

Assessing the Effects of Human-Wildlife Conflicts on Socio-Economic Status Among the People in Zambia: A Case Study of Simoonga Community, The Villages Surrounding Dambwa Forest And Maloni Area Near Mosi-Oa-Tunya National Park.

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Abstract: *The purpose of the study was to explore effects of human-wildlife conflicts on socio-economic status among the people in Zambia: a case study of Simoonga Community, the villages surrounding Dambwa Forest and Maloni area near Mosi-Oa Tunya National Park in Livingstone. The specific objectives were to find out the underlying causes of human-wildlife conflicts in Simoonga, Dambwa Forest and Maloni; To establish the extent to which human-wildlife conflicts has contributed to hidden costs on the people living near Mosi-Oa-Tunya National Park; To establish the specific mitigation measures to be taken as to improve the socio economic status for the people; and to determine local peoples' awareness of the role that conservation plays in addressing human-wildlife conflicts in Simoonga, Dambwa Forest and Maloni near the Mosi-Ao-Tunya National Park.*

The study found out that the following the various causes of human-wildlife conflicts such as human encroachment in protected areas this has led to the destruction of the wildlife habitats which has resulted into no much grazing land for wildlife hence the wildlife such as hippos, elephants, baboons and others raiding the crops among other causes. Also disturbing the wildlife corridors especially, the elephant corridors if they are destructed or disturbed leads the elephants to discharge towards people and even injure them sometimes even kill them. Furthermore, when the crops are raided, when humans are injured or killed, this results into hidden costs as a socio-economic status of the people living near Mosi-Tunya National park. Lately, the elephants from Mosi-Oa-Tunya National Park have been raiding the crops in the communities and even killing people due to lack of vegetation in the park caused by 2018-2019 dry spell experienced in Southern Province in particular in Livingstone.

Based on the findings the researcher recommended among other recommendations that the government of Zambia and the cooperating partners through the Department of National Parks and Wildlife should come up with policy measures on the reduction of human-wildlife conflicts with the aim of co-existence between human and wildlife. Furthermore, the government to come up with compensation measures especially when death of a human-being has occurred in order to reduce on negative effects on the socio-economic status of the residents and the affected families therefore reducing on the poverty levels. Finally, the lodge and hotel owners to provide transport for their workers for safety among other recommendations.

Keywords. *Conservation, mitigation, socio-economic, encroachment, endangered species.*

I. CHAPTER 1: INTRODUCTION

1.1 Background

Livingstone was established in 1905 and named after the famous Victorian missionary explorer, Dr. David Livingstone, Livingstone Town has grown from an early settlement to a bustling hub of tourism over the years. This 'tourist gateway' to Zambia is steeped in history and its Edwardian heritage can still be seen in the colonial style buildings throughout the town. The proximity of the Zambezi River and the spectacular Victoria Falls has led Livingstone to become a base for travelers from all over the world wanting to explore this 'Wonder of the World' and offers a host of adventure and adrenaline experiences to choose from.

Mosi-Oa-Tunya National Park is one of the smallest NPs in Zambia occupying 66 Km land area which is located South-west of Livingstone town, Zambia's tourist capital and it is 470 Km South-west of Lusaka. Mosi-Oa-Tunya National Park is one of the National Parks in Zambia which have vegetation for supporting wildlife and was Founded in 1972 and within easy reach of Livingstone (approximately a 15-minute drive), and stretches for an estimated 12 kilometers of river frontage above the Victoria Falls. It is split into two sections, the Victoria Falls World Heritage National Monument site and the Mosi-oa-Tunya Game Park. The park itself contains the different species and has become a popular destination for walking with rhinoceros. Although it has a limited variety of wildlife, mainly elephants, rhinoceros, antelopes, zebra, giraffe, warthog, buffalo, crocodile, hippo, monkeys, birds and fish, it is open to the public 365 days a year. The wildlife-livestock-human interface area around this National Park provides a very complex diversity, having urban, peri-urban and rural components.

Among the wildlife are the elephants, hippopotamus, crocodiles, baboons and others

represent the biggest human-wildlife conflict issue in Mosi-Oa-Tunya National Park in Livingstone, Zambia. However, little is known about their movements of the elephants. Understanding wildlife' use of land outside of protected areas is considered important to the future conservation and management of African elephant populations (Okello *et al.* 2015).

1.2 Statements of the problem

Conflict between human and wildlife have always occurred throughout history, population growth and increased demand for natural resources have aggravated the problem. Human-wildlife conflicts result in very bad effect on society as well as on wildlife. These situations can impose a wide range of costs upon local people, varying from livestock predation (Rigg *et al.* 2011), crop-raiding (Campbell Smith *et al.* 2010), attacks on humans (Dunham *et al.* 2010) and disease transmission (Kilpatrick *et al.* 2009). Sometimes, the only earning member of the family is killed in the incident. Mosi Oa Tunya National Park is no exception to this trend. The GMA has been identified as a hot spot for HWC and that the problem has persisted since the 1930s (Nyirenda *et al.*, 2011; Sennett, 2013). Human-wildlife conflicts cannot completely be stopped but can be reduced to minimum and can be controlled if some precautions are taken and measures adopted sincerely. Therefore, crop raiding and attacks on people by wild animals has given rise to significant conflict both local communities leading to social economic implication. Conflict between and local communities are wide spread and a major concern in Simoonga Area, Villages surrounding Dambwa Forest Reserve near Mosi Oa Tunya National Park and Maloni Area in Livingstone Zambia. Many of their livelihood activities usually come in contact with wildlife. The major livelihood activities for the local people are farming, small businesses, working in the nearest lodges and hotels and farms and

charcoal production. Most of these activities involve the clearing of land leading to massive encroachments of areas which are predominantly habitats for wildlife. Furthermore, some endangered species such as the rhinoceros and the elephants are being poached hence increasing on the human-wildlife conflicts. Such a situation posed a problem which needed to be investigated by the researcher and, hence, the present study.

1.3. General Objective of the project

To find out how the Human-Wildlife Conflict has affected the socio-economic status of the people of Simoonga community, villages surrounding Dambwa Reserve Forest in (Mosi oa Tunya National Park) and Maloni Area in Livingstone.

1.3. Specific Objectives

To evaluate the underlying causes of human-wildlife conflicts in Simoonga, villages surrounding Dambwa Forest, and Maloni Area near Mosi-oa-tunya National park.

1. To establish the extent to which human-wildlife conflicts has contributed to hidden costs on the people living in the communities
2. To establish the specific mitigation measures to be taken as to improve the socio-economic status for the people.
3. To determine local peoples' awareness of the role that conservation plays in addressing human-wildlife conflicts.

1.4 Theoretical Framework / Model

This research is based on Rational Choice Theory and the study assumes that people are rational actors driven largely by financial incentives. Rational Choice Theory is a framework for understanding economic behavior with the idea that each individual is a rational actor aiming to maximize his or her 'utility' or 'happiness'. (John *et.al* 2013)

describe rational choice as: "When making decisions, people are influenced by the potential financial costs and benefits of a given course of action ... and by their understanding of how they are expected to behave within society. Rational Choice becomes a powerful predictive theory when it is combined with assumptions about preferences or with data on peoples observed choices" (John *et.al*, 2013). Although this study is not focused on Rational Choice Theory and its application, the theory is an important mechanism to justify the assumptions made regarding rational human behavior driven by financial gains. Here forth, this study will refer to the aforementioned financially motivated assumption as simply 'rational choice'. By better understanding the influencing factors that drive people to either act as poachers or protectors, policies and conservation programs can be designed that optimize conservation activities in respect to the local economic and social conditions (Messer, 2017).

II. CHAPTER 2: LITERATURE REVIEW

2.1 Overview

There are several reasons that have caused wildlife to become aggressive towards the community. Three main factors that have been caused the wildlife population to decline are habitat destruction, deforestation and over-hunting. Habitat destruction is the effect of the urbanisation, deforestation is the effect of the urbanisation, deforestation and industrial development. The human population has been increasing drastically; causing the need for land to be utilised for urbanisation and agricultural purposes. It will expand their urban area into natural wildlife territory and slightly change the habitat as large areas of forest have been converted to other land. Uses, like urban areas that force the wildlife to migrate and find new habitats for their survival.

2.2. To evaluate the underlying causes of human-wildlife conflicts in Simoonga, Dambwa Forest in Mosi-oa -Tunya National Park and Maloni Area

Land use transformation is root core driver of human wildlife conflict is a close relative of human population growth. High population densities have escalated human activities. The said human activities have led to transforming savannah, forests and other ecosystems to urban cities or agrarian areas. This is a direct consequence of increase in demand for food production, land raw materials and energy. For instance, in Gujarat India, on the edge of Gir National sanctuary, exuberating conflicts with leopards and lions (*Panthera pardus*) are as a result of rapid extensive change in land use related to the conversion of millet and groundnut fields into mango and sugarcane plantation cultivation. Human-carnivore conflict is now very common global phenomenon in rural areas and has become common on urban fringe in both developing and developed countries (Dickman 2010). With increasing human population and pressure on forest areas, human-wildlife interaction and resultant conflict is also increasing. It occurs when growing human populations overlap with established wildlife territories, increasing interaction of man and wild animals and thus resulting in increased levels of conflict. Direct contact with wildlife occurs in both urban and rural areas, but it is generally more common inside and around protected areas. This suggests wildlife species as conscious human antagonists, rather than a society in which food security is threatened (Peterson *et al.*, 2010). Movement and ranging patterns of large mammals are controlled essentially by availability of food, water, escape cover and mates. According to (Young *et al.*, 2010) the core of these conflicts could be linked to power relationships and/or socio-economic limitations. The wealth of the people will determine the tolerance and hatred of these wild

animals (Dickman, 2012) while the other dimension on power pointed out that power asymmetries can contribute to the hatred of wildlife by the local communities.

Reducing conflict between wildlife and people is considered a top conservation priority, particularly in landscapes where high densities of people and wildlife co-occur, (Dickman A.J 2010) Increased visibility for conflict incidents may be attributed to actual increase in incidents taking place or just greater reporting by affected local people. Dearth of knowledge about conflict loss and compensation distribution contributes to poor allocation of conservation resources. Failure to address emerging issues with conflict losses and distribution of compensation may lead to escalation of tensions between people and wildlife, and promote retaliatory actions leading to extirpations of species, (Treves *et al.*, 2011). Preventing conflict and improving distribution of compensation are important to fostering co-existence in landscapes that surround protected areas and function as critical buffers for wildlife, (Defries *et at.*, 2010).

People will not only develop their animosity towards wildlife but the hatred can also be imbedded within their societal tensions. This is reflected by the antagonistic behaviour towards other groups of people involved in the HWC, (Dickman 2012). Such tensions emanate from the perceptions of the local communities who feel that the government, incur revenues from tourists and external entities at the expense of the local people. In the same development, people residing close to the proximities of the national parks believe that wildlife is a government property, as seen in (Holmes, 2016) were national parks are regarded as a representation of the state in colonial Burma, as a result organisations that manage and oversee national parks are perceived responsible for protecting wildlife from wandering outside the national parks and away from human settlements.

Human–primate conflict is a subset of human–wildlife conflict that can broadly be defined as “any human–primate interaction which results in negative effects on human social, economic or cultural life, primate social, ecological or cultural life or the conservation of primates and their environment” (adapted from Hockings and Humle 2009)

Socio-economic status (SES) is defined as a measure of one's combined economic and social status and tends to be positively associated with better health. This entry focuses on the three common measures of socioeconomic status; education, income, and occupation. Socio-economic status had main effects for academic achievement. (Ghaemi & Yazdanpanah, 2014)

Additionally, conflicts are often rooted in less visible, more complex social tensions between people (Hill 2015).

Socioeconomic status (SES) is an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic and social position in relation to others, based on household income, earners' education, and occupation are examined, as well as combined income, whereas for an individual's SES only their own attributes are assessed.

Zambia had continued to experience the human wildlife conflicts at an alarming rate and hundreds of people had continued being killed by wildlife especially in the Mosi-Oa-Tunya National Park. Abundant research exists on the economic costs of human-wildlife conflicts. This situation posed the researcher to carry out a survey.

2.3. Evaluating the underlying causes of human-wildlife conflicts in Asia

Human-wildlife conflicts is a global concern and a critical threat to the existence of several endangered

species such as lion, crocodile, leopard, bear, elephant, as well as to human beings (Lamarque *et al.*, 2009; Bhattacharjee & Parthasarathy, 2013). These conflicts are among the factors that threatened the most wildlife species throughout the world. Human-wildlife conflicts occur when the needs of wildlife overlap those of human populations. Conflicts are more intense in areas where both human populations and wildlife live and share ecosystem services, mainly around protected areas. The implications of conflicts are manifold, ranging from psychological manifestations, such as fear, to fatal attacks (Bhattacharjee & Parthasarathy, 2013; Jhamvar-Shingote & Schuett, 2013).

According to (Young *et al.*, 2010), the core of these conflicts could be linked to power relationships and/or socio-economic limitations. The wealth of the people will determine the tolerance and hatred of these wild animals (Dickman, 2012). According to (Skogen *et al* 2008) another dimension on power pointed out that power asymmetries can contribute to the hatred of wildlife by the local communities.

People will not only develop their animosity towards wildlife but the hatred can also be imbedded within their societal tensions. This is reflected by the antagonistic behaviour towards other groups of people involved in the HWC, (Dickman 2012). Such tensions emanate from the perceptions of the local communities who feel that the government, incur revenues from tourists and external entities at the expense of the local people.

Furthermore, causes of human-wildlife in Asia human-elephant conflict is a major challenge for supporting the survival and persistence of elephants in their range countries because these are places where the development and well-being of human communities sharing space with these mega-herbivores is also important. Other Asian and African range countries document similar or worse

consequences; (Acharya *et al.*, 2016; Pant *et al.*, 2016).

There are several reasons that have caused wildlife to become aggressive towards the community. Three main factors that have been caused the wildlife population to decline are habitat destruction, deforestation which can be through encroachment and over-hunting among many others. Habitat destruction is the effect of the urbanisation; deforestation is the effect of the urbanisation, deforestation and industrial development (Abdullah and Hezri, 2008). The human population has been increasing drastically; causing the need for land to be utilised for urbanisation and agricultural purposes. It will expand their urban area into natural wildlife territory and slightly change the habitat as large areas of forest have been converted to other land. Uses, like urban areas that force the wildlife to migrate and find new habitats for their survival (Abdullah and Hezri 2008).

Human-wildlife conflicts, which often result from competition between animals and humans over the same resources, are as old as humankind (Anand and Radhakrishna, 2017). In the marine environment, the global expansion of fisheries over the last fifty years has led to the overexploitation of many fish stocks and major changes in fishing techniques.

Although problems have been well known for many years, the increase in conflicts, particularly in regions with high biodiversity, suggests that improved strategies are urgently needed to promote the co-existence of wild animals and people. The continuous increase in the human population results in competition between people and wildlife for shared but limited resources, which manifest as various types of conflict, such as crop-raiding, livestock predation, property damage, human death and injury, and the retaliatory killing of wildlife.

Crop and livestock depredation and attacks on humans are well-known examples of actions by wildlife that have negative impacts on humans (Inskip *et al.*, 2014)

While the causes of human-wildlife conflicts (HWC) increase annually in Malaysia, especially in Kelantan (Goldthorpe and Neo, 2011). There are two major factors that caused the conflict which are push and pull factors (Saaban *et al.*, 2011). The push factors occur when the wildlife habitat. However, the pull factors occurred when wildlife itself intrude into the human area because they are attracted to agriculture crops and livestock that have been freed randomly (Saaba *et al.*, 2011). Tigers, elephants, pig's macaques, pythons, sunbeams, water monitor lizards and wasps and wildlife have been identified to be frequently attacking the human in Malaysia (Chua *et al.*, 2005). According to (Jayraj *et al.* 2013), most of the species are categorised in the endangered category. The conservation status of a wildlife species can be identified using the IUCN Red List of threatened species.

