

**THE IMPACTS OF HUMAN ACTIVITIES ON WILD-LIFE CONSERVATION IN
KAHUZI-BIÉGA NATIONAL PARK IN DEMOCRATIC REPUBLIC OF CONGO**

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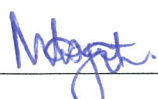
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APPROVAL

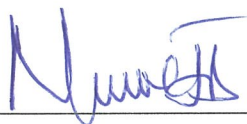
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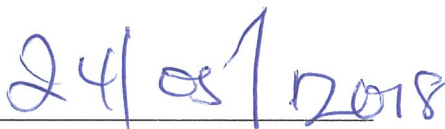
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Date

DEDICATION

dedicate this Thesis report to my father without him all this would have not been possible if it were not for your undying support and love that has always been forthcoming.

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LIST OF ABBREVIATIONS AND ACRONYMS

- DRC**-----Democratic Republic Of Congo
- IECWG**-----Human-Elephant Conflict Working Group
- CHAT**-----Cultural-Historical Activity Theory
- WWF**-----World Wildlife Fund for Nature
- APF**-----International Anti-Poaching Foundation
- U.S**----- United States
- USA** -----United States of America
- UCN**-----International Union for the Conservation of Nature
- UNEP**-----United Nations Environment Programme
- WCS**-----Wildlife Conservation Society
- IRF**-----International Ranger Federation

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ABSTRACT

The research topic was "The impact of human activities on wild-life conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo." The main objective of this study was to establish how human activities have affected wildlife conservation in Kahuzi-Biega National Park in the Democratic Republic of Congo. This study used quantitative method for data collection. It is economical and efficient in data collection. It is used in investigating relationships between variables. It is very precise and objective; more focused and out-come-oriented. Data are represented quantitatively and processed using quantitative models (inferential statistics). The study findings were that Legal issues related to hunting/poaching are essential towards wildlife conservation, such as those on regulation of hunting, on licenses and on ownership of wildlife. Among the most common protection rules are those which set out prohibitions applicable to hunting. This was in line with that these prohibitions are of different types. Limitations in the quantity of animals which may be hunted (for example under a single license, or within a certain period) are not common in the principal legislation, as they are more frequently placed in subsidiary legislation periodically adopted or incorporated as license conditions. It was concluded that Poaching is the illegal killing of wildlife, undertaken for reasons that may include revenge, meat for food or sale, tradition or money. Poachers might be poor locals from the area to foreigners capitalizing on the lucrative illegal wildlife trade. The researcher recommended that there is need to protect Forests/tree planting which is critical for wildlife conservation as they provide many benefits. Tree planting that later turns into natural and artificial forest has the following advantages to wildlife: They provide habitat which is the most obvious, they provide breeding grounds for species that aren't typically common to forests. My favorite example that I want to see is the marbled murrelet, They are also key to helping filter water and slow the run off of soil into water, this helps not only animals living in streams but also dams that generate power, Next up they are critical for certain species of fish.

CHAPTER ONE

Introduction

1.1 Background of the study

Wildlife conservation has become an increasingly important practice due to the negative effects of human activity on wildlife such as poaching. Poaching which is the illegal hunting or capturing of wild animals usually associated with land use rights. It is usually undertaken for reasons that may include revenge, meat for food or sale, tradition or money.

Fewer natural wildlife habitat areas remain each year due to high demand for human settlement and other human activities that exert pressure on wildlife habitats. Moreover, the habitat that remains has often been degraded to bear little resemblance to the wild areas which existed in the past. Habitat loss due to destruction, fragmentation and degradation of habitat is the primary threat to the survival of wildlife in the United States and in sub Saharan Africa (Burger et al., 2004).

1.1.2 Historical Perspective

It is evident that Human activities affecting wildlife and their habitats are pervasive and increasing world over. Effects of these activities are manifested at all ecological scales, from short-term changes in the behavior of an individual animal through local extirpations and global extinctions (Henson & Grant, 2009). Consequently, understanding the effects of humans on wildlife and wildlife populations, as well as devising strategies to overcome these effects, is an increasing challenge for resource managers. Given the conflicting mandate to both encourage human use and to protect sensitive natural resources in national parks, developing reliable strategies for assessing and monitoring the effects of human activities on natural resources is essential in ensuring appropriate stewardship of these resources, (Green, 2010).

(Francel & Schnell, 2012), virtually all human activities can affect wildlife populations either positively or negatively. Those activities that are likely to have adverse effects can be divided into two; those that function primarily by altering the physical environment in a relatively permanent way and those that cause changes to an animal's behavior. Activities that alter the physical environment change the amount or the suitability of habitat for a species. Widespread

and large-scale examples include activities that directly alter the structure and composition of the landscape, such as agriculture, forestry, livestock grazing, and unregulated off-road vehicle use. Fernandez, 2000) shows that the interaction of human activities and wildlife have ecological effects on these activities and vertebrates which are readily or perhaps less obvious were some of the non-consumptive human activities that do not appreciably alter the physical environment but nonetheless can affect wildlife. These human recreational activities such as hiking, wildlife viewing, and boating all common activities for visitors in parks greatly affect wildlife conservation. As recreational use increases in wilderness and other protected areas, sensitive wildlife species may be increasingly affected by these activities (Steidl and Anthony, 2000).

Blair, 2012), explains that the magnitude of effects of recreational activities on wildlife is influenced by many factors that are type, duration, frequency, magnitude, location, and timing of the disturbance, as well as the particular species of interest. Although the interactions of human activities with wildlife are typically of short duration, cumulatively they can effect wildlife populations adversely in both the short- and long-term (Burger 2010; Henson, 2009, 2010 and Grant, 2009).(Johnson *et al.*, 2005) Observed effects include increased energetic stresses, changes in activity budgets, displacement from preferred environments, and reduced productivity through abandonment and decreased survival of the young.

Although there are human activities that cause physical changes in park environments, such as construction of building and roads, or vegetation destruction resulting from overuse of particular areas, most wildlife-related impacts away from these areas likely result from short-term recreational pursuits of visitors (Tremblay and Ellison, 2010; White and Thurow, 2010).

1.3 Conceptual perspective

In Africa as a region, the increased human population has led to the expansion of human settlements in protected wildlife habitats. This has led to the destruction of species habitats (Jaruthers, 2007). The animal population has increased resulting in many animals straying out on people's crops field. Still in Africa and Democratic Republic of Congo (DRC) in general, it has been reported that human-wildlife conflicts have been on the increase where animals damage people's crops and are a threat to their lives. Conflicts are particularly common near conservation areas bordering densely populated human settlements. In 1998, the local people in

South Luangwa marched to the Warden's Office demanding that more elephants be cropped (Lichstein et al, 2012).

According to (Noon ,2003) Human activities are around and within national parks on the increase and needs to be given due consideration in order to minimize future conflicts as human activities can have adverse impact on wildlife and humans alike. According to the Zambia Daily Mail Newspaper dated 15 April 2013, Zambia had continued to experience the human-animal conflict at an alarming rate and hundreds of people had continued being killed by wildlife. The same Newspaper further stated that this conflict was largely caused by human beings encroaching and settling in natural habitats of wildlife (Eliason, 2003). As a result, human beings were attacked by wildlife and in the process lost their lives or were left permanently impaired. For instance, a rampaging elephant was reported to have killed three people in Kazungula and sent villagers scampering for safety. It was therefore very cardinal that the Zambia Wildlife Authority enhanced educative campaigns for people in the areas where human-animal conflict was likely to arise (Romero and Wikelski, 2012).

1.1.4 Contextual perspective

In the North of Kahuzi-Biéga National Park in the Democratic Republic of Congo Government imposed great restrictions on land use, which was formerly a hunting wildlife reserve owned by local communities and controlled by village leaders as of controlling human activities on wildlife in the area. At present, local people's activities, such as small-scale agriculture, livestock rearing, fishing, hunting and gold mining, are restricted to a transitional area surrounding the park's border. The most affected crops were reported to be maize (*Zea mays*), millet (*Sorghum spp.*), yam (*Dioscorea rotundata*) and cotton (*Gossypium spp.*), while the species inflicting most of the losses were African elephants (*Loxodonta Africana*), baboons (*Papioanubis*), green parrots (*Psittacus senegalus*) and warthog (*Phacochoerus aethiopicus*), (Gibson, 2009).

In an area where wildlife caused major damage to crops and livestock, the most affected crops were staple foods, and bush meat constitutes about 24% of the animal protein intake, the people were attempting to secure their livelihoods through illegal encroachment of farm and poaching (Weladji and Tchamba, 2003).

Therefore the study provided evidence excluding the local population from access to land and resources, such as fuel wood, fish, bush meat and pasture, may have long-term negative effects on conservation and result in an intensification of the conflict.

1.1.5 Theoretical Perspective

The study was guided by Activity Theory which differentiates between internal and external activities. It emphasizes that internal activities cannot be understood if they are analyzed separately from external activities, because they transform into each other. Internalization is the transformation of external activities into internal ones. Internalization provides a means for people to try potential interactions with reality without performing actual manipulation with real objects (mental simulations, imaginings, considering alternative plans, etc.). Externalization transforms internal activities into external ones. Externalization is often necessary when an internalized action needs to be "repaired," or scaled. It is also important when collaboration between several people requires their activities to be performed externally in order to be coordinated, (Gerrodette, 2009).

1.2 Statement of the problem

Human population is continually increasing, leading to invasion of wildlife habitats. As human population continues to grow, they clear forested land to create more space which stresses wildlife populations as there are fewer homes and food sources to survive (Gregorian and Buhyoff, 2010). Human activities on wildlife conservation are a growing problem in today's crowded world, and can have significant impacts on both human and wildlife populations in Kahuzi-Biéga National Park in Democratic Republic of Congo. Species most exposed to human activities are shown to be more prone to extinction (Ogada *et al.*, 2003) because of injury and death caused by humans. These can be either accidental, such as road traffic and railway accidents, capture in snares set for other species or from falling into farm wells, or intentional, caused by retaliatory shooting, poison or capture. According to (Grier, 2009) reports that human activities cause physical changes to park environments, such as construction of building and roads, or vegetation destruction resulting from overuse of particular areas, most wildlife-related impacts away from these areas likely result from short-term recreational pursuits of visitors.

Furthermore Human-wildlife conflicts undermine human welfare, health and safety, and have economic and social costs. Nuisance encounters with small animals, exposure to zoonotic diseases, physical injury or even death caused by large predators' attacks have high financial costs and loss of lives for individuals and society in the form of medical treatments to cure and prevent infections transmitted from animals through human contact (Ministry of Water, Land and Air Protection, British Colombia, 2003).Despite the application of different management practices, both locally and globally, the problem still exists.

Therefore, this study was conducted to address the problem caused by human activities on wildlife animals in Kahuzi-Biéga National Park in democratic republic of Congo by bringing or understood the key players in the human-animal conflict of Kahuzi-Biéga National Park. Such a situation poses a problem which needs to be investigated and, hence, the present study.

1.3 Main objective of the Study

The aim of this study was to establish how human activities have affected wildlife conservation in Kahuzi-Biéga National Park in democratic republic of Congo.

1.4 Specific Objectives

- i. To determine ways through which poaching has affected wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo.
- ii. To assess the impacts of charcoal burning on wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo
- iii. To establish measures that have been put in place to ensure wildlife conservation against human activities in Kahuzi-Biéga National Park in Democratic Republic of Congo.

