposures on cultural and wildlife conservation issues such as policies, human-wildlife conflict, the observed impact of climate change and changes in land use systems over the past 50 years. In addition to past and present experience on knowledge in presence and distribution of wildlife in the study site, they were also believed to be aware of the chronological historical events on wildlife conservation in Kenya.

The interview was conducted in Swahili and Maasai language, and audio recorded. This allowed for the free flow of information and ideas. To ensure that the discussion was kept on track of the themes under investigation, questions were framed sequentially and probing was done as much as possible. The interview took around 1 hour 48 minutes. Since I do not understand Maasai language, I used an interpreter at each point of discussion to be assured of clarity and no relevant data was missed from the misunderstanding of the questions. A checklist was used to guide the FGD interview (Appendix 2).

3.6.6 Key informant interviews

The purpose of the Key Informant Interview (KII) was to elicit detailed information in relation to the study topic with an aim to verify and seek clarity to issues raised in the questionnaire survey.

3.6.6.1 Key informant with the women

With the help of research assistant, three in-depth interviews were done with female members of Maasai community (one with an elderly woman aged about 90 years, age estimate was based on the age era she was born (“Ilnyagusi,” meaning 1920s) and with two women aged around 50-55 years age set “Ilkishuru” meaning 1968 (see Appendix 4). This was after a failed attempt to get at least 6 women from the six villages to conduct focus group discussion. It was difficult to bring women together to a central location; as a result of various issues some related to health.

The criteria for identifying the potential participant was based on one being born a Maasai and had lived long enough (at least 40 years) in the study area and able to understand traditional Maasai cultural practices. The main aim of the key informant interview with the women was to get clear information on the role of women in traditional knowledge towards wildlife conservation, the socio-cultural norms, and taboos that relate to wildlife as well as the prohibitions that exist in the Maasai culture in relation to wildlife. We also talked about the benefits of wildlife to women in the Maasai culture in the present and in the past. Each interview lasted about 45 minutes and was also audio-recorded and later transcribed.

3.6.6.2 Key informant interview with stakeholders in wildlife conservation in Kajiado County

Additional information was obtained from 2 purposively identified officials from conservation organizations with over 20 years of experience in wildlife conservation, and community wildlife service in issues regarding protection of wildlife on community land, 1 County official and 1 local leader (area Chief). 3 KII were conducted in English and 1 conducted in a mixture of Swahili and English to complement and verify some of the information obtained through the questionnaire survey and FGD with the elders (Appendix 3).

For example, the officials were requested to provide facts and opinions that relate to the survival of wildlife outside PAs, management of human-wildlife conflicts on community land, compensation mechanisms in place and community awareness on matters relating to wildlife conservation. The officials were further requested to comment on the possibility of the inclusion of traditional knowledge and practices in the conventional wildlife conservation measures in Kenya.

The main issues that were of concern were; on policy implementation on matters relating to wildlife conservation, with focus on wildlife policy and Wildlife Conservation Act 2013 and on the procedure of compensation and community incentives to support wildlife conservation on their land. Each interview took around 50 minutes was recorded in the IC recorder and later transcribed to obtain the key points relevant to support evidence for the study.

3.6.7 Observation and field records

Observation of the existing land use practices, and measures that have been put in place to control problem animals in the study site (at household level) was made. The main point of concentration was on practices that were in support or against wildlife conservation. In addition, photography was used to store data that was relevant to the study as well as field notes which were used to record any other additional information of importance to record data on what was seen, heard and understood while at the field, and the results have been used to support the findings of this report.

3.7 Data processing and analysis

Data was constantly checked for quality control by the researcher through downloading completed questionnaire from the online k-MACHO database, which allows constant quality control. The data was later exported into the Statistical Package for the Social Sciences (SPSS) version 20.

The data was analyzed using descriptive statistics to determine frequencies and percentages so as to check for errors, and understand the distribution of the study variables. Cross tabulation with Chi-Square test was used to establish the association between the independent and dependent variables. Logistic regression analysis was used to examine the association of individual factors on awareness on traditional wildlife conservation ways and attitudes towards wildlife conservation, and to test for the degree of strength of relationship between the dependent and independent variables. Factor analysis was used to define the category of attitudinal measures based on various questions relevant to the research objective. While Chi-Square test was used to test the null hypothesis.

Analysis of qualitative data was done using thematic approach (Bernard, 2002). This was relevant to provide the contextual information and well-elaborated description of a wide range of related issues, in order to provide evidence-based results to support the quantitative data from the household surveys.

3.8 Tests for reliability and validity

3.8.1 Attitude towards wildlife conservation

The two components of attitude towards wildlife conservation measured were: 1) on affection (how do people feel towards wild animals) which was conceptualized based on a series of statements (Table 3-2), and 2) to what extent are they willing to support wildlife conservation initiatives (behavioural intention). For example, respondents were asked to indicate their perception on the protection of wild animals (lions and leopards), benefits and support for conservation activities and whether allowing them to trap/hunt a predator which kills their livestock could be a good thing. The response categories were *1= strongly agree, 2=Agree 3=neither agree nor disagree, 4= disagree and 5= strongly disagree*.

Statements on attitudes were scored based on factor analysis and used to place respondents on an index of attitude towards conservation. Agreement with a positive attitudinal statement was scored +1 whereas disagreement was scored -1. Similarly, agreement with a negative

attitudinal statement was scored -1 whereas disagreement was scored +1. Indifferent responses (neither agree/disagree) were scored zero. The potential scoring ranged from -5 to +5. The measure was found to be reliable (Cronbach's $\alpha=0.74$; see Table 3-2).

A binary outcome variable—attitude towards wildlife conservation—was created from the scores to represent those with a positive attitude (that is, respondents with scores above zero), and negative attitude (respondents with zero or negative scores). The analytical approach was similar to that used in other studies to measure attitude towards wildlife conservation (Infield & Namara, 2001).

Table 3- 2: Measurement of attitude towards wildlife conservation

Statements on attitude towards wildlife conservation	Cronbach's alpha
The presence of a lion is a sign of human coexistence with wild animals	0.74
Presence of hyena is a sign of clean environment	
Lions should be protected	
Leopards should be protected	
Hyenas are unacceptable threat to livestock	
Allowing us to trap /hunt a predator which kills our livestock could be a good thing	
Enkusero Sampu conservancy is beneficial to our community	
I am willing to support wildlife conservation programmes of Enkusero Sampu conservancy	

Source: Researcher 2018

3.8.2 Awareness of wildlife conservation policy and regulation

Awareness of wildlife conservation policy was conceptualized based on a series of statements for which respondents were to indicate agreement, disagreement or don't know (Table 3-3). Agreement with a positive attitudinal statement was scored +1 whereas disagreement was scored -1. 'Don't know' responses were scored zero. Responses were scored and used to place respondents on knowledge scale that ranged from -3 to +3. The measure was found to be reliable (Cronbach's $\alpha=0.77$). A binary outcome variable—knowledge of wildlife conservation policy—was created from the scores to represent those knowledgeable about the policy (that is, respondents with scores above zero), and otherwise (respondents with zero or negative scores).

Table 3- 3: Measurement of knowledge of policies towards wildlife conservation

Statements	Cronbach's alpha
Awareness of wildlife conservation policy	
Wildlife outside Protected Area should be protected	0.77
Wildlife utilization involves the non-consumptive use unless an individual has a valid license that permits consumptive utilization	
No compensation shall be paid where the owner of the livestock, crops or other property failed to take reasonable measures	
A person who is dissatisfied with the award of compensation may file an appeal within 30 days of notification	
In the case of death from wild animals, one qualifies for five million shillings	
In the case of injury from wild animals occasioning permanent disability, one qualifies for three million shillings	
In the case of any other injury, one qualifies for a maximum of two million shillings, depending on the extent of injury.	

Source: Researcher, 2018

3.9 Ethical Considerations

Approval was obtained from the National Council for Science and Technology (NACOSTI), permit number: NACOSTI/P/18/25211/21556. Informed consent was obtained from prospective respondents. All respondents who participated in the study were clearly informed that the information they would give shall be purely for research purposes. Each participant was given an opportunity to voluntarily participate in the survey. In all the cases that a photograph was to be taken the interviewer had to seek permission from the respondents, in which case some of the respondents were very cautious and declined to give permission for the photographs to be taken. Some agreed to have photographs taken but not on their property except on the ground, and a few requested for money or credit card as a condition for the photographs while others had no issues with photographs. To achieve anonymity of the data gathered from the respondents, there was no identifying information such as names in the dataset.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

This chapter deals with the presentation of the results of the survey.

4.1 Background characteristics

Majority (72 %) of the respondents were female while 28 % were male, this is because in the study area polygamy was common with most women performing the role of household heads. Additionally, at the time of the survey most men had migrated to other areas in search of pasture and water for their livestock. The age of the respondents varied widely, where 42 % of the respondents were between age 31-50 years while respondents aged 51 years and above constituted 34.9 %. There was a significant difference between the age group of the respondents and gender at ($\chi^2=13.4$, $df=2$, $p=0.001$, at $\alpha 0.05$) (Table 4-1).

Table 4- 1: Distribution of respondents by age and sex

	Female		Male		Total		χ^2 df p-value
	n=200	%	n=78	%	n=278	%	
Age							
<30 years	57	28.5	7	9.0	64	23.0	$\chi^2=13.4$ df =2 p=0.001
31-50 years	82	41.0	35	44.9	117	42.1	
>50 years	61	30.5	36	46.2	97	34.9	

Source: Researcher, 2018

In reference to the marital status data was collected on the basis of four marital statuses namely; married, divorced, widowed and single. For ease of analysis, these demographic variables were regrouped and re-categorized as -In Union (Married with a living spouse) and Not in union (divorced single and widowed). Among the respondents interviewed, those “in union” were 86.3 % while those not in unions were 13.7 %, marital status differed significantly among gender. ($\chi^2=8.9$, $df =2$, $p=0.003$) see Table 4-2.

Table 4- 2: Distribution of respondents by marital status and sex

	Female		Male		Total		χ^2 df p-value
	n=200	%	n=78	%	n=278	%	
Marital status							
In Union	165	82.5	75	96.2	240	86.3	$\chi^2=8.9$ df =1 p=0.003
Not in union	35	17.5	3	3.8	38	13.7	

Source: Researcher, 2018

Family size ranged between 1-11 persons, most respondents were members of larger families of 7 persons and above (47.5 %), there was significant difference between family size and education level at ($\chi^2=40.194$, df=6, $p<0.001$). On the same note, there was no significant difference between family size and gender at ($\chi^2=1.1$, df =2, $p=0.568$) as indicated in Table 4-3.

Table 4- 3: Distribution of respondents by household size and sex

	Female		Male		Total		χ^2 df p-value
	n=200	%	n=78	%	n=278	%	
Household size							
1-3 persons	17	8.5	6	7.7	23	8.3	$\chi^2=1.1$ df =2 p=0.568
4-6 persons	92	46.0	31	39.7	123	44.2	
7 and above	91	45.5	41	52.6	132	47.5	

Source: Researcher, 2018

In the level of education, 61.9 % of the surveyed respondent had no formal education while 20.1 % had secondary education and only 18 % had primary education. However, the level of education significantly differed among gender ($\chi^2=8.207$, df=2, $p=0.017$) (Table 4-4).

Table 4- 4: Distribution of respondents by level of education and sex

	Female		Male		Total		χ^2 df p-value
Level of Education	n=200	%	n=78	%	n=278	%	
No Education	128	64.0	44	56.4	172	61.9	$\chi^2=8.2$ df =2 p=0.017
Primary	40	20.0	10	12.8	50	18.0	
Secondary and higher	32	16.0	24	30.8	56	20.1	

Source: Researcher, 2018

The main source of livelihood was found to be livestock keeping with 77.7 % of respondents practicing it, respondents involved in formal employment /business activities were 16.9 %

while other sources of livelihood mentioned were activities such as crop farming, beadwork, motor riders and casual labourers at the Chinese mining company in the study area. There was no significant difference between main source of livelihood and gender ($\chi^2=4.5$, df =2, p=0.104). The main source of cooking energy was revealed to be fuel wood used by majority of the respondents (90.3 %) (Table 4-5).

Table 4- 5: Distribution of respondents by main source of (livelihood, cooking energy) and sex

	Female		Male		Total		χ^2 df p-value
	n=200	%	n=78	%	n=278	%	
Main source of livelihood							
Livestock keeping	160	80.0	56	71.8	216	77.7	$\chi^2=4.5$ df =2 p=0.104
Formal employment/Business	28	14.0	19	24.4	47	16.9	
Others	12	6.0	3	3.9	15	5.4	
Main cooking material							
Charcoal	9	4.5	3	3.9	12	4.3	$\chi^2=11.7$ df =2 p=0.003
Firewood	186	93.0	65	83.3	251	90.3	
Gas	5	2.5	10	12.8	15	5.4	

Source: Researcher, 2018

On the duration of stay in the study area, more than half (51.1 %) of the respondents had stayed in the study area for over 21 years. There was a significant difference in the duration of stay and gender with male having stayed longer in the study area compared to women ($\chi^2=18.9$, df =2, p=0.001) as represented in Table 4-6.

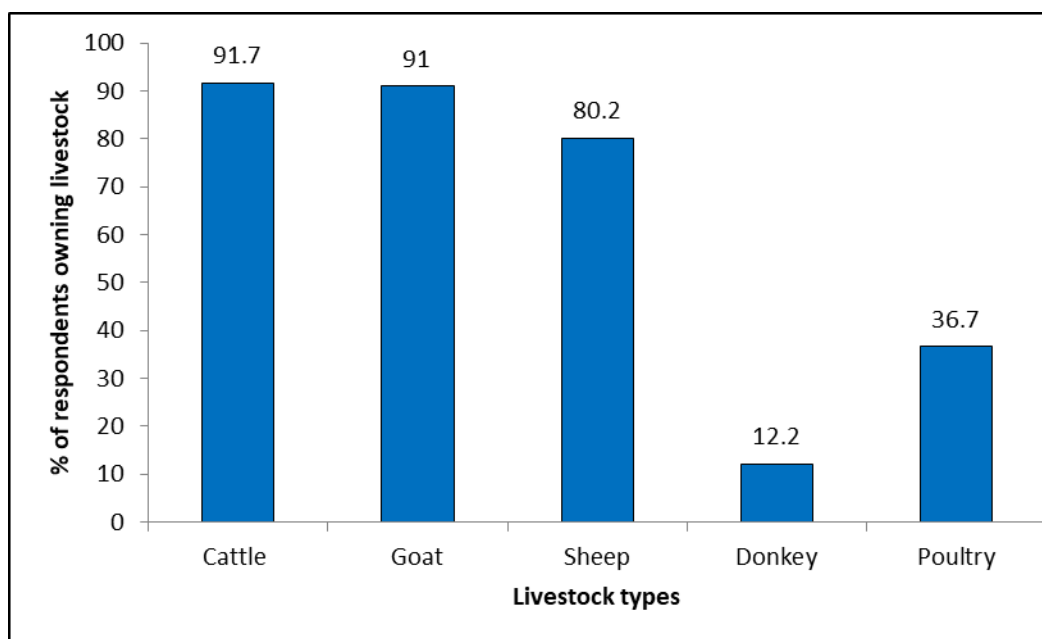
Table 4- 6: Distribution of respondents by duration of stay in the study area and sex

	Female		Male		Total		χ^2 df p-value
	n=200	%	n=78	%	n=278	%	
Duration stay in the study area							
10 year or less	59	29.5	7	9.0	66	23.7	$\chi^2=18.9$ df =2 p=0.001
11-20 years	54	27.0	16	20.5	70	25.2	
21 or more years	87	43.5	55	70.5	142	51.1	

Source: Researcher, 2018

4.1.1 Livestock ownership

Livestock owned by the respondents varied from poultry to cattle (Plate 4-1). Most female respondents owned poultry and donkey (90%), while all (100 %) male owned cattle, goat and sheep. The majority of respondents owned either cattle or goat at 91.7 % and 91.0 % respectively (Figure 4-1). The average number of cattle owned was found to be 17 animals per household while the average number of goat owned was 31 per household.