2.4. Evaluating the underlying causes of human-wildlife conflicts in East Africa

Human-wildlife conflicts (HWC) are those interactions between humans and wildlife which are perceived as detrimental for either party. Examples of HWC are; the predation of livestock; crop raiding; damage to infrastructure such as grain stores and water channels; and physical harm or death. These conflicts are seen throughout the world, in both urban and rural contexts. There is a general consensus that underlying these human-wildlife conflicts are human-human or human-state conflict (Peterson *et al.* 2010).

In East Africa infrastructural development has exposed wildlife habitats to fragmentation, interrupting migration patterns, animal stress, inbreeding and other behavioural changes that

eventually lead to reduced wildlife productivity (Thomassen & Hindrum, 2011). Nevertheless, Uganda Wildlife Authority (UWA) has tried to manage the impacts of oil resources through strengthened capacity under the oil for development program. Preparation of General Management Plan to overcome challenges of petroleum development in PA, and development of a Sensitivity atlas for PA have been prepared, and a warden in charge of oil monitoring at Murchison Falls Protected Area (MFPA) to support oil exploration in MFPA have been employed (UWA, 2013). This situation led to the displacement of wildlife and hence causing the conflicts between humans and wildlife.

To some extent wild animals will always pursue their interests at all cost especially where their survival is dependent on foraging crops plantations and, killing livestock, thereby threatening human livelihoods. Insufficient efforts taken by the protected area management to compensate people for the losses has led to an increase in animal kills, (Sanchez-Vasquez *et al* 2016) argued that there is no direct or linear link between environmental factors and conflicts. Rather conflicts are conditioned by social and institutional factors, resource use relationship by people and environment, and the traits of the ecosystem itself. Therefore, the social effects would cause conflicts, and the direct environment causes should be considered as at secondary causal level (Sanchez-Vazquez, Espinosa, & Eguiguren, 2016).

It is argued that the increase in human wildlife conflicts is attributed to lack of effective ways to deal with it locally, and lack of inclusion of people living adjacent protected areas in decision making on conservation. In addition, external factors like resettled population, poaching, restriction to access laws and regulations are known to set trends of human wildlife conflicts in reserves. The migration of animals retreating from oil development is prevalent as asserted by the wildlife experts. Further

experts attribute this to noise and vibrations, with great fear that movement of animals will disrupt human settlements, and crop growth. This is anticipated to worsen as the production phase starts with the local wildlife affected most (Ericson, 2014).

However, conservationists argue that the problem of human wildlife conflict escalates as the growing rural population settle in or near wildlife habitats. Further experts noted that this had led to crop damage and loss of lives for humans and livestock. In Africa, the victims abandoned their farmland due to high cost of reestablishment and in response to the damage caused by wildlife. Traditionally in Africa conflicts between local people and wildlife have been resolved by creating barriers to animal movements. This has been through digging trenches and fencing reserves. Nonetheless, some of these initiatives have not managed to restrict movement of small sized wildlife and possess an ecological impact to migratory species by distracting their movement. In Kenya wildebeest have destroyed fences set up to protect farms to reclaim their traditional migratory routes from dispersal areas to the parks (Musimbi, 2013). Oil development may cause noise that is influencing animal behaviours. During exploratory drilling in Murchison Falls Protected Area studies showed that the background noise exceeded the maximum permissible noise levels for environmental and recreational sites of and during day and night respectively. The on-site measurements results were between which makes the habitats of the wild animals inhabitable (EPCL, 2012). This also leads to the conflicts because the wildlife has nowhere to live and no enough food to eat.

There are multiple reasons why some species are more tolerated than others. How animals are perceived depends on species' physique, religious and or cultural value which may present additional importance to humanity. There may be a heightened

awareness of the potential risk from large-bodied and or potentially dangerous and intimidating species, such as large herbivores, large carnivores and primates (Dickman, 2012). Some people in East Africa believe spirit lions are possessed with evil powers to kill rivals and their livestock. Antagonism towards particular species may be further embedded in cultural norms and expectations (Dickman 2012). Fear may act as an exaggerated perception of a posed danger often exacerbating antagonism towards conflict-causing species.

An increase in human population (Kenya National Bureau of Statistics 2014) has also contributed to the shrinking of elephant habitats and displacement of elephants in most regions of Africa. This displacement and the uncontrolled elephant movement and migration have led elephants to frequently come into contact with humans resulting to conflicts.

A study was carried out which reviewed that conflict may be intensely political, linked to power relationships and socio-economic constraints (Young *et al* 2010). The relative wealth and security of the people can affect the real impact of damage and therefore their antagonism (Dickman, 2012). In impoverished rural economies, further conflict may arise from local people searching for solutions to their overwhelming livelihood demands. Great losses can leave poverty-stricken people feeling powerless if they feel costs have been imposed upon them, especially in areas nearby PAs, (Dickman, 2012) often suffering from “compounding vulnerability” if they are unable to recover from impacts of damage.

The changes in land use and loss or abandonment of traditional methods of human wildlife conflict control are also believed to be contributing factor in the rise of conflict (Graham and Litoroh 2009). Most elephant ranges have continued to be

converted to agricultural land to accommodate the demand of a growing population, such changes coupled with the lack of proper management of human -elephant conflict can be a pre-cursor for the increased human-elephant wildlife conflict resulting to a further decline in elephant population and their distribution.

Human wildlife conflict is a growing concern all over the world where humans’ border protected areas. With increase in human and wildlife population over a period of time the boundaries have been overlapped resulting in the escalation of the problem. Human wildlife conflict in Kenya has become a persistent problem for wildlife managers and conservationist in areas that border protected areas. These conflicts range from crop raids, livestock predation, death and injury to both human and wildlife. Large mammals tend to feature heavily in these conflicts; this is mainly due to their perceived increase in population and the need for larger home ranges.

This displacement of wildlife by human activities can result in conflict from competition for scarce resources like water and pasture in these arid rangelands. Other studies have shown that livestock husbandry in arid range lands to have both negative and positive effects on biodiversity and wildlife in general (Corinna *et al* 2012). habitats, as a result of incompatible land use practice adjacent to protected areas, has continued to pose a challenge in wildlife conservation and management.

Urbanization causes humans and wildlife to come into increased contact, especially at the urban-rural interface, or ‘urban fringe. Mitigating any conflict that may occur is an important conservation strategy, as well as a means of safeguarding people’s livelihoods, safety, and well-being in these spaces. However, positioning human-wildlife conflict as conflict between humans and wildlife instead of between different stakeholder groups

masks the reality of the broader social drivers of conflict, such as urbanization processes, political-economic and socio-cultural contexts and conditions, and competing development trajectories (Peterson *et al.*, 2010). The different meanings of wild dogs also contribute to human conflict over wildlife, rather than conflict between humans and wildlife, by demonstrating how different stakeholder groups have contrasting values, priorities, and management strategies concerning wild dogs as well as competing economic development strategies (e.g. agriculture versus wildlife tourism and conservation). Portraying human-wildlife conflict as human conflict over wildlife, as well as developing stronger collaborative integrative management planning, are two conflict mitigation strategies that address human conflict over wildlife which may be more sustainable in the long-term.

Before the invasion of the colonialists, the ownership of land resources was communal in Uganda. The interaction with nature was based on local people's needs, regular activities, and there was limited need for external trade. Overtime, the societies formally made public certain rules and regulations on resource use and these were precisely enacted by the cultural leaders and embedded in their culture (Baker *et al.*, 2013). Therefore, the social effects would cause conflicts, and the direct environment causes should be considered as at secondary causal level (Sanchez-Vazquez, Espinosa, & Eguiguren, 2016).

The vulnerability of individuals or households to human-wildlife conflict will vary depending on wealth, livelihood strategies and social capital. The threat to humans, particularly at the household level, can be very real and impact various members in terms of risk of injury, spread of disease, and disruption of daily chores and schooling through increased need to guard crops or livestock. However, we argue that there is legitimacy in going

beyond studying human-wildlife conflict as a means to quantify humans' tolerance of wildlife, for the end point of protecting wildlife.

2.5 Causes of human-wildlife conflicts in Southern Africa (Zimbabwe, Botswana and South Africa)

Human-wildlife conflict is a growing global problem that adversely affects agricultural productions and people's livelihood. Regionally (Zimbabwe, Botswana, Namibia) Crop-raiding by wild animals is one of the major causes for HWC, (Regmi, *et al* 2013; Diakman 2010). Crop raiding affects not only loss of crops but also it affects the life of future generation by decreasing the percentage of school environments. (Mackenzie Ahabyina 2012), indicated in their study that elephants in the garden: financial and social costs of crop raiding reported that many children drop their education to stay at home and protect crops from damage. Elephant is considered as one of the crop raiding wildlife in some African countries like Gabon, Ghana, Malawi, Uganda and Zimbabwe. In 1996 about 21% of crop was lost only in Uganda (FAO, 2009). The percentage of crop lost by elephant in Zimbabwe and Mozambique is also significant that can affect food security and escalate human-elephant conflicts. The most common causes of these conflicts are the direct attack of predators on human and domestic animals and degradation of crops (Torres *et al*, 2018). Large carnivores like lions, spotted hyenas and leopards were reported to attack cattle, donkeys, goats and sheep in Tanzania. Other studies in Ethiopia by (Yilwize *et al* 2009) indicated that spotted hyena caused the most pronounced problems and the local communities' loss their oxen, cows, donkeys, mules and horses by spotted hyena. Carnivores are attacking domestic livestock due to prolonged droughts and habitat degradation (Marchant, 2010 cited Mwamidi *et al*) through the warthog holes hence crossing over to unprotected areas and killing

livestock like goats and sheep (Mwamidi *et al* 2012).

Changes in individual land use strategies involving the switch from large fields to scattered cultivated lands likely contributed to increased conflicts in rural lands adjacent to Protected Areas. Meanwhile, because of the high rate of unemployment and increasing poverty, the area of subsistence farming of cultivated lands expanded. Growing poverty has led to the over-exploitation of natural resources and the increase of illegal activities including poaching. Inevitably an augmentation in conflicts between poor communities living side-by-side with Protected Areas and wildlife has been experienced (Samu, 2010). In addition, it is observed that the situation is exacerbated by insufficient revenue from wildlife to communities resulting in their decreased tolerance level towards wildlife.

2.6. Causes of human-wildlife conflicts in Zambia

In Zambia, human-wildlife conflict is very common in Game Management Areas (GMAs) where human settlements and wildlife co-exist. This has presented challenges in meeting the needs of local people as well as those of wild animals. Challenges are compounded by limited livelihood alternatives and infrastructure, lack of sufficient agricultural inputs, and poor or restricted access to credit (Richardson *et al.*, 2012).

However, continuing increased human habitation within GMAs has led to proliferation of livelihood activities that are affected by the presence of wildlife. These activities include subsistence agriculture, charcoal production and fishing (Simasiku *et al.*, 2008, Richardson *et al.*, 2012). Human-wildlife conflict has therefore been a major problem in many GMAs in Zambia, particularly where farmers routinely experience crop destruction by wildlife despite help provided by the

Zambia Wildlife Authority (ZAWA) and NGOs operating in GMAs.

Furthermore, the major types of wildlife damage on the human being are predation of domestic animals, crop damage and sometimes killing of humans (Madden, 2008). The number and type of damage caused by wildlife varies according to the species, the time of year, and the availability of natural prey and crop raiding species (Datiko and Bekele, 2011; Mwamidi *et al.*, 2012). In spite of diverse and unique nature of the country landscape and ecological diversity, the natural resources of the country are declining by human activities (Bekele *et al.*, 2011; Tefera, 2011). This has increasingly restricted wild animals' movement of the country to a few protected areas/habitats in Livingstone. The forest area of Livingstone especially the areas near Mosi-Oa-Tunya National Park such as Dambwa Forest are under great threat due to over-exploitation which forces wild animals to compete with humans for their resource and results in conflict between them

Zambia environmental threats and opportunities assessment illegal off-take, driving deforestation and unplanned land conversion. Zambia has one of the highest deforestation rates in the world (Wignaraja *et al.* 2010). Though data on Zambia's forests is very poor, the country is experiencing a very high deforestation rate, largely due to charcoal production and agricultural practices. This in turn leads to increased greenhouse gas emissions, lower greenhouse gas sequestration potential, biodiversity loss, and negative impacts to ecosystem services (such as water quantity and quality).

The poaching of animals is parallel to the illegal harvest of forest resources. Animals are poached for food, for income through the selling of bush meat, and for illegal export. Well-intended projects in some areas have resulted in supplying poachers with material for snares: fences erected to reduce

human wildlife conflict or to control Tsetse flies have been turned into snares by poachers. A lack of enforcement of existing laws and ineffective sharing of revenues through community resource boards also contribute to poaching as a means to gain income.

Mining-induced Population Growth in Forest and Woodlands. Growth in human population associated with mining brings with its other harmful environment- and biodiversity-impacting activities, such as the indiscriminate clearing of the forests and woodlands for timber and non-timber forest products, charcoal production, and fuel wood leading to the loss of habitats of a large number of animals and plant species. The increase in demand for timber, non-timber forest products, charcoal, and fuel wood puts the survival of a large number of animal and plant species at stake. For example, the people from different communities go to mine sand in Dambwa Forest reserve area which popularly known sandy quarries. This type of mining has destroyed a lot of forests which is the wildlife habitat. This situation, has caused the people to come in conflict with wildlife.

In most studies conflict is predominantly framed and measured in terms of its visible impacts. These are impacts that are easy to notice and can be readily evaluated. The effects of human-wildlife conflicts on socio economic status of the people are usually over-looked and poorly addressed in the relevant literature. This frequently results in only a partial evaluation of the impacts of conflict on people's wellbeing. Since some areas in the national parks in Zambia experience considerable human-wildlife conflict, mainly manifested as crop raiding, competition for available resources (mostly forest products), injuries or deaths of local people according and in some cases killing of the animals involved (Monney *et al.*, 2010). This major gap in the literature regarding, the causes of human-wildlife conflicts, hidden costs presents a challenge,

the mitigation measures being taken to reduce on HWC and the awareness of the role of conservation plays in reducing the HWC by the local people. Local people are key to effective HWC management and conservation efforts. If the costs of HWC are borne entirely by local people and are not adequately identified or dealt with, this may increasingly hinder various conservation and HWC management efforts over time leading to poverty (Muyoma Philip James 2016). There remains, in this regard, the need to understand these effects on the socio-economic status on the people. This study, therefore, exams the effects of human-wildlife conflicts on socio-economic-status among the people of Simoonga community, Dambwa forest in Mosi-oa-tunya National Park and Maloni area in Livingstone.

Under customary tenure, the land is held by individuals, families, clans or communities of past, present, and future generations and cover the majority of Zambia's land. The conversion of land from customary tenure to statutory tenure has seen at least 10% of land being redistributed on title to foreign investors, local elites, politicians, and land speculators. Whilst such developments may have provided needed investments in these rural areas and created opportunities for local employment, contract farming, secondary businesses, infrastructure and social services development, and transfer of skills, they pose a threat to customary rights in the areas affected. This development leads also to HWC because the government sometimes grab the customary land from the people living near the park to be part of the park or protected area. People are made to relinquish their customary rights, thus affecting and sometimes changing their livelihoods. Government needs to be assisted to better handle such matters to avoid eroding of local rights to common pool resources, loss of access to water sources, grazing land, and forest products (USAID 2010). This leads to the people to stay

illegally or start encroaching on the protected land and hence being attacked by wildlife especially when fetching firewood or when drawing water.

Further, misrepresentation of human-wildlife conflicts for human-wildlife interaction puts wildlife at risk as they are perceived a threat to livelihood rather than an alleviation factor to their welfare through coexistence. This perceived context human-wildlife conflicts can hinder uncovering of underlying conflicts due to different values, priorities, and political relations between different actors that might reinforce conflicts to levels that are hard to deal with (Hill, 2015; Peterson *et al.*, 2010).