1.5 Research questions

- i. How has poaching affected wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo?
- ii. How does charcoal burning affect wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo?
- iii. What are the measures that have been put in place to ensure wildlife conservation against human activities in Kahuzi-Biéga National Park in Democratic Republic of Congo?

1.6 Null hypothesis (Ho):

- i. There is no significant impact of poaching on wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo.
- ii. There is no significant impact of charcoal burning on wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo.
- iii. There are no measures that have been put in place to ensure wildlife conservation against human activities in Kahuzi-Biega National Park.

1.7 Scope of study

1.7.1 Geographical scope

The study was carried out in Kahuzi-Biéga National Park which is a protected area for wild life near Bukavu town in Eastern Democratic Republic of the Congo. It is situated near the western bank of Lake Kivu and the Rwandan border. The park covers an area of 6,000 square kilometres (2,300 sq. mi); with 28.45 °E – 28, 85 °E and 2.66 °S of longitudes, 5 °N and 5 ° to S latitudes with an elevation of 3317m altitude.

Kahuzi-Biéga is one of the biggest national parks in the country set in both mountainous and lowland terrain, it is one of the last refuges of the rare species of Eastern lowland gorilla hence being encroached by the farmer, pastoralists and hunters, (Grier, 2009).

1.7.2 Time scope

The study looked at a period from 2013 to 2017. This period was useful in providing relevant information about the impact of human activities on wildlife in Kahuzi-Biéga National Park. It is within this period that the wildlife habitats were encroached up by the people around Kahuzi-Biéga National Park looking for human survival.

1.8 Definition of Terms

According to (Watson, 2000), human activity is most widely viewed as changing the planet through the burning of fossil fuels. In order to produce the energy that drives the world's

economy, countries rely on carbon-rich fossil fuels like coal, oil, and gas. Humans have historically tended to separate civilization from wildlife in a number of ways including the legal, social, and moral sense. Some animals, however, have adapted to suburban environments. This includes such animals as domesticated cats, dogs, mice, and gerbils (Guest, 2004). Some religions declare certain animals to be sacred, and in modern times concern for the natural environment has provoked activists to protest against the exploitation of wildlife for human benefit or entertainment (Steidl, 2001).

Wildlife refers to all varieties of species of flora and fauna. That is plants, animals, insects, birds and marine life. Wildlife traditionally refers to undomesticated animal species, but has come to include all plants, fungi, and other organisms that grow or live wild in an area without being introduced by humans (Gregoire and Buhyoff, 2010). Wildlife can be found in all ecosystems. Deserts, forests, rain forests, plains, grasslands, and other areas including the most developed urban areas, all have distinct forms of wildlife. While the term in popular culture usually refers to animals that are untouched by human factors, most scientists agree that much wildlife is affected by human activities (Gerard and Dzus, 2008).

Conservation: Is the Preservation, protection, or restoration of the natural environment, natural ecosystems, vegetation, and wildlife (Steidl, 2001).

Wildlife Conservation is the practice of protecting wild plant and animal species and their habitats. The goal of wildlife conservation is to ensure that nature will be around for future generations to enjoy and also to recognize the importance of wildlife and wilderness for humans and other species alike. Many nations have government agencies and NGO's dedicated to wildlife conservation, which help to implement policies designed to protect wildlife (Thompson, 2012).

Wildlife conservation is the preservation of rare population or endangered species of wild plants and animals.

Wildlife tourism is the human activity undertaken to view wild animals in a natural settings or in captivity.

Biodiversity: The term 'biodiversity' will in this study be used to describe the number, variety and variability of living organisms

Ecosystem: An ecosystem is made up of plants, animals, microorganisms, soil, rocks, minerals, water sources and the local atmosphere interacting with one another.

Endangered species: A native species that faces a significant risk of extinction in the near future throughout all or a significant portion of its range. Such species may be declining in number due to threats such as habitat destruction, climate change, or pressure from invasive species (Leaky and Morel, 2001).

Environment: An interaction between the physical surroundings and the social, political and economic forces that organize people in the context of these surroundings.

Environmental Education: A process that allows individuals to explore environmental issues, engages in problem solving, and takes action to improve the environment. As a result, individuals develop a deeper understanding of environmental issues and have the skills to make informed and responsible decisions (Journal of Wildlife Management, 2003).

Human-animal conflict: A range of direct and indirect negative interactions between human and-wildlife.

Poaching: refers to illegal killing of animals within

Reserve: an enclosed piece of ground stocked with game and held by royal prescription or grant

Perception: The feelings, understandings of the people of Kafue game management area concerning human animal conflict.

Poaching: poaching which is the illegal killing of wildlife, undertaken for reasons that may include revenge, meat for food or sale, tradition or money.

Species: A class of individuals having some common characteristics or qualities; distinct sort or kind.

Sustainable: Conserving an ecological balance by avoiding depletion of natural resources.

Wildlife: Traditionally refers to non-domesticated vertebrates, but has come to broadly reference all wild plants, animals and other organisms, for this study it will only refer to wild animals (Berne, 2008).

9. Significance of the Study

- The present study is significant in that it will fill the knowledge gap that exists regarding the wild life conservation against the ongoing human activities around and within Kahuzi-Biéga National Park in Democratic Republic of Congo.
- It is expected that the study will contribute information that may help governments, wildlife managers, scientists and local communities ensure positive coexistence between people and animals in the interest of human and environmental well-being.

- It is anticipated that the results of the study will help future researchers especially those who will be researching in a similar area of the impacts of human activities on wildlife as they will use it as reference source. This is when the government can apply the recommendations made by the researcher and get some solutions related to conservation and those in charge of wildlife conservation.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The following chapter elaborates the theoretical review; then illustrates the conceptual framework showing the interaction between the study variables and concludes with the review of related literature. The related Literature of this study is an important part that provides the reader and other people what other writers and researchers have said on a similar study. It provides evidences and facts that support the study undertaken by the researcher. Therefore, this chapter critically reviews the related literature, from reports, journals and other publications done by other scholars and writers in relation to human activities and wildlife conservation in parks and game reserves.

2.1 Theoretical review

This study was guided by one theory; which is the activity theory;

Activity Theory is all about ‘who is doing what, why and how’. However, things are rarely that simple. Sometimes referred to as the Cultural-Historical Activity Theory (CHAT), Activity Theory is grounded in the work of the *Russian psychologist Vygotsky* and his students, in particular, Leontiev, in the 1920s.

Activity Theory provides a lens with which to tease out and to better understand human activity in relation to wildlife conservation. Activity Theory emphasizes that human activity is mediated by tools in a broad sense. Tools are created and transformed during the development of the activity itself and carry with them a particular culture - historical remains from their development. So, the use of tools is an accumulation and transmission of social knowledge. Tool use influences the nature of external behavior and also the mental functioning of individuals (Morrison and Kendall, 2001).

The premise of activity theory is that a collective work activity, with the basic purpose shared by others (community), is undertaken by people (subjects) who are motivated by a purpose or towards the solution of a problem (object), which is mediated by tools and/or signs used in order

o achieve the goal (outcome). The activity is constrained by cultural factors including conventions (rules) and social organization (division of labour) within the immediate context and framed by broader social patterns (of production, consumption, distribution and exchange). The Activity theory provides a conceptual framework or inter-relationship between human activities, actions, operations on wildlife (Johnson et al., 2005).

2.2 Conceptual frame work

The study was carried out basing on the interrelations between the variables in the research problem. It explores the connection between the independent and the dependent variables in the study. The frame work examines the relationship on how human activities influences or impacts wildlife conservation. The relationship between the variables is diagrammatically illustrated in figure 1 below.

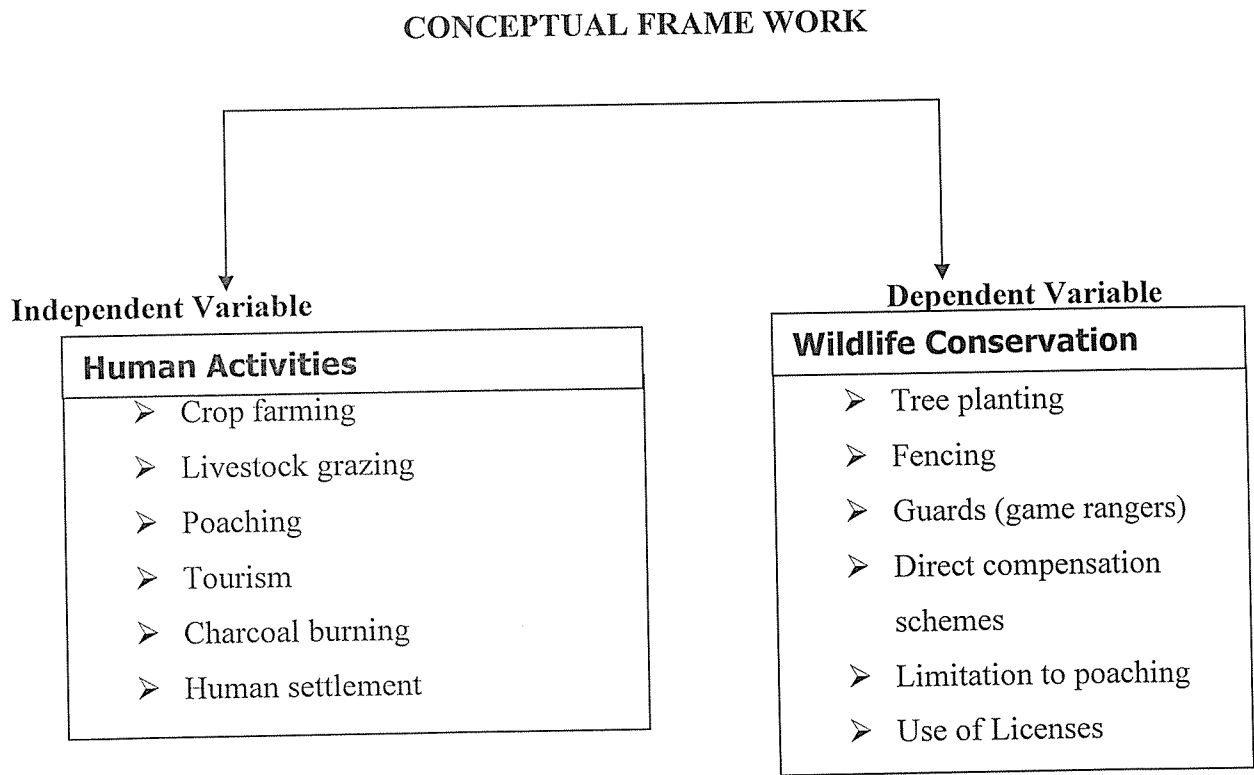


Figure 1.conceptual frame work

Source: *World Life Conservation Report (2006)*

The figure above shows the influences of human activities on wildlife conservation in parks and game reserves. In the figure above, human activities represent independent variable and wildlife conservation as the dependent variable.

The frame work identifies human activities like crop farming, livestock grazing, poaching, tourism, charcoal burning, and human settlement as the main factors or elements under human activities that impact on wildlife conservation. The frame work measures wildlife conservation in terms of tree planting, fencing, guards/game rangers, use of direct compensation schemes, and restriction of poaching and use of license.