*multiple response question

Figure 4- 1: Proportion of respondents who own livestock by type of livestock

Source: Researcher, 2018



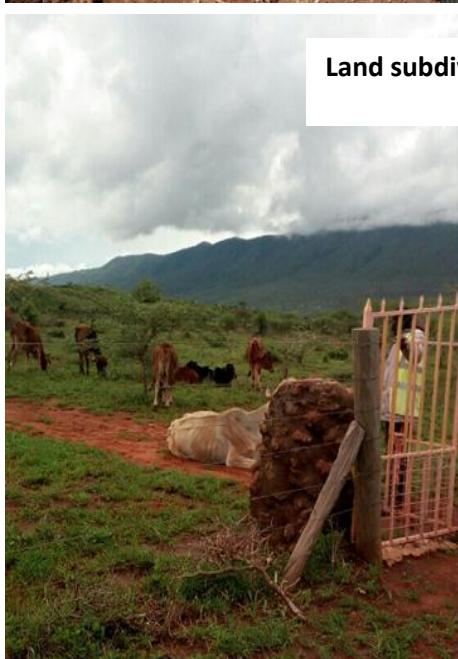
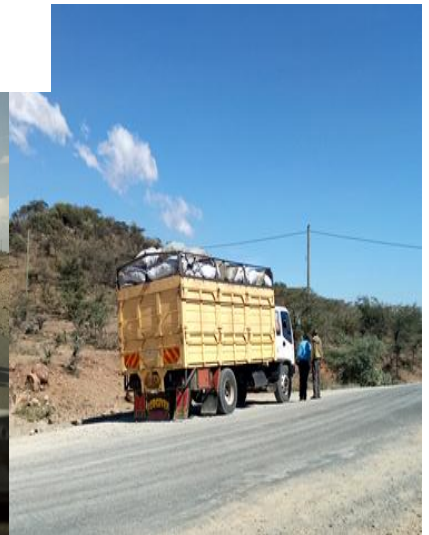
Plate 4- 1: Various livestock types owned by local communities

Source: Researcher, 2018

On land holding, the results of the survey show that the majority (95.3%) of the respondents has never donated land, and only 4.7 % of the respondents' family had donated land to support the establishment of ESC. Fencing of land as a result of land subdivision was a major strategy used by most of the respondents to keep off livestock and wild animals from getting into their land. Within most of the fenced areas; vegetation was being cleared for charcoal burning as shown in Plate 4-2.



Charcoal Burning and Transportation



Land subdivisions and fencing

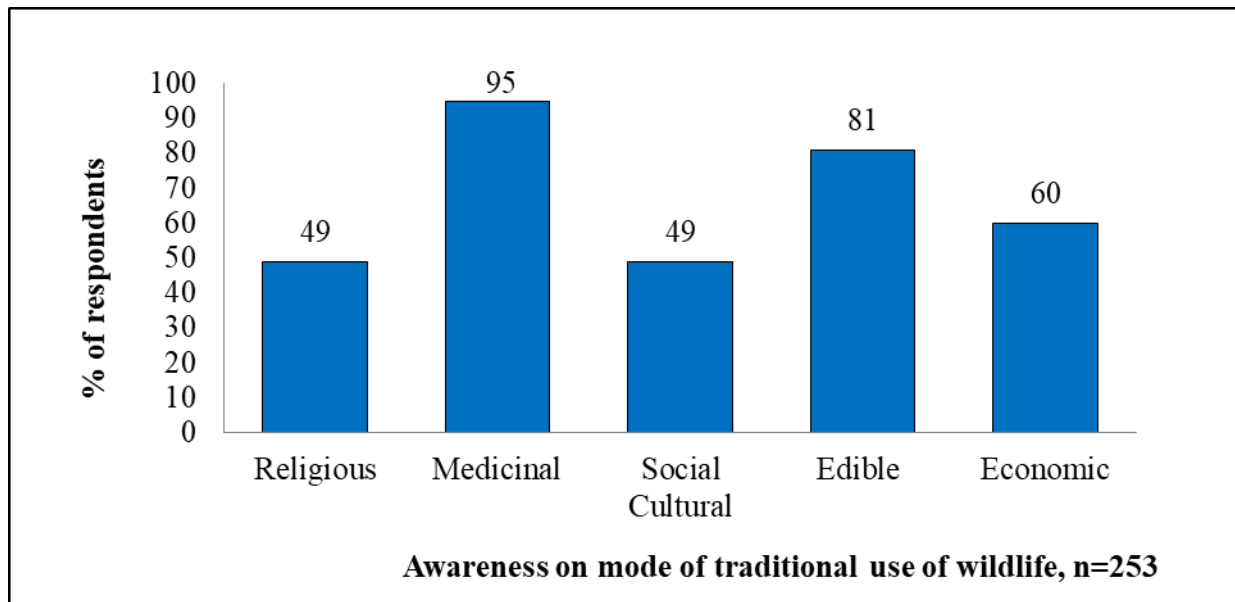


Plate 4- 2: Charcoal burning and land subdivision

Source: Researcher, 2018

4.2 Traditional knowledge towards wildlife conservation

In regard to the traditional knowledge towards wildlife conservation, the majority 253 (91 %) out of 278 indicated that traditional use of wildlife (plants and animals) is very important. Respondents also highlighted various categories of uses of plants and animals like medicinal use (95%) followed by food (81%) (Figure 4-2).



*Multiple response questions

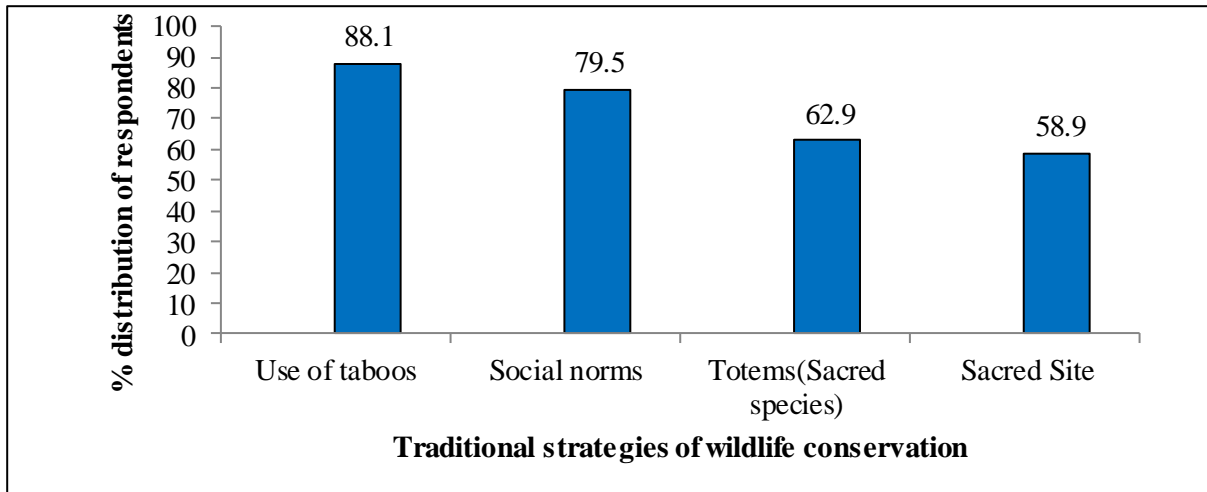
Figure 4- 2: Distribution of respondents by traditional use and awareness of wildlife

Source: Researcher, 2018

4.2.1 Awareness of traditional knowledge on ways of wildlife conservation

About 54.9 % of the respondents were aware while 44.1 % were not aware of any mode of traditional wildlife conservation.

Figure 4-3 shows the distribution of respondents by awareness of traditional mode of wildlife conservation. The majority of respondents indicated that the relevant modes of conservation was use of taboos (88%) followed by social norms at 79.5 %.



***Multiple response questions**

Figure 4- 3: Distribution of respondents by awareness of traditional mode of wildlife conservation

Source: Researcher, 2018

The results from the quantitative data were corroborated by qualitative data. The most cited way of wildlife conservation includes use of taboos. FGD participant mentioned that it was a taboo to cut some of the trees for domestic use. Trees such as “oreteti (*Ficus thonningii*)” and “oloirien (*Olea africana*)” were considered as scared trees.

“Oloirien tree is only used to burn the slaughtered sheep as a sacrifice to God, under the “oreteti” tree. No one was allowed to cut the Oreteti and Ol-oirien tree as it was believed to be sacred and should be respected (FDG male participants).

“In the past in the Maasai culture when an old man died “oreteti” tree was planted on top of his grave yard. It was then natured to maturity and never to be cut as it symbolized the presence of the man guarding his home. The tree could only be used as a source of shade where people could sit under it during hot sunny days” (IDI-female participant).

It was also taboo to kill some animals such as the tortoise. The presence of Tortoise in an area was a symbol of the coming of rain. As a result, most people believed that if Tortoise was killed there would be no rainfall. The role of tortoise as source of rainfall was linked to its habitat as explained by one FGD participant below;

“The tortoise lives in water so if you kill it there will be no need to have water as the tortoise will not be there to live in it”.

It was also a taboo to kill an Ostrich (*Struthio camelus*) as it was believed that its calling was a symbol of rain. Other Sacred animals cited included all the dove species namely; Laughing dove (*Streptopelia senegalensis*) Ring necked dove (*Streptopelia capicola*) and Red eyed dove (*Streptopelia semitorquata*) which were referred to as Gods messenger thus it was prohibited to kill or even think of killing it for whatever reasons.

On the other hand, some traditional and cultural practices have led to destruction of certain species of plants and animals among the Maasai community. Wild animals and plants were significantly used in cultural practices such as during the initiation and circumcision ceremonies. FGD elder participant and In-depth interview with one female elder reveal the following:

“Birds like Grey-headed bush shrike Malaconotus blanchoti “Olkirapash”, African hawk eagle Hieraaetus spilogaster “Orkupelia”, Black cuckoo shrike Campephaga flava Cuculus clamosus “Orkududu” and Red headed weaver Anaplectes rubriceps “Ol-odakashi” “Ollakasha” were killed to obtain feathers to make the headgear that was worn after circumcision. The head gear needed maintenance by replacing the worn out feathers because it was worn for a period of 2-3 years before its removal, during which an age set could go for “Moran” stage.

“During circumcision if one displayed feelings of an indication of pain, the headgear worn was made without the feathers of red headed weaver” (FGD male participants).

The following quotes also reveal how animals (such lions) and indigenous plants are endangered due to cultural practices

“The lion was constantly hunted by the “morans” whereby if one came home with the tail of the lion it was a symbol of being a hero. During preparation of circumcision ceremonies goat is slaughtered under Ol-oirien tree and the meat burnt using firewood from Ol-oirien twigs and the meat placed on the Ol-oirien leaves. An “Oseki” stem was put on the entrance of the area that circumcision was to be done and also the boy to be circumcised was made to lean on it as a sign of

blessings from God. These activities are conducted simultaneously with prayers for God to bring rain and bless the society with many livestock children and free from diseases” (FGD Male participants).

“Oreteti tree was used during the rituals of blessing women in the past where a group of women could move around a curve formed by the oreteti stem deep inside the forest, when they came back, elders sprinkle brewed milk on them using the leaves of Oltukai (Phoenix reclinata) as a sign of receiving blessings from God. The climax of this ceremony was goat meat feasting that has been roasted using Ol-oirien twigs and is served on Ol-oirien leaves” (IDI female Participant).

An in-depth interview also revealed that during the naming ceremonies “Orkipoket” and during initiation or after childbirth, the leaves of Olmisigiyoio (*Rhus natalensis*) or Ol-oirieni plant are spread and uniformly colored sheep slaughtered on top. The meat was roasted using Oloirieni wood and eaten only by women. This is followed by beer drinking ceremony by two women and two elders and then the new born or newly initiated person is given a name and blessed.

In the Maasai culture sorcery and witchcraft was practiced by use of wild animal and plant parts. For example, the egg of an Ostrich is used to bless people.

“The egg of the ostrich was broken and smeared on the person to be blessed by an elder (FGD male participants and IDI female participant).

FGD participants also narrated that the teeth of the warthog were used to make ornaments worn by women to protect them from bad spells associated with witchcraft while the eggs of “big” snakes was used in sorcery and the skin of all snakes used to break a curse. Ol-oisesiai Saddle wood (*Osyris compressa*) was used for witchcraft to keep off bad spells. In addition Oloiborrbenek (*Croton dichogamus*) was used by Oloibon to treat ailments that are believed to have been caused as a result of witchcraft.

Sacred sites which are specifically used to pray for rain in periods of prolonged drought and also in cases of livestock disease pandemic were cited, and are still in use by the local communities. The areas cited were: Mt Suswa, Oloouruka, Oldonyo onyokie and Oololaiserr hills where burnt sheep (has to be one colored) sacrifices are offered to “enkai” God, half of

the meat is eaten by the elders and the remaining half left to the God. Women were not allowed to visit the sacred places. Consumption of game meat was prohibited and only the Dorobo were allowed to hunt wild animals. The ndorobo were looked upon by the Maasai and considered as poor people as they did not have livestock. If any Maasai individual was found to have eaten game meat he was denied milk as a form of punishment. Thus this discouraged most of the Maasai from eating game meat.