In many cases, rapid growth in human populations near areas protected for wildlife has led to encroachment into protected areas, thereby disturbing wildlife habitat, (Lamarque, 2009). In Mosi-Oa-Tunya National Park in Livingstone Southern Province in Zambia is no exception; the area experiences considerable human-wildlife conflict, mainly manifested as crop raiding, competition for available resources (mostly forest products), injuries or deaths of local people, and in some cases killing of the animals involved, (Monney *et al.*, 2010).

It is argued that research should seek to understand the what, why and how of the impacts of human-wildlife interactions on humans.

2.7. Hidden costs being faced by the communities living near National Parks and the protected area in Asia

Hidden impacts of human-wildlife conflict Hidden impacts of human-wildlife conflict may be defined as costs characterized as uncompensated, temporally delayed, psychological or social in nature (Ogra, 2008). The term 'hidden', synonymous with 'indirect' or 'secondary' impact, is deployed here as it encapsulates many causes and

antecedents that slip critical inquiry when the focus is on visible impacts of human-wildlife conflict. Further, the term has come into use in the human-wildlife conflict literature (DeMotts and Hoon, 2012).

In Hidden impacts include diminished states of psycho-social wellbeing resulting from injury or fatality, disruption of family, livelihoods and food security through crop or livestock loss. It also includes opportunity costs, poor health and nutritional status, and transaction costs incurred when pursuing compensation. Such impacts are generally temporally delayed, their effects on individuals or communities becoming pronounced well after the occurrence of a conflict event. Visible impacts may also have hidden consequences which may lead to hidden and visible impacts interlace with each other (Jadhav, 2011). The degree and severity of psychosocial effects of conflict may be shaped by a range of precedent factors that compound vulnerability for many social groups. These include poverty, poor access to resources and social capital, ethnic and political marginalization.

Human-wildlife conflict (HWC) is often considered in terms of how the impact on humans can be translated into tolerance or intolerance of wildlife for meeting conservation goals. Drawing on narratives of wildlife as destructive, wildlife as above humans, and wildlife as pathways for resource capture, we explore the impacts of HWC on human wellbeing, situating the study within the HWC, political ecology and human security.

Hidden (Invisible) impacts of Human wildlife conflicts Hidden impacts of human-wildlife conflict may be defined as costs characterized as uncompensated, temporally delayed, and may be psychological or social in nature (Ogra, 2008). Until recently these impacts have widely been disregarded with the main focus.

2.8 Evaluating the extent to which human-wildlife conflicts has contributed to Hidden costs among the people in East Africa

Since 1990, human-wildlife conflicts get an increasing interest from scientists (Marchand, 2016) in an interdisciplinary approach (Dickman, 2010). In Africa, several studies have been carried out on human-wildlife conflicts. Despite smaller species such as insects and birds cause more damages, more attention is paid to large mammals and crocodiles (Lamarque *et al.*, 2009). Wildlife damages are mainly towards crops and livestock. In many areas, people are injured or killed by wildlife (Lamarque *et al.*, 2009; Dunham *et al.*, 2010). These conflicts that can be very costly to communities (Mkonyi *et al.*, 2017) jeopardize peoples' livelihoods. People in retaliation kill wildlife, endangering several wildlife species (Swanepoel *et al.*, 2015). Various forms of human-wildlife conflicts are observed in West Africa (Lamarque *et al.*, 2009; Sogbohossou *et al.*, 2013). Like in other parts of Africa and the word, emphasis was placed on large herbivores and carnivores. Studies investigated aspects such as characteristics of conflict people perceptions, mitigation measures. (Lamarque *et al.*, 2009; Bauer *et al.*, 2010; Sogbohossou *et al.*, 2011; Sogbohossou *et al.*, 2013; González *et al.*, 2017). However, there are very few publications on the subject in the region compared to other parts of Africa;

Therefore, Madden (2010) looks at the conflict between different actors with historical wounds, cultural differences, socioeconomic needs, and trust and communication void on sustainable conservation strategy that considers local people's well-being. It is argued that term human wildlife conflict does not capture the broader nature of relationship between wildlife and humans. This is because of the perceived lack of knowledge of established boundaries between protected areas and communities by wild animals (Peterson, Birckhead,

Leong, Peterson, & Peterson, 2010). Further, misrepresentation of human wildlife conflicts for human wildlife interaction puts wildlife at risk as they are perceived a threat to livelihood rather than an alleviation factor to their welfare through coexistence. This perceived context human wildlife conflicts can hinder uncovering of underlying conflicts due to different values, priorities, and political relations between different actors that might reinforce conflicts to Vulnerability, described as the ability of a social-ecological system to adapt to exposed stress of humans to human-wildlife conflict will differ between households and communities. For example, in relation to crop-raiding, one household may be able to tolerate a certain amount of economic loss while the neighbouring household cannot. While some individuals or households may be at greater risk to crop-raiding or predation, due to issues such as proximity to forests, this risk may not fully show their vulnerability (Dickman 2010). levels that are hard to deal with (Hill, 2015; Peterson *et al.*, 2010)

Human-wildlife conflict has resulted in economic losses, reduced food security, and livelihood options to farming households due to crop damages (Bailey 2011; Pant and Hockings 2013). However, the tendency to measure the impact of HWC to farmers from the perspective of direct economic losses alone often obscures the actual impacts, because HWC generates other costs to farmers in the form of time used in guarding fields, interruptions in children's schooling, and increased risk of injury and disease contraction (Carter *et al.* 2014). In the CNP buffer zone, some farmers have lost their economic livelihoods because they had to abandon their crop fields due to persistent wildlife destructions (Sapkota *et al.* 2014).

Wildlife attacks on people, crop and livestock depredation, and property damages are obstacles to local communities' support for conservation (Silwal *et al.* 2016); thus, there is the need for

solutions to HWC to ensure that local communities do not unjustly bear the adverse effects of conservation, which can result in opposition to conservation (Bowen-Jones 2012). Since vulnerability and access to the benefits of wildlife vary from community to community, delivering collective community-level benefits alone is not enough to captivate the interest and commitment of all individuals to tolerate and protect wildlife (Bowen-Jones 2012). Thus, to ensure the success of conservation efforts, there is the need to ensure the benefits to the local people are panoramic and all embracing, since dissatisfaction from a single individual living with wildlife can lead to the failure of conservation initiatives (Hazzah *et al.* 2009; Bowen-Jones 2012).

By taking a holistic perspective we are able to identify such hidden costs which are often overlooked. It is argued that in order to contribute to sustainable and successful HWC management, firstly there is need to understand the entire context of such HWC beyond the visible, economic and physical. Further there is need to understand human rights and social justice-based approaches to conservation (Fletcher 2010) and to understand the hidden dimensions of HWC (Barua *et al.* 2013).

The majority of children guarded crops two days a week (presumably on non-school days); however, other children guarded crops three to seven days a week during the peak-raiding season. In Tanzania, sixty-percent of students reported missing school to guard crops (Mackenzie & Ahabyona 2012). Regular school absenteeism degrades children's academic performance. Studies showed that students living in communities that experienced regular elephant crop-raiding scored worse on national exams than students living in communities not impacted by wildlife. (Mackenzie & Ahabyona 2012; Sitati & Ipara 2012). Therefore, absenteeism from school makes the learners not to perform well academically hence failure to get good

results and leading to not getting well-paying jobs after school.

2.9. The hidden costs in Southern Africa Botswana as a result of human-wildlife conflicts

In Southern Africa in particular Botswana there are two costs caused by human-wildlife conflicts such as visible costs and hidden costs impacts can be in two categories such as material or economic consequences for human well-being (e.g. reduced food supply, income loss, death) which they generally occur through a direct chain of causation (e.g. an elephant raids a farmers' crops, the farmer suffers reduced yield, (Lamarque *et al.* 2009; Barua *et al.* 2013). Hidden impacts can be characterised by immaterial and emotion-based consequences for human well-being (e.g. persistent fear or worry, changed behaviours, lost opportunities) secondly; they typically occur through an indirect chain of causation (Barua *et al.* 2013; Khumalo and Yung 2015). For example, if an elephant mock charges a human while they are collecting water, its direct action may cause the human to be fearful of elephants, which then affects their future behaviour and willingness to collect water in areas where elephants are present (Roskaft *et al.* 2014).

Hidden impacts of human wildlife conflict exist in many forms that have rarely been quantified, with some of the hidden impacts coming as a result of the visible impacts of conflicts, usually delayed and only pronounced after the occurrence of such conflicts. This led to suggestion that both forms of impacts are in some cases interlaced with each other.

Examples of some of these hidden impacts includes poor/diminished states of physio-social wellbeing due to resulting injury and death, disruption of families, loss of livelihoods from crop raids and livestock losses. The severities of these impacts are

dependent on the vulnerability of the individuals or community e.g. the poverty levels, limited access to resources and political and ethnic marginalization (Jadhav 2011). Other hidden impacts of conflict include opportunity cost, transaction cost when pursuing compensation in some countries and poor health and nutrition. resources being invested in resolving the visible impacts regarding human wildlife conflicts (DeMotts and Hoon, 2012).

During conflicts where death or injury of a family member occurs this can have a big impact on the family of the deceased, especially where the deceased was the main bread winner of that family, leading to the transfer of responsibilities to other family members in most cases children? Such cases may result in disruption of parent-child relationships, poor attendance in school or aggravation of debts and pre-existing poverty (Lamarque et al 2009 and Jadhav 2011).

Furthermore, hidden costs are difficult to quantify, but may help reveal the root causes of conflict within an area, especially in low-income rural communities. Costs may include diminished wellbeing, health, restrictions on personal mobility and education (Barua *et al.*, 2013). High opportunity costs of living alongside wildlife can also manifest further into problems of habitat destruction and poaching demanding a detailed identification of cause-and-effect relationships to design future interventions. The interventions must be well documented so that they are referred to by the implementers.

Researchers are increasingly recognizing that human-wildlife (HWC) can be better understood as conflict between humans over wildlife. Typically, human conflict over wildlife involves conflict over the management, appropriate place and value of wildlife and over development goals and competing priorities between different stakeholder groups who are either affected by wildlife or who manage

wildlife and incidents of HWC (Dickman, 2010; Fisher, 2016; Peterson *et al.*, 2010; Redpath, Bhatia, & Young, 2015; Yurco, King, Young, & Crews, 2017).

Regarding crop raiding, maize, sorghum, millet and cotton were the most destroyed crops by elephants and baboons (Kiki, 2012). These studies focused on conflicts' characteristics without highlighting measures developed by local communities to manage these conflicts. In order to guaranty a bright future for the coexistence between wildlife and people, it is important to evaluate regularly the importance of conflicts and the effectiveness of conflicts mitigation methods used

HWC can impose a variety of significant costs. Economic costs from crop raiding or livestock predation can be substantial. Crop raiding reduces the surplus crops available to market food and may even deplete food available to feed the family. Education of children may be impeded if parents fear they will be injured on their way to or from school, or if children must stay home to help protect crops. Injury and death can result from animal attacks. The fear and insecurity that the threat of wildlife attacks and raiding produces can be substantial and can have major effects on local people's way of life and sense of well-being. To be effective, conservation policies and programs will need to find ways to prevent or minimize these costs and help local people gain benefits from wildlife.

2.10 Hidden costs in Zambia caused by human-wildlife conflicts.

This does not mean that they are no costs and limitations living close to the park. Usually evictions, limited access to the protected areas, and loss of crops, livestock and humans lives to the wild animals from the park are part of such conservation initiatives (Tumusiime & Vedeld, 2015)

These are most commonly crop and or property damage but also include physical injuries or death. Food security has been compromised in many areas that are vulnerable to crop losses, particularly to elephants in some National parks in Zambia case; costs are often uncompensated and impacts are increased by limited infrastructure, shortages of agricultural inputs, and lack of access to affordable credit (Richardson *et al.*, 2012). It is vital to understand the social context in which crop raiding, property damage, human injuries, loss of life among others. In this development, the case is not yet known despite other researchers carrying out similar research. It is very important to ask some questions before concluding on the causes.

The costs of human-wildlife conflict are numerous and can be divided into two categories: visible and hidden costs. The visible costs are well known and perhaps clearly understood. On the other hand, the hidden costs are costs are not directly noticeable and are more difficult to quantify but are equally borne by the affected communities. It is these hidden costs that were of particular interest to this study.

The hidden costs of HWC in this study were identified from the day to day socio-economic effects of conflicts on affected people. The aspects of livelihoods and social activity assessed were loss of possible income, insufficient food, loss of time due to guarding of fields, and restricted movements within villages. Another hidden cost flowing from guarding crop fields is absenteeism from school because children are required to participate in guarding duties. The worst absenteeism occurs when a family shifts to a temporary home in their crop fields, which increases the distance to schools. Many children stop attending school for the duration of the guarding period, through until harvesting is completed. This is a common activity in most communities near national parks or Game Management Areas. This may result in increasing

school dropouts and high illiteracy levels in the study area. Teachers confirmed that school attendance by pupils reduces during the guarding period, which leads to poor performance and the eventual drop out from school.

However, many approaches to framing and studying human-wildlife conflict only emphasize its visible direct costs. Hidden impacts remain poorly addressed and include costs that (a) are indirect or uncompensated, (b) may involve foregone opportunities, (c) are usually temporary delayed, and/or (d) are often psychosocial in nature. The above situation is the same in Simoonga, Maloni and the villages surrounding Dambwa Forest reserve near Mosi-Oa-Tunya National Park.

Zambia has been working with various organizations in the conservation of the African elephant. Given the scarcity of resources suffered by the Department of National Parks and Wildlife, research has been focused on estimating the status of elephants in the country as a basis for the creation of trend patterns.

There is sufficient evidence to demonstrate that Zambia has not benefited from the ivory ban, and considers that the continued ban is an infringement of its sovereign right to utilise the species to generate income that would strengthen the law enforcement strategies. It must be noted that Zambia derives income for law enforcement and staff emoluments from the sustainable use of wildlife resources. Zambia is not ready to continue struggling to raise funds to support elephant conservation, personnel welfare and in addition to continue incurring the already existing costs of securing the ever-increasing stockpile. The challenge for Zambia is how this economic potential can be translated into direct economic incentives for all players in conservation. One way is to allow controlled trade, sustainable trophy hunting and sale of hides. In the absence of

economic benefits accruing from the elephant, negative attitudes towards the elephant will heighten and may place the elephant population under renewed risk of increased poaching which may reverse the progress made by the country so far. To compensate the direct costs of living with elephants, which include crop damage, injury and loss of human life, implies that the elephant must yield economic returns to the landholders. However, the Zambian Government has no policy on compensation. Therefore, lack of compensation has contributed to poverty levels for the people in Simoonga, Maloni and villages surrounding Dambwa Forest Reserve areas.

2.11. Mitigation measures being taken by the relevant authorities and the communities being affected by human-wildlife conflicts in Asia.

Growing understandings of wildlife behaviours and spatio-temporal patterns of human-wildlife conflict have led to the suggestion, development, and adoption of a wide variety of prevention and mitigation approaches (Gubbi, 2012; Baruch-Mordo *et al.*, 2013; Hoare, 2015). There are, however, few examples of such approaches for addressing HWC.

In Asia mitigation measures being taken by the relevant authorities and the communities are being affected by human-wildlife conflicts India. Anthropogenic activities fragment natural landscapes, leading to increased interactions between wildlife and people inside and outside protected areas (PAs; Watson *et al.*, 2016). Such interactions could be positive such as nature-based tourism that encourages people's affinity for wildlife and wild places while providing revenue and employment (Sinha, Qureshi, Uniyal, & Sen, 2012). Other benefits include pollination or hydrological services (Nesper, Kueffer, Krishnan, Kushalappa, & Ghazoul, 2017; Tscharnke *et al.*, 2011).