2.3. Human activities

Humans are continually expanding and developing, leading to an invasion of wildlife habitats, as humans continue to grow, they clear forested land to create more space which stresses wildlife populations as there are fewer homes and food sources to survive off (Gregorian and Buhyoff, 2010). According to (Johnson et al., 2005), shows that the increasing population of human beings is the most major threat to wildlife. More people on the globe means more consumption of food, water and fuel. Therefore, more wastes are generated; every major threat to wildlife as seen above is directly related to increasing population of human beings, if the population is altered so that is the amount of risk to wildlife. The less is the population; less is the disturbance to wildlife.

Tropical forests are among the most beautiful and biologically rich environments in the world. While forest reserves are considered safer for wildlife than unprotected areas, they provide far less conservation value than national parks largely because of human activities in the reserves (Noon, 2003).

(Colin Chapman, 2009), a professor of Anthropology at McGill University has worked in the tropics for over 35 years documenting the devastation that is occurring in these important areas. Recently, (Chapman, 2009) investigated the relationship between human activities and the declining number of animals such as chimpanzees, elephants, and giant forest hogs within four forest reserves in Uganda. These Ugandan reserves allow firewood collection, timber cutting, gardening, and pole cutting. Illegal hunting also takes place. Chapman found a significant decline in animals in the reserves compared to the better protected adjacent Kibale National Park. "This decline is very likely due to a combination of the forest degradation and hunting that is occurring in the forest reserves, but not in the national park," says Chapman. "However, signs of aardvarks, bushbucks, bush pigs, duikers (blue and red), giant pangolin, giant forest hogs, and jackals are still present in some of these reserves, this is a promising sign for their potential to

recover and become viable conservation areas, if they receive protection. *“In summary, human activities mostly done in national parks and game reserves include the following:*

2.3.1 Crop farming

Farmed areas both on land and in the water – provide important habitats for many wild plants and animals. When farming operations are sustainably managed, they can help preserve and restore critical habitats, protect watersheds, and improve soil health and water quality. But when practiced without care, farming presents the greatest threat to species and ecosystems (Thompson, 2012). (Boyle and Sampson, 2011) report that since the post-war drive to intensify farming, the soil at Smite has steadily declined in terms of humus content, organic matter and soil wildlife. As a result it had become almost totally reliant on artificial inputs to grow arable crops and this is associated with costly heavy cultivations to create seedbeds. With around 75% of terrestrial wildlife living in the soil, a thriving soil food web is vital to the recovery of the majority of farmland wildlife, most of which continues to suffer ongoing declines (Grier, 2007).

Agriculture/crop farming is an important source of livelihood, food security, and development opportunities. Many aspects of the current agricultural systems in Africa, such as over-irrigation, short rotation cropping, and slash-and-burn agriculture, threaten wildlife and landscapes—and even people (Trivers, 2010). As the agricultural sector grows to achieve local and national food security and meet the growing global demand for food, fuel, and fiber, these threats are poised to intensify. Inappropriate agricultural practices in the wrong places can cause habitat destruction and degradation, deforestation, exploitation of water and soils, erosion, sedimentation, pollution, and even regional and local climate change (Jachmann and Billiouw, 2009). This sets in motion a vicious cycle, where farmers, faced with declining crop yields from degraded soils, turn to even more destructive practices such as short rotation cropping, shifting agriculture, and over-irrigation which then even further strip the soil and exert more pressure on the wildlife habitats leading to animal displacement and some of the them die due to starvation and poaching in parks including Kahuzi-Biéga national park in DRC (Blair, 2009).

2.3.2 Livestock grazing

Domestic livestock such as cattle, sheep, goats, horses, mules, burros, reindeer, and llamas are exotic species that are maintained in some parks for commercial herding, pasturing, grazing, or trailing; for recreational and human use; or for administrative use for maintaining the cultural

cene or supporting park operations. The policies applicable to the grazing of commercial domestic livestock in national parks are not clear. This needs to phase out the commercial grazing of livestock whenever possible and manage recreational and administrative uses of livestock to prevent those uses from unacceptably impacting park resources (Fernandez and Azkona, 2008).

2.3.3 Poaching

Poaching is the illegal killing of wildlife, undertaken for reasons that may include revenge, meat for food or sale, tradition trophies or money. Poachers might be poor locals from the area to foreigners capitalizing on the lucrative illegal wildlife trade. By contrast, trophy hunting is the entirely legal killing of wildlife, often carried out by rich foreigners for sport and enjoyment. Both result in one animal fewer in the wild, but the similarity ends there. Unregulated hunting and poaching causes a major threat to wildlife, along with this, mismanagement of forest department and forest guard's triggers this problem (Mann and Dalton, 2012).

(Holthuijzen, 2013) argues that Wildlife poaching has negative side-effects that affect local communities, wildlife populations, and the environment. It is a crime fueled by a lucrative black market trade of animal parts. The animal parts are sold as novelty items and are sold for their "medicinal" properties. Environmental groups, animal rights groups, government agencies, and even the Duke of Cambridge are calling for an end to wildlife poaching (Weladji and Tchamba, 2003). The United States Fish and Wildlife Service (USFWS), The World Wildlife Fund for Nature (WWF), and The International Anti-Poaching Foundation (IAPF) are leading international efforts to end wildlife poaching (John and Mulder, 2005).

Poachers kill for profit, for example, bear gall bladders and big horned sheep antlers are worth top dollar for their so-called medicinal properties. This past November, at the National Wildlife Property Repository in Colorado, the wildlife service destroyed six tons of ivory confiscated at U.S. borders. Elephants are killed for their tusks because, while it is possible to remove the tusks without killing the elephant, they are too dangerous to remove when they are alive. The international community is responding. China recently increased its prosecutions of ivory smugglers, sentencing eight citizens to jail for bringing in over 3 tons of ivory between 2010 and 2012 (Wild Life conservation report, 2009).

The United States is second to China in its desire for illegal wildlife parts. According to an *On Earth* article, poachers killed over 30,000 elephants last year (Holthuijzen, 2013). Experts believe that elephants will go extinct within the next decade if the killing continues at this rate. The extinction of a species can have a negative economic effect on a local community's tourism industry (Hess and Hess-Orthmann, 2012). A community that relies on its wildlife to attract tourists is at great risk for economic hardship if the prevalence of poaching is high. Furthermore, a tourist boycott due to local poaching is a real threat. A boycott could have a detrimental effect on a community's economy since restaurants, hotels, rentals, and other attractions would suffer. Extinction is the greatest threat to animals that are victims of wildlife poaching. In 2011, the International Union for the Conservation of Nature (IUNC) declared the Western Black Rhinoceros extinct. This subspecies of the critically endangered Black Rhino was poached due to the belief in the healing properties of its horn (Gerrodette, 2009).

(Steidl, 2001) reports that Poaching is also dangerous to the environment, when the North American Gray Wolf was on the brink of extinction, due to trophy hunting and poaching, the elk populations in Yellowstone National Park soared. With no natural predator, the elk nearly ate the aspen tree to extinction. The economic challenges of a community can lead to poaching, which in turn can lead to endangerment (and in the worst cases, extinction) of different species. We need various species of flora and fauna in our environmental ecosystems so that it can maintain healthy and balanced (Anthony et al., 2009). Corruption, toothless laws, weak judicial systems and light sentences allow criminal networks to keep plundering wildlife with little regard to consequences. These factors make illegal wildlife trade a low risk business with high returns. The poachers often poor locals are the usually the only ones caught, leaving the real masterminds and their network safe and operational with the ability to strike again (Mathisen, 2014).

2.3.4 Tourism

Tourism is the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business, and other purposes. Wildlife tourism can cause significant disturbances to animals in their natural habitats (Morrison and Kendall, 2001). This may frighten animals, especially at sensitive times of their life cycle, and have an adverse effect on breeding. Feeding of wildlife by tourists can change social behavior patterns. For example, artificial feeding by tourists caused a breakdown of the territorial breeding system of land iguanas in the Galapagos Islands (Henson and Grant, 2009). (Romero

and Wikelski, 2002) show that humans as well as animals can be disrupted by tourism, social and cultural impacts related to tourism may include: changes to family structure and gender roles, leading to tension and loss of self-esteem for men and older generations; dilution of local languages and culture; loss of artifacts and access to private sacred sites; and impacts on health and integrity of local cultural systems. Although wildlife is a valuable natural resource that brings a range of benefits to the people, in some regions (e.g. Africa) wild animals may cause damage. This damage could be in terms of attacks on people and livestock, damage to crops and other property such as infrastructure, and disruption of peaceful existence in local communities living close to wildlife areas. Increasing human populations brings with it increasing encroachment onto wildlife habitat (e.g. settlements, cattle posts, farmlands). Inevitably, human-wildlife conflicts have become more common (Thelmes, 2009).

2.3.5 Charcoal burning

Charcoal burning as it burns wood produces carbon dioxide - one of the main greenhouse gases responsible for climate change. But this CO₂ will be absorbed by a new tree planted to replace the one being burnt (Caruthers, 2008). Carbon dioxide emissions from wood fuel systems are 95% lower than gas, oil, or electric systems in most cases. This is because the carbon dioxide that is released from burning wood was the same amount that was absorbed from the atmosphere during the growth of the trees. The only new carbon dioxide released is from the fossil fuel used during its processing and transport, which is why wood fuel works best at a local scale and can be referred to as "carbon lean" (Jonson et al., 2005). Still over 90% of all charcoal consumed all over the world comes from overseas, predominantly the endangered tropical rainforest and mangrove habitats of South America, West Africa and South East Asia (Holmes and Stegall, 1994). In addition to the damage caused by unsustainable forestry practices in these regions, is the negative environmental impact arising from the consumption of fossil fuels transporting charcoal so far around the world (Lichstein and Franzreb, 2002).

(Boyle & Sampson, 2008) identify two main direct causes of land degradation in DRC: overuse of vegetation and agricultural intensification. Over exploitation of vegetation occurs mainly through gathering wood for fuel, fencing and construction materials, over grazing of livestock and charcoal production which affects wildlife habitats as most of them are displaced and other die due to starvation and poaching. This is an un-controlled activity which selectively clears trees

over (especially *Acacia busei*). Its effects are further complicated by the diminishing natural resilience of the vegetation occasioned by frequent and prolonged drought in the last few years (Fraser and Mathisen, 2012).

Extensive charcoal burning in the pastoral environment has the following impacts: reduced rangeland carrying capacity, biodiversity depletion, soil erosion, land degradation and gully formation. Moreover, development of unplanned feeder roads and unplanned water points increases the number of settlements and increase the pastoralist's vulnerability to droughts, reduced grazing areas and create rangeland resource conflicts (Trivers, 2010).

Introducing and adapting alternative energies might improve the condition of the environment and the livelihood of pastoralists, since it will reduce deforestation and more people will get the benefit of employment in new sectors. Stakeholders need to take up their roles within their respective mandates and capabilities in order to move from biomass to alternative energies (biogas, solar, wind, Kerosene). This is quite a long process but it needs the commitment, determination and consistency of all stakeholders. Government has to take the lead and coordinate with all stakeholders for realizing their commitments (Warran and Sievert, 2009).