However, considerable numbers of the participants observed that certain things are changing nowadays in the Maasai culture and traditions, and that may affect conservation of wildlife as revealed in the quote below.

“But today things have changed the Maasai have become modern like any other person and a few people are eating game meat. The gazzeles, dikdik O-sirua Common Eland (Turotragus oryx) and even the Giraffe are eaten if found trespassing on our property. This is because no one compensate for the losses we incur the game people just come here to take photographs and go no one has ever been compensated” (FGD male participants).

Economic benefits that were highlighted during the survey included; the important benefit of harvesting and selling Ol-oisesiai Saddle wood (*Osyris compressa*) in which a Kilo Gram (Kg) is sold at 800 Kenya shillings (Kshs). Charcoal burning business which attracts 2500 kshs for a 90Kg bag. Wood carvings are also sold at the nearby Kiserian and Ngong market on market days. Some of the tree species were effective in building the houses as well as used to make hollow salt troughs, and also fencing of the bomas to keep off predators from attacking livestock.

Other plants mentioned to have medicinal, and edible value to the local communities were as shown in Table 4-7. These plants are at a major threat to over exploitation and land use change resulting into land degradation, which affects the wildlife species distribution range and population viability.

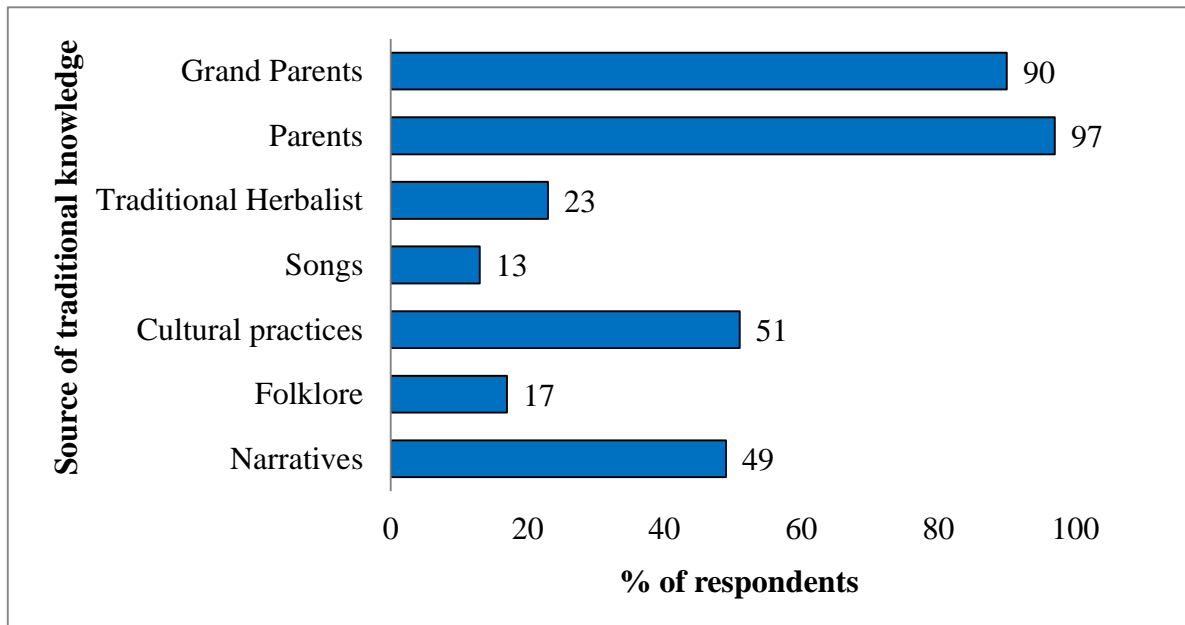
Table 4- 7 plants that have medicinal, edible and economic values to the local communities of ESC

Plant Use	Maa name	English name	Scientific name	Uses
Medicinal	Ol-kiloriti	<i>Acacia nilotica</i>	<i>Acacia nilotica</i>	To boost appetite, promote nutrient supplement, fasten digestion and disinfecting circumcision wounds
	Ol-oirien	Olive	<i>Olea africana</i>	Used to treat malaria and common cold
	Ol-kokola	<i>Rhamnus staddo</i>	<i>Rhamnus staddo</i>	Boost immunity/ cure sexually transmitted diseases such as syphilis and treat pneumonia
	Ol-tepesi	<i>Acacia tortilis</i>	<i>Acacia tortilis</i>	Treating of sexually transmitted diseases such as gonorrhea
	Ol-makutut	<i>Clerodendrum myricoides</i>	<i>Clerodendrum myricoides</i>	To sure stomachache and as a deworming
	Oremit	<i>Salvadora persica</i>	<i>Salvadora persica</i>	Cleansed the stomach fever in women who have just delivered. Treat stomach fever, induce vomiting and cleansing of the gall bladder by induced release of bile
	Eluai	<i>Acacia drepanolobium</i>	<i>Acacia drepanolobium</i>	Used to cleanse the women after delivery to avoid any infections
	Esumaita			Used to induce vomiting and bile reduction
	Or-ngosua	<i>Balanites gabrus</i>	<i>Balanites gabrus</i>	Inducing vomiting in pregnant women if they were suspected to have malaria. Promote enhanced release of bile
Edible Plants	Ol-amurik	Bush plum	<i>Carissa spinarum</i>	Edible fruits that are also believed to have medicinal value protect from catching cold.
	Osilalei	Gum Tree	<i>Commiphora africana</i>	The Gum is chewed and used as a mouth freshener.
	Eluai	<i>Acacia drepanolobium</i>	<i>Acacia drepanolobium</i>	Galls freshly formed are eaten and have a sour taste
	Ol-kiloriti	<i>Acacia nilotica</i>	<i>Acacia nilotica</i>	Soup is made from the stem or bark boiled.

Source: Researcher, 2018

4.2.2 Sources of traditional knowledge on traditional use of wildlife

The survey results established that the main holders of traditional knowledge were parents (97 %) and grandparents at 90 %. More than half (51%) of the respondents got the traditional knowledge on use of wildlife from the cultural practices. Only 13% learnt the traditional knowledge through songs. Figure 4-4.



* Multiple response questions.

Figure 4- 4: Mode of transmission of traditional knowledge

Source: Researcher, 2018

4.3 Factors associated with awareness of traditional knowledge of wildlife conservation

4.3.1 Bivariate analysis on factors associated with traditional way of wildlife conservation

There was significant variation in sex and awareness of traditional way of wildlife conservation ($\chi^2=18.2$, $df=1$, $p=0.001$). Approximately 74% of the male respondents were aware of any traditional ways of conserving and managing wildlife compared to only 46% of the female respondents (Table 4-8). Hence, we reject the null hypothesis and accept the alternative hypothesis that gender is associated with awareness on traditional knowledge of wildlife conservation

Household size, main source of livelihood, main source of cooking material and willingness to pay for lion conservation project were significantly related with the awareness of

traditional ways of wildlife conservation all at $p \leq 0.05$. Respondents from larger households (≥ 7 persons) were more likely (60.6%) to be aware of the traditional way of wildlife conservation compared to over half 52.1% of the participants from smaller households (≤ 6 persons) ($\chi^2=4.5$, $df =1$, $p=0.023$). This is because those from larger households depended largely on wildlife resources for their livelihood in terms of medicinal herbs and pasture for their livestock. Hence we reject the null hypothesis, and accept the alternative hypothesis that household size is associated with awareness on traditional knowledge of wildlife conservation

Among the participants practicing livestock keeping as the main source of livelihood, 46.3% were aware of the traditional way of wildlife conservation while those practicing others sources of livelihood activities (crop farming, business and formal employment) 80.7 % were aware of traditional way of wildlife conservation ($\chi^2=22.9$, $df =1$, $p=0.001$). Hence we reject the null hypothesis and accept the alternative hypothesis that main source of livelihood is associated with awareness on traditional knowledge of wildlife conservation.

Table 4- 8: Proportion of respondents aware of traditional ways of wildlife conservation by respondents' background characteristics

Variables						
	Not aware	Aware	Total	χ^2	df	p-value
Sex	%	%	n			
Female	54.0	46.0	200			
Male	25.6	74.4	78	18.2	1	0.001
Age						
<30 years	54.7	45.3	64			
31-50 years	41.9	58.1	117	2.8	2	0.252
>50 years	45.4	54.6	97			
Marital status						
In Union	39.5	60.5	38			
Not in union	47.1	52.9	240	0.8	1	0.382
Household size						
<=6 persons	52.1	47.9	146			
>=7persons	39.4	60.6	132	4.5	1	0.023
Level of Education						
No Education	51.2	48.8	172			
Primary	38.0	62.0	50	4.8	2	0.092
Secondary and higher	37.5	62.5	56			
Main source of livelihood						
Livestock	53.7	46.3	216			
Others	19.4	80.7	62	22.9	1	0.001
Main cooking material						
Firewood	49.0	51.0	251			
Others	18.5	81.5	27	9.1	1	0.003
Duration stay in the study area						
10 year or less	51.5	48.5	66			
11-20 years	50.0	50.0	70	2.2	2	0.303
21 or more years	41.6	58.5	142			
Willingness to pay						
No	58.0	42.0	119			
Yes	37.1	62.9	159	11.9	1	0.001

Source: Researcher, 2018

In reference to the respondents main source of cooking material, 51% of those using firewood were aware of traditional wildlife conservation ways while respondents' using other sources of cooking(charcoal and gas), 81 % were aware of the traditional way of wildlife conservation ($\chi^2=9.1$, df =1, p=0.003). On the contrary, there was no significant association in awareness of traditional knowledge of wildlife conservation and socio-demographic characteristics (age, marital status, level of education and duration of stay in the study area) at

$p > 0.05$. Hence we fail to reject the null hypothesis, that age, marital status, level of education and duration of stay is not associated with awareness on traditional knowledge of wildlife conservation (Table.4-8).

4.3.2 Result of the logistic regression model on awareness of traditional ways of wildlife conservation

Table 4-9 presents the parameters of logistic regression model estimating the effect of demographic and socio-economic factors on awareness of traditional knowledge of wildlife conservation. Sex was significantly associated with awareness of traditional knowledge of wildlife conservation in the study area. Male household heads were more than three times (OR 3.755; 95% CI; 1.884-7.673) more likely to be aware of traditional knowledge of wildlife conservation compared to female house hold heads. The relationship was significant at $p = 0.001$

Age was an important predictor of traditional knowledge of wildlife conservation. Respondents aged 31-50 years old were 2.6 times (95% CI; 1.009-5.994) more likely to be aware of traditional way of wildlife conservation compared to those aged less than 30 years. This relationship was significant at $p = 0.039$. Similarly, respondents aged 50 years or above were twice more likely to be aware of traditional ways of wildlife conservation compared to younger respondents, however, this relationship was not significant.

Marital status and household size were also found to be associated with traditional knowledge of wildlife conservation. Respondents not in marital union were about 0.4 times (95% CI; 0.167-0.982) less likely to be aware of traditional knowledge of wildlife conservation. In terms of household size, respondents from bigger household (7 or more members) were approximately 2.3 times (95% CI; 1.204-4.169) more likely to be aware of traditional wildlife conservation relative to respondents from smaller households (6 or less members). The association was significant at $P < 0.05$.

Table 4- 9: Adjusted Odds ratios from a multivariate logistic regression model showing factors associated with awareness of traditional ways of conserving wildlife

	Exp(B) [95% CI]	S.E.	Sig.
Sex			
Female [®]			
Male	3.755[1.884-7.673]	0.360	0.0001
Age			
<30 years [®]			0.109
31-50 years	2.587[1.009-5.994]	0.461	0.039
>50 years	2.102[0.672-6.264]	0.571	0.193
Marital status			
In Union [®]			
Not in union	0.392[0.167-0.982]	0.450	0.038
Household size			
<=6 [®]			
7 and above	2.275[1.204-4.169]	0.316	0.009
Level of Education			
No Education [®]			0.109
Primary	2.346[1.061-5.386]	0.416	0.040
Secondary and higher	1.667[0.808-4.434]	0.447	0.253
Main source of livelihood			
Livestock [®]			
Others	5.773 [2.204-11.172]	0.414	0.0001
Duration stay in the study area			
10 year or less [®]			0.484
11-20 years	0.626[0.260-1.376]	0.429	0.276
21 or more years	0.615[0.244-1.402]	0.451	0.281

Note: [®] reference category.

Source: Computed from Survey data, 2018

Socio-economic variables; level of education and main source of livelihood had a significant effect on traditional knowledge of wildlife conservation (Table 4-9). Respondents with primary education were 2.3 times more likely to be aware of traditional ways of wildlife conservation compared to those with no education (have never attended school). Similarly, respondents with secondary or higher level of education were about 1.7 times more likely to be aware of traditional wildlife conservation compared to those with no education. In terms of main source of livelihoods, result shows that respondents from households with other sources of livelihoods were 5.8 times more likely to be aware of traditional knowledge of wildlife conservation relative to those from households that dependent on livestock keeping,

this could have been as a result of ignorance from those practicing livestock keeping, as they were mainly knowledgeable on use of taboos while those from other sources were knowledgeable of (use of taboos, social norms, totemic species and sacred sites). However, the result showed insignificant association between awareness of traditional ways of wildlife conservation and duration of stay in the study area.

4.3.3 Respondents Knowledge on wildlife conservation law

The awareness existing wildlife conservation and management Act 2013 is an important aspect for this study as this act guides the daily interactions with wildlife species in Kenya. It was evident that 88.8% of the respondents agreed that wildlife outside PAs should be protected indicating that it is the responsibility of KWS. In reference to the wildlife utilization 83.1% of the respondents disagreed with the statement that wildlife utilization in Kenya involves non- consumptive use unless an individual has a valid license that permits consumptive utilization. Furthermore, 65.1 % of the respondents were aware that no compensation shall be paid where the owner of the livestock, crops or other property failed to take reasonable measures to protect their property from wild animal destruction; this is through having fences, predator proof bomas and use of close watch and guarding. In addition, over 25% of the respondents were not aware of the provision on the compensation regarding personal injury and death as a result of wild animal attack. As shown in Table 4-10.