Thus, human-wildlife conflict resolution not only has scientific and conservation importance but a management and social need to retain traditional values of tolerance in people towards elephants in human-elephant relationships (Singh and Kumar 2014). There have been various mitigation measures such as electric fences, elephant proof trenches, and early warning systems to resolve human-elephant conflict across Africa and Asia (Graham *et al.* 2010). Nevertheless, very few of them have focused on impact of conflict mitigation measures in terms of cost-benefit ratio, functionality, feasibility of techniques, and benefits to people (Hedges and Gunryadi 2010, King *et al.* 2010, Graham *et al.* 2011, Chen *et al.* 2013). On the other hand, there is a lack of information on the efficacy of conflict mitigation techniques in terms of reduction in incidence of conflicts, sustainability, ease of adoption by local communities, and increased tolerance of people towards elephants. (Baskaran *et al.* 2013). As this landscape is surrounded by protected areas, elephant use of these areas for foraging and wide-ranging seasonal movements (Kumar *et al.* 2010) will inevitably continue and bring the animals into contact and possible conflict with people.

The Malaysian federal government, under the department of Wildlife and National Parks (DWNP), is the main body that tries to control threats against wildlife, with the current regulation under the (Wildlife Conservation Act 2010). Mitigation measures being used to reduce human wildlife conflicts in Malaysia. Translocation as a method is the same method that described above for mitigation of human-elephants conflict. The problem tiger should be captured and be relocated to another area in order to avoid further problems such as livestock predation and minimize tiger deaths by farmers. According to Barlow and his study in the Bangladesh Sundarbans tiger translocation is in the same level of success as

firecrackers regarding the human lives saved while, it has better success on tigers saved (Barlow *et al.*, 2010).

Using of fire is a universal ancient method against elephant and other wild animals as most wild animals avoid fires. Fires at the field entry points or at field boundaries constitute a short-term disturbance method. In some areas in Africa capsicum seeds and sheep dungs are added in the fire as farmers believe that elephants dislike the smell of burnt dungs and chilly smoke bothers them. This kind of activity loses its effectiveness after a short period as elephants become easily habituated; Fernando argues that male elephants appear to habituate more readily than females in a herd.

Firecrackers Forest workers use firecrackers to scare away tigers from an area before getting in and starting work. Local people in Bangladesh who live close to the Sunderban Tiger Reserve report that firecrackers have limited results on tigers ((Barlow *et al.*, 2010).

Dogs can detect the presence of tiger or other animal faster than a man that gives time to react and move away. Hence, dogs may prevent some tiger attacks on human (Khan, 2009). According to Barlow and his study, guard dogs as a conflict mitigation method considered the most cost-effective after killing of problem tigers but better on reduction of tiger deaths (Barlow *et al.* 2010). Tigers can be killed only under specific circumstances when they threaten lives or property and, by law, any incident must be reported to DWNP (NTAP, 2008). Although, unauthorized killing of tigers is illegal, livestock depredation by tigers leads to illegal killing by farmers in defence of their livestock. A research in Bangladesh about human-carnivore conflict shows that killing of tigers considered the best option for reducing human deaths. However, to reduce tiger deaths,

killing of tigers is the worst solution (Barlow *et al.*, 2010). According to the online survey for this study, more than the half of the participants claim that the method of killing is not effective at all, and around 10 per cent thinks that is effective only in a short term.

Fencing agricultural areas and PAs to minimize crop raiding and protect vegetation from grazing and trampling intensifies livestock grazing in human settlement areas and elephant feeding inside PAs, while restricting movement of both humans and elephants (Campos-Arceiz *et al.*, 2008; Guldmond; Riddle *et al.*, 2010).

Mitigation techniques for HWC such as electrified fences and translocation constitute important tools for wildlife conservation. Competition for food and lack of space bring human and wild animals into close contact and livestock become an easy prey for carnivores to attack. So, many farmers in order to protect their properties resort to illegal culling, using snares and poisons. Illegal hunting constitutes main drive force to animal extinction in Malaysia such as Malayan tiger. Asian elephants and Malayan tiger are listed as endangered on the red list of Threatened animals (IUCN) as their population has been decreased dramatically within the last century. Moreover, connecting forest corridors between fragmented forests plays a key role to the survival not only of elephants and tigers but of many other species as well as to the reduction of economic losses (Salman Saaban *et al.*, 2011).

2.12 Establishing the specific mitigation measures to be taken as to improve socio-economic status for the people affected by human-wildlife conflicts in East Africa

The diverging meanings of wild dogs presented here reveal the human dimensions of conflict that are often the overlooked, yet underlying drivers of human-wildlife conflict. Recognizing these broader

social drivers as well as different stakeholder groups' competing interests, priorities, and values as well as feelings of injustice and hopelessness, are important for addressing human conflict over wildlife. Two mitigation strategies such as recognizing human conflict over wildlife and integrative management plans may help in increased and continued meaningful engagement with communities affected by conflict, as well as more collaboration and communication between stakeholder groups (Darkoh & Mbaiwa, 2009; Madden & McQuinn, 2014; Redpath *et al.*, 2015).

This information is necessary to develop more efficient mitigation measures in order to sustainably preserve wildlife species and human populations' livelihoods. Guarding, the most widely used method in Pendjari Biosphere Reserve is the oldest and the most effective human-wildlife conflicts management measure (Nyhus, 2016). However, the costs of labour and the need for constant vigilance are the key drawbacks of this approach (Kiki, 2012). This method can be effective both against crop raiders and livestock depredators. Its efficiency is limited against nocturnal depredators as it is difficult to guard farms during the night. Fire, used to dissuade nocturnal predators, is not a sustainable measure because fire made with fallen branches could not stay for long time to dissuade animals (Linnell *et al.*, 2012).

(Hazzah *et al.*, 2009) summarise the problem for wildlife (outside protected areas) as being an expensive nuisance to those who lose crops, livestock, and occasionally human life. They state that this can only be reversed through national reforms that allow rural people to profit economically from ecotourism or other wildlife-based enterprises. In the Kenya case study, it was indicated that, the major failing of most schemes is that the cost of wildlife presence still usually outweighs the benefits (Dickman *et al.*, 2011). Successful conservation outcomes are most likely

when there is a clear net positive livelihood benefit through the application of multiple complimentary measures. In other words, financial mitigation should top up preventative actions, and livelihood benefits in the communities and households most affected by HWC.

1.5.9.2. Mitigation measures being carried out in Southern Africa (Zimbabwe, Botswana) in order to improve on the effects of human-wildlife conflicts on the socio-economic status of the people.

One of the researches conducted in Zimbabwe suggests that elephant populations will co-exist to varying degrees with human communities until a threshold is reached. At this point, the habitat loss and fragmentation accrued from a transformation of the landscape for human livelihood activity use renders the area unfit for elephants. Farmers and pastoralists alter biophysical dynamics and habitat patterns through subsistence agricultural production and management of key natural resources (Shaffer, 2010; McHale *et al.*, 2013). Cutting trees and burning to clear land for agricultural expansion and improve livestock forage may draw elephants to patches of new vegetative growth (Shaffer, 2010; Babigumira *et al.*, 2014). Planting fields adjacent to water sources and digging holes to access groundwater may alter elephant migration routes.

The combined results of these livelihood activities confine elephant herds to small patches of minimally-developed lands and PAs that restrict natural migration patterns, increasingly deprive elephants of their preferred forage, and contribute to biodiversity losses in small to medium-sized PAs due to concentrated elephant foraging. Human-elephant conflict has become a threat to biodiversity conservation, and the management of such conflict is a primary goal for elephant conservation in range countries

The most sensible approach to addressing HWC is to implement a combination of two different approaches: short-term mitigation tools along with long-term preventative strategies, so as to reduce the current problems while fostering the rapid development and use of innovative approaches to address future issues and eradicate the problem. When low environmental impact strategies and traditional low-cost deterrents are not successful, some invasive approaches, such as regulated harvest, wildlife translocation or human relocation may need to be implemented.

Among the innovative strategies are electric fencing, natural resource use compensation systems, CBNRMS, incentive and insurance programmes seem to be the most sustainable. Irrespective of the approaches adopted, there is a need to test them against any possible side effects, such as the restriction of an animal's requirements, effects on non-target species and the environment as a whole and last but not least its cost-effectiveness. The best approach should ensure the participation and involvement of local populations, as their goodwill and support in wildlife conservation plays a crucial role for preventing and mitigating HWC.

Practical mitigation measures to be taken in other countries as to improve the socio-economic status for the people in living near or those living in the national park conflicts, if not addressed through appropriate prevention and mitigation measures, may also lead to decreased tolerance towards elephants among local people. Further, as few studies on African elephants (Ahlering *et al.* 2011) have revealed, human-induced pressures may increase stress levels in elephants and affect their survival in human-modified landscapes.

2.13. Mitigation measures being taken in Zambia to minimise the effects of human-wildlife conflicts on the socio-economic status of the people.

The National Policy on Environment (MTENR 2007), the 2005-2008 Integrated Land Use Assessment (Mukosha and Siampale 2009), and the Reducing Emissions from Deforestation and Forest Degradation (REDD+) National Joint Program (Wignaraja *et al.* 2010) all list mining and mineral processing as a threat to the environment and biodiversity from (a) dereliction of land through erosion, toxic dumps, and redundant facilities; (b) pollution of water due to unmanaged waste water and sediment discharge; and (c) air pollution by dust and gases. This policy helps the people of Zambia living in protected areas to follow the government policy on mitigation measures.

It is stated that 66% of Zambia is under forest cover (Mukosha and Siampale 2009). What are the implications of that on other land users, such as agriculture or even wildlife, especially in the advent of destruction of wildlife habitat? The absence of effective high-level natural resource planning and coordination mechanisms is largely to blame for the ineffective unilateral management of Zambia's natural resources. At this level, good legislation and regulations are passed but not easily implemented for a variety of reasons ranging from inadequate capacity and absence of national land use planning, to inadequate funding. Sometimes the participating partners appear to push for developments that are not fully supported by government despite agreeing to them.

There must be efforts to pass a land policy following the enactment of the Lands Act have been unsuccessful, largely due to inadequate protection for populations that depend on rural land and access to natural resources. The policies are firstly equitable access to land and associated resources,

secondly equitable access to and ownership of land by women, while thirdly, land tenure security, sustainable and productive management of land resources and fourthly transparent and cost-effective management of land. Further there are other policies are conservation and protection of ecologically sensitive areas, and lastly cost-effective and efficient settlement of land disputes. Appropriate support is encouraged in this area to enhance transparency and governance (USAID 2010).

Community-based initiatives to harness and manage natural resources have been pursued, particularly among the wildlife, forestry, and fisheries sectors in a variety of forms in the recent past. The advent of community-based initiatives as opposed to “command and control” approaches, are showing some success and creating community collective action models that include co-management, participation, and collaboration in the use of available natural resources. However, the community managing the resources must have the legal rights, the local institutions, and the economic incentives to take substantial responsibility for sustained use of those resources. Adequate benefit-sharing mechanisms that are currently not fully resolved need to be established to evade potential conflicts among all those tasked with natural resources management. Various concerns ranging from licensing to payment of royalties need to be addressed to benefit both government and the local communities. Success has been scored when participating communities have become owners and primary implementers, receive technical assistance, and also participate actively in part of the monitoring, (USAID 2010).

2.14 Establishment of the gap and Personal critique summary

This research identified rights and responsibilities the society to co-exist with human-beings and share the natural resources around them.

- The Zambian government to come up policies to help reduce human-wildlife conflicts.

- This document has also suggested some alternative solutions to help the people improve their socio livelihoods in the affected areas.

Detailed and careful evaluation of the literature review presented focusing on; past methodologies used, results or findings obtained, sample sizes, location and year when the research was conducted

III. METHODOLOGY/RESEARCH DESIGN

3.1 Project Design / Approach

Research design, is the general plan of how the researcher will go about answering the research questions (Saunders *et al.*, 2012). Since research design is determined by the research objectives that are the derivative of the research questions, accordingly it is essential to have clear research questions in order to achieve an adequate research design (Saunders *et al.*, 2012). The researcher used the case study.

Research design also refers to a plan of a research study. The design of a study defines the study type (descriptive, correlational, semi-experimental, experimental, review, meta-analytic) and if applicable, data collection methods and a statistical analysis plan. Research design is the framework that has been created to seek answers to research questions.

The research design shows that the researcher is able to tackle the research problem in a coherent and explicit way. Research design is a blue print or plan for conducting a research project, it shows the approach taken when conducting the project. Must follow the scientific approach or methodology in order to arrive at valid and reliable results and conclusions.

In light with this, (Saunders et al. 2012) stated that this process provides more time to collect data,

obtain more detailed data by high quality staff and devote more time and effort striving to collect data from more difficult situations.

3.1.1 Case study

Case studies are a design of inquiry found in many fields, especially evaluation, in which the researcher develops an in-depth analysis of a case, often a program, event, activity, process, or one or more individuals (Creswell, 2005). Additionally, Yin (2009, 2012) defines and suggests processes the case study design as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used. Therefore, a case study design was used to help the researcher explain the human –animal conflict.

3.2 Sampling procedure

To establish the required sample for a study, the researcher chose the most appropriate sampling technique, In this regard purposive sampling was employed when sampling on the residents of Simoonga community, Maloni community and villages surrounding Dambwa Forest Reserve, parents to the learners, officials from Department of National Parks and Wildlife (DNPW), teachers, lodge workers and lodge owners from within or areas surrounding the Mosi-Ao-Tunya National Park because the researcher was able to get hands on information from those who have been assessing the human wildlife conflict and those in conflict with wildlife. This method was chosen to enable the researcher study a relatively small proportion of the population, and also, it is appropriate because the population of study is similar in character. The researcher chose the sample purposefully, the reason being to maximize the depth of data elicited.

Macmillan *et al* (2006) defined a population as a group of elements comprising of individuals,

objects or events that conform to specific criteria that are intended to provide a suitable base for a research. Therefore, the researcher targeted the learners from Simoonga secondary, Tongabezi, Twabuka, Linda East and Dambwa Secondary School.

While other respondents were from Simoonga, Maloni and Dambwa Forest communities near Mosi-Oa-Tunya National Park. and Department of National Parks and wildlife (former ZAWA) officials.

3.2.1 Purposive sampling

Purposive sampling was preferred, and respondents were deliberately chosen because of their knowledge and experience based on the involvement and interaction with wildlife, and prevalence of human wildlife conflicts in their communities. In addition, their willingness to participate, and ability to communicate their experiences, and perceptions in an articulate, expressive, and reflective manner (Palinkas *et al.*, 2015). Therefore, purposive sampling was more realistic than randomization in terms of time, effort and cost needed in finding respondents from DNPW, the residents, lodge owners and lodge workers.

Simple random sampling technique was used in the selection of Maloni, Simoonga and Dambwa Forest residents and the pupils from Simoonga Secondary School, Twabuka, Tujatane and Linda East primary schools in Livingstone. According to (Christensen Johnson 2004), Simple random sampling is a basic sampling technique by which a sample is selected for study from a larger group where each individual is chosen entirely by chance and each member of the population has an equal chance of being included in the sample. Simple random sampling technique also facilitated the application of inferential statistics.

2.3 Target populations and Sample size

Target population or institutions and reasons for targeting them must be stated, applied consistently with the project design and sampling technique and the sample size to be considered in the project.

Stratum	Target Population	Sample Size
DNPW	20	8
Lodge Owners	10	5
Lodge Workers	200	18
Residents	370	27
Pupils	700	115
Teachers	200	27
Total	1500	200

3.4. Research Instruments

Macmillan (2006), defined data collection (research) instrument as a tool for measuring, observing or documenting quantitative or qualitative data. The data collection instruments are used to collect both primary and secondary information

The data collection instruments are used to collect both primary and secondary information. The primary data is the data collected during research from the field and for the first time, and thus is original in character while the secondary data, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical or thematical process, Kothari, (2004). Three research instruments were used to collect qualitative data for the study. These are; interview schedule, questionnaires and focus group interview. Questionnaires are the most widely used social science method in conservation is useful for quantifying human behaviour (Newing 2010). Questions were designed based upon information elicited from the focus groups and were carefully worded to make sure that they were unambiguous, socially and culturally appropriate, precise and neutral (Newing 2010).

3.4.1. Semi-Structured Interview Guide

This is a qualitative study done with semi-structured interviews, which means that the interviews do not follow a structured scheme, but instead some main questions and follow-up questions with open answers are used (Troost, 2010).