2.3.6 Human settlement

Human settlement is a socio–ecological zone in which human settlements abut or intermingle with natural or semi-natural ecosystems, and it is a friction area in which multiple biotic and abiotic processes are affected or even driven by anthropogenic activities. Combining the processes, the development of houses in the wildlife habitats has a cumulative effect on the surrounding natural ecosystem and its wildlife (Mathisen, 2014). First, human settlement in and around the national park (wildlife habitats) causes habitat loss, which reduces the area available for wildlife and abiotic ecosystem processes and fragment habitats, therefore altering the flow of materials and organisms across the landscape and decreasing its resilience to disturbances. Second, human settlement and development within the premises of gazetted areas for wildlife increases the magnitude of the human–natural interface and, consequently, promotes diffusion processes, such as the introduction and spread of invasive species, wildfire ignitions, and pollutants from settlements and roads into the surrounding landscape. These processes can have pervasive effects on human lives and property, as well as on plants, wildlife, and ecosystems (Watson, 2000).

Worldwide, humans are increasingly building houses in natural and semi-natural ecosystems, and this means that a further increase can be expected in the coming decades in the extent of the human settlement and in the magnitude of the detrimental processes associated with it. Therefore, we need new scientific, management, and policy tools that can help managers reduce the negative effects of human settlement footprints in order to limit and mitigate the impacts of human settlements on the Earth's ecosystems (wildlife) (Noon, 2003).

Even small human settlements in rural areas can exert an ecological impact on a much larger area according to (Hansen, 2010), Director of the Landscape Biodiversity Lab at Montana State University in Bozeman, USA. The effect of rural homes on native species' population dynamics can be felt tens to hundreds of kilometers away," said Hansen. A small village, for example, could provide a sheltered habitat during extreme conditions for species that would otherwise be forced to migrate elsewhere. In this way, the ecological makeup of a wider area is disrupted. This can affect conservation efforts within nearby protected areas, such as Yellowstone National Park, where Hansen has conducted research. "Human-caused mortality of grizzly bears on private lands may threaten bear populations in Yellowstone National Park," he explained. Bears are free to cross the borders of the park; culling the animals on private land therefore reduces the numbers that enter the park (Forsyth and Forsyth, 2009).

4 Wildlife Conservation

Wildlife Conservation is the practice of protecting wild plant and animal species and their habitats. The goal of wildlife conservation is to ensure that nature will be around for future generations to enjoy and also to recognize the importance of wildlife and wilderness for humans and other species alike. Wildlife conservation has become an increasingly important practice due to the negative effects of human activity on wildlife. An endangered species is defined as a population of a living species that is in danger of becoming extinct because of several reasons (Johnson et al., 2005).

In 2010, the Government of India enacted a law called the Wild Life (Protection) Act (Westmoreland and Best, 2010). The World Conservation Strategy was developed in 1980 by the "International Union for Conservation of Nature and Natural Resources" (IUCN) with advice, cooperation and financial assistance of the United Nations Environment Programme (UNEP) and the World Wildlife Fund and in collaboration with the Food and Agriculture Organization of the

United Nations (FAO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO)" The strategy aims to "provide an intellectual framework and practical guidance for conservation actions." This thorough guidebook covers everything from the intended "users" of the strategy to its very priorities. *Wildlife conservation is mainly done through tree planting, fencing, guards, game rangers, direct compensation schemes, limitation to poaching, and use of licenses these can be further be explained below:*

.4.1 Tree planting

Forests/tree planting is critical to for wildlife conservation as they provide many benefits. According to (Watson, 2000), tree planting that later turns into natural and artificial forest has the following advantages to wildlife: They provide habitat which is the most obvious, they provide breeding grounds for species that aren't typically common to forests. My favorite example that I want to see is the marbled murrelet, They are also key to helping filter water and slow the run off of soil into water, this helps not only animals living in streams but also dams that generate power, Next up they are critical for certain species of fish. The salmon is the most prominent species that relies on clear water gravelly beds which are not possible without forests, forests especially rain forests can be extremely important sources of revenue for ecotourism which is key to funding conservation.

.4.2 Fencing

Wildlife fences are constructed for a variety of reasons including to prevent the spread of diseases, protect wildlife from poachers and to help manage small populations of threatened species. Human–wildlife conflict is another common reason for building fences: wildlife can damage valuable livestock, crops, or infrastructure, some species carry diseases of agricultural concern and a few threaten human lives (Eliason, 2011).

At the same time, people kill wild animals for food, trade, or to defend lives or property, and human activities degrade wildlife habitat. Separating people and wildlife by fencing can appear to be a mutually beneficial way to avoid such detrimental effects. But in a paper published in 2009 in the journal *Science*, Wildlife Conservation Society and Zoological Society of London scientists review the pros and cons of large scale fencing and argue that fencing should often be a last resort. Although fencing can have conservation benefits, it also has costs. When areas of

ontiguous wildlife habitat are converted into islands, the resulting small and isolated populations are prone to extinction, and the resulting loss of predators and other larger-bodied species can affect interactions between species in ways that cause further local extinctions, a process which has been termed “ecological meltdown.” (Forsyth, 2010) “In some parts of the world, fencing is part of the culture of wildlife conservation—it’s assumed that all wildlife areas have to be fenced,” said Rosie Woodroffe of Zoological Society of London and lead author of the study. “But fencing profoundly alters ecosystems, and can cause some species to disappear. Therefore conservationists as well as other sectoral interests carefully weigh up the biodiversity costs and benefits of new and existing fences.” In addition to their ecosystem-wide impact, fences do not always achieve their specific aims. Construction of fences to reduce human-wildlife conflict has been successful in some places but the challenges of appropriate fence design, location, construction and maintenance mean that fences often fail to deliver the anticipated benefits. Ironically, in some places, fences also provide poachers with a ready supply of wire for making snares (Herne, 2008).

A variety of alternative approaches—including better animal husbandry, community-based top-guarding, insurance schemes and wildlife-sensitive land-use planning—can be used to mitigate conflicts between people and wildlife without the need for fencing," said co-author Simon Hedges of Wildlife Conservation Society. “WCS projects working with local people and government agencies have shown that human–elephant conflict can be dramatically reduced without using fences in countries as different as Indonesia and Tanzania.” “An increased awareness of the damage caused by fencing is leading to movements to remove fences instead of building more,” said co-author Sarah Durant of the Zoological Society of London. “Increasingly, fencing is seen as backward step in conservation.”(Gregoire and Buhyoff, 2010).

The desire to separate livestock from wildlife in order to create zones free from diseases such as foot and mouth diseases has resulted in extensive fencing systems, particularly in southern Africa. Some of these fences have had devastating environmental effects. Fortunately, it is increasingly recognized that a combination of improved testing, vaccination and standardized approaches to meat preparation can prevent spread of diseases without the need to separate cattle from wildlife by fencing (Forsyth, 2009). (Gibson, 2009) reports that Habitat fragmentation undermines the functioning of ecosystems and so biodiversity conservation often entails maintaining or restoring landscape connections. However, conservationists also destroy

connectivity by constructing wildlife fences. A recent debate about the use of fences to protect African lions highlights a more general need to evaluate the role of fencing in conservation. People and wildlife can be uneasy neighbors. Many wild species damage valuable livestock, crops, or infrastructure; some carry livestock diseases; and a few threaten human lives. At the same time, people kill wild animals for food, trade, or to defend lives or property, and human activities degrade wildlife habitat. Separating people and wildlife by fencing can appear a mutually beneficial way to avoid such detrimental effects (Guest, 2004).

Caruthers, 2007) urges that while some fences may be last-ditch attempts to preserve wildlife areas already isolated by human development, others are constructed within relatively contiguous wildlife habitat. For example, in parts of southern Africa, fencing of individual land parcels secures wild animals as privately owned commodities in a wildlife economy centered on sport hunting (Trivers, 2010). In North America, roads may be fenced to minimize collisions that can kill people and wildlife. Fences have been constructed in Australia to protect native marsupials from invasive species, and in Kenya to separate critically endangered hirola antelope from natural predators (Weladji and Tchamba, 2003). Botswana is traversed by veterinary cordons fences intended to prevent disease transmission from wildlife to livestock, and fencing has also been considered as a way to halt the spread of infectious cancer among Tasmanian devils (Herne, 2008). In Africa and in DRC, containing rhinos in small fenced areas makes them easier to protect from poachers. Fences may allow some species, such as lions, to reach high densities, but they also profoundly alter ecosystems (Caruthers, 2008).

2.4.3 Guards/game rangers

Game rangers work tirelessly to watch over some of the most endangered wildlife on the planet, like tigers, elephants and rhinos. Many of these animals are among the most widely targeted by poachers for the illegal wildlife trade, and rangers regularly pay with their lives while trying to keep them safe. More than 100 rangers died on duty in 2015 and many more were injured, according to a recent report by the International Ranger Federation (IRF, 2009). Of these rangers, 42% were killed by poachers. And almost 90% of them worked in the two most dangerous continents for rangers: Asia and Africa (Carter, 2006).

Governments often lack resources to equip and train rangers, and rangers typically earn very little. Some go months without receiving their salary or seeing their families.

Rangers on the ground must be better equipped. But they also need support beyond backpacks and boots. They must be respected and supported by their governments and national laws against poaching enforced (Meredith, 2005).

WWF's actions focus on advocating for rangers and the need for increased professionalism, training and equipping rangers, and development and promotion of ranger standards and welfare. WWF's Back a Ranger project helps rangers get the equipment, training, resources and infrastructure they need to stop wildlife crime. When you donate to the project, 100% of your contribution will go toward providing rangers with everything from fully stocked first-aid kits to improved living conditions at a remote post. The reserve uses a team of 29 armed guards, 26 armed Black Mambas, and an intelligence team that seeks to stop the poachers before they can kill. The Mambas' main job is to be seen patrolling the fence (Lichstein and Simons, 2012). They also set up listening posts to hear vehicles, voices and gunshots and patrol the reserve on foot, calling in the armed guards whenever they find something (Leaky and Morel, 2001).

2.4.4 Direct compensation schemes

Ecotourism that shares benefits with local communities is an incentive mechanism being tried out in developing countries (Leaky and Morrell, 2001) "If it pays, it stays" is an old catch-phrase that has been used to summarize the importance of generating incentives for local communities, private sector organizations, or even government agencies to invest in biodiversity conservation. One way to do this is by regulating the use of biodiversity – for example by banning the trade in certain species. However, a lack of enforcement and political will often means such regulatory activities are not effective. Regulation needs to be complemented by policy measures which provide incentives to actors to conserve biodiversity and promote sustainable development (Hess and Hess-Orthmann, 2010).

Incentive mechanisms are increasingly being tried out in developing countries to address the conservation of biodiversity and provision of ecosystem services – that is services that ecosystems provide. Examples of incentives include:

- payments for environmental service schemes, in which natural resource users are paid to conserve natural resources or manage them more sustainably.

- Ecotourism that is either community-based, or involves benefit-sharing to give local communities a stake in conserving critical habitats and species.

These mechanisms have mostly concentrated on creating incentives for biodiversity conservation rather than compensating those affected by biodiversity loss (Jachmann and Billiouw, 2009). But interest is also growing in ‘biodiversity offsets’ which seek to compensate communities for the unavoidable negative impacts of development projects on biodiversity at one site, for example from establishing a mine or building a road, through conservation actions aimed at restoring or reducing threats to biodiversity at another site. With all types of incentive and compensation mechanisms the rules governing their operation is critical for determining their social impact, in particular in determining who participates, who benefits and who loses out (Jachmann and Billiouw, 2009).