Table 4- 10: Distribution of respondents by statements on knowledge about wildlife conservation policy

Statement	Agree %	Disagree %	Don't Know %	Total (n)
Wildlife outside Protected Area should be protected	88.8	7.9	3.3	278
Wildlife utilization in Kenya involves the non-consumptive use unless an individual has a valid license that permits consumptive utilization.	13.3	83.1	3.6	278
No compensation shall be paid where the owner of the livestock, crops or other property failed to take reasonable measures to protect the property from wild animal destruction.	65.1	29.5	5.4	278
A person who is dissatisfied with the award of compensation may file an appeal within 30 days of notification	51.4	19.4	29.1	278
In the case of death from wild animals, one qualifies for five million shillings	55.4	17.3	27.3	278
In the case of injury from wild animals occasioning permanent disability, one qualifies for three million shillings	43.2	29.9	27.0	278
In the case of any other injury, one qualifies for a maximum of two million shillings, depending on the extent of injury.	58.3	14.8	27.0	278

Source: Researcher, 2018

4.4 Attitude towards wildlife conservation

Respondents were asked to give their view on a 9 statements regarding wildlife conservation and presence of wild animals on their land. About 37.4% disagreed with the statement that the presence of a lion is a sign of human coexistence with wild animals with 1 in every 4 respondents strongly disagreeing. 39.7% of the respondents disagreed that presence of hyena is a sign of clean environment. In regard to the protection of lions and leopards 50.4% and 53.2% of the respondents respectively disagreed with the statement that's asked Lions / leopards should be protected. In addition 43% of the respondents disagreed that hyenas are unacceptable threat to livestock.

On asking whether leopards have been known to attack and injure people 36.8% disagreed. On the retaliatory killing / hunting of predators that kills livestock 48.4% agreed that it would be a good thing if they are permitted to act. Enkusero Sampu Conservancy was stated to be beneficial to the local community with 51.5% of respondents agreeing to this statement. On willingness to support conservation programmes of ESC only 21.4% agreed that they are ready to support such programmes See Table 4-11.

Table 4- 11: Distribution of respondents by a series of statements on attitudes towards wildlife conservation

Statements	1	2	3	4	5	Mean
The presence of a lion in this area is a sign of human coexistence with wild animals ^a	18.0	5.4	39.2	11.9	25.5	3.2
Presence of hyena is a sign of clean environment ^a	33.1	4.3	21.9	29.5	11.2	2.8
Lions should be protected ^a	43.5	2.2	4.0	46.8	3.6	2.6
Leopards should be protected ^a	38.1	3.2	5.4	49.6	3.6	2.7
Hyenas are unacceptable threat to livestock ^b	31.4	5.8	19.9	40.1	2.9	3.3
Leopards have been known to attack and injure people ^b	28.5	2.9	31.8	30.7	6.1	2.7
Allowing us to trap /hunt a predator which kills our livestock could be a good thing ^b	26.6	21.8	12.0	36.4	3.3	2.8
Enkusero Sampu conservancy is beneficial to our community ^a	40.3	11.2	8.3	37.8	2.5	2.6
I am willing to support wildlife conservation programmes of Enkusero Sampu conservancy ^a	18.0	5.4	39.2	11.9	25.5	2.5
1=Strongly agree; 2=Agree; 3=Indifferent; 4=Disagree; 5=Strongly disagree ^a =positive attitudinal statement ^b =negative attitudinal statement						

Source: Researcher, 2018

In regard to action to be taken on livestock predators, results in Figure 4-5 indicates that, more than three-quarter of respondents (76%) indicated that livestock predators should be protected and controlled while 1 in 4 (24%) indicated that should be killed. Majority (87%) of the respondents indicated that they would not support wildlife conservation if wild animals destroyed they crops or killed their livestock see Figure 4-6.

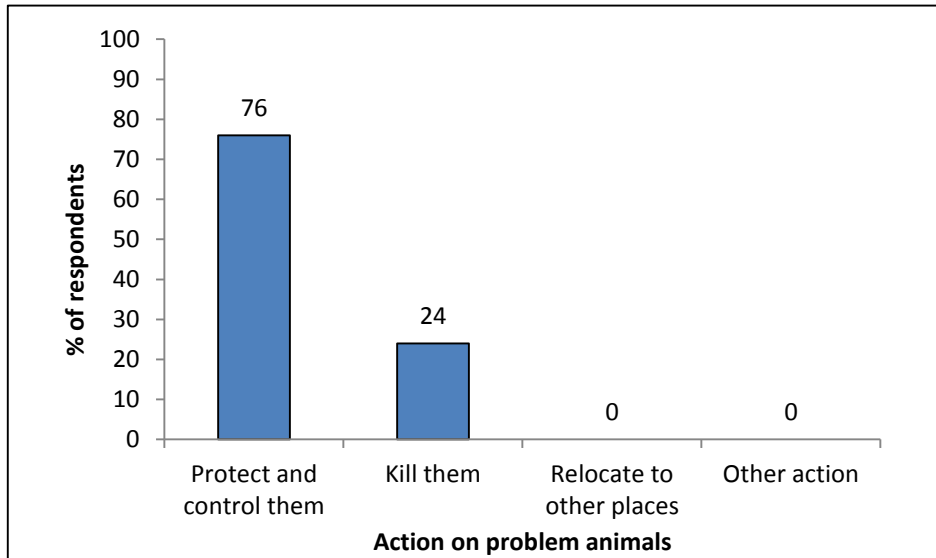


Figure 4- 5: Action taken on problem animals

Source Researcher, 2018

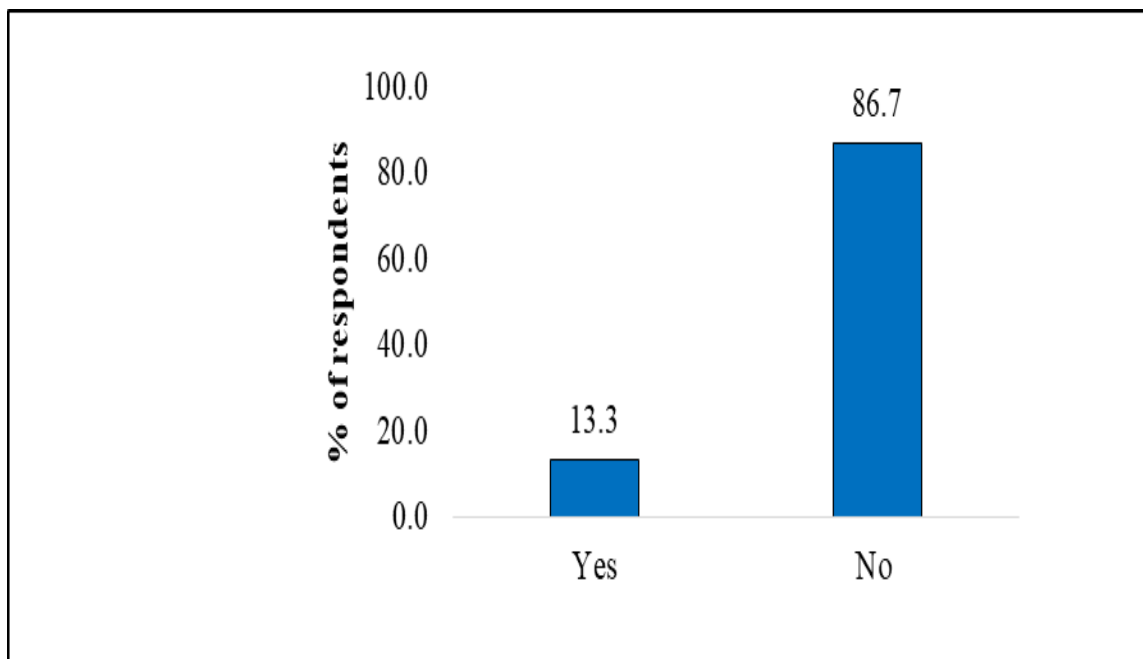


Figure 4- 6: Proportion of respondents' willingness to support wildlife conservation after property destruction by problem animals

Source: Researcher, 2018

4.4.1 Bivariate analysis on attitude towards wildlife conservation

A binary outcome variable—attitude towards wildlife conservation—was created from the scores to represent those with a positive attitude (that is, respondents with scores above zero), and negative attitude (respondents with zero or negative scores). From the survey results over half (54.3%) of the respondents had positive attitude towards wildlife conservation. Majority (68%) of male respondents' had positive attitude towards wildlife conservation while more than half (51%) of the interviewed female had negative attitude towards wildlife conservation. The relationship between sex of the respondent and attitude was significant at $p=0.004$ (Table 4-12). Hence we reject null hypothesis, and adopt the alternative hypothesis that gender is associated with attitudes towards wildlife conservation.

Table 4- 12: Association between attitude towards wildlife conservation and sex of the respondents

Variable	Attitude towards wildlife conservation					
	Negative	Positive	Total	χ^2	df	p-value
Sex	%	%	n			
Female	51.0	49.0	200			
Male	32.1	68.0	78	8.1	1	0.004

Source: Researcher, 2018

In terms of age group, older respondents (>51 years) had positive attitude towards wildlife conservation (68.0%) while more than half (57.8%) of younger (<30 years) respondents had negative attitude towards wildlife conservation at $p=0.002$ (Table 4-13). Hence we reject null hypothesis, and adopt the alternative hypothesis that age is associated with attitudes towards wildlife conservation.

Table 4- 13: Association between attitude towards wildlife conservation and Age of the respondents

Variable	Attitude towards wildlife conservation					
	Negative	Positive	Total	χ^2	df	p-value
Age	%	%	n			
<30 years	57.8	42.2	64			
31-50 years	50.4	49.6	117	12.2	2	0.002
>51years	32.0	68.0	97			

Source: Researcher, 2018

In regard to household size, respondents in larger households (7 persons and above) had more (63%) positive attitude towards wildlife conservation than their counterpart in smaller

households. The association was statistically significant at $p=0.009$ (Table 4-14). Hence we reject null hypothesis, and adopt the alternative hypothesis that household size is associated with attitudes towards wildlife conservation.

Table 4- 14: Association between attitude towards wildlife conservation and household size of the respondents

	Attitude towards wildlife conservation					
Variable	Negative	Positive	Total	χ^2	df	p-value
Household size	%	%	n			
≤ 6	54.1	45.9	146			
7 and above	36.4	63.6	132	8.9	1	0.009

Source: Researcher, 2018

Level of education had no significant association with attitude towards wildlife conservation. Hence we fail to reject null hypothesis, that the level of education is not associated with attitudes towards wildlife conservation. About 56.4% of the respondents with no education had positive attitude towards wildlife conservation. On the same note half (50%) of the respondents with primary and secondary or higher level of education had positive attitude towards wildlife conservation. see Table 4-15.

Table 4- 15: Association between attitude towards wildlife conservation and level of education of the respondents

	Attitude towards wildlife conservation					
Variable	Negative	Positive	Total	χ^2	df	p-value
Level of Education	%	%	n			
No Education	43.6	56.4	172			
Primary	50.0	50.0	50	0.8	2	0.664
Secondary and higher	48.2	51.8	56			

Source: Researcher, 2018

Respondents whose main source of livelihood was livestock keeping had positive attitude (56.5%) towards wildlife conservation, while those with other sources of livelihood half (53.2%) had negative attitude towards wildlife conservation. The association was not statistically significant at $p=0.180$ (Table 4-16). Hence we fail to reject null hypothesis, that main source of livelihood is not associated with attitudes towards wildlife conservation.

Table 4- 16: Association between attitude towards wildlife conservation and main source of livelihood

	Attitude towards wildlife conservation					
Variable	Negative	Positive	Total	χ^2	df	p-value
Main source of livelihood	%	%	n			
Livestock	43.5	56.5	216			
Others	53.2	46.8	62	1.8	1	0.180

Source: Researcher, 2018

Regarding duration of stay in the study area, majority of respondents who had stayed in the study area for 11 years and more had positive attitude towards wildlife conservation (57% and above) while majority (56%) those who had stayed for 10 years and less had negative attitude towards wildlife conservation. The relationship was not statistically significant at $p=0.152$ (See Table 4-17). Hence we fail to reject null hypothesis, that duration of stay is not associated with attitudes towards wildlife conservation.

Table 4- 17: Association between attitude towards wildlife conservation and duration of stay in the study area

	Attitude towards wildlife conservation					
Variable	Negative	Positive	Total	χ^2	df	p-value
Duration stay in the study area	%	%	n			
10 year or less	56.1	43.9	66			
11-20 years	42.9	57.1	70	3.8	2	0.152
21 or more years	42.3	57.8	142			

Source: Researcher, 2018

Past experience of destruction of property by wild animals was also a determinant of attitude. The majority of respondents who had never lost livestock to predators (80.8%) had positive attitudes towards wildlife conservation than those who had lost livestock to predators. The association was statistically significant at $p=0.02$. Hence we reject null hypothesis, and adopt the alternative hypothesis that attitudes towards wildlife conservation is associated with past experience of livestock predation.

About a half (50.5%) of the respondents who had ever experienced crop destruction had positive attitude towards wildlife conservation while 55.9% of the respondents who had never experienced crop destruction by wild animal had positive attitude towards wildlife conservation. However, this association was not statistically significant. Table 4-18.

Table 4- 18: Association between attitude towards wildlife conservation and past experience with wild animals' destruction to property

Variable	Attitude towards wildlife conservation					
	Negative	Positive	Total	χ^2	df	p-value
Ever lost livestock to predators	%	%	n			
No	19.2	80.8	26			
Yes	51.6	48.4	252	9.9	1	0.002
Ever experienced crop destruction						
No	44.1	55.9	68			
Yes	49.5	50.5	210	0.6	1	0.442

Source: Researcher, 2018

4.4.2 Factors associated with attitude towards wildlife conservation

Table 4-19 presents results of a multivariate logistic regression, odd ratios and 95% confidence interval for factors associated with attitude towards wildlife conservation. Among the socio-demographic variables only age and main source of livelihood had a statically significant association with attitudes toward wildlife conservation. The results that respondents aged 50 years or above were 2.5 times (95% CI=0.907-6.832) more likely to indicated positive attitude towards wildlife conservation compared to younger respondents. In terms of source of livelihood, those who depended on other source of livelihood were 0.5 less likely than those who relied on livestock to have positive attitude towards wildlife conservation.

Traditional knowledge of wildlife conservation has positive statistically significant effect on attitude towards wildlife conservation. As shown in Table 4-19, respondents who were aware of traditional ways of conserving wildlife were 2.4 times (95% CI =0.355-4.308) more likely to have positive attitude towards wildlife conservation compared to those with no knowledge. This association was found to be statistically significant at $p=0.003$.