One way of learning about things we cannot observe is by asking people who have or are experiencing such situation to tell us. In this study, a semi-structured interview guide will be used to collect in-depth qualitative data from, Five (5) Community chairpersons, Sixty (60) Learners from Mosi-Ao- Tunya National Park, Five (5) parents to the learners, Five (5) officials from ZAWA, Five (5) class teachers, Ten (10) lodge workers and Five (5) lodge owners from within or areas surrounding the Mosi-Ao-Tunya National Park.

3.4.2. Focus group discussions

A focus group is a small, but demographically diverse group of people and whose reactions are done in open discussions about a new product or something else to determine the reactions that can be expected from a larger population. It is a form of qualitative research consisting of interviews in which a group of people are asked about their perceptions, opinions, beliefs, and attitudes towards a service, concept, or idea, (Houghton Mifflin Harcourt Publishing 2018). Questions are asked in an interactive group setting where participants are free to talk with other group members. During this process, the researcher took notes and records of the vital points she is getting from the group. The researcher selected members of the focus group carefully for effective and authoritative responses. Focus group discussion is frequently used as a qualitative approach to gain an in-depth understanding of social issues. The method aims to obtain data from a purposely selected group of individuals rather than from a statistically representative sample of a broader population.

3.4.3. questionnaires

One hundred questionnaires were used to collect data from the mentioned communities.

2.5. Data analysis

Merriam (in: Engelbrecht *et al.*, 2003) clearly indicates that data analysis is the process of making sense out of the data. Making sense out of data involves consolidating, reducing, and interpreting what people have said and what the researcher has seen and read. Data analysis was done using qualitative methods. Thematic analysis was used to analyze data qualitatively. Responses to open ended questions were recorded and then grouped into categories or themes which were emerged. Qualitative data were analyzed by bringing out emerging themes that were categorized and interpreted. Responses were grouped in themes according to the research questions of the study. These themes were used as the variables whose frequency distribution showed which ones were more recurring than others thereby providing answers to the research questions of the study. Furthermore, quantitative data were analyzed using the Statistical Package for Social Science (SPSS) software. Descriptive statistics were applied to the processed data by showing variable frequency distributions from learner's responses. Data were presented using graphs, tables and percentages.

3.6. Ethical Consideration

Before subjecting respondents to the data collection procedures, informed consent was considered by explaining the aim of the research and seeking permission from all the relevant officers such as the Department of National Parks and Wildlife in Chilanga and Livingstone DNPW offices. The researcher also got permission from DEBS office in Livingstone, Lodge owners and also from community leaders to allow the researcher to collect data from the community members. When it came

to data collection, a three-step general procedure was applied. In selecting all respondents, purposive sampling procedure will be used because these people are expected to have adequate knowledge on the subject matter. Introductory letters will be obtained from the Directorate of Research from Information and Communication University (ICU). The letters were then presented to the relevant officers for permission to be granted to the researcher to carry out the research. Interviews were conducted to Community chairpersons, Learners from Mosi-Ao-Tunya National Park, officials from Department of National Parks and Wildlife, class teachers, lodge workers and lodge owners from within or areas surrounding the Mosi-Ao-Tunya National Park in each respective community.

3.7 Dependent and Independent Variables

Independent variables are factors that can influence the frequency and intensity of human wildlife conflicts and interaction. Therefore, activities during cutting down of trees and sand mining cause noise which represent disturbance that was key to human wildlife conflicts.

The occupation of respondents, this was used categorically to check for relationships with changes to land use cover influenced by respondent's work, resident activities and its impact on human wildlife conflicts and interactions.

Population density, the rising population in each village and community due to tourism and development and forecasted opportunities in form of employment, and assets acquisition was vital to understanding the underlying factors causing pressure on available resources.

Distance from residential areas and human wildlife incidents was used to measure the distance between human wildlife incidents from the sampled communities

Household income, the different income generating activities the local people before tourism and development are key attributes to standards of

living which influence use of resources in proximity to the household.

Dependent variables are factors that will be influenced by the independent variables. Especially the experienced land use and cover change by respondents in the three local communities.

Human wildlife conflicts and interaction, these come as result of independent variables influencing people's livelihoods and response of wildlife to changes in their habitats. This is recognized through damage of crops and property, loss of life, and conflicts with protected areas such as the Mosi-Oa-Tunya National Park management.

3.8. Validity and Reliability

Validity refers to truthfulness. The validity of an instrument is a determination of how well the instruments reflect the abstract concept being examined (Saunders et.al. 2011). Reliability refers to how consistent a measuring device is (Nueman, 2000). A measurement is said to be reliable or consistent if the measurement can produce similar results if used again in similar circumstances. The researcher performed a pilot study to examine the reliability and validity of the instrument. In order to enhance reliability of the findings, data collected were verified by using triangulation and respondent validation.

3.9 Summary

The methodology chapter described the design of the research and how data was collected

Hundred (200) respondents participated in the study. Instruments for data collection were including interview schedules and questionnaires and focus group discussions.

IV. CHAPTER FOUR: PRESENTATION OF THE FINDINGS AND RESULTS

4.0 Overview

The chapter presents the findings and results on effects of human-wildlife conflicts on socio-economic status among the people of Simoonga Community, Maloni area and Dambwa Forest near Mosi-Oa-Tunya National Park in Livingstone-Southern Province. Findings were obtained using questionnaires, interviews and focus group discussions. The results of the study are presented under subheadings derived from the study objectives and research questions. These include background information of the respondents, age, sex, source of income, distance to workplace and school for pupils.

Quantitative data was obtained using questionnaires from which tables, percentages and Graphs were generated. Qualitative data obtained from interviews, focus group discussions and open-ended questions from the questionnaires were analysed by coding and categorizing the emerging themes and subtitles accordingly. The findings are presented under the headings below:

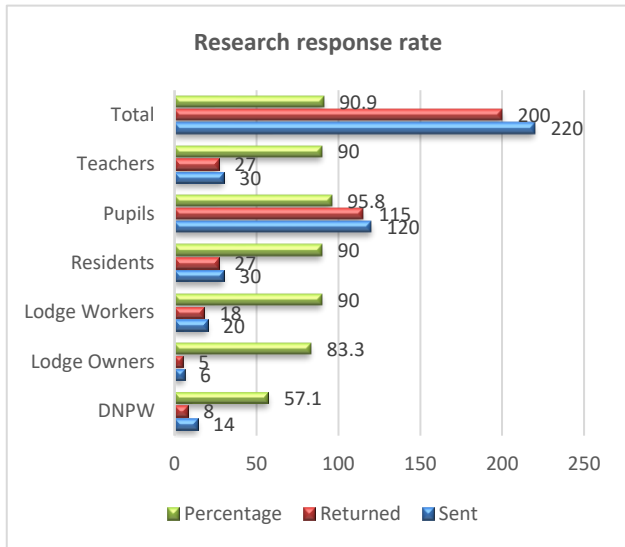
4.1 Research response rate.

Questionnaire response rate indicates the percentages of the questionnaires that were filled and returned by the respondents. The returned questionnaires were the ones analysed.

Out of the 220 respondents targeted in the study, 200 completed and returned the questionnaire which constitutes a response rate of 90.9%. This response rate is excellent and a representative of the target population as noted by (Mugenda and Mugenda 2003) who postulates that a response rate of 95.8 for pupils, 90% for teachers, 90% for residents, 90% for lodge workers, 83.3% for lodge workers and 57% for Department of National Parks and Wildlife. Therefore, results indicate that above 80% is excellent while a response rate of above 70% is very good and above 60% is good and also the

research at 50% is adequate for analysis and reporting.

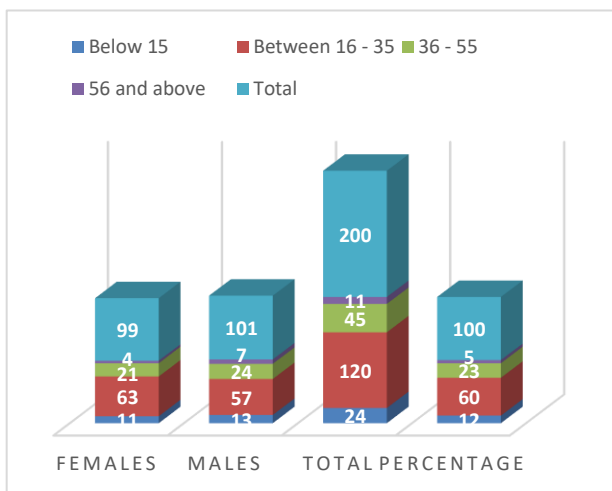
Figure 1: Responses from DPNW, Lodge Owners, Lodge Workers, Residents, Teachers and Pupils



4.2 Age of the Respondents

The study also sought to establish the age of the respondents who were engaged in the study of the influence of Human Wildlife Conflict on socio-economic welfare of local communities in Simoonga area.

Figure 2 : Distribution of Respondents by Age



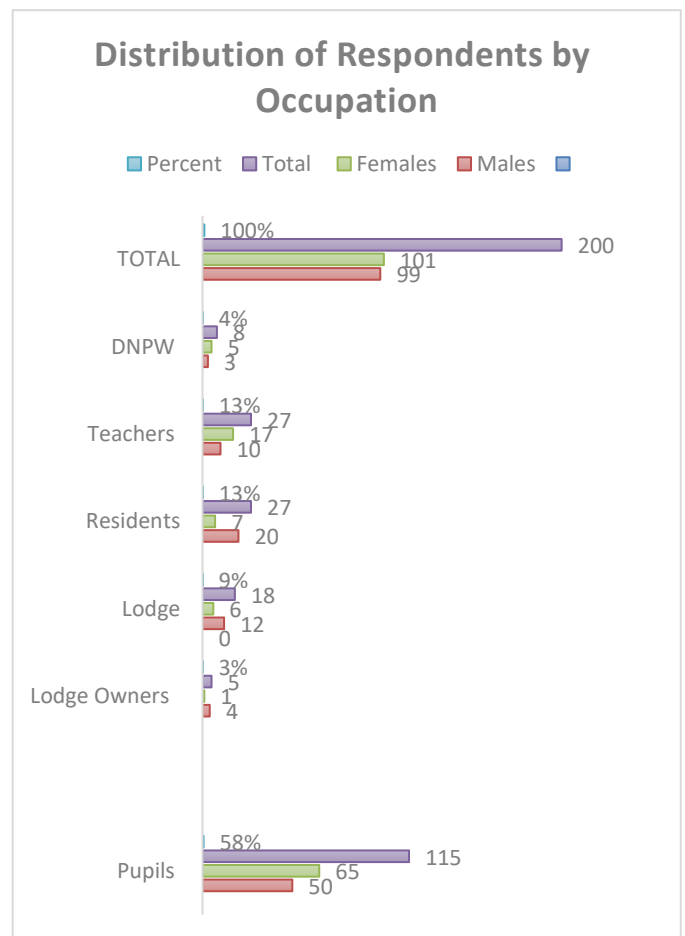
The ages have been categorized as minor in age bracket of below 15 years, youth in age bracket of 16-35 years, the middle aged from 36-55 years and elders as those 56 and above.

There is need of inclusion of all age groups in the influence of Human Wildlife Conflict so that it is holistic and everyone is involved and engaged. The results obtained are shown in figure 2 below.

4.3 Distribution of Respondents by Occupation

This study sought to establish the number of respondents from each of the groups affected by Human Wildlife Conflicts. This was necessary to ensure that all the various groups that were affected by these conflicts were included in the study. This distribution is shown in table 2 below.

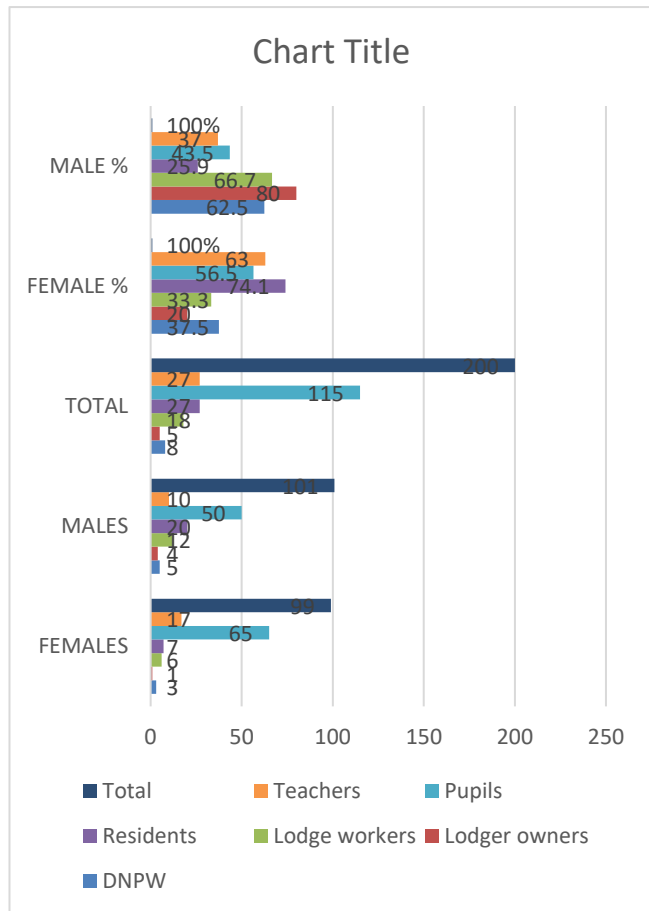
Figure 3: Distribution of Respondents by Occupation



From the findings, the majority of the respondents engaged in the research were pupils at 58%, followed by residents and teachers at 13% each while lodge workers were third at 9% . Department

of National Parks and Wildlife were represented by 4% and 3% reopresented lodge onwers. All the respondents who participated in this study were, therefore, faily represented in the study.

Figure 3: Distribution of Respondents by Gender

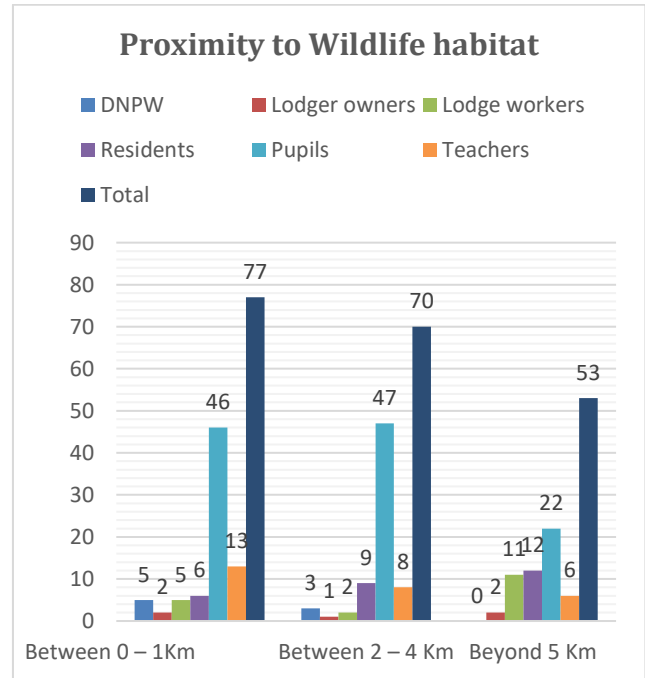


As shown in tfigure 4 above, 37.5% of the respon dents were females from Department of National Parks and Wildlife while 62.5% were males, 20% represented female Lodge Owners while 80% were males, Lodge Workers were represented by 33.3% females and 66.7% males, Residents were distributed in the percentages 74.1% females and 25.9 males, 56.5% represented females pupils whereas 43.5 were males and teachers were distributed in the percentages of 63% for females and 37% for males. It, therefore, implied that the research engaged

majority of people who were the pupils and took part in various economic activities.

4.4 Proximity to Wildlife habitat

Figure 4: Distribution of Respondents by Closeness to School, Fields and Workplace



The study sought to find out the proximity of respondents to Wildlife Habitats. This was important because the research mainly focused on residents who lived close to Zambezi River and they were the ones who were mostly affected by these conflicts.