2.4.5 Limitation to poaching

Legal issues related to hunting/poaching are essential towards wildlife conservation, such as those on regulation of hunting, on licenses and on ownership of wildlife. Among the most common protection rules are those which set out prohibitions applicable to hunting. These prohibitions are of different types. Limitations in the quantity of animals which may be hunted (for example under a single license, or within a certain period) are not common in the principal legislation, as they are more frequently placed in subsidiary legislation periodically adopted or incorporated as license conditions (Meredith, 2005).

Limitations on time are quite common. Most laws prohibit hunting between sunset and sunrise. The fixing of open and closed seasons is also common, although more frequently through subsidiary legislation (Grier, 2009). At the time of adoption of the current law on hunting in 1992, Italy chose to establish hunting seasons respectively for various species directly in the law, allowing the regions to modify them, subject to certain conditions (Eliason, 2008)

Regarding hunting methods and weapons, many prohibitions are common to most of the legislation (Hern, 2008). This is the case, for example, regarding the use of drugs, poison, explosives, fire, as well as hunting from moving vehicles. Methods of hunting, however, are a typical part of local traditions and therefore additional prohibitions in this regard may vary greatly from one country to another (Gibson, 2009). In countries where hunting continues to

contribute to subsistence, there are exemptions from prohibitions to hunt to allow traditional hunting practices (Belanger and Bedard, 2011). The Bonn Convention on the Conservation of Migratory Species of Wild Animals of 1979 already allowed exceptions to its regime for purposes which included the needs of traditional subsistence users of protected species. In traditional African societies, prohibitions to hunt were usually not necessary, as hunting was often part of customary management systems which by their nature could rarely produce negative impacts on the conservation of wildlife. Progressive settlement into stable areas brought about the suppression of rotation of hunting areas, but also changes of habitats, increase of agriculture, and subsequently the market economy (Burger and Niles, 2004). This implied also an incentive to destroy "noxious" animals, and generally a loss of respect for game. These various factors, and the tendency to establishing State ownership of land and wildlife resources, have caused the disappearance of traditional regimes of wildlife management and hunting, and have brought about the establishment of legislation setting out a number of hunting prohibitions. Exemptions from such prohibitions to allow traditional hunting practices are currently often limited to specified species (usually small game) and to the areas in which hunters live, excluding commercial purposes (Carter, 2006).

2.4.6 Use of Licenses

Licenses or other kinds of permits are a typical administrative instrument for the management of natural resources and are utilized also in relation to wild animals, to authorize hunting or other kinds of uses. Licenses can contribute to management where they are effectively used to limit the number of animals which may be taken under a single license, based on a periodical assessment of sustainable levels of exploitation and adequate plans. Provisions which clearly relate the number of animals allowed to be taken under licenses to surveys or management plans, however, are rare, while ample discretion tends to be left to the administration in this regard. One example in which the administration's discretion is to be guided by "the interests of wildlife management" is the law of Malawi, which allows the Chief Parks and Wildlife Officer to refuse a license if he/she is satisfied that such interests "will be better served by a temporary freeze in issuing licenses of that class" (Guest, 2004). Although not necessarily in co-ordination with the evolution of the state of wildlife, limits to the number of animals which may be hunted frequently exist. The law of Guinea provides for the issue of subsidiary legislation to set them (Blair, 2012). One way in which licensing systems may contribute to adequate management is to require

holders of licenses to supply data gathered while acting under a license for monitoring and statistical purposes. Guinea's law, for instance, requires holders of every kind of license to keep a register in which all relevant information must be reported daily and other countries have similar requirements (Gibson, 2009).

The issue of a license may be subject to a test of the applicants' knowledge and abilities (Henson, Gerrard and Bortolotti, 2008). This may be a significant barrier to inadequate hunting practices and violations of the law which may be due simply to ignorance of biological or legal information. It is not uncommon for principal legislation to envisage the requirement of an examination, specifying subjects and other details, as is done in the laws of Italy and Germany. The possibility of testing applicants' abilities is left to the discretion of licensing officers in Botswana (sec. 31(2)(b)) (Gibson, 2009). In Cameroon, the law requires applicants for a hunting license to declare that they are acquainted with the legislation and that they undertake to abide by it (art. 38). Similar purposes are pursued by requirements for supervision of some categories of hunters, in particular big game hunters, by hunting guides, who in turn need a special permit. The law of Guinea requires every tourism hunting expedition to be accompanied by a licensed guide, who must have passed a specific examination (Guest, 2004). Similar rules apply in Botswana, where a more ample discretion is left to the Director of Wildlife, who "may" require applicants to pass an examination (Gibson, 2009). A professional hunter must take all reasonable steps to ensure that hunters assisted by him understand and respect the terms and conditions of licenses and permits issued to them as well as the applicable legislation, and the burden of proving that he has complied with this obligation rests on him (secs. 43 and 44) (Gerrodette, 2009).

Most countries require some kind of authorization for hunting, and in some cases different kinds of hunting licenses are set out in the legislation. Categories are not uniform. Some are based on different degrees of protection granted to the animals concerned or on different types and size of animals. There may also be different licenses depending on the purpose of hunting (whether for recreation or tradition/subsistence), and licenses for visitors as opposed to residents (Caruthers, 2007).

5 Empirical Literature review

Although many studies have been conducted on threats that protected areas face, there is a scarcity of literature that assesses why those threats have persisted. In addition, there is a scarcity

of published literature that analyzes why some strategies aimed at preventing biodiversity loss succeed in some instances and fail in other instances. In the absence of such literature, it becomes difficult to propose other strategies or to have a basis upon which new ones can be improved (Eliason, 2003). Although the Secretariat for the Convention on Biological Diversity identified underlying causes to biodiversity loss such as demographic change, economic activity, levels of international trade, per capita consumption patterns linked to individual wealth, cultural and religious factors, and scientific and technological change, these factors were not discussed in specific detail in the context of conserving biodiversity in National Parks in Africa (Eliason, 2011).

Human activities are manifested at all ecological scales, from short-term changes in the behavior of an individual animal through local extirpations and global extinctions (Pimm et al. 1995; Chapin et al. 2000). Consequently, understanding the effects of human on wildlife and wildlife populations, as well as devising strategies to ameliorate these effects, is an increasing challenge for resource managers. Given the conflicting mandate to both encourage human use and to protect sensitive natural resources in national parks, developing reliable strategies for assessing and monitoring the effects of human activities on natural resources is essential to ensuring appropriate stewardship of these resources (Guest, 2004).

Given the breadth of relevant human activities, the diversity of wildlife species potentially affected, and the multitude of ways they may be affected, scientists and resource managers planning to assess the effects of human activities on wildlife must be careful to state their study objectives explicitly. Virtually all human activities can affect wildlife populations either positively or negatively. Those activities that are likely to have adverse effects can be divided into those that function primarily by altering the physical environment in a relatively permanent way and those that cause changes to an animal's behavior. Activities that alter the physical environment change the amount or the suitability of habitat for a species. Widespread and large-scale examples include activities that directly alter the structure and composition of the landscape, such as agriculture, forestry, livestock grazing, and unregulated off-road vehicle use (Forsyth, 2010).

In general, these are land use or land management practices that change the trajectory of ecological succession, including altering the dominant plant communities and the abiotic features of a site. The ecological effects of these activities on vertebrates are readily apparent and have

been relatively well studied (e.g., Blair 2009; Spies et al. 2009; Lichstein et al, 2012). Perhaps less obvious in their ecological impacts are those non-consumptive human activities that do not appreciably alter the physical environment but nonetheless can affect wildlife adversely. Examples include recreational activities such as hiking, wildlife viewing, and boating—all common activities for visitors in parks. As recreational use increases in wilderness and other protected areas, sensitive wildlife species may be increasingly affected by these activities (Steidl and Anthony, 2000). The magnitude of effects of recreational activities on wildlife is influenced by many factors, including the type, duration, frequency, magnitude, location, and timing of the disturbance, as well as the particular species of interest. Although effects of these activities are typically of short duration, cumulatively they can effect wildlife populations adversely in both the short- and long-term (Burger, 1981; Henson and Grant, 1991; Fernandez and Azkona, 2008; Holmes et al. 1994; Steidl and Anthony, 2009, Swarthout and Steidl 2001, Mann et al. 2012)

Johnson et al., 2005) observed effects include increased energetic stresses (Bélanger and Bédard, 1990), changes in activity budgets (Steidl and Anthony, 2000; Mann et al. 2012; Swarthout and Steidl 2001, 2003), displacement from preferred environments (McGarigal et al. 1991), and reduced productivity through abandonment and decreased survival of young (Tremblay and Ellison, 1979; White and Thurow, 1985). Although there are human activities that cause physical changes to park environments, such as construction of building and roads, or vegetation destruction resulting from overuse of particular areas, most wildlife-related impacts away from these areas likely result from short-term recreational pursuits of visitors.

Finally, the literature quoted above have clearly brought out the types of human activities that impact conservation of wildlife in one way or the other, the type of destructions done to efforts towards wildlife conservation as well as the control measures that could be employed to curb the menace. The situation in the context of study here, that is the Kahuzi-Biega National Park is not indifferent as far as wildlife conservation is concerned. A lot of human activities such as poaching and charcoal burning perhaps happen to be the biggest threats to the sustenance of the Park. Although the Management of the Park could have put some control measures to solve the threats faced by the Park, these problems still persist. Besides, many studies have been conducted on threats that protected areas face; there is a scarcity of literature that assesses why those threats have persisted.

CHAPTER THREE: MATERIALS AND METHODS

3.1 Study Area

The study was carried out in **Kahuzi-Biega National Park** which is a protected area near Bukavu town in eastern Democratic Republic of Congo. It is situated near the western bank of Lake Kivu and the Rwandan border. With an area of 6,000 square kilometres (2,300 sq. mi) lying between 28.45 ° E – 28, 85 ° E and 2.66 ° S of longitudes, 5 ° N and 5 ° to S latitudes with an elevation of 3317m altitude.

Kahuzi-Biega is one of the biggest national parks in the country. Set in both mountainous and lowland terrain, it is one of the last refuges of the rare species of Eastern lowland gorilla (*Gorilla beringeigraueri*), an endangered category under the IUCN Red List (Henson and Grant, 2009).