Table 4- 19: Adjusted Odds ratios from a multivariate logistic regression model showing factors associated with attitude towards wildlife conservation

	Model I		
Variables	Exp(B) [95% CI]	S.E.	Sig.
Sex			
Female [®]			
Male	1.680[0.053-3.308]	0.346	0.133
Age			
<30 years [®]			0.036
31-50 years	0.983[0.441-2.193]	0.409	0.967
>50 years	2.490[0.907-6.832]	0.515	0.077
Marital status			
In Union [®]			
Not in union	1.322[0.564-3.097]	0.435	0.521
Household size			
<=6 [®]			
7 and above	1.618[0.910-2.880]	0.294	0.102
Level of Education			
No Education [®]			0.835
Primary	0.951[0.452-2.004]	0.380	0.895
Secondary and higher	1.224[0.555-2.701]	0.404	0.616
Main source of livelihood			
Livestock [®]			
Others	0.539[0.705-3.447]	0.358	0.084
Duration stay in the study area			
10 year or less [®]			0.332
11-20 years	1.559[0.406-2.115]	0.405	0.273
21 or more years	0.926[0.267-1.087]	0.421	0.856
Awareness of Traditional ways of wildlife conservation			
Not Aware [®]			
Aware	2.416[0.355-4.308]	0.295	0.003
Ever lost livestock to predators			
Yes [®]			
No	1.840[0.736-4.603]	0.468	0.036
Ever experienced crop destruction			
Yes [®]			
No	1.444[0.782-2.665]	0.313	0.240

Note: [®] reference category.

Source: Researcher, 2018

Experience of loss of livestock due to predators was found to be a significant factor influencing attitude towards wildlife conservation. Respondents who had not experienced

loss of livestock to predators were 1.8 times (95% CI=0.736-4.603) more likely to have positive attitude towards wildlife conservation compared to those who had experienced loss of livestock to predators (Table 4-19). This relationship was statistically significant at $p=0.036$.

Experience of crop destruction did not have a statistically significant effect on attitude towards wildlife conservation; this is because very few people practiced crop farming. However, the relationship was in the expected direction. Respondents who had not experienced crop destruction were 1.4 times (95% CI=0.782-2.665) more likely to have positive attitude towards wildlife conservation compared to those who had experienced crop destruction (Table 4-19).

4.5 Practices towards wildlife conservation

From the survey almost all of the interviewed respondents had experienced destruction of property through various incidents of livestock predation or crop destruction by wild animal(s) within the last two years. Over 91 % of the respondents cited incidents of livestock loss due to wild animal attack, while 74.8 % had incidences of wild animal attack on their crops. The predatory attacks were mainly driven by leopards and hyenas (92 %) while predation by lion was only 11%. Crop destruction was mainly caused by Baboons (96.5 %) and Elands (90.1 %). Majority of respondents 86.2 % had different methods of protecting their property against wild animals' destruction as shown in Figure 4-7.

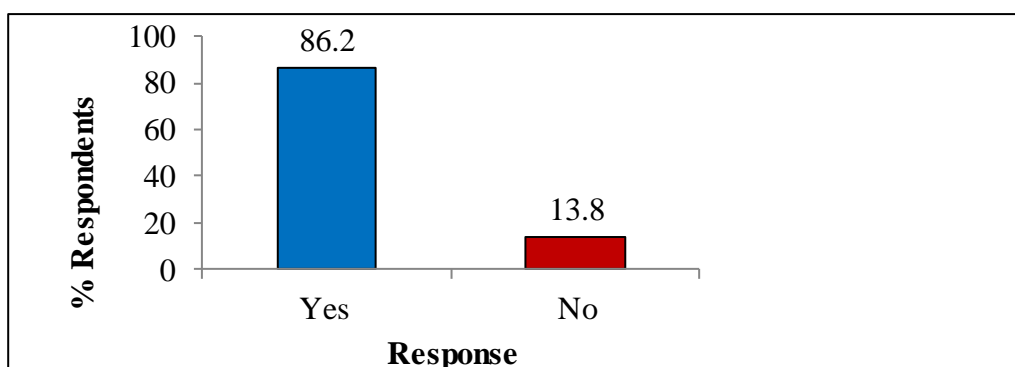
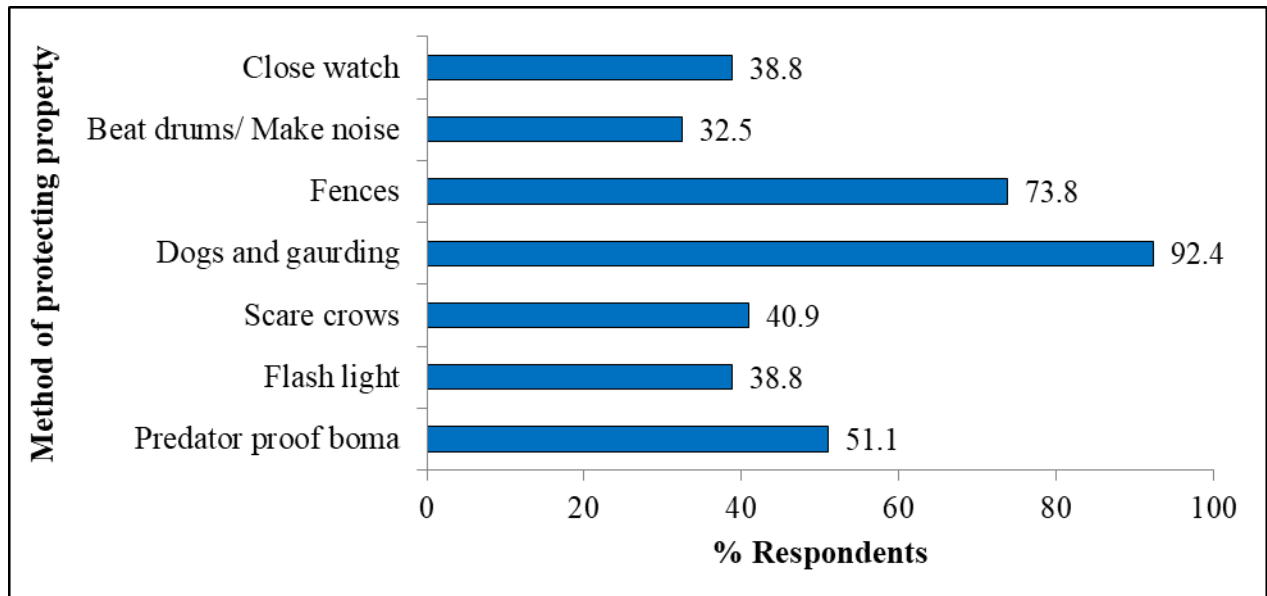


Figure 4- 7: Respondents with a means of guarding property against wildlife destruction
Source: Researcher, 2018

The methods used to guard property against wildlife destruction varied from one respondent to another. Use of dogs and guarding was mostly cited (92.4%) followed by use of fences (73.8%) (Figure 4-8 and Plate 4-3).



*Multiple response questions

Figure 4- 8: Method of guarding property (crop and livestock) against predator attack.

Source: Researcher, 2018

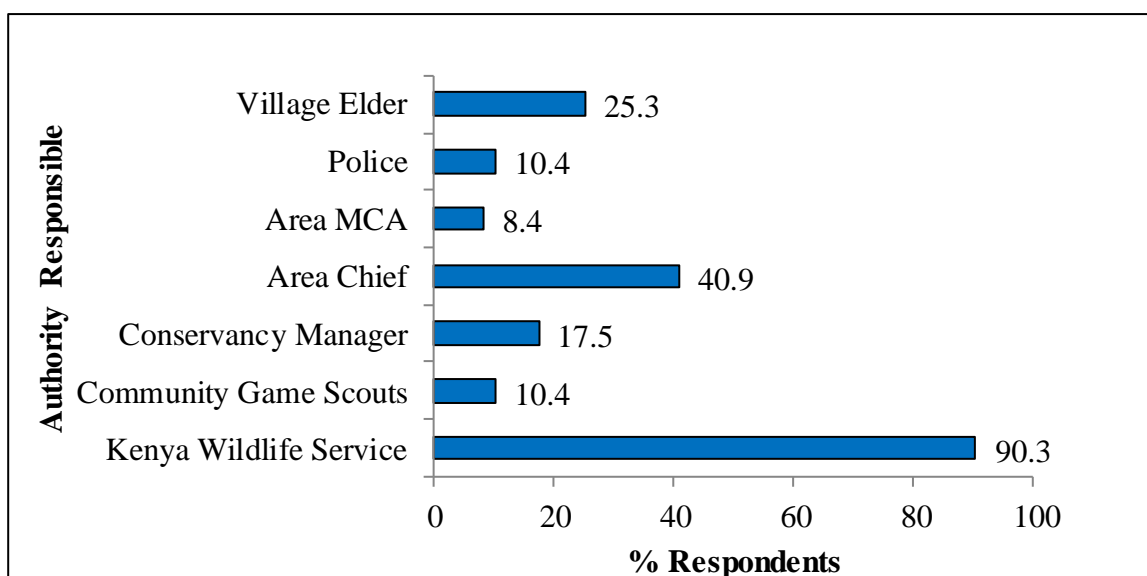


Plate 4- 3: Methods used to protect property from wild animals destruction

Source: Researcher, 2018

Out of the respondents who had ever experienced destruction of property by wild animals, about half (54.2%) reported the problems encountered with having wild animals on their land. Majority (90.3 %) of the respondents had reported to the warden in charge of Kenya

Wildlife Service office at Ngong Station, less than half (40.9%) of the respondents reported to the Area Chief as shown in Figure 4-9. When the respondents were asked to state whether they were satisfied with the help they received after reporting, 81.3 % were not satisfied while 18.7% were satisfied. The main reason cited by majority (61.3%) for not being satisfied was lack of awareness of where to report to. Others cited lack of compensation (26%) hence they saw it as a waste of time so as shown in Table 4-20.



***Multiple response questions**

Figure 4- 9: Authority where wildlife problems are reported

Source: Researcher, 2018

Table 4- 20: Distribution of respondents by reason for not reporting

Statement	Frequency	Percentage response
Do not know where to report to	73	61.3
There is no compensation	32	26.9
I have no reason	22	18.5
The distance is far	18	15.1

***Multiple response questions**

Source: Researcher, 2018

4.6 Willingness-to-pay (WTP)

Willingness-to-pay (WTP) towards wildlife conservation in Enkuseru Sampu Conservancy was used as a measure of support for conservation success. Due to high prevalence of human-wildlife conflict involving lions and other predators in the study area, respondents were asked to indicate how much they were willing to pay per year to a conservation organization, to support lion conservation project which includes building of predator proof *bomas*⁴ in the study area. Respondents were to indicate their maximum amounts they were willing to pay annually and the response categories include: Kshs 0, 5000 or less, 5000-10000, 10001-20000, 20001-50000, and 50001 or more. The response category values were based on livestock ownership, we hypothesized that the poorest person might own no livestock hence 0 kshs, the values increased by the ownership of a single goat to 10 goats and above, having in mind that the average price of goat is 5000Kshs.

Results show a significant proportion of respondents (57.2 %) who indicated willingness to pay certain amount for the conservation of lion in the study area (see Figure 4-10). Approximately 42 percent of respondents were willing to pay Ksh 20001-50000 annually, and 10 percent were willing to pay Ksh. 10001-20000. About 43 percent of respondents were not willing to pay. The high level of the WTP for the conservation of lions shows that conservation has been seen by respondents as important.

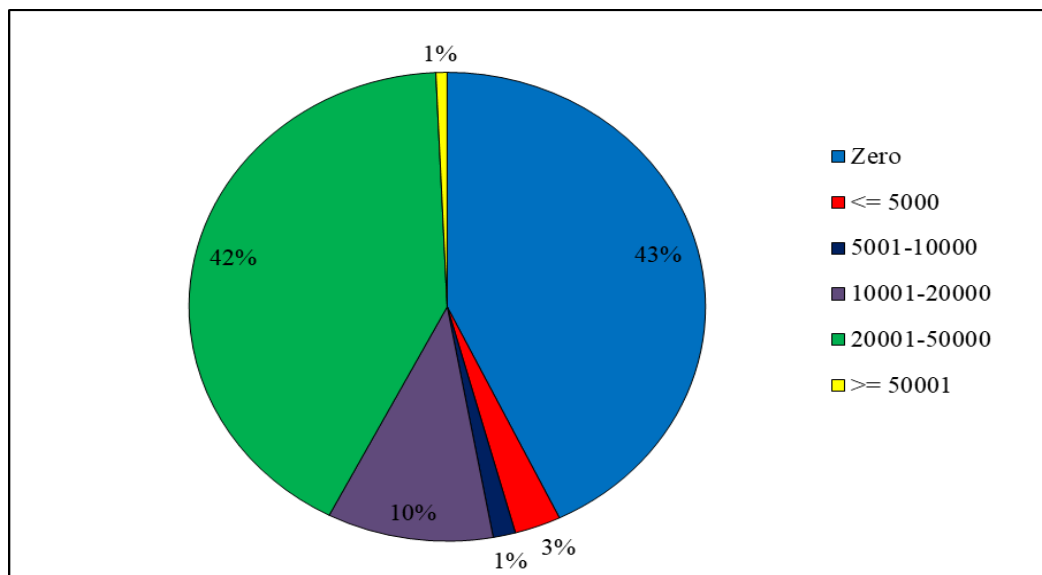
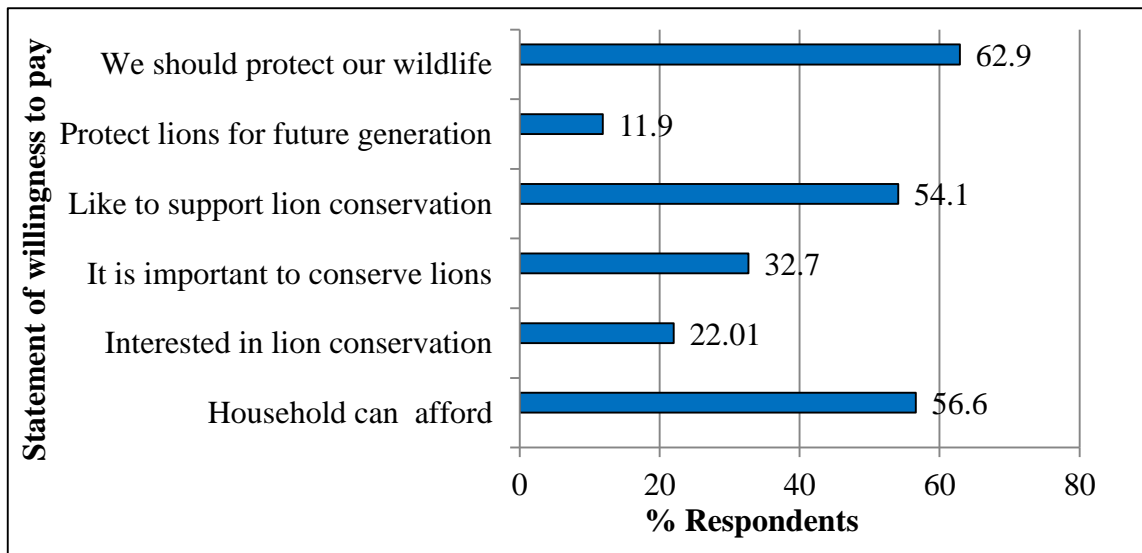


Figure 4- 10: Willingness-to-pay (WTP) for the conservation of Lions

Source: Researcher, 2018

⁴ *Bomas* refers to an enclosure where livestock are kept.