As shown in table 3 above, 100% of the responden ts were living close to Zambezi River and more so, near Mosi-oa-Tunya national Park. This is in line with the scope of the effects of Human-Wildlife Conflicts on socio-economic status of the local people in Simoonga area whose plight is that of wildlife attack and threats.

4.5 Period of residence in Simoonga, Maloni and Dambwa Forest Areas

This study sought to establish the duration of residence of the respondents in Simoonga. This would give an indication if they understood the nature and severity of Human-Wildlife

Conflict as well. This distribution is shown in figure 5 below.

Figure 5: Distribution of Respondents by Period of Residence

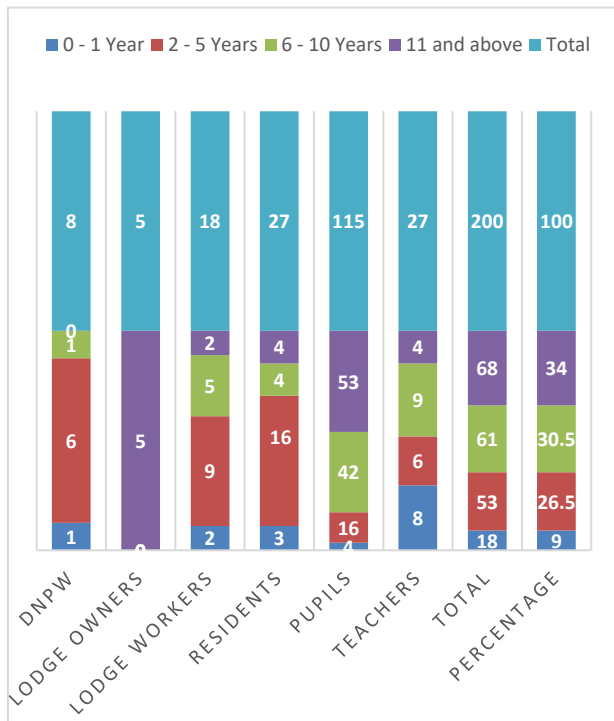


Figure 5 indicates that majority of the respondents who constituted 68.0% were residents of Simoonga who had lived in the area for more than 10 years and, therefore, understood how land use, poverty and conservation practices influenced human-wildlife conflicts on the socio-economic status of the people who live near Mosi-oa-Tunya National Park. The understanding of this report is based on the premise that the respondents had verifiable evidence of the on-going conflicts between humans and wildlife.

4.6 Transport System and its contribution to wildlife conflicts on the residents

This question sought to determine if respondents felt that roads stretched to wildlife habitats.

In an effort to determine the influence of Human Wildlife Conflict on socio-economic status of the local communities, respondents in this study were asked to indicate their levels of agreement with specific statements in the questionnaire that related to means of transport and its influence on human-wildlife conflict. The coding hired in the analysis was from 0 to 40, which according to this study represented a strong agreement with the hypothesis that human-wildlife conflicts affect movements of people living near national parks.

4.7: Means of Transport for pupils, DNPW officials, lodge workers, lodge owners, teachers and residents in the area.

The findings are as shown in figure 6.

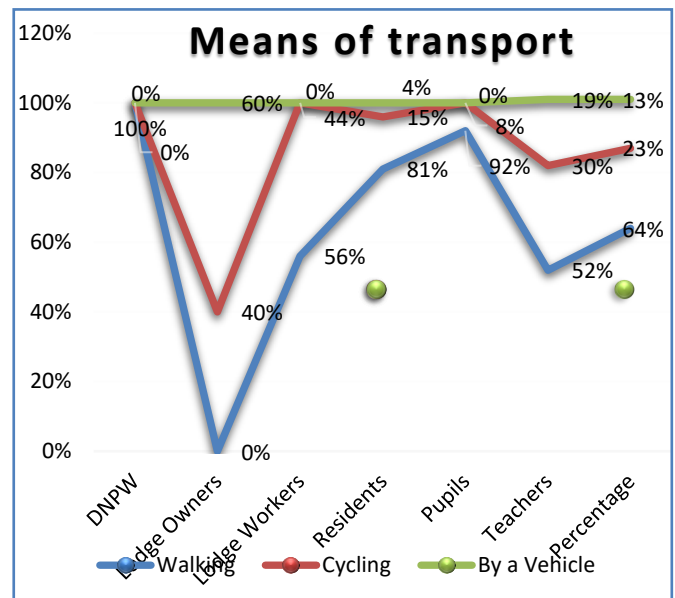
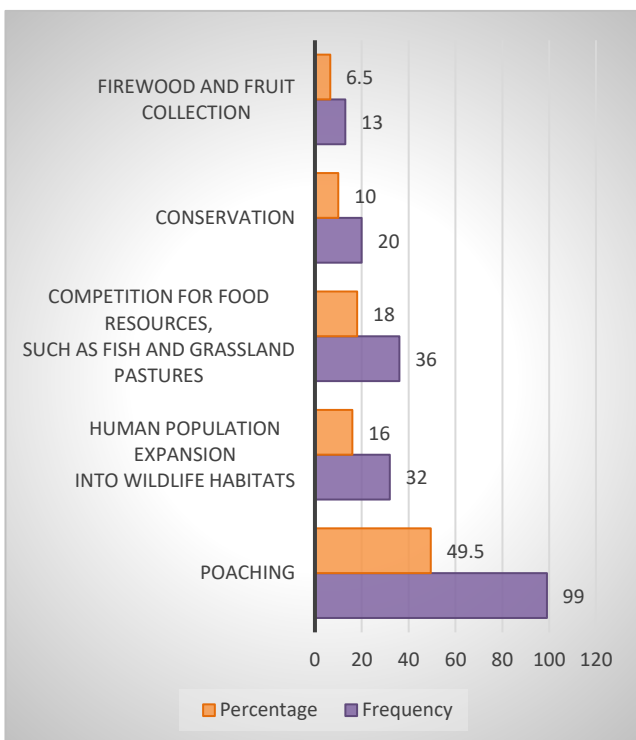


Figure 6 shows that 80% of the Respondents agreed that walking was the most common form of transport leading to wildlife habitats (the Mosi-oa-Tunya National Park in this instance), thus frequent disturbances experienced by wild animals as vehicle pass through the park. This, also, indicated that residents had serious encounters with the wild animals while carrying out their day-to-day activities. Worse still, learning for pupils was extremely affected as most of the learners would opt

to stay away from school for fear of animals. Workers in the lodges are also badly attacked by animals because of the frequent movements they have to make every day, that is to and from places of work.

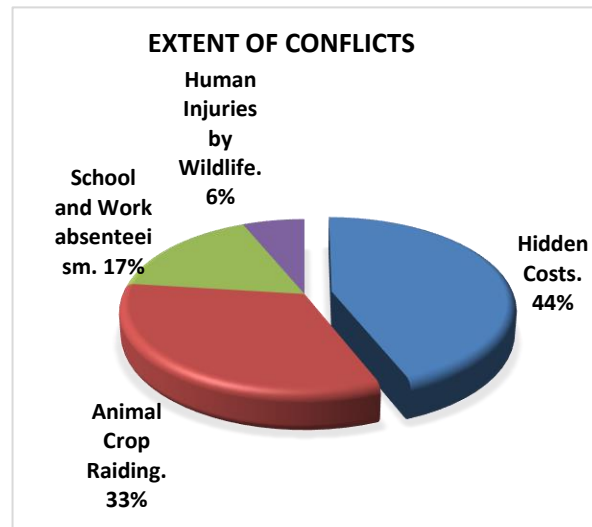
Figure 7. Causes of human wildlife conflicts in Simoonga, Maloni and Dambwa Forest Communities.



The figure above indicates that the most common cause of human wildlife conflicts is poaching (49.5%), and the underlying cause, according to this study, revolves around abject poverty in which most of the local people wallow. As humans endeavor to hunt animals for food or otherwise tusks, they end up soliciting their aggressiveness in a bit to defend themselves from human beings. 16% shows that human expansion into protected areas has its share in as far as human wildlife conflicts go. It is sad to mention that the desire for more land leaves human beings susceptible to wildlife attack. These encroachments into animal habitats fuels the conflicts that go on between wild animals and human beings.

4.8 The extent of Human-Wildlife Conflicts in Simoonga, Maloni and Dambwa Forest

Figure 8: Extent of human wildlife conflicts



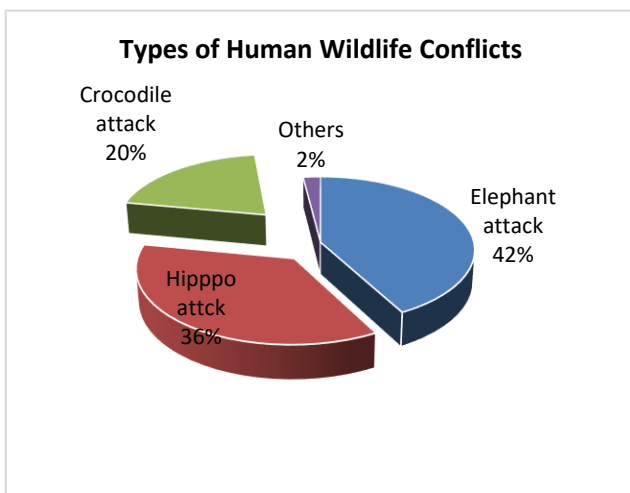
This figure above shows that there was a strong indication of animal damage to crops around the area of study. As a result, this research reviewed that 44% of the conflicts contributed to hidden costs while 33% was on the wild animal crop raiding to the extent of conflicts between human being and wild animals was the damage that wildlife wrecks on the socio-economic status of the people living in Simoonga area, Maloni and near Dambwa Forest near Mosi-oa-Tunya National park. Of that response, 17% indicated the extent to which human-wildlife conflicts have on school and work absenteeism and finally 6% on human injuries by wildlife. The human-wildlife conflicts has contributed to the socio-economic status of some local people in Livingstone district negatively.

Types of human wildlife conflicts and its affects on the socio-economic status of local people in Simoonga, Maloni and villages around Dambwa Forest Communities.

The study was conducted with a view to find out the types of conflicts that humans and wild animals grapple with. To that effect, it was discovered that the types of conflicts revolved around elephant

attack as opposed to that attacks. This was represented in figure 7, indicating that elephants attacks at 42% while hippopotamus attacks at 36% and further crocodile attacks at 20%. Crocodile attacks are common in Maramba River and the residents of Maloni community are more at risk. Finally, 2% of wildlife attacks are caused by other wildlife species such as the Giraffe, Baboons, wild dogs and many more species. In the long run, this result depicts a future that is bleak for residents if the conflicts are not checked. Besides, elephants are also threatened by humans as they may be strategizing on ways of killing them just like the endangered rhinoceros.

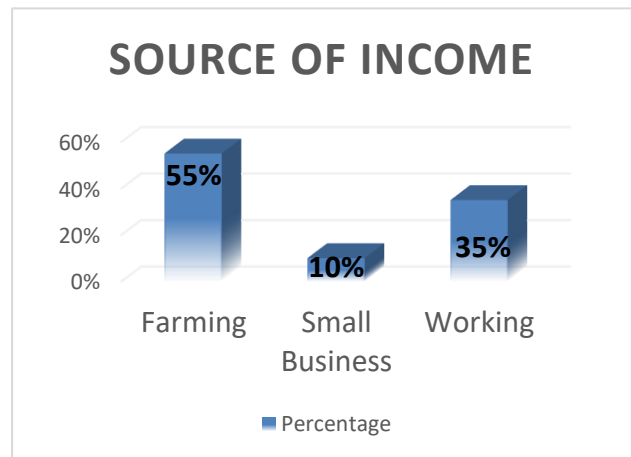
Figure 9: Types of human wildlife conflicts



4.9 Source of income of the Respondents

This question sought to determine if respondents felt that most of the residents in Simoonga were poor and their income was below 1 USD. Farming was found to be the prominent source of income for the residents, at 55%. According the findings, most of the residents around Simoonga, Maloni, and those found quarrying in Dambwa Forest were found to have a limited access to basic needs like food, clothing and shelter. These findings are shown in figure 8.

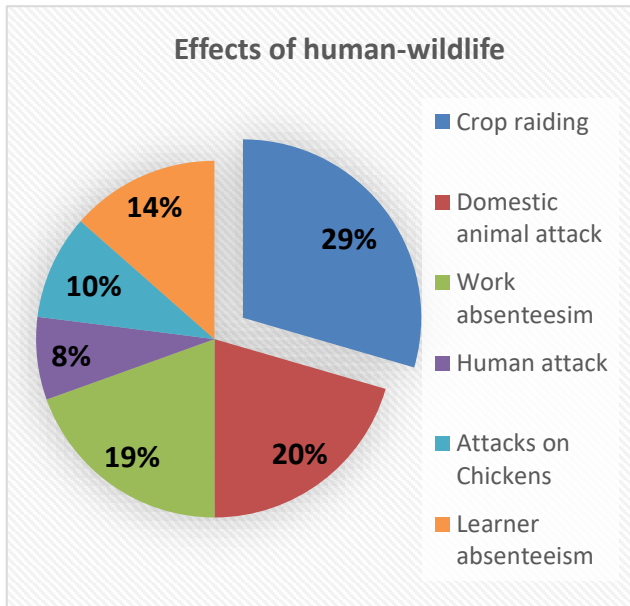
Figure 10: Sources of Income of Respondents



4.9.1 Effects of Human-Wildlife Conflicts on the socio-economic status of the people living in Simoonga near Mosi-oa-Tunya National Park

According to figure 11 below, due to the nature of poverty, Simoonga, Maloni residents and those found in the villages around Dambwa Forest were found to be suffering at the hand of wildlife attack, the worst of which was found to be crop raiding by wildlife. Food is important for every community. Therefore, a loss of crops indicates that local people have no access to descent meals as result of the damage caused by wildlife in the area of study. Crop raiding came first in the finding at 29%, while domestic animal attack came second at 20%, work absenteeism was third at 19%, while learner absenteeism was at 14% and attacks on chickens at 10% and finally human attacks at 8%. This in itself explains that human-wildlife conflicts have a serious effect on the socio-economic status of the people living in Simoonga, Maloni and Dambwa Forest according to figure elaborates.

Figure 11: Effects of human-wildlife on the socio-economic status of the respondents



Incidents of Injuries or death caused by Wildlife Attacks

This question sought to determine if respondents had experiences of injuries or death ensuing from animal attacks. The findings were shown in figure 12.