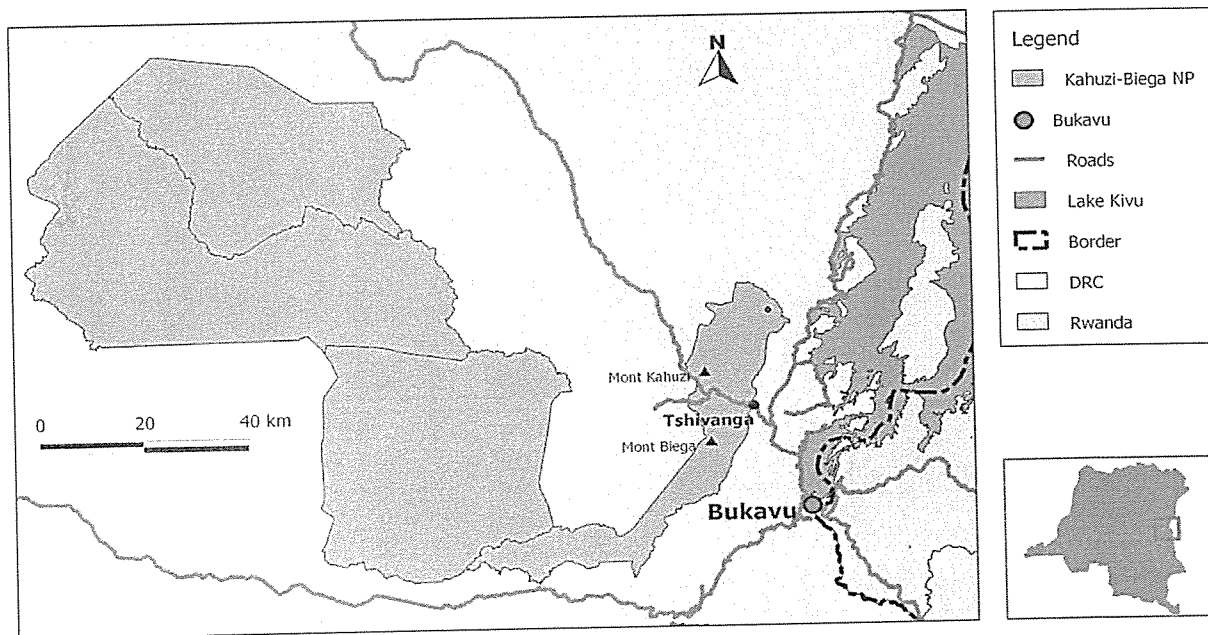


Figure 2: Map of Kahuzi-Biega National Park

3.2 Flora and fauna

The park has a rich diversity of flora and fauna and provides protection to 1,178 plant species in the mountainous region of the park, with some 136 species of mammals 349 species of birds, as of 2003(Leaky and Morell, 2001).

3.2.1 Flora

The Park's swamps, bogs, marshland and riparian forests on hydromorphic ground at all altitudes are rare worldwide. The western lowland sector of the park is dominated by dense Guineo-Congolian wet equatorial rainforest, with an area of transition forest between 1,200 metres (3,900 ft) and 1,500 metres (4,900 ft). (Fernandez-Juricie, 2000).

3.2.2 Fauna

Among the 136 species of mammals identified in the park, the eastern lowland gorilla is the most prominent. According to a 2008 status report of the DR of Congo, the park had 125 lowland gorillas, a marked reduction from the figure of 600 gorillas of the pre-1990's conflict period, and consequently the species has been listed in the endangered list. The park is the last refuge of this rare species. According to the census survey of eastern lowland gorillas reported by the Wildlife Conservation Society in April 2011, at least 181 gorillas were recorded in the park. (Eliason, 2011).

It is here noted that many species of mammals are being found within Kahuzi-Biega National Park such as Elephants(Proboscidea),carnivores(dogs,Foxes),perissodactyla(Oddtoed Hoofed animals),Monotremata(egg-laying Mammals),Artiodactyla(Even-toed Hoof),Pholidata(Pangolin),Pinnipedia(Seals and Sea Lions),Zibra,Antilopes,Buffalos.Here it is therefore observed that Kahuzi-Biega National Park has a lot of species of birds such as wood Duck , Mallard, Red head ,Gad wall, Lesser Scaup,Brant ,Long tailed Duck, Crested Helmet-shrike, Congo Peafowl African Green Broadbill,Rockefeller'sunbird,etc.

3.2 Research design

This study used quantitative method for data collection. It is economical and efficient in data collection (Fama, 2007).It is used in investigating relationships between variables. It is very

precise and objective; more focused and out-come-oriented. Data are represented quantitatively and processed using quantitative models (inferential statistics)

3.3 Research Population

The study was carried out in Kahuzi-Biéga National Park in Democratic Republic of Congo. The study population was 250 people comprising of local people and staff of ICCN, NGOs, CBOs and cultural leaders. The researcher used simple random sampling which gave each one in the entire population of respondents an equal and independent chance to be in the study population of 250 denoted by letter N. The sampling strategy involved the use of lottery methods where a name was written on a tag. The tags were then placed in a container well mixed. Each tag was drawn from the container until the wanted number of tags was obtained.

3.4 Sample Size

The sample size of 154 comprising of 94 respondents from among the local community members, ICCN staff 6 respondents, NGOs 12 respondents, CBOs 15 respondents, cultural leaders 12 and local government representatives 15 respondents were sampled by using Slovicene’s formula below which states that, for any given population (N), the sample size (n) is given by;

$$n = \frac{N}{1+N(\alpha)^2}$$

Where; n = the required sample size; N = the known population size; and α = the level of significance, which is fixed at = 0.05.

$$n = \frac{N}{1+N(\alpha)^2}$$

$$n = \frac{250}{1+250(0.05)^2}$$

$$= \underline{154}$$

Therefore the sample size for the study was 154 respondents and was further simplified in the table below.

The population and sample distribution of this study was presented in table 3.1 below.

Table 1 .3:1 Population and Sample size of the respondents

Category of respondents	Total Population	Sample Size
Local community members	150	94
CCN staff	10	6
NGOs	20	12
CBOs	25	15
Cultural leaders	20	12
Local government representatives	25	15
Total	250	154

3.5 Sampling Procedure

The researcher used purposive sampling to select 94 local community members at the local level from around Kahuzi-Biéga National Park in DRC. This method was preferred because it allowed the selection of participants who were well informed about the subject under study. The researcher also used simple random sampling to select cultural leaders. This was done by cross checking through the Kahuzi-Biéga National Park employee lists from the human resource department. The names of 20 cultural leaders were listed in alphabetical order and later the researcher randomly selected 12 participants around Kahuzi-Biéga National Park.

3.6 Research Instruments

The following researcher-based tools were utilized in this study: face sheet to gather data on the respondents’ demographic characteristics (gender, age, educational level, and working experience); and the researcher used open ended questionnaires to establish the impact of human activities on wildlife conservation (see appendix A).

Data sources, collection and procedure

Self-made closed ended questionnaires were used as a tool for data collection. The study got data from primary source which was got from self-administered questionnaires. Questionnaires were administered using simple Random Sampling method targeting the 154 respondents within the Kahuzi-Biega National Park. The management of Kahuzi-Biega National Park was comprised by the Board of Trustees, the Executive Director, the permanent secretary, the Director Tourism and Business, Director Legal and corporate affairs, Director Finance, Chief Conservation area Manager and lastly the Director Conservation. Questionnaires were administered using Drop and pick method since those questionnaires could be dropdown for the respondents to answer them then after being answered they could be picked up for further analysis.

3.7 Validity and Reliability of the Instrument

Validity: Validity of instruments was tested using Content Validity Index (CVI). The researcher established the validity of the instruments by using expert judgment method as suggested by Amin (2014). This involved judges scoring the relevance of the questions in the instruments in relation to the study variables and a consensus judgment given on each variable.

The formula is given by;

$$CVI = \frac{number\ of\ items\ declared\ valid\ by\ experts}{total\ number\ of\ items}$$

Number of items declared valid by experts was 134

total numbers of items was 154

Therefore, $CVI = \frac{134}{154}$

CVI=0.87

Content validity index is accepted for the items measured which have the average validity index of above 0.70 as recommended by (Amin, 2014).

3.8 Data Gathering Procedure

After the approval of the research proposal, the researcher got a transmittal letter of introduction from the College of Higher degrees and Research of Kampala International University to enable the researcher proceed to the field. After ascertaining the reliability of the instruments, the researcher proceeded to administer the questionnaires in the area of study.

3.9 Data Analysis

Data were prepared to eliminate unusual data, interpret unusual answers and verify and reject wrong responses and contradicting data from unrelated questions. Blanks and non-responses were ignored. The data were then coded and fed into a computer programme (the Statistical Package for Social Sciences SPSS) for easy analysis and interpretation of results. Primary data was analyzed through descriptive statistics that is mean and standard deviation. Data presentation: data were presented in frequency tables and narrative under themes consistent with the research objectives.

3.10 Ethical Considerations

The following strategies were adapted to ensure the moral justification of the investigation.

Authorization: This involved getting clearance from the ethical body and consent of the respondents.

Anonymity and Confidentiality: The names or identifications of the respondents were anonymous and information collected from them was treated with utmost confidentiality.

Integrity: The researcher was able to act and respond honestly, fairly and respectfully to all other stakeholders that were involved in this study.

Descriptions of authorships: The researcher accurately attributed the sources of information in an effort to celebrate the works of past scholars or researchers. This ensured that no plagiarism occurred.

Scientific adjudication: The researcher worked according to generally acceptable norms.

CHAPTER FOUR

PRESENTATION, DESCRIPTION, ANALYSIS AND INTERPRETATION OF RESULTS

4.0 Introduction

This chapter presents the analysis of the data gathered and interpretation thereof. It gives the demographic characteristics of the respondents and description of the objective per objective of the study.

4.1 Demographic characteristics of the study population

This section determines the demographic characteristics of the respondents in terms of gender, age, education level and work experience. To achieve it, questions were asked to capture these responses. Frequencies and percentage distributions were employed to summarize the demographic characteristics of the respondents as presented in Table below;

Table 4.1 below shows the demographic characteristics of respondents basing on the category of respondents got from local communities, ICCN staff, NGOs, CBOs, cultural leaders and local government representatives. In regard to the information gathered from all respondents, local community members took the biggest share in the study with 61% followed by local government representatives and CBOs with 9.7%, cultural leaders and nongovernmental organizations with 7.7% and finally ICCN staff with 3.8%.

With regard to gender, Table 4.1 below revealed that the majority of the respondents were males while females were the fewer in the study. This means that the male respondents took the high percentage in the study. This could be because the nature of work such as game rangers is not mostly preferred by women, while their males' counterparts are preferred so as to ensure wild life conservation.

With regard to age, Table 4.1 revealed that the majority (26.6%) of the respondents were 20-29 years while 9.5% of them belonged to the age group of 30-39 years and the rest of the respondents were above 40 years. This meant that respondents within the age group of 20-29 and 30-39 years were commonly accessed during the study. This could be because this age group is considered hardworking and had more knowledge on wildlife conservation.

With regard to education level, the majorities (35.7%) of the respondents were Diploma Holders and were mostly from the local community members, followed by those with masters 10.4%. Furthermore, 14.3% of the respondents had first degrees Qualifications and only 1% was PhD

holders which come from nongovernmental organizations. This suggests that Diploma Holders were dominant in the study. This could be because education level in democratic Republic of Congo is just semiskilled hence most of the Diploma Holders gets a chance to hold key positions in the national park.

With regards to work experience, the majority (26%) of the respondents had work experience of 1-5 years while 17.5% of the respondents had work experience of less than one year and 6 and above years. This implied that respondents with work experience above 5 years were dominant in the study. This could be because this group of employees was considered to be knowledgeable and therefore had the necessary expertise to improve wildlife conservation against human activities.