Figure 4-11 presents respondent's reasons for willingness to pay for Lion conservation. Main reasons stated by respondents for willingness to pay include: 'I feel we should protect our wildlife and environment (62.1%); I like to support wildlife Conservation (54.1 %) and I feel it is important/worthy to conserve them (32.7 %).

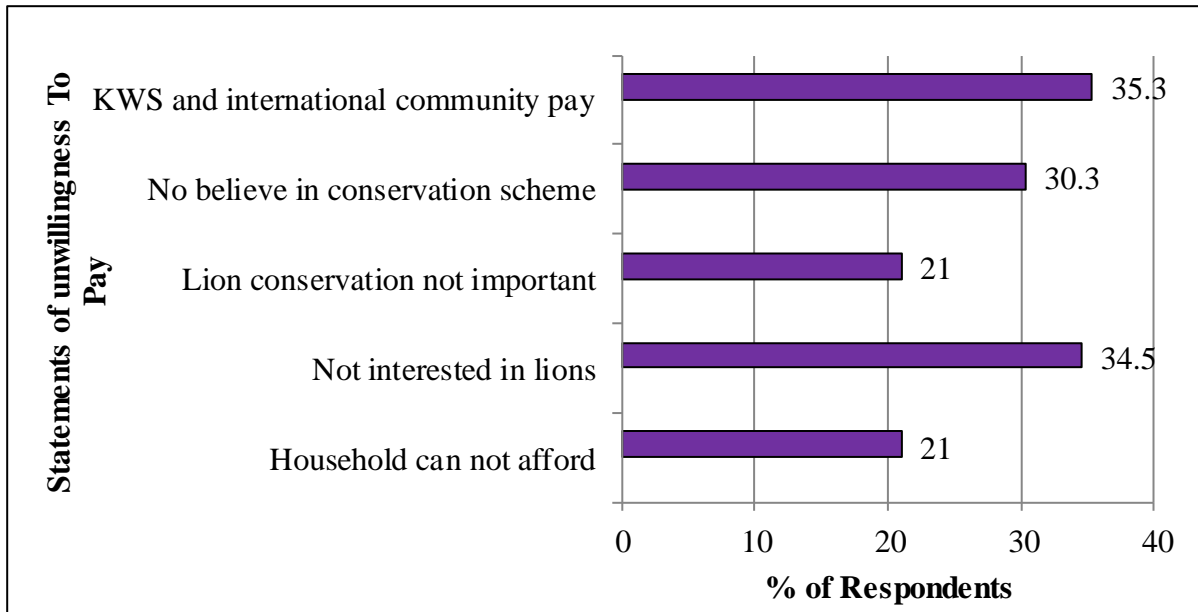


***Multiple response questions**

Figure 4- 11: Reasons for willingness to pay for lion conservation

Source: Researcher, 2018

As shown in Figure 4-12 among those who were not willing to pay for lion conservation, the main reasons stated were classified into true zero and protest bid. The true zero included; our household cannot afford (56.6%) and, I am not very interested in lions (22%). While protest bids included; it is the responsibility of the Government (in this case referred to as KWS) and International Community (%); and I do not believe in the success of contribution scheme (19%).



***Multiple response questions**

Figure 4- 12: Respondents reasons provided for unwillingness to pay for lion conservation project

Source: Researcher, 2018

4.7 Discussion

In this survey it was evident that the main transmitters of traditional knowledge on ways of wildlife conservation were mainly foster parents and grandparents, it involved knowledge on the use of wild plants and animals in relation to the Maasai socio-cultural practices, this is similar to the findings of Scott (1998) who found that the holders of traditional knowledge are the elders. Furthermore, the main mode of transmission was through use of taboos (88.1%) and the practice of social norms (79.5%) similar to the findings made in the studies of (Twarog & Kapoor, 2004; Sutherland *et al.*, 2014; Roué *et al.*, 2016).

Gender was found to be associated with awareness on traditional ways of wildlife conservation, where male respondents were more likely to be aware of the traditional ways of wildlife conservation than female. This could be as a result of the cultural settings of the Maasai where women and men have different roles. According to Browne-Nunez (2010) in the Maasai culture women spent most of their time in household chores taking care of the family. For example, during circumcision women were not allowed to actively take part but could sing and clap for the newly initiated boy, women also were not allowed to attend the praying ritual rites when sacrifices were offered to God, thus they were not very conversant with the traditional knowledge regarding the ways of wildlife conservation. This is true with

the findings of Kideghesho (2008, 2009) who found that traditional knowledge on the use and presence of natural resources have been effective in the understanding local peoples' customs, traditions, beliefs and rituals by promoting traditional knowledge on wildlife resource use.

The over reliance on wildlife resources for a livelihood for people living in the rural areas has been reported in many areas globally (Convention on Biological Diversity, 2005; Millennium Assessment, 2005). In this study respondents in larger households who relied on livestock keeping, were heavily dependent on pasture to feed their livestock, medicinal herbs to cure themselves and livestock too (Ole-Miaron, 2003), and firewood as a means of cooking and warming themselves, therefore they were more aware of the traditional wildlife conservation methods than their counterparts who were from smaller households and relied on other sources of livelihood and cooking material. This was because they interacted more frequently with nature and knew more about each plant and animal species as they used them in their day to day life. This findings concurs with the studies by Kangwana (1993); Burford *et al.* (2001); Western (2001); Kameri-Mbote (2002); Kuriyan (2002); Sitati (2003); Kioko (2004); Browne-Nunez (2010); Muiruri and Maundu (2010); Sifuna (2012); Dickman *et al.* (2015), who found that, the Maasai community heavily relies on wildlife resources for socio-cultural rituals, traditions and taboos in the sustenance of their livelihoods.

In the traditional practices of local communities at the ESC, it was a taboo to cut some tree species (Oreteti) or kill some animals considered as scared or totemic (Dove, tortoises and Ostrich). The killings of these animals were linked to a bad omen that might befall a community such as; prolonged period of drought, death of livestock or death of the parent. Moreover it was a ritual to plant an Oreteti tree seedling on top of the grave of an elder and the tree was never to be cut as it presented the presence of the dead man. Similar reports have been found in other societies globally, where traditional knowledge of a taboo associated with the utilization of wildlife resources if broken leads to bad omen or cause diseases (Gadgil & Vartak, 1976; Gadgil & Guha, 1992; Ale, 1998; Kideghesho, 2008; Darr *et al.*, 2009; Djugoun *et al.*, 2009; Kideghesho, 2009; Muiruri & Maundu, 2010; Abugiche *et al.*, 2017). In addition killing of pregnant or lactating animals was also prohibited in the culture of local communities in ESC, the same applies to the studies of Scott (1998) in Uganda who found that killing of pregnant animals is an annoyance to the ancestral spirit.

The positive traditional practices associated with wildlife resources ultimately results in the conservation of wildlife species and their habitats leading to their protection from human persecution. It is evident that 21 out of 70 species listed in the African Culture as taboos species are found in the IUCN red list of endangered species (Colding & Folke, 2001). Similarly at the Kenyan Coast Kaya forest, 4 out of 9 bird species are listed in the IUCN red list as endangered due to their restricted home ranges (Metcalf *et al.*, 2010).

In the contrary, negative impacts of the traditional cultural practices associated with the killing of wild animals to obtain their parts for; food, witchcraft, and initiation ceremonies, in addition to considering some wild animals as carriers of bad omen, have often led to the killing of wild animals. From the findings of this survey, it is evident that in the past local communities of ESC were involved in the killing of various bird species to use the feathers in making a head gear which was worn during the initiation ceremony, the head gear had to be worn for a period of 2-3 years and whenever it was worn out, it needed repair with new feathers resulting into the killing of more birds. This practice has been found to be detrimental to the survival of some wildlife species listed as endangered or near threatened in the IUCN red list of threatened species. For example; the African vulture, African Lion, and Aye aye of Madagascar (Simons & Meyers, 2001; Sifuna, 2012; McKean *et al.*, 2013; Dickman *et al.*, 2015; Ogada *et al.*, 2016).

In general, the overall attitude of the local communities towards wildlife conservation in ESC was positive; this is evident from the survey result which indicates that over 54% of the respondents held favorable support towards wildlife conservation. Positive attitude was recorded irrespective of massive destruction to property caused by wild animals attack (livestock predation 91% and crop destruction 74%).

Gender had a significant association with attitude towards wildlife conservation, where male respondents were more likely to have favorable support towards wildlife conservation than their female counterparts. The findings of this study conforms with the findings of Kangwana (1993); Browne-Nunez (2010); Tessema *et al.* (2010); Mir *et al.* (2015) who reported that in a survey of local communities in Amboseli area Kenya, in four PAs in Ethiopia and in India Kashmir Valley respectively, found a significant correlation of gender and attitude towards elephant conservation and PA as important in wildlife conservation.

However, other studies have shown contrary result (Kideghesho *et al.*, 2007; Gandiwa, 2012). In these studies, gender had no statistical significance with attitudes toward conservation. The findings of this study established that gender had an association with attitudes towards wildlife conservation due to the fact that the benefits women derive from wildlife resources differs with men in terms of wildlife resource access and use. Most women tended to portray negative attitude towards wildlife conservation, because there were many social taboos and norms that restricted and prohibited them from utilizing wildlife resources.

In regard to age, the study revealed that older respondents were more likely to have positive attitudes towards wildlife conservation than their younger counterparts. As expected, older respondents had interacted with wildlife for a longer period of time and they have been involved in the traditional practices that involved use of wildlife in most of their daily livelihoods than younger respondents. The findings of this study concur with the results of Kangwana (1993); Browne-Nunez (2010); Tessema *et al.* (2010) who found that age was significantly positively correlated with attitudes towards wildlife conservation. Younger respondents had negative attitude due to the influence of modernization such as the impact of Christianity and formal education, which has led to the changes in lifestyle and cultural deterioration where Ilmurran⁵ is considered as a thing of the past, with younger respondents having less interaction with nature. The current generation spends more time in school unlike in the past where learning was majorly informal with more interaction with nature. Additional influence of the negative attitude held by younger respondents was due to lack of tangible benefits derived from having wildlife in the area such as employment and compensation to losses incurred (Gadd, 2005).

The finding of this study concurs with the results of Wuletaw (2008) who indicated that, household size was associated with attitude towards wildlife conservation. This is due to the perceived long-term benefits of wildlife for example; source of livelihood, future employment opportunity and for their own recreation (Archabald & Naughton-Treves, 2001; Naughton-Treves & Weber, 2001; Walpole & Goodwin, 2001; Anthony, 2007; Kioko & Kiringe, 2010; Snyman, 2012; Nsonsi *et al.*, 2017). In this study individuals in larger household had more favorable attitude towards wildlife conservation, because their livelihood source was heavily reliant on wildlife for example, fuel wood, pasture for their livestock, medicinal herbs and building materials for their houses.

⁵ Male Maasai aged between 15-30 years commonly referred to as warrior who main role is to defend livestock and family from predators attack.

In this study, awareness on traditional ways of wildlife conservation had a significantly positive correlation towards support to wildlife conservation. Respondents who were aware of traditional ways of wildlife conservation were more likely to have favorable support towards wildlife conservation than those who were not aware. This results relates with findings of Infield and Namara (2001) who reported that cultural benefits are efficient in gaining local peoples support to conservation. Similarly, Kideghesho *et al.* (2007); Kideghesho (2008) confirms that where taboos and social norms compels individuals to use wildlife resources with caution, it automatically leads to support to conservation as a result of fear of being punished or befallen by a bad omen.

Another finding of this study was that past experience of livestock predation was significantly correlated with attitudes towards wildlife conservation. Therefore, those who had never lost livestock to predation over the past 2 years were more likely to have positive support towards wildlife conservation (predators) than those who had ever lost livestock to predators. This results corroborate with the findings of Oli *et al.* (1994); Archabald and Naughton-Treves (2001); Walpole and Goodwin (2001); Rao *et al.* (2002); Bagchi and Mishra (2006); Wang and Macdonald (2006); Romanach *et al.* (2007); Suryawanshi *et al.* (2013) that predation had a significantly negative effect on attitudes of local communities towards wildlife conservation. This is due to the fact that of the negative impact of livestock predation on the individual wealth status of pastoral communities (Manoa & Mwaura, 2016).

In this study livestock predation was cited as the main source of human wildlife conflict, mostly caused by Hyaena (*Hyaena Brownae*), past experience of livestock predation also significantly influenced attitudes towards wildlife conservation. Similarly, Manoa and Mwaura (2016) found in their study in Kajiado County, that Hyenas were mainly responsible for most of the predatory attacks. Livestock predation was likely to influence negative attitudes as it has been linked to cause negative attitudes (Weladji *et al.*, 2003; Wang & Macdonald, 2006; Manoa & Mwaura, 2016). To counter the effect of massive losses incurred by predation, local communities in ESC have adopted various methods to protect property from predation. These include use of dogs at home and in the fields as well as fences in the cattle bomas. This results concur with the observations of Oli *et al.* (1994); Kideghesho *et al.* (2007) who reported that positive attitudes often results to pro-conservation behavior.

In regard to human wildlife conflict, respondents were in agreement that wildlife outside protected areas should be protected and, that incase of damage to property or livestock loss

the farmers has to be compensated if they had taken appropriate measures to protect property from wild animal damage. The sole authority cited to be responsible for compensation was KWS, in which most of the respondents cited dissatisfaction with the services they received in cases of livestock predation due to lack of any compensation on damages incurred.

Additionally, some individuals felt that it was unfair for KWS staff to arrest those who kill wild animals or those who are involved in bush meat trade, as well as those involved in illegal forest harvesting especially of saddle wood. This may highly be due to lack of awareness on the value of conserving wildlife. This results are similar to the findings of Badola *et al.* (2012) who reported that, in East Coast of India local communities continued to destroy the mangrove ecosystem irrespective of their potential benefits to the improvement of their livelihoods, and in Wilshusen *et al.* (2002) in their review on various people centered conservation programmes, they found that high chances of portraying lack of support to conservation and protected area is as a result of inadequate knowledge of on wise use of wildlife resources and PA rules and regulations.