Figure 12: Incidents of Injuries or death and property damage caused by wildlife attacks

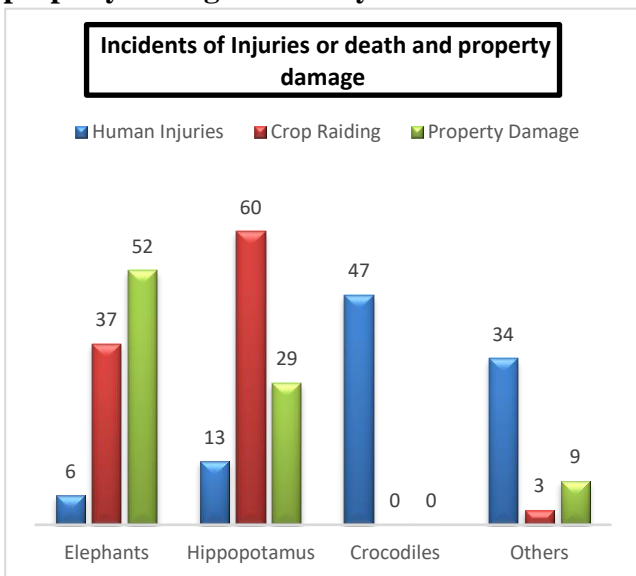
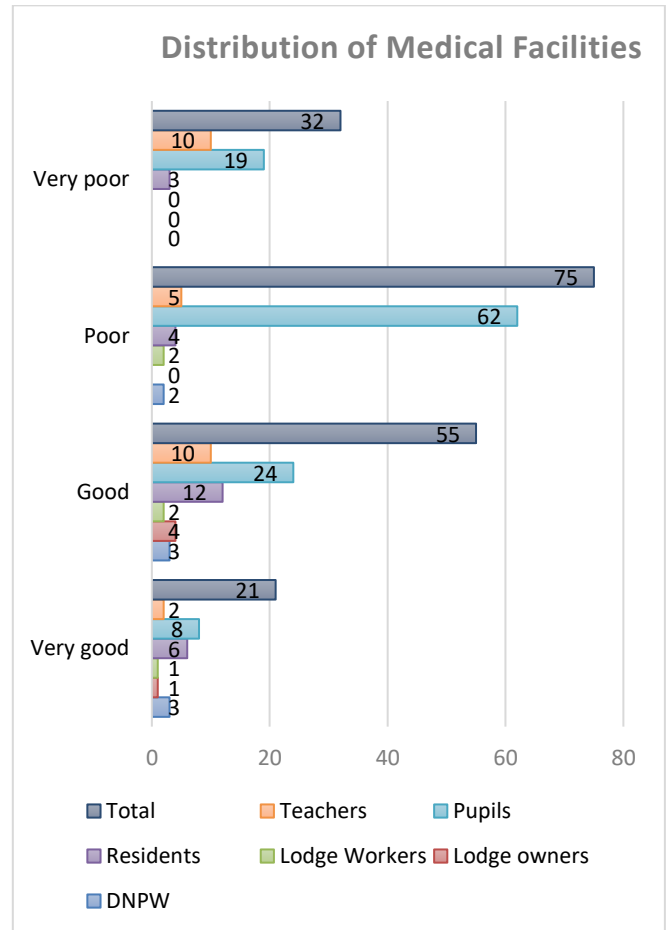


Figure 12. shows that number of human injuries caused by elephants stand at 6%, hippos at 13%, crocodiles at 47% and others at 30%. Number of crop raiding incidences were discovered in the percentages; 42% elephants, 60% hippos and others at 10% while property damage was reported in the percentages: 52% elephants, 27% hippos, and others at 9%. It is, therefore, evident that the incidences of crop raiding and property damage caused by wildlife in these areas is overwhelming. Suffice to say that these injuries, crop raidings and property damages cause serious effects on the socio-economic status among the people who reside in the areas under study

4.9.2 Status of Medical Facilities Available

Figure 13: Distribution of Medical facilities

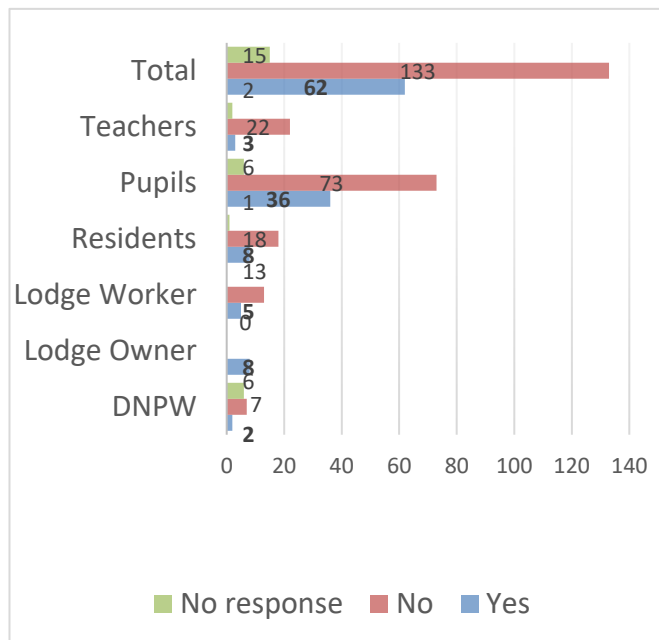


This question was aimed at finding out whether there were medical measures put in place in the event of accidents caused to human beings by wild animals. Sad to discover, this research indicates that people who fall victim to wildlife attacks can hardly access medical attention effectively unless they are taken to Livingstone central hospital which tend to be expensive to the residents. Table 4 shows that medical care in affected communities were not good enough.

4.9.3 Availability of Compensation for losses caused by wild animals

This question sought to find out the level of compensation for losses faced by residents. Figure 11 shows that respondents had no experience of relevant authorities availing compensation on the loss of crops, property, injuries or death experienced in the area.

Figure 14: Compensation by relevant Authorities



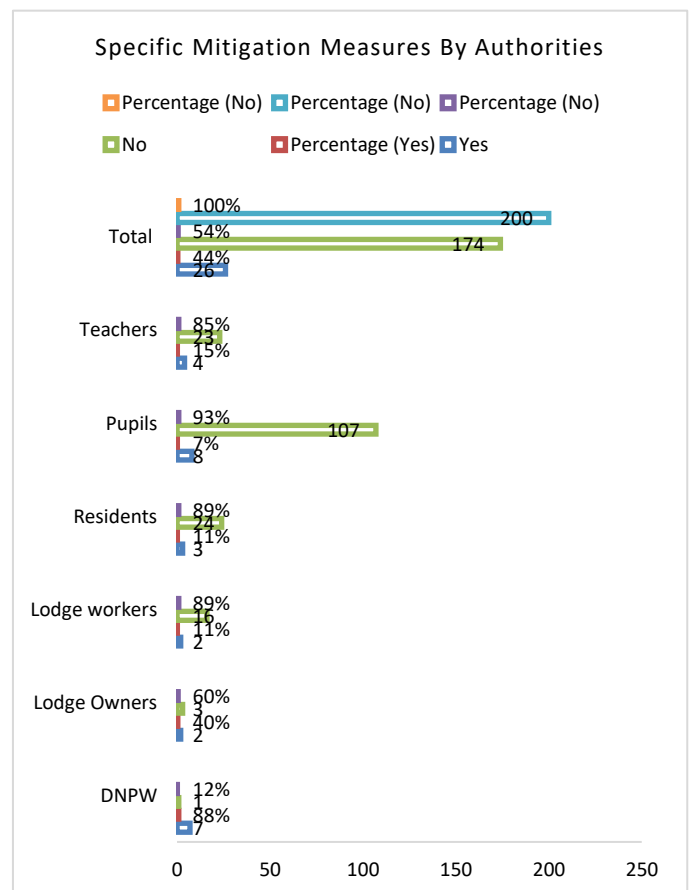
Out of the total number of respondents 66.5% indicated that relevant authorities were not given to taking measures in view of compensating affected individuals on the loss of crops, property, injuries or death. While 31% indicated that compensation is

usually done by lodge owners compensate those who die as a result of wildlife attacks and 2.5% did not give their responses. Some pupil respondents agreed that the lodge owners compensate the affected families not the government. The responses are illustrated in figure 14 above.

4.9.4 Specific Mitigation Measures being taken in the areas

The research indicated that respondents had no experience of mitigation measures meted out on account of the damage animals had caused on their property or lives.

Figure 15: Specific Mitigation measures by authorities



The figure above shows that 54% of the respondents strongly disagreed with the existence of well-defined measures taken for restricting the human-wildlife conflicts. However, 44% indicated that the

government was attending to issues bordering on damage caused by wildlife. This in the end brought out the understanding that the mitigation measures were there except that they were not enough to rise to the occasion.

4.9.5 Awareness campaign on the importance of conservation of wildlife resource

Awareness campaigns on the importance of conservation of wildlife resource is very important if human-wildlife conflicts are to be cramped. According to the study, the figures show that most of the residents were not aware of conservation campaigns in the district. This proves that curbing these conflicts may continue proving a challenge to the relevant authorities. 3% of the residents were found to be aware of the conservation campaigns, 10% were lodge workers, 12% teachers, 20% lodge owners, 47% were officials from the Department of National Parks and Wildlife (DNPW) and 8% pupils. Those who agreed that the conservation measures are in place were the officers from the DNPW. According to the officers interviewed, they said that the conservation campaigns were mainly done through the community Based Natural Resource Management (CBNRM). Understanding community tolerance and perceived risk are both important in the context of HWC management.

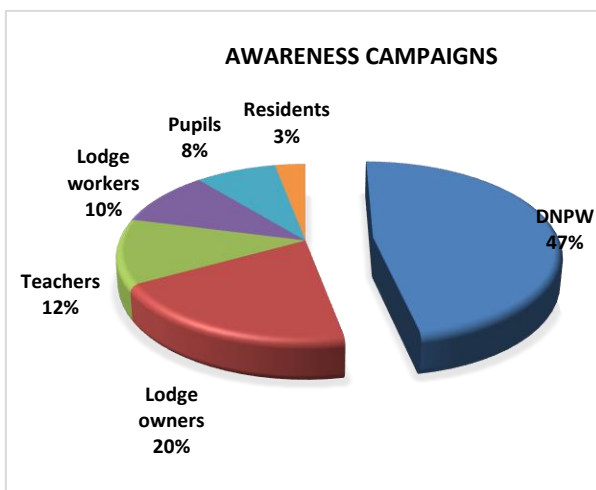


Figure 16: Awareness of Conservation Campaigns by the local people.

4.9.6 An interview with the officer in charge of CBNRM

The office from the Department of National Parks and Wildlife concluded that the number of elephants in Africa has decreased over the years, especially in Mosi-Oa-Tunya National Park.

The main reason for the reduction is the killing of elephants for their tusks of ivory. In the recent years ago, poaching became commercial and since then the elephant population has decreased dramatically. The other endangered species such as the rhino was also killed by some Livingstone residents who were later imprisoned in Livingstone prison. The officer believes that the effect of human-wildlife conflicts on the reduction in elephant numbers is negligible. He said that the shooting of problem elephants and hippopotamus that keep returning to communities injure and sometimes even kill people and destroying crops can occur, but these numbers are small in relation to the number of animals killed by poachers. However, he points out, the negative attitudes of people affected by crop-raiding and other human-wildlife conflicts might result in an increased recruitment of poachers in the long term. The officer also concludes that the human-wildlife conflicts have not decreased, at least according to the people he has spoken to. His explanation of the decrease is that the elephants learn to avoid densely populated areas and areas where poaching tends to occur.

According to the findings by the researcher, among the causes of HWC are the encroachment of protected areas such as the Dambwa Forest where a lot of people going there to burn charcoal. The burning of charcoal has been contributing to the destructions of wildlife habitat and the wildlife goes far in people's fields to look for food hence attacking people, damage property and crop raiding sometimes even kill the people they become in contact with.

Furthermore, the officer officer on hidden costs she said that even as much as they are aware that the conflict between humans and wildlife comes with costs, the government has no provision in the policy to carry out compensation measures instead they have programmes only on mitigation measures, preventive measures and conservation measures which the residents in these areas have to be willing to follow and participate in order to achieve the goals.

The officer also explained to the researcher which programmes on preventive measures which are being carried out by the department. The officers through CBNRM have got a laid down programme on teaching the residents especially on co-existence between wildlife and humans in order to avoid human-wildlife conflicts and its consequences. In some areas humans and wildlife seemingly co-exist within a 'tolerance habitat' (Athreya et al. 2013), while in other places retaliatory killing of animals is dictated more by the perceived risk of local people than by the actual impact of the event. i.e the response is disproportionate to the initial incident (Inskip et al. 2013). The officer explained that the discussions with the community members are done through the community leaders such as village headmen and women and group chairpersons.

V. CHAPTER 5: RECOMMENDATIONS/CONCLUSION

5.1 Land Use and its influence to Human Wildlife Conflict on Socio-economic welfare of local communities

The study established that land use highly influenced human wildlife conflict on socio-economic welfare of local communities in Livingstone. According to the study many homesteads were closely built within wildlife habitat which was the Zambezi River. Road transport extended to wildlife habitats thus continuous disturbances experienced by wild

animals through the motorcycles used by human beings for transport. Farmers also used the modern technology like the tractors for agriculture which cause serious disturbances to wild animals.

Changes to land use and land cover have effects in the level of human wildlife conflict, as well as on the availability of suitable habitat for wildlife. (Woodroffe et al. 2015) also arrived at similar conclusions and added that, "the reduction of natural habitat sizes also reduces the amount of available natural food, which could then promote conflict in the form of crop raiding.

Acknowledging the causes, hidden costs on socio-economic effects, mitigation measures and the role of conservation plays and minimizing them is thus vital for ensuring both wildlife conservation and human wellbeing. When human-wildlife conflict are poorly researched and specific policies to address them are lacking, they contribute to this discrepancy. First, framings of human-wildlife conflict accentuate visible aspects of the issue (Dickman, 2010). Immediate conflicts can be, e.g. crop and livestock loss, injury and loss of life.

However, apart from attacks by wildlife on humans, human-wildlife conflicts can be vice-versa where people are also killing the wildlife through poaching especially the endangered species such as the elephants and the rhinoceros because of their value of money. For example, among the rhinoceros in the Mosi-Oa-Tunya National Park, one was poached in last year 2018 by some residents who are now facing the jail sentence and the young rhino was beaten by a snake and later died. These two incidences contributed to the reduction in the number of the most wanted animal. Therefore, in order to reduce on the killing of the precious wildlife, the government of Zambia through the Department of the National Parks and Wildlife have been guarding the animals throughout. They are the most guarded wildlife in the park.

In the same development of guarding the rhinoceros, the researcher recommends that the

government and the cooperating partners should also install some security camera because it is very risk for the officers from the Department of National Parks and Wildlife guarding the animals without being monitored through the security cameras and it is very hectic following the animals throughout the day and night. Furthermore, for the guarding to be effective, the officers who guard the rhinoceros should be motivated by adding more to their incentives, conditions of service and increase their salaries because what they do is so hectic and risk to their lives.

5.2 Education and training activities for local people

The findings of the study indicated that no education and training activities were offered to the local people of Simoonga, Maloni communities and villages around Dambwa Forest Reserve concerning human-wildlife conflicts. Arising from this, it is recommended that education and training activities at different levels be offered. Education and training activities at different levels, for instance in schools or in adult education arenas such as farmer field schools, would have the objective of disseminating innovative techniques, building local capacity in conflict resolution and increasing public understanding of HWC. Educating rural villagers in practical skills would help them to deal with dangerous wild animal species and to acquire and develop new tools for defending their crops and livestock. Over time, it would result in a change of behaviour amongst local populations and would contribute to reduced risks, improvements in local livelihoods and a reduction in their vulnerability. Furthermore, education and training would promote commitment towards conservation, raise awareness on the essential role of wildlife in the ecosystem functioning and its ethical and economic value, as well as its recreational and aesthetic importance. The school curriculum from early childhood to tertiary should as well conclude wildlife

conservation and how to reduce on the human-wildlife conflicts in the protected areas. By doing so the skills acquired from school can be shared with community members.

According to the study, wildlife conservation practices highly influences human wildlife conflict on socio-economic welfare of the local communities. Majority of the local residents have no knowledge and do not clearly understand what wildlife conservation practices are and they are also saying that awareness campaigns on the importance of wildlife are rarely done in the community. Additionally, they are saying that there are no environmental community-based projects that cater for sources of livelihoods for members of the community.

Adding that the benefits of living with wildlife generated through community conservation projects outweigh the costs and need add to the promotion and advocacy of conservation as a means to achieve development in local communities generates often unrealistic expectations and unrealized goals that can be problematic for the future of conservation support.

While scholars state that coping strategies and alternative livelihoods are key for individuals and households to reduce vulnerability to human-wildlife conflict (Dickman 2010), these studies often don't consider other processes within the rural context which impact upon these alternative livelihood strategies.

5.3 Wildlife Conservation Practice and its influence to Human Wildlife Conflict on Socio-Economic welfare of local communities.

The impacts of crop loss and stock predation are compounded when farmers' and pastoralists' alternative livelihood strategies are also undermined by other natural resource conflicts, such as failure to herd the cattle due to fear of being attacked by wildlife while heading the cattle, or through institutional gaps such as insecure land

rights and loss of access to resources. Indeed, in relation to human-wildlife conflict, 'context matters' (Stedman 2012), as the female farmer in Simoonga area illustrated, the effects of the elephant raiding her crop is far more significant than the visible crop loss. The effects are multi-dimensional, both visible and hidden. Her loss of livelihood is two-fold where maize production is her alternative livelihood to cope with livestock rustling and livestock production is her alternative livelihood to cope with crop loss from elephants.