Table 2.4.1 Demographic characteristics of the respondents

SEX					
Category of Respondents		Male	Female	Frequency	Percentage
Local Community Members		64	30	94	61%
ICCN Staff		4	2	6	3.8%
NGOs		8	4	12	7.7%
CBOs		10	5	15	9.7%
Cultural Leaders		12	-	12	7.7%
Local Government Representatives		13	2	15	9.7
Total				154	100
AGE GROUP					
Local Community Members	20-29	29	12	41	26.6%
	30-39	20	10	30	9.5%
	40 and above	15	8	23	4.9%
ICCN staff	20-29	3	1	4	2.6%
	30-39	1	1	2	1.3%

	40 and above	-	-	-	-
NGOs	20-29	4	2	6	3.9%
	30-39	3	1	4	2.6%
	40 and above	1	1	2	1.3%
BOs	20-29	5	2	7	4.5%
	30-39	3	2	5	3.2%
	40 and above	2	1	3	1.9%
Cultural leaders	20-29	1	-	1	0.6%
	30-39	3	-	3	1.9%
	40 and above	8	-	8	5.2%
Local government representatives	20-29	3	-	3	1.9%
	30-39	4	-	4	2.6%
	40 and above	6	2	8	5.2%
Total				154	100

EDUCATION

Local Community Members	Diploma	40	15	55	35.7%
	Degree	14	8	22	14.3%
	Masters	9	7	16	10.4%
	PHD	1	-	1	0.6%
CCN staff	Diploma	3	2	5	3.2%
	Degree	1	-	1	0.6%
	Masters	-	-	-	-
	PHD	-	-	-	-
NGOs	Diploma	2	-	2	1.3%
	Degree	4	1	5	3.2%

CBOs	Masters	1	1	2	1.3%
	PHD	1	-	1	0.6%
	Diploma	2	3	5	3.2%
	Degree	7	2	9	5.8%
Cultural Leaders	Masters	1	-	1	0.6%
	PHD	-	-	-	-
	Diploma	5	-	5	3.2%
	Degree	7	-	7	4.5%
Local Government Representatives	Masters	-	-	-	-
	PHD	-	-	-	-
	Diploma	2	1	3	1.9%
	Degree	8	1	9	5.8%
	Masters	3	-	3	1.9%
	PHD	-	-	-	-
Total				154	100

WORK EXPERIENCE

Local Community Members	Under 1 year	12	15	27	17.5%
	1-5 years	30	10	40	26%
	6 and Above	22	5	27	17.5%
CCN staff	Under 1 year	-	-	-	-
	1-5 years	3	1	4	2.6%
	6 and Above	1	1	2	1.3%
NGOs	Under 1 year	3	1	4	2.6%
	1-5 years	2	3	5	3.2%
	6 and Above	3	-	3	1.9%

CBOs	Under 1 year	5	3	8	5.2%
	1-5 years	4	1	5	3.2%
	6 and Above	1	1	2	1.3%
Cultural Leaders	Under 1 year	-	-	-	-
	1-5 years	-	-	-	-
	6 and Above	12	-	12	7.8%
Local Government Representatives	Under 1 year	4	-	4	2.6%
	1-5 years	2	1	3	1.9%
	6 and Above	7	1	8	5.2%
Total				154	100

Source: Field data, 2017

4.2 Impact of poaching on wildlife conservation in Kahuzi-Biéga national park in Democratic Republic of Congo

Table 4.2 above, shows that 75% of the respondents reported that poaching is one important human activity carried out in the park, and only 25% of the respondents were not aware of what was going on in the national park.

Table 3. 4.2: Poaching as a human activity carried out in the park

	Frequency	Percent
Yes	116	75.3
NO	38	24.7
Total	154	100.0

With regard to reasons for poaching ,Table 4.3 below, respondents revealed that the major reasons for increased poaching was increased poverty among the locals with 32%, followed by the high demand for ivory at the international market with 25%, availability of wild life resource and need for food with 12.3%, followed by weak regulations with a percentage of 9.7% and then corruption among the national park administration with 7%, and finally weak regulations and laws with 10% were behind the reasons for increased poaching in the national park.

Basing on the interpretation of the table below, the findings on the reasons for increased poaching activities in the national park was poaching done by the locals because of lack basic needs in their homes such as food need for clothing which they get through selling ivory, hides and skins from elephants, baboons, and monkeys among others. The findings are in line with study where Poachers might be poor locals from the area to foreigners capitalizing on the lucrative illegal wildlife trade. By contrast, trophy hunting is the entirely legal killing of wildlife, often carried out by rich foreigners for sport and enjoyment. Both results in animals were in the wild, but the similarity ends there. Furthermore it was found out that unregulated hunting and poaching causes a major threat to wildlife

Table 4.4.3: Reasons for increased poaching in the Kahuzi-Biega National park in Democratic Republic of Congo

Based on the interpretation of the Table 4.4 it was revealed that local people in the area are

Reasons for poaching	Frequency	Percent
Increased poverty among the locals	50	32.5
High demand for ivory	40	26.0
Availability of wild life resources	20	12.3
Weak regulations/laws	15	9.7
Corruption	10	6.5
Need for food	19	12.3
Total	154	100.0

highly involved in wild life poaching with 41.6% revealed locals hunt these animals for food, meat, and are sold for economic benefit and get money from the traders of animal products.

The study also revealed that game rangers in collaboration with national park to the level of administration including supervisors were also involved in killing and poaching of wild life animals to the level of 32.5%. Game rangers are involved in poaching.

Table 5. 4.4: Categories of people involved in poaching of wild life in Kahuzi-Biéga National Park in Democratic Republic of Congo

CATEGORIES	Frequency	Percent
Foreigners	40	26.0
Local people in the area	64	41.6
Game rangers	50	32.5
Total	154	100.0

Source: Field data, 2017

From the table 4.5 below, the findings revealed that poaching has a big negative impact on wild life conservation where 90.9% of the respondents agreed with the issue and only 9.1% disagreed. This response gave the researcher to further consult from the respondents on how poaching impacts wild life conservation.

Table 6.4.5: Response on whether poaching has negative impact on wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo

OPTIONS	Frequency	Percent
Yes	140	90.9
No	14	9.1
Total	154	100.0

Source: Field data, 2017

From the interpretation of the table 4.6, respondents revealed that increased illegal poaching of wild life has led to reduced numbers of wild animals with 32.5%, threats to wild animals 19.5%, destruction of flora 19.5%, and tourist boycott 16% and finally the study revealed that poaching in the national park has resulted into environmental pollution/destruction with 13%.

From the above, the study findings revealed that wildlife poaching has negative side-effects that affect local communities, wildlife populations, and the environment.

Table 7.4.6: How poaching has affected wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo

IMPACTS	Frequency	Percent
Depopulation of wild animals	50	32.5
Threat to wild animals	30	19.5
Destruction of flora	29	18.8
Tourist boycott	25	16.2
Environmental Pollution	20	13.0
Total	154	100.0

Source: Field data, 2017

The table 4.7, respondents revealed that the most poached wild life animals in the national park are the elephants with 52%. The study also revealed that monkeys are also hunted most especially by the locals for meat and food with 26%. Further the study also revealed Black Rhino 13% being hunted by use of guns and leopards 9%. These animals other than elephants are most particular hunted by locals to get food, skins and medicines for sale.

It was concluded that Black Rhino, and elephants are poached due to the fact that they are believed to have healing properties of its horn and one of the respondents narrated that “We need various species of flora and fauna in our environmental ecosystems so that it can maintain healthy and balanced development”. The demand for elephants products, make illegal wildlife trade a low risk business with high returns. The poachers—often poor locals—are the ones usually the only ones caught, leaving the real masterminds and their network safe and operational with the ability to strike again (Mathisen, 2014).

Table 7. 4.7: Wild animals being poached in Kahuzi-Biéga National Park in Democratic Republic of Congo

SPECIES	Frequency	Percent
Elephants	80	51.9
Monkeys	40	26.0
Black Rhino	20	13.0
Leopards	14	9.1
Total	154	100.0

Source: Field data, 2017

Based on the interpretation of Table 4.8 study shows that indeed charcoal burning is a human activity being carried out in the national park with 91% whereas 9% were not agreeing with the researcher on the question that was posed to them.

Table 8.4.8: Impacts of charcoal burning on wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo.

Response on whether or not charcoal burning is taking place in national park

OPTIONS	Frequency	Percent
Yes	140	90.9
No	14	9.1
Total	154	100.0

Source: Field data, 2017

With regards to charcoal burning, Table 4.9 revealed that the most common reason for ongoing charcoal burning in the national park was attributed to availability of tree species for charcoal production with 26%. This followed by 23% of the respondents who reported that charcoal burning in the national park is due to need for money by the local nationals. In the discussion the study revealed that “due to poverty and lack of financial capability to help their survival has resulted into deforestation and encroachment of the park to get trees for charcoal burning and rewood”.

Furthermore, the study also revealed that high population pressure resulting from civil wars has turned the park into survival for refugees with 19%. Also weak government regulations/laws led to human encroachment in the national park for charcoal burning with 13% (Grier and Buhyoff, 2010)

From the above discussion, the findings of the study revealed that charcoal burning has led to endangered tropical rainforest and endangered mangrove habitats of the national park. In addition, damage caused by unsustainable forestry practices in these regions, is the negative environmental impact arising from the consumption. Furthermore the findings revealed that over exploitation of vegetation in the national park occurs mainly through gathering wood for fuel, fencing and construction materials, over grazing of livestock and charcoal production which affects wildlife habitats as most of them are displaced and other dies due to starvation and poaching. (Steidl and Anthony, 2012)

Table 9.4.9: Reasons for the increased charcoal burning in national park

REASONS	Frequency	Percent
Availability of tree species	40	26.0
Need for money	35	22.7
High demand for charcoal	30	19.5
High population pressure	29	18.8
Weak governmental regulation/laws.	20	13.0
Total	154	100.0

Source: Field data, 2017

Based on the findings in the tables 4.10 below, charcoal burning has a negative impact on world life conservation. Respondents identified frequent and prolonged drought with 26% as the most outcome of prolonged drought in the national park. During an interview with some administrative staff of the National Park, it was gathered that “since the introduction of Charcoal burning in the national park the park started experiencing climate changes where as it burns

wood produces carbon dioxide which has been one of the main greenhouse gases responsible for climate change in the area”.

Furthermore, respondents revealed that charcoal burning has been responsible of Biodiversity depletion with 19.5%. Charcoal burning as it burns fume producing gas has resulted in death of living organisms, soil erosion, land degradation and gully formation. It was found out that wildlife conservation has not done well ten years ago because of frequent death of flora and fauna due to destruction of wild life habitats.

The study revealed that as human activities keep increasing in the National Park most especially charcoal burning, wildlife habitats have been destroyed and loss of vegetation cover experienced. Currently, most of the valuable areas for animal habitats has been cleared up and these animals have been threatened by humans which have forced wild animals to move out of the park to other areas.

Based on the findings made by this study, it was found out that charcoal burning has increased and over exploitation of vegetation occurred mainly through gathering wood for fuel, fencing and construction materials. Over grazing and charcoal production had affected wildlife habitats as most of them are displaced while others even died due to starvation. Furthermore, the findings also revealed that extensive charcoal burning in the Park has led to reduced rangeland carrying capacity, biodiversity depletion, soil erosion, land degradation and gully formation. These findings were in line with those of (Trivers,2010,) who showed that Charcoal burning as it burns wood produces carbon dioxide being one of the main greenhouse gases responsible for climate change and destruction of wild life habitats as most of them die due to starvation and high temperature.(Norris and Sutherland,2001)

Table 10.4.10: Effects of charcoal burning on wild life conservation

EFFECTS	Frequency	Percent
Reduced rangeland carrying capacity	20	13.0
Biodiversity depletion	30	19.5
Frequent and prolonged drought	40	26.0
Destruction of wildlife habitats	24	15.6
Land degradation	15	9.7
Loss of vegetation cover	25	16.2
Total	154	100.0

Source: Field Data, 2017

Based on the finding made in Table 4.11 by this study, it was revealed that the National Park was provided with strategies to ensure the protection and conservation of wildlife in the Park. From the results, 88% of the respondents confirmed that while 12.3% of them claimed to know nothing about control strategies put in place by the authorities of the Park.(Norris and Sutherland, 2001)

Table 11.4.11: If there are Mechanisms or not that are put in place to ensure wild life

OPTIONS	Frequency	Percent
Yes	135	87.7
No	19	12.3
Total	154	100.0

Source: Field Data, 2017

Table 4.12 below shows the level of strategies used in ensuring that human activities do not infringe on wildlife including flora and fauna, basing on the findings it was evidenced that the National park mainly uses game rangers 26%. Narrated that “Game rangers work tirelessly to watch over some of the most endangered wildlife on the planet, like tigers, elephants and rhinos are protected by these security officers”.