Most of the respondents expressed negative statements towards conservation organizations, in which majority indicated that conservation organizations only give higher values to animals and not local communities' welfare. This result concurs with the findings of de Lima Roque (2009); Nsonsi *et al.* (2017) who respectively noted that in Amboseli National Park local communities felt that the government cared more about wildlife than community, and in Nouabale Ndoki National Park in northern Congo, conservationists were more concerned with elephants survival at the cost of local community welfare. This automatically results into lack of confidence and greater resentment towards Protected Area management and staff.

There was evidence of lack of awareness on the role of KWS in compensation among local community members. The impression provided by the respondents indicated that if they are not compensated for the losses incurred, in the near future or appropriate measures put in place to protect their property, they will resort to killings of wild animals destroying their crops and killing their livestock as revenge (Oli *et al.*, 1994; Williams *et al.*, 2002; Bagchi & Mishra, 2006). The finding is similar to that of Wilshusen *et al.* (2002) who noted that inadequate access to knowledge that relates to conservation policies, rules and regulations as well as awareness on Protected Area management practices is a precursor to likeness to have unfavorable support towards conservation.

Support to wildlife conservation diminishes in areas where residents incur losses due to frequent property destruction without compensation (Infield & Namara, 2001; Romanach *et al.*, 2007). This may lead to lack of support to protect wildlife on community lands (Gadd, 2005). In this study, it was evident that support to wildlife conservation has reduced by having most of the individuals not willing to donate their land towards the expansion of the conservancy, rather, those who had already donated their land preferred that it be returned to them, due to lack of benefits from having the conservancy. It was also evident that receiving benefits from conservation projects often results into improved development and support to conservation programmes (Brandon & Wells, 1992; Abbot *et al.*, 2001; Infield & Namara, 2001; Campbell & Vainio-Mattila, 2003). Over 43% were not willing to pay an annual contribution fee in support of a lion conservation project which involved building of predator proof bomas to reduce livestock predation. About 57% were willing to pay towards lion conservation project.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the project results

Out of 278 respondents, 72% were females and 28% were male. Majority of the respondents were aged 31-50 years (42%); hailed from smaller households (6 persons and fewer, 52.5%), and had no formal education (61.9%). The main source of livelihood was livestock keeping (77.7%) with cattle and goat being the most reared animals. The main source of cooking was fuel wood (90.3%). By observation the major land use change seen in the area was massive land subdivision with barbed wire fences, charcoal burning and evidence of ballast mining at two operational sites.

One major finding of this survey was that majority of the surveyed respondents were aware of the traditional ways of wildlife conservation and they categorized the traditional use of wildlife as very important to them. Factors that influence traditional awareness towards wildlife conservation were gender, age, marital status, education level, duration of stay in the study area, main source of livelihood, main source of cooking and willingness to pay for a lion conservation project. Although there was no significant relationship in age, education level and duration of stay with awareness of traditional ways of wildlife conservation the association was in the expected direction.

Secondly, irrespective of the persistent livestock predation in the study area, at least more than half of the respondents had favorable support towards wildlife conservation. The factors that were found to influence attitudes towards wildlife conservation were; sex, age, household size, awareness on traditional ways of wildlife conservation and experience of livestock loss due to predation. Despite this some attributes as such as main source of livelihood, level of education and duration of stay in the study area had no significant effect on attitudes towards wildlife conservation.

The practices of the local communities towards wildlife was mainly through access of pasture for grazing their animals and extraction of wild plant materials for the medicinal use, socio cultural ceremonies, building materials and as source of fuel wood. A small percentage of the respondents were involved in sale and lease of land for establishment of the conservancy, settlement, agriculture and mining purposes while some were involved in charcoal burning activities to raise income to support households. In relation to practices involving human

wildlife conflict, majority of the respondents had methods of protecting their properties against wild animals' damage. Despite having knowledge on wildlife conservation and management Act 2013 on the section of compensation to losses incurred as a result of wild animal destruction, most individuals did not report cases of human wildlife conflict to the responsible authority with the main reason being that there is never compensation, and they see it as a waste of time and money to travel. While those who reported to KWS officers at Ngong station with most of them having a strong believe that KWS is the body responsible for their compensation.

5.2 Conclusion

Understanding local communities' traditional knowledge attitudes and practices towards wildlife conservation is necessary for the success of the conservation policies and programmes. It is important to identify the triggers of individuals' attitudes for effective decision making in planning and implementation of measures aimed at gaining local communities support to wildlife conservation.

From this study it can be concluded that within the local communities in ESC traditional use of wildlife resource is still recognized and given high priority. The best practices that have been put in place to prevent over exploitation of wildlife resources, if adopted into the conventional wildlife management could lead to the recovery of many plant and animal species which are at the verge of extinction due to over-exploitation.

It is also evident that young people were less aware of traditional ways wildlife conservation. This could be attributed by the current formal education systems whereby the young people spend more time in schools, with less interaction with wildlife. In addition to the influence of Christianity which has greatly affected the perception of people such that, most people no longer believe in some of the provisions of the taboos and social norms. Lastly the effect of urbanization has led to lifestyle changes from the former traditional Maasai cultural practices to the "westernized lifestyle" hence traditional knowledge transmission towards wildlife conservation is facing a major deterioration within the society.

In regard to attitude it is evident that more than 40% of respondents had negative attitudes towards wildlife conservation, due to past experience of wildlife predation and lack of compensation for the destruction. There was also a major misconception of the role of KWS in the protection of local communities, their property and life against damages caused by wild

animals with compromising their role in conserving protecting and managing wildlife in and outside PAs in Kenya.

From the findings of this study we can conclude that majority of people were willing to support wildlife conservation in the study area if they could reap tangible benefits from having wildlife on their land. Moreover, fair consideration on their welfare was also a pre-requisite to gain support to wildlife conservation. In order to control wild animal attack on livestock, local communities are trying to use the possible existing methods within their reach to reduce the rate of human wildlife conflict. This involved the willingness to contribute an annual payment to support lion conservation project in the area which included building of predator proof bomas.

5.3 Recommendations

5.3.1 Recommendation for policy and programmes

- There is need to provide extensive education and awareness programmes to the local communities in ESC and the larger Kajiado County on the importance of wildlife conservation.
- Inclusion of the best practice traditional knowledge on wildlife utilization into the amendment and review of the new wildlife conservation and management act 2013.
- Effort should be put in place to ensure that the local people are well conversant with the wildlife policy, rules and regulations within the country. The role of each stakeholder involved in wildlife conservation should be clearly specified, to promote change in attitudes of local people towards conservation organization specifically KWS which has been blamed in most occasions for the lack of compensation and livestock predation.
- The Ministry of Agriculture, Livestock and Fisheries, Ministry of Wildlife and Tourism, Kenya Wildlife Service, the County Government of Kajiado and the Non-Governmental organizations involved in wildlife conservation should work jointly with the local communities towards the development of an insurance policy towards livestock keeping and crop farming.

5.3.2 Recommendation for management

- Local community should be involved at each phase of decision making concerning wildlife conservation Kajiado County and the whole country at large.
- There is need for the Ministry of Wildlife and Tourism, County Government of Kajiado and KWS to work jointly to fast track compensation claims to losses incurred by local communities
- There is need for the Ministry of Wildlife and Tourism, County Government of Kajiado and KWS to ensure that there is equitable sharing of benefits accruing from wildlife conservation with the local communities.
- All stakeholders involved in wildlife conservation should promote alternative livelihood projects to reduce over reliance on livestock such as beekeeping, agroforestry and eco-tourism as well as game farming.
- The County government in liaison with the local community should provide alternative source of fuel, such as use of energy saving stove with less emission of methane gas and less use of fuel.

5.3.3 Suggestions for further research

- This study focused mainly on the traditional knowledge, attitudes and practices of local communities towards wildlife conservation by surveying head of households. Similar studies should be done on the traditional knowledge attitudes and practices focusing on the youth.
- This study focused on the minimum part of willingness to pay towards lion conservation project, there is need to conduct a detail economic valuation of the ESC so as to guide policy makers in their decisions, also local people will attach more value to a resource if they know its monetary value.
- Lastly the study focused on the observatory changes in land use and land cover practices towards wildlife conservation, there is need to conduct a thorough research on the projected impact of land use and land cover changes on the traditional knowledge, attitudes and practices of local community towards wildlife conservation.

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APPENDIX 1: HOUSE HOLD QUESTIONNAIRE

TRADITIONAL KNOWLEDGE, ATTITUDES AND PRACTICES OF LOCAL COMMUNITIES TOWARDS WILDLIFE CONSERVATION IN ENKUSERO SAMPU CONSERVANCY

HOUSEHOLD QUESTIONNAIRE

INFORM CONSENT

Kindly note that, the information that you will give here will be used strictly for academic purposes and will be treated with high confidentiality. Your assistance will be greatly appreciated

IDENTIFICATION

Village name: _____

PART 1: BACKGROUND CHARACTERISTICS

Q1	Sex	Male <input type="checkbox"/> Female <input type="checkbox"/>
Q2	Age (years)	18-29 <input type="checkbox"/> 30-39 <input type="checkbox"/> 40-49 <input type="checkbox"/> 50-59 <input type="checkbox"/> Above 60 <input type="checkbox"/>
Q3	Marital status	Single <input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed <input type="checkbox"/>
Q4	Size of your household	1-3 <input type="checkbox"/> 4-6 <input type="checkbox"/> 7-10 <input type="checkbox"/> 11-15 <input type="checkbox"/> 16 above <input type="checkbox"/>
Q5	Education attainment	No formal education <input type="checkbox"/> Primary <input type="checkbox"/> Secondary <input type="checkbox"/> College/University <input type="checkbox"/>

Q6	Duration of stay in the study area (in years)	0-5 <input type="checkbox"/> 6-10 <input type="checkbox"/> 16-20 <input type="checkbox"/> 21 and above <input type="checkbox"/>		
Q7	Main cooking material	Firewood <input type="checkbox"/> Charcoal <input type="checkbox"/> Gas <input type="checkbox"/> Electricity <input type="checkbox"/> Other <input type="checkbox"/> (Specify)_____		
Q8	Main source of livelihood for the household	Crop Farming <input type="checkbox"/> Livestock keeping <input type="checkbox"/> Formal Employment <input type="checkbox"/> Business <input type="checkbox"/> Hunting <input type="checkbox"/> Charcoal burning <input type="checkbox"/> Other <input type="checkbox"/> (Specify_____)		
Q9	How many of the listed livestock do you own?	Domestic animal	Write Number	Unit market price (Ksh.)
		Cattl		
		Goat		
		Sheep		
		Donkey		
		Poultry		
Q10	Have you ever donated land for wildlife conservation?	Yes <input type="checkbox"/> 2. No <input type="checkbox"/>		
Q11	If yes, approximately what size have you donated?	Write size of land in acres_____		
PART 2: TRADITIONAL KNOWLEDGE				
Q12	Traditional use of wild plants and	Yes, important <input type="checkbox"/> 2. Not important <input type="checkbox"/> 3. Unsure <input type="checkbox"/>		

	animals is important?					
Q13	If yes , which traditional use of wild plants and animals are you aware of? (<u>Do not read.</u> Tick all that apply)	Socio-cultural <input type="checkbox"/> Religious <input type="checkbox"/> Medicinal <input type="checkbox"/> Edible plants/fruits & animals <input type="checkbox"/> Economic <input type="checkbox"/> Other <input type="checkbox"/> (Specify _____)				
Q13a	List the names of wild plants in each category	Edible/ food	Medicinal	Socio- Cultural	Economic	Religious
Q13b	Which part of the plant is used in each category?		Leaves	Stem	Fruits	Tubers/ roots
		Edible/ food				
		Medicinal				
		Socio-cultural				
		Economic use				
		Religious				
Q14a	List the names of wild animals in each category?	Edible/ food	Medicinal	Socio- Cultural	Economic	Religious

Q14b	Which part of the wild animal is used in each category?		Flesh		Horn/Claws	Bone
				Skin/Feathers		
		Edible/ food				
		Medicinal				
		Socio-cultural				
		Economic use				
	Religious					
Q15	How did you learn about traditional use of wild plants and animals above?	Narratives <input type="checkbox"/> Folklore <input type="checkbox"/> Cultural practices <input type="checkbox"/> Songs <input type="checkbox"/> Parents <input type="checkbox"/> Grandparents <input type="checkbox"/> At school <input type="checkbox"/> Media(radio, TV, Newspaper) <input type="checkbox"/>				
Q16a	Are you aware of any traditional way of conserving and managing wildlife?	1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/>				
Q16b	If Yes, which traditional way of wildlife conservation are you aware of?	Use of Taboos <input type="checkbox"/> Social Norms <input type="checkbox"/> Totemic(Sacred Species-Plants and animals) <input type="checkbox"/> Sacred Sites <input type="checkbox"/>				
PART 3. HUMAN WILDLIFE CONFLICT						
Q17a	Have you ever lost livestock to predators during the last 2 years?	1.Yes <input type="checkbox"/> 2.No <input type="checkbox"/>				
Q17b	If yes, which of the following predators was involved?	Lion <input type="checkbox"/> Leopard <input type="checkbox"/> Hyena <input type="checkbox"/> Jackal <input type="checkbox"/> African Wild dog <input type="checkbox"/> Civet Cat <input type="checkbox"/> Cheetah <input type="checkbox"/> Others(Specify)_____				

Q17c	During which season do you suffer the losses	Wet Season <input type="checkbox"/> Dry Season <input type="checkbox"/> All season <input type="checkbox"/>		
Q18a	Have you ever experienced crop destruction by wild animals on your farm?	1.Yes <input type="checkbox"/> 2.No <input type="checkbox"/>		
Q18b	If yes by which animal	Baboon/ Monkey <input type="checkbox"/> Zebra <input type="checkbox"/> Eland <input type="checkbox"/> Buffalo <input type="checkbox"/> Elephant <input type="checkbox"/> Birds <input type="checkbox"/> Others(Specify)_____		
Q18c	During which season do you suffer the losses	Wet Season <input type="checkbox"/> Dry Season <input type="checkbox"/> All season <input type="checkbox"/>		
Q19	Can you please tell me approximately how much Kshs you lose each year in ;	Crop destruction? _____(Kshs) Livestock predation ? _____(Kshs)		
Q20	Have you or your family member ever suffered bodily injury from wildlife attack	1.Yes, serious <input type="checkbox"/> 2.Yes, not serious <input type="checkbox"/> 3.Never <input type="checkbox"/>		
Q21	Did you ever report the wild animals' problems you encountered previously?	1.Yes <input type="checkbox"/> 2.No <input type="checkbox"/>		
Q21a	If Yes whom did you report to?		Tick Where Appropriate	
		Kenya wildlife Service		
		Communit Game Scouts		
		Conservancy Manager		
		Area Chief		