The personal security of humans living in competition with wildlife is challenged by the potential threat of attack by a wild animal, but the Dambwa Forest case shows that this is further compounded by the threat of violence elephants since they are very close to Mosi-Oa-Tunya National Park. Health insecurity from being attacked from wildlife may have implications for food and economic security through a person's reduced capacity to pursue their livelihood.

5.4 Recommendations on effects of human-wildlife on socio-economic status on the people.

There is need for the government and the international organization such as WWF through community conservancies reinvest a percentage of earnings into community development such as education bursaries, these communal benefits may help offset individual costs of the residents living with wildlife in the protected areas.

CBNRM also involves management. This implies that there should be rules or regulations governing how, when, or in what quantity the resource can be used. These rules must be understood and agreed to by community members and recognized and respected beyond the community. Therefore, this situation may minimise human-wildlife conflicts in these communities. This creates opportunities for dialog and idea-exchange with organizations such as WWF. WWF and the DNPW can arrange meetings and seminars

where they discuss and find solutions to problems and villagers are always facing. Since WWF always works through the village committees, the researcher believes that local farmers and the residents have a possibility to affect the decision-making concerning the wildlife and find solutions to the problems of conflicts.

The officer stated that villagers have a chance to affect the decision-making concerning the wildlife. They can express their opinions, exchange ideas and learn about preventive and deterrent measures at the village meetings. He mentions that the number of elephants has decreased over the years, mostly because of poaching. The human-wildlife conflicts have however increased, because the population around these communities is growing and villagers are settling down closer to protected areas in Mosi-Oa-Tunya National Park. He concludes that "there is not enough land for example the elephant corridor is being disturbed humans through constructions of hotels and lodges and it is one the major underlying causes of the conflict. As a solution he suggests better land use planning to prevent communities to come closer to the park. Another suggestion is to establish buffer zones between communities, but he points out that this requires even more land.

To prevent the human-wildlife conflicts the government should give money to farmers to settle in other areas so that no one has to live close to the park. The Sibbuku (the community leader) mentioned that there are more tensions from human-elephant conflicts where there currently are wildlife corridors, as in Simoonga area since a larger number of elephants passes through those areas. He also says that he is aware of the conflict between communities of Simoonga and workers from DNPW and explains that many people in the community are involved in illegal activities such as charcoal burning and that the villagers therefore often have negative attitudes toward the DNPW workers. However, some members from other

communities in Livingstone are involved in illegal poaching of wildlife.

He concludes the interview by saying that he thinks the problems concerning human-wildlife conflicts will get bigger because of the increasing population and farming activities and any other encroachment of the protected area and he once more emphasizes the importance of awareness-raising.

Firstly, Donor Agencies through Non-Governmental Organizations dealing in Environmental Conservation should launch Community Based Projects aimed towards the conservation of wildlife resources. Secondly there should be the introduction of the community Based Environmental Projects which should focus on all the studied objectives. And thirdly, the Zambian Government through the Department of National Parks and wildlife should complete fencing the areas close to the elephant corridors and the poor local communities living near the Zambezi River and the Maramba River.

However, in this development, the government can come up with a policy on compensation by having fixed amounts to be given to the victims of human-wildlife conflicts according to categories. This will help both the government and the victims of HWC by avoiding over paying or under paying the victims. The human rights will also be respected apart from conserving wildlife.

Villages close to permanent water sources are especially prone to visits by elephants. Although the animals usually come into the fields at night time, when crops are ready, they can come at daytime as well, even on a daily basis. The farmers in Maloni area grow maize near the Maramba river are most often affected by elephants.

Since both humans and elephants require large areas of land, the spatial overlap is identified that as the underlying cause of the human-elephant conflicts, there is need for enough space for elephants to be able to migrate long distances in

their search for food and water and humans need land to cultivate to feed a fast-growing population. With more land being cultivated, less and less areas are left unexploited. However, Livingstone city is a small city including the park. This has made the poorest that are forced to cultivate the land nearest protected areas, since there is not enough available land. The researcher observed that protected areas like Mosi-Oa-Tunya national park will be subjected to an even higher pressure in the future, due to the rapid population growth. Since the land cannot be expanded our agricultural activities and settlements much further, the only way was is to find alternative land such as the out skirts of Livingstone elsewhere to allocate the residents of these affected communities for making farming more effective.

5.5 Growing alternative crops

The government and NGOs operating in Livingstone especially in the areas near the Mosi-Oa-Tunya National Park should consider promoting cash crops that are less palatable or unpalatable to wildlife. These crops could include chilli and possibly cotton; however, it would also be essential to ensure that there is market for such crops. Initiatives such as Community Markets for Conservation (COMACO) may be of value in Livingstone to provide more income for participating households. As such, they could limit growing crops for consumption to areas surrounding their villages, thereby ensuring that their household food security is not compromised. This can be done through selling of the cash crops and earn money to meet their socio needs.

5.7. Economic Responses

Economic incentives are widely applied to increase tolerance for predators and other wildlife (Bruskotter J.T et al, 2014). Compensation typically involves reimbursing with cash or in-kind payments people who have experienced wildlife damage to crops or livestock, or who have experienced personal injury

or threats from wildlife. The idea behind these payments is to increase tolerance for wildlife. Common challenges associated with compensation schemes include the difficulty of verifying the cause of damage; slow, cumbersome, or insufficient payment; moral hazard (e.g., farmers may have little incentive to protect livestock if they can obtain economic compensation for depredation); high transaction costs; and problems of trust and transparency (Linnel J.D, Odden.J, Mertens 2012). In Zambia there is no policy on compensation after the loss of property, injury or even loss of life as a result the Government of Zambia does not compensate the affected people.

Performance payments compensate people on the condition of wildlife abundance. These payments establish a direct link between monetary payments and the production of desired conservation objectives (Linnel J.D, Odden.J, Mertens 2012), but this does not happen in the Mosi-Oa-Tunya National park.

Findings on Poverty level and its influence to human-wildlife conflict on Socio-Economic welfare of local communities. The study established that majority of the respondents were in agreement with the positive role that poverty played in Human Wildlife Conflict. Majority of the respondents at 76% of the people are living in poverty. This indicated that most of the residents were poor and could not access some of the basic needs like food, clothing and shelter. 66.6% noted that majority could not access essential commodities like water. However, 68.8% indicated that incidences of poaching existed whereby residents killed hippopotamus for meat as a source of food.

5.6 Alternative livelihood activities

The residents of Maloni. Simoonga and villages around Dambwa Forest Reserve areas should be engaged in alternative livelihood activities for survival apart from agriculture. To the extent that feasible options might be available, residents of

Maloni, Simoonga community and villages around Dambwa Forest area could be encouraged to explore and engage in alternative or supplementary other livelihood activities that are less vulnerable to conflict with wildlife. Bee keeping and honey production may be a viable alternative, and has become a profitable activity in many regions with increased global demand for organic honey. In Songwe and Mukuni areas the residents in Livingstone are now being involved in bee keeping as a livelihood activity to reduce crop raiding. More so, bee keeping has proved to be a successful deterrent to wildlife in HWC prone areas, which are affected mainly by Elephants (Hoare, 2012; Harich et al., 2013).

In the same development, the residents can also be involved in making and selling of curios since Livingstone is a tourism capital and attracts a lot of tourists who usually buy these curios. Even if the cutting down of trees for curio making contributes to deforestation and when the residents go the bush to cut down the trees can result elephant encounters with humans. However, sustainable tree cutting can be encouraged to avoid deforestation. The residents also can go to the areas where elephants do not reach and also go in the bush when elephants are not searching for food and water.

The high levels of HWC in the study area and resultant loss of income have meant that many households are unable to pay school fees for their children, especially those in secondary school and colleges, leading to many pupils stopping education and resorting to early marriages. In this regard, this reduced access to education due to loss of income and a lack of financial resources is a hidden cost of human-wildlife conflict.

5.8. Establishing the specific mitigation measures to be taken as to improve the socio-economic status for the people living in Maloni, Simoonga and villages around Dambwa Forest Reserve near the Mosi-Oa-Tunya National Park.

5.9. Governance and Policy on mitigation measures

Public policy is one important ingredient in strategies to promote coexistence of people and wildlife (Clark SG, Rutherford MB, Mattson, D.J 2014) and helps to reduce on human-wildlife conflicts. As a result, there is a diverse suite of policy responses has been used to address human-wildlife conflict. Some of the most notable, particularly in Europe and North America, include stable political institutions, national laws and international agreements, effective law enforcement, and wildlife-friendly economic and agricultural policies (Chapron G, et al 2014). This situation of policy has been helping the parties concerned such as the government, investors such as lodge owners and the residents to draw the boundary on socio-economic effects caused by wildlife and at the end have a win-win situation.

Mitigation may be more difficult in regions where education levels are more limited or there are specific historical or cultural attributes (such as herding or hunting) that predispose communities to conflict. In this development, some residents show residence in following the conservative measures especially those who burn charcoal in Simoonga community and Dambwa Forest refuse to comply with the law of not cutting trees indiscriminately giving reasons that they do not have the means of finding money for their survival specially to pay the school fees.

A wide range of approaches encourage people to work together to resolve wildlife and conservation conflicts in a proactive way, including education and information sharing, co-management, collaborative and participatory

planning, risk assessment, strategies to change perceptions, poverty alleviation programs, community-based natural resource management, and other forms of stakeholder engagement and processes (Clark SG, Rutherford MB, Mattson, D.J 2014).

Findings on Wildlife Conservation Practice to Human Wildlife Conflict on Socio-Economic welfare of local communities is not welcome publicised. Majority of respondents in the study did not clearly understood what wildlife conservation practices were. Therefore, the researcher recommends more sensitizations to be carried out to educate the residents. This can be done through community meetings, workshops and some drama which will play a vital role in educating the residents in the communities to learn and be aware of wildlife conservation practices in Human-wildlife conflict. However, since that awareness campaigns on the importance of wildlife were rarely done in the community and some of the teachers, lodges workers and lodge owners and some learners agreed that they are aware of them, DNPW can take advantage of the situation and use these residents to educate others. Further, on the recommendation, each community should have Environmental Community Based projects that catered for sources of livelihoods for members of the community. Following the researchers' observations, the local people of Simoonga, Maloni and villages around Dambwa Forest Reserve Areas should be involved in the conservation activities using traditional ideas in order to conserve the wildlife.

5.9.1 Electric fences and trenches

Physical exclusion methods such as electric fences and trenches are commonly used to deter elephants from entering farmland and human settlements. Substantial costs of construction and long-term maintenance confer challenges for larger scale application of these physical barriers,

especially in fragmented landscapes with high forest/farm frontage (Kioko et al., 2008; Perera, 2009; Wijayagunawardane et al., 2016). Long-term effectiveness may be further hindered by design, responses to reports of fence breaks and fence-breaking animals, and overall PA enforcement and management (Graham et al., 2009b; Massey et al., 2014). Studies show that once African elephants learn that their tusks do not conduct electricity, they may use their tusks to break an enclosing electric fence, resulting in costly damage to the fence (Graham et al., 2009a; Mutinda et al., 2014). Physical barriers also negatively affect long-term survival by further isolating already fragmented elephant populations, disrupting movement, and access to seasonal food and water resources, and impeding gene flow between herds (Lee and Graham, 2006). Fencing effectiveness remains largely unexplored in Asia.

The residents of Maloni community appreciated the great, great grandson for David Livingstone for working closely with the Department of National Parks and Wildlife and for fencing part of the park across the Victoria Falls road to block elephants from crossing the road through the elephant corridor and raid their crops, damage their property or even attack them. This has helped reduce human-elephant conflict in Maloni but not the crocodile attacks in Maramba River by promoting this conflict-mitigating activity. Conflict alleviation is a two-sided equation. Both wildlife and people are in conflict.

5.4 Determining local peoples' awareness of the role that conservation plays in addressing human-wildlife conflicts.

5.9.1 Conservation awareness on the residents

Risk perception is one important ingredient in wildlife conflict, and there is often a mismatch between perceptions of risk, actual degree of risk, and proportional response to risk (Dickman AJ.2010). Factors that influence perception of

conflict risk How conflicts are framed by the media can shape public opinion (Rust NA. 2015) and education may encourage behaviours that reduce risks of conflict. Enforcement may keep people outside of protected areas, but both education programs and enforcement are challenging and require long-term commitments (Nyhuis P.J & Tilson R. 2010). Education can be done through the inclusion of mitigation measures in the school curriculum and also teach the local residents on the mitigation measures. This will help the community to be aware of the prevention measures.

According to the findings, most of the residents were not aware not of the conservation measures to help them reduce the HWC in their communities. It was reviewed that the their no education activities being carried out by the DNPW officials to educate them. But this was contrary to the officer's revelations which they told the researcher that they go around the communities to educate the people. Therefore, it was discovered that most the residents are ignorant on conservative measures to be taken hence being found in conflict with the wildlife and the Zambian Laws on natural resources as a wildlife and its habitats.

Other factors limit opportunities for communities to work together to reduce conflict. Some people may be unwilling to overcome distrust and different values to engage in meaningful dialogue, there may be a mismatch in the scale of the problem and parties involved, and legislation and enforcement tools may not be sufficiently flexible (Redpath SM. *et., al* 2013)

In Dambwa forest some people go their cut down trees and burn in order to make charcoal to sale and make a living. This is causing deforestation in the forest and depleting the wildlife habitat. Reporting on local community participation, (Sebele 2010) indicated that community participation in natural resources management enables the use of local knowledge, which can be of major importance in ecotourism development as

well. Community participation is important because it helps to facilitate the protection of cultural and natural resource attractions that serve as a basis for ecotourism.

In the same development, some people are encroaching the protected land claiming that they have no land to live on and to carry out their farming activities as a means of survival. Consequently, others have been in conflict with the law on the protected land claiming that the land is theirs left for them by their fore fathers hence refusing to move out. For example, there is a family which has taken the government to court over the government possessing their ancestral land.

However, the encroachment on wildlife habitats makes the residents to be in conflict with wildlife. Their inabilities to access water to use to water their gardens especially in Maloni force them to use the only risky but available river water and thus the continuous confrontation with crocodiles in Maramba River.

A nature conservation landscape where both humans and elephants can co-exist should be created. The researcher also recommends the method of block-farming, where several farmers cultivate a common area of land, to facilitate cooperation so that the responsibility of preventive and deterrent measures can be shared among the farmers.

Among other conservation programmes, more areas as wildlife corridors must be created to avoid further conflicts. Without them, national parks face the risk of becoming isolated islands, insufficient for migrating animals like elephants. Through the creation of buffer zones around reserves the protection of wildlife can also be enhanced and the risk of human-wildlife conflicts can be reduced but for Mosi-Oa-Tunya National Park is small to creation of buffer zones and farming is not allowed within the buffer zones,

some activities like cattle grazing and the retrieving of firewood may be permitted. However, since most of these residents just need small portions of farming land and they are poor, they should be encouraged to find alternative sources of income such as small businesses.

CONCLUSIONS

Human conflict with wildlife has contributed to the decline and extinction of many species, particularly large terrestrial carnivores. Important underlying drivers of conflict include expanding human populations and associated growth in agriculture and livestock, urbanization, energy, and transportation.

Numerous factors may predict why some wildlife are more likely to damage crops, or kill or injure livestock or people. These include animal life stage, sex, season or time of day, proximity to cultivation, and proximity to natural habitat. Frequency of interaction is often an important predictor of conflict between people and wildlife.

Human relationships with wildlife are influenced by differences among different stakeholder groups over perceived threats to lifestyles, values, and worldviews. Risk perception, historic context, and social, cultural, and political influences can increase or decrease opportunities for conflict.

Throughout history people have killed animals to minimise or eliminate property damage or threats to human safety. Diverse lethal and non-lethal methods are available to prevent conflict before it occurs or to ameliorate the compensation or insurance payments. There is growing recognition that people and wildlife can co-exist in human.

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