		Area MCA			
		Police			
		Village elder			
		Others			
Q21b	If No, what is the reason for not reporting?		Tick where appropriate		
		Do not Know where or who to report to			
		I have no reason			
		There is No compensation			
		The distance to reporting place is far			
		Others (Specify)			
Q21c	How long did the Authority take to respond to the case?	24 hours <input type="checkbox"/> 2-5 days <input type="checkbox"/> 1-2weeks <input type="checkbox"/> Never Came <input type="checkbox"/>			
Q22a	Have you ever received compensation for the damages?	Yes <input type="checkbox"/> 2. No <input type="checkbox"/>			
Q22b	How much did you receive for the following damages, indicate your satisfaction with the amount compensated?	Damage	Amount	Sufficient	Not Sufficient
		Loss of Livestock			
		Crop destruction			
		Bodily Injury/			
Q23	What benefits do you receive of having wildlife in this area?	Provide meat			
		Cultural items for use in ceremonies			
		Creates job opportunity			
		Funds for			

		development(Schools, Dispensaries)	
		Seeing / know different kinds of animals	
		None	
Q24	What are the disadvantages of having wildlife in this area?	Eat livestock	
		Destroy Crops	
		Threat to Security /Safety	
		Spread animal diseases	
		Causes overgrazing	
		None	

Part 4: Attitudes and Practice towards wildlife conservation

Q25	Please indicate your most accurately feelings toward the species listed		Maa Names	Strongly Like	Like	Indifferent	Dislike	Strongly dislike	
		Lion	Olgatuny						
		Leopard	Olowuaru						
		Hyena							
		Elephant							
		Rhino							
		Giraffe	ormeut						
		Zebra							
		Monkey/ Baboon							
		Buffalo							
		Cattle Egret							
		Vulture							
		Oxpecker							
		Grey Headed Bush Shrike	Olkirapash						
		Augur Buzzard	Olkupelia						

Q26	Please indicate your opinion towards the following statements		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
		The presence of a lion is a sign of human coexistence with wild animals					
		Presence of hyena is a sign of clean environment					
		Lions should be protected					
		Leopards should be protected					
		Hyenas are unacceptable threat to livestock					
		Leopards have been known to attack and injure people					
		Allowing us to trap /hunt a predator which kills our livestock could be a good thing					
		Enkusero Sampu conservancy is beneficial to our community					
		I am willing to support wildlife conservation programmes of Enkusero Sampu conservancy					
Q27	What should be done to problem livestock predators (Tick the most appropriate option)?	Protect and control all of them <input type="checkbox"/> Kill them <input type="checkbox"/> Relocate to other place <input type="checkbox"/>					

		Other Action (please explain)_____	
Q28	If a predator kills your livestock or any wild animal destroys your crop would you still love to support wildlife in this area?	1.Yes <input type="checkbox"/> 2 No <input type="checkbox"/>	
Q29 a	If you had the chance to make a second thought would you withdraw the parcel of land your family donated towards the establishment of Enkusero Sampu Conservancy?	1.Yes <input type="checkbox"/> 2.No <input type="checkbox"/>	
Q29 b	Give reasons for your response if Yes /No?	_____	
Q30 a	Do you have any means of guarding your property livestock and crops against wild animal attacks?	1.Yes <input type="checkbox"/> 2 No <input type="checkbox"/>	
Q30 b	If yes which method do you use among	Use predator proof bomas <input type="checkbox"/> Use of solar flash Light Bomas <input type="checkbox"/> Use of Scare crow <input type="checkbox"/> Close watch <input type="checkbox"/> Use of Dogs and guarding <input type="checkbox"/> Use of fences(twigs, wire,) <input type="checkbox"/> Beat drums and debes/ make noise <input type="checkbox"/>	

	these?					
Q31	Please indicate your opinion towards the following statements	Act/Policy	Agree	Disagree	Do not Know	
		Wildlife outside Protected Area should be protected				
		Wildlife utilization involves the non-consumptive use unless an individual has a valid license that permits consumptive utilization.				
		No compensation shall be paid where the owner of the livestock, crops or other property failed to take reasonable measures, to protect such crops, livestock or property from damage by wildlife or his land use practices are in compatible with the ecosystem-based management plan for the area.				
		A person who is dissatisfied with the award of compensation by either the County Wildlife Conservation and Compensation Committee or the Service may within thirty days after being notified of the decision and award, file an appeal to the National Environment Tribunal and on a second appeal to the Environment and Land Court.				

		<p>Upon approval of claim by the County Wildlife Conservation Compensation Committee the claimant will be awarded as follows;</p> <p>(a) In the case of death, five million shillings;</p> <p>(b) In the case of injury occasioning permanent disability, three million shillings;</p> <p>(c) In the case of any other injury, a maximum of two million shillings, depending on the extent of injury.</p>				
Q32 a	How much are you willing to pay per year, to support lion conservation project which includes building of predator proof bomas in this area?	Amount in Kshs Per Year	Willing to pay			
		0				
		5000				
		10000				
		20000				
		40000				
		≥ 60000				
Q32 b	If Zero, ask why he or she is not willing to pay in the following statement indicate as relevant (True False)?				True	False
		Our household cannot afford				
		I am not very interested in lions and feel that their conservation is not important				
		I do not believe in the success of contribution scheme				
		The government (KWS) and International Community should pay				

Q32 c	Why you are willing to pay indicate true or False against the following statement?	That is what my household can afford			True	False
		I am interested in the lion and feel it is important to conserve them				
		I like to support wildlife Conservation				
		We should protect lions for future generations				
		I feel we should protect our wildlife and environment in general				
Q33	Can you please, give suggestions on improvement of wildlife conservation related Projects in Enkusero Sampu Conservancy?	Tourist Campsite(hotel)				
		Beekeeping				
		Game Farming				
		School For wildlife Education				
		Tree planting				
		Others(specify)				
Thank You So Much For You Time and Information provided.						

APPENDIX 2: FOCUS GROUP DISCUSSION GUIDE

A: We are interested in examining role of traditional knowledge and its impact to sustainable wildlife conservation in the Enkusero Sampu Conservancy

A) Focus Group Discussion (FGD) elders aged 55 years and above

1. Can you please tell me of any traditional practices that are associated with wildlife (Plants and animals)?
 2. Please discuss the traditional ways of conserving wildlife to avoid over exploitation that were used in the past and are currently being used?
 3. Kindly highlight on the social norms related to wildlife present in your community?
 4. Please tell me when and how they are enforced?
 5. Are there any sacred sites in this area, and what is their role?
 6. Can you please list the wild plant of wild animal species considered as totems (sacred) in your community and their importance?(probe further on the species name and part used)
 7. Please tell me the role of Enkusero Sampu Conservancy in wildlife conservation?
 8. Explain on the wildlife conservation and management history as you know in the past, present and future?
 9. What is the serious wildlife conservation problem in this area?
 10. How is local community members involved in wildlife conservation activities?
 11. Please tell me about Human Wildlife Conflict in this area?(probe further on compensation and their view)
 12. What is your view on the future of wildlife outside protected areas?
- Do you have any other comments that you would like to share?

Thank you for your valued time and participation

B) Focus Group Discussion (Youth aged 35 -25 years)

1. Please discuss the benefits of wildlife in the Maasai culture?
2. What is your view on the traditional knowledge in wildlife conservation?
3. Discuss how you as the youth are or were in the past interacting with wildlife (Probe on the changes that have occurred over time and ask why?)
4. Discuss the possible challenges encountered by having wildlife in this area
5. In your view what are the benefits of having wildlife here in ESC?
6. IN the next 30 years where do you see the future of ESC, in terms of wildlife conservation and community support?
7. Any other suggestion you may wish to add to this discussion is welcomed.

APPENDIX 3: KEY INFORMANT GUIDE

A) Key Informant Guide KWS- Community warden

1. Kindly elaborate on the current challenges in Wildlife conservation in the Southern Conservation Region and Kenya?
2. What Mechanisms do you use to protect wildlife on Community land?
3. In cases of Human Wildlife Conflict how do you help rest the situation in areas bordering Nairobi National Park (More specifically In Enkusero Sampu Conservancy Area?)
4. How can you predict the future of Wildlife conservation in Kenya with the case of Nairobi National Park?
5. In wildlife Conservation and Management Policy, Rules and Regulation implementation, how do you in cooperate traditional Knowledge and practices into modern wildlife conservation?

B) Key Informant Guide for County representative on matters relating to wildlife

Please provide your view to the following question as a county official in regard to wildlife conservation in Kajiado County. The information you provide will be treated with high confidentiality and will only be used to inform policy and fulfill the requirements of my studies.

1. Kindly elaborate on the current challenges in Wildlife conservation in Kajiado County?
2. What Mechanisms are there in place to protect people and wildlife on Community land?
3. In cases of Human Wildlife Conflict how do you help in ensuring the losses incurred by the local people are compensated for in due time?
4. What measure is there in place to ensure local community continued support to wildlife conservation?(attitudes , values and practices as well as traditional knowledge?
5. How can you predict the future of Wildlife conservation in Kenya with the Kajiado County?
6. In wildlife Conservation and Management Policy, Rules and Regulation implementation, what is the role of the county government in wildlife conservation, as this is one of our national treasure?
7. Any other suggestion you may wish to add in this discussion is highly welcomed

Key Informant Conservancy Manager

1. What challenges are experienced in the Enkusero Sampu Conservancy towards wildlife conservation?
2. How do you collaborate with other stakeholders in Wildlife Conservation and management in Kenya and Globally?
3. What role do you play in ensuring that Wildlife outside Protected areas is safe?
4. What are the mechanisms used to offset damages caused by wildlife on Human Property?
5. How can you predict the Future of wildlife Conservation in Kenya with the case of Enkusero Sampu Conservancy?
6. What traditional Mechanisms are there in place to ensure sustainable wildlife resource use in Enkusero Sampu Conservancy?
7. How can you describe practices of local communities towards wildlife conservation in this area?

Key Informant guide for the women:

1. Kindly elaborate on the traditional use of wildlife in the past?
2. Probe on the wildlife uses that are currently being used, and probe further why they are still in use?
3. Which uses are currently used up to date and why are the present uses still maintained?
4. How was this traditional knowledge on the use of wildlife resources passed on from one generation to another?
5. Probe further on how it was done for girls and what role did women in the Maasai culture play in the cultural practices?
6. Please discuss if any social norms and taboos that were in place in relation to wildlife resource use in the past, and are they still in use at present?
7. Kindly discuss the benefits women derive (d) from having wildlife in this area in the past and at present?
8. Briefly discuss the role of women in the Maasai culture in matters pertaining to wildlife conservation especially in Kajiado County?

APPENDIX 4: AGE SET CATEGORIES FOR CLASSIFYING RESPONDENTS

ERA OF BIRTH	AGE CATEGORY
Intareto	1890s
Iintsati	1904s
Iinterito	1914s
Iinyangusi	1920s
Iseuri	1940s
Ilkitoip	1952s
Ilkishuru	1968s
Iimirishi	1974s
Orkor	1988s

Source: Elder & Researcher, 2018

APPENDIX 5 ADDITIONAL FIELD PHOTO GRAPHS

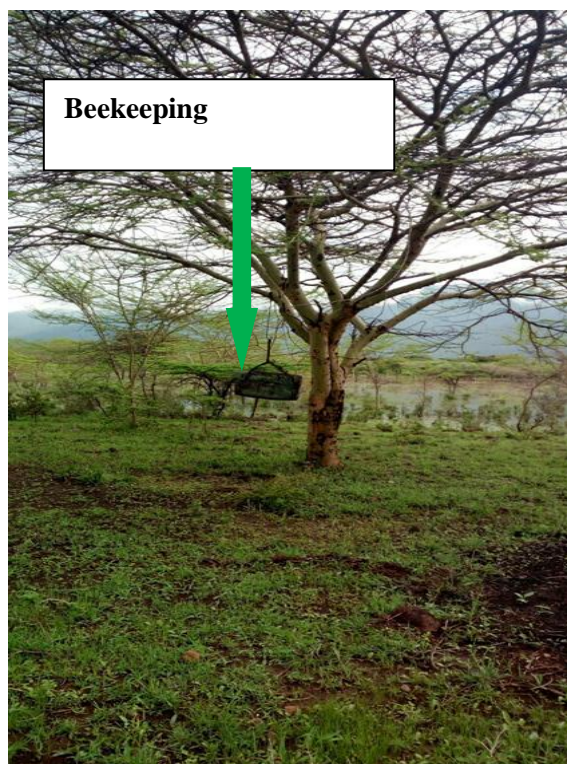


Plate 4- 4: Various field photographs on consumptive benefits of wildlife resources

Source: Researcher, 2018



Plate 4- 5: Researcher with some local community members in the field at Inga'rooj village

Source: Researcher, 2018

APPENDIX 6: RESEARCH AUTHORIZATION LETTER



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
Fax: +254-20-318245, 318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/18/25211/21556**

Date: **2nd March, 2018**

Christine Nyangweso Ochieng
University of Nairobi
P.O. Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Traditional knowledge, attitudes and practices of local communities towards wildlife conservation in Enkusero Sampu Conservancy,”* I am pleased to inform you that you have been authorized to undertake research in **Kajiado County** for the period ending **2nd March, 2019.**

You are advised to report to **the County Commissioner and the County Director of Education, Kajiado County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

G P Kalerwa

**GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Kajiado County.

The County Director of Education

APPENDIX 7: RESEARCH PERMIT

CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.



REPUBLIC OF KENYA



National Commission for Science,
Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No.A **17784**

CONDITIONS: see back page

THIS IS TO CERTIFY THAT:
MS. CHRISTINE NYANGWESO OCHIENG
of UNIVERSITY OF NAIROBI, 0-100
NAIROBI, has been permitted to conduct
research in Kajiado County

on the topic: TRADITIONAL
KNOWLEDGE, ATTITUDES AND
PRACTICES OF LOCAL COMMUNITIES
TOWARDS WILDLIFE CONSERVATION IN
ENKUSERO SAMPU CONSERVANCY

for the period ending:
2nd March, 2019

Permit No : NACOSTI/P/18/25211/21556
Date Of Issue : 2nd March, 2018
Fee Recieved :Ksh 1000



.....
Applicant's
Signature

J.O. Kalerwa
.....
Director General
National Commission for Science,
Technology & Innovation

APPENDIX 8: TURNITIN REPORT

APPENDIX 9: DECLARATION OF ORIGNIALITY

APPENDIX 10: PROOF OF REGISTRATION FOR PROJECT PAPER