Furthermore, the use of licenses, fines, and demarcation of national park were other strategies used in wildlife conservation. During an open focused interview, one of the respondents narrated that “while some demarcation may be last-ditch attempts to preserve wildlife areas already isolated by human development, others are constructed within relatively contiguous wildlife

abitat”. Wildlife fences are constructed for a variety of reasons including to prevent the spread of diseases, protect wildlife from poachers and to help manage small populations of threatened species from human disturbances.

The study also revealed that the management uses licenses to people who pay and authorized to hunt but this is limited to specific time, and type. The findings on use of Licenses or other kinds of permits were a typical administrative instrument for the management of natural resources and are utilized also in relation to wild animals, to authorize hunting or other kinds of uses. One of the chief instructor of game rangers said that “since the national park started use of Licenses has contributed to management where they are effectively used to limit the number of animals which may be taken under a single license, based on a periodical assessment of sustainable levels of exploitation and adequate plans. The national park administration also uses community sensitization mechanisms through use of radio adverts on the relevancy of wildlife conservation with 6%. Similar purposes are pursued by requirements for supervision of some categories of hunters, in particular big game hunters, by hunting guides, who in turn need a special permit.

Table 12.4.12: Strategies that are put in place to ensure wildlife conservation

STRATEGIES	Frequency	Percent
Use of game ranger	40	26.0
Use of licenses	25	16.2
Demarcation of National Park	25	16.2
Use of Fines	24	15.6
Legislation	20	13.0
Tree planting	10	6.5
Community sensitization	10	6.5
Total	154	100.0

Source: Field Data, 2017

As indicated in table 4.13, the findings on opinions of the community on what should be done to wild life conservation was that respondents requested the responsible stakeholders to design a benefit-sharing system and Incentive mechanisms with 19% as a means of social responsibility in wildlife conservation. Benefit sharing that is community-based, or involves benefit-sharing will give local communities a stake in conserving critical habitats and species against human activities such as charcoal burning and animal grazing.

Respondents also suggested need for Compensation of destroyed crops for farmers by wild animals. It was found out that community members could put fences against wild animals which can be in position to destroy people's crops since most of the wild animals could leave the park and go to people's crops where most of these animals are destructive and farmers are not compensated by the park management where respondents requested need for compensation with 23%.

Furthermore, the opinion of community was that there should be need for Authorization for hunting to the community at least once in a year. Respondents argued that "In our community hunting continues to contribute to subsistence and way of living, therefore there is need to hunt to allow traditional hunting practices" as hunting is often part of customary management systems which by their nature could rarely produce negative impacts on the conservation of wildlife.

Finally, the study findings were that Legal issues related to hunting/poaching are essential towards wildlife conservation, such as those on regulation of hunting, on licenses and on ownership of wildlife. Among the most common protection rules are those which set out prohibitions applicable to hunting.

Furthermore, the use of licenses, fines, and demarcation of national park were other strategies used in wildlife conservation with. During an open focused interview, one of the respondents narrated that "while some demarcation may be last-ditch attempts to preserve wildlife areas already isolated by human development, others are constructed within relatively contiguous wildlife habitat". Wildlife fences are constructed for a variety of reasons including to prevent the spread of diseases, protect wildlife from poachers and to help manage small populations of threatened species from human disturbances.

As indicated in table 4.13, the findings on opinions of the community on what should be done to wild life conservation was that respondents requested the responsible stakeholders to design a benefit-sharing system and Incentive mechanisms with 19% as a means of social responsibility in wildlife conservation. Benefit sharing that is community-based, or involves benefit-sharing will give local communities a stake in conserving critical habitats and species against human activities such as charcoal burning and animal grazing.

Respondents also suggested need for Compensation of destroyed crops for farmers by wild animals. It was found out that neighboring communities were facing a problem of wild life destruction of their farms as most of wild animals could leave the park and go to people’s crops where most of these animals are destructive and farmers are not compensated by the park management where respondents requested need for compensation with 23%.

Table 13.4.13: Opinions of the community on what should be done to wild life conservation

OPINIONS	Frequency	Percent
Benefit-sharing	30	19.5
Allocating land for human activities	25	16.2
Compensation of destroyed crops for farmers	35	22.7
Authorization for hunting	20	13.0
Incentive mechanisms	29	18.8
Need to separate livestock from wildlife	15	9.7
Total	154	100.0

Source: Field Data, 2017

CHAPTER FIVE

5.0 DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1.1 How poaching has affected wildlife conservation in Kahuzi-Biéga National Park

With regards to poaching which was undertaken for several reasons such as revenge, meat for food or sale, tradition or money, it was revealed that poaching was one of the most devastating human activities carried out in the national park. Poachers were categorized into poor locals from the area to foreigners capitalizing on the lucrative illegal wildlife trade that has resulted into drop in the number of wildlife in the National Park.

Unregulated hunting (poaching) and charcoal burning were the most threats and most activities which were practiced against wildlife conservation within Kahuzi-Biega National. Along with this, mismanagement of forest department and forest guard's triggers this problem. (Holthuijzen, 2013) argues that Wildlife poaching has negative side-effects that affect local communities, wildlife populations, and the environment. It is a crime fueled by a lucrative black market trade of animal parts. Some animal parts are sold as novelty items and are sold for their "medicinal" properties. Environmental groups, animal rights groups, government agencies, and even the Duke of Cambridge are calling for an end to wildlife poaching.

The findings also revealed that the ongoing hunting of animals in the national park is that poachers kill wild animals for profit and meat. For example, bear gall bladders and big horned sheep antlers are worth top dollar for their so-called medicinal properties. This past September 2017, at the National Wildlife Property Repository in DRC, the wildlife service destroyed six tons of ivory confiscated at DRC borders. Elephants are killed for their tusks because, while it is possible to remove the tusks without killing the elephant, they are too dangerous to remove when they are alive (Wild Life conservation report, 2009). The findings also revealed that the economic challenges of a community can lead to poaching, which in turn can lead to endangerment (and in the worst cases, extinction) of different species.

The findings also revealed that elephants and black rhinos were the wildest animals being hunted for medicine and ivory purposes. According to an On Earth article, poachers killed over 30,000 elephants last year. Experts believe that elephants will go extinct within the next decade if the

killing continues at this rate. The extinction of a species can have a negative economic effect on a local community's tourism industry (Hess and Hess-Orthmann, 2012).

The findings on the effect of poaching on wildlife conservation were that Poaching has negative impact on wildlife conservation where a community that relies on its wildlife to attract tourists is at great risk for economic hardship if the prevalence of poaching persists. Furthermore, a tourist boycott due to local poaching was a real threat. A boycott could have a detrimental effect on a community's economy since restaurants, hotels, rentals, and other attractions would suffer. Extinction is the greatest threat to animals that are victims of wildlife poaching. In 2011, the International Union for the Conservation of Nature (IUCN) declared the Western Black Rhinoceros extinct. This subspecies of the critically endangered Black Rhino was poached due to the belief in the healing properties of its horn (Gerrodette, 2009).

It was concluded that poaching in National Park was majorly attributed to corruption, toothless laws, weak judicial systems and light sentences allow criminal networks to keep plundering wildlife with little regard to the consequences. These factors make illegal wildlife trade a low risk business with high returns. The poachers often poor locals are usually the only ones caught, leaving the real masterminds and their network safe and operational with the ability to strike again (Mathisen, 2014).

5.1.2 Effects of charcoal burning on wildlife conservation

With regard to charcoal burning, the study revealed that Charcoal burning was also another human activity that had impacted negatively on wild life conservation because as it burns, wood produces carbon dioxide - one of the main greenhouse gases responsible for climate change and destruction of the environment including flora and fauna. In addition to the damage caused by unsustainable forestry practices in these regions, is the negative environmental impact arising from consumption of fossil fuels transporting charcoal.

Further findings were that charcoal burning has resulted into overuse of vegetation and animal intensification. Over exploitation of vegetation occurs mainly through gathering wood for fuel, fencing and construction materials, over grazing of livestock and charcoal production which affects wildlife habitats as most of them are displaced and others die due to starvation and

poaching. This is an un-controlled activity which selectively clears tree cover (especially *Acacia bussei*). Its effects are further complicated by the diminishing natural resilience of the vegetation occasioned by frequent and prolonged drought in the last few years (Fraser and Mathisen, 2012). Extensive charcoal burning in the national park has resulted into reduced rangeland carrying capacity, biodiversity depletion, soil erosion, land degradation and gully formation. Moreover, development of unplanned feeder roads and unplanned watering points has increased the number of settlements and increased the wildlife vulnerability to droughts, reduced animal conservation areas and create rangeland resource conflicts (Trivers, 2010).

5.1.3 Reasons for charcoal burning

These findings were in line with (Fraser and Mathisen, 2012) who reported that charcoal burning effects are further complicated by the diminishing natural resilience of the vegetation occasioned by frequent and prolonged drought in the last few years.

5.1.4 Reasons for increased poaching

Increased poaching were also attributed to economic challenges of the community which has led to increased poaching, which in turn has led to endangerment (and in the worst cases, extinction) of different species. We need various species of flora and fauna in our environmental ecosystems so that it can maintain healthy and balanced (Anthony *et al.*, 2009). Corruption, toothless laws, weak judicial systems and light sentences allow criminal networks to keep plundering wildlife with little regard to consequences. These factors make illegal wildlife trade a low risk business with high returns. The poachers often poor locals are the usually the only ones caught, leaving the real masterminds and their network safe and operational with the ability to strike again.

5.1.5 Strategies that have been put in place to ensure wildlife conservation

The findings on strategies used in ensuring that human activities do not infringe on wildlife including flora and fauna, was that the national park mainly uses game rangers. One of the respondents narrated that “Game rangers work tirelessly to watch over some of the most endangered wildlife on the planet, like tigers, elephants and rhinos are protected by these security officers”. Furthermore, the use of licenses, fines, and demarcation of national park was another strategy used in wildlife conservation. (Eliason, 2011) Human–wildlife conflict is another

common reason for building fences: wildlife can damage valuable livestock, crops, or infrastructure, some species carry diseases of agricultural concern and a few threaten human lives.

During an open focus group interview, one of the respondents narrated that “while some demarcations may be last-ditch attempts to preserve wildlife areas already isolated by human development, others are constructed within relatively contiguous wildlife habitat”. Wildlife fences are constructed for a variety of reasons including to prevent the spread of diseases, protect wildlife from poachers and to help manage small populations of threatened species from human disturbances. (Eliason, 2011) Human–wildlife conflict is another common reason for building fences: wildlife can damage valuable livestock, crops, or infrastructure, some species carry diseases of agricultural concern and a few threaten human lives. The study also revealed that the management issues licenses to people who pays and authorized to hunt but this is limited to specific time, and type of animal is needed by the poacher.

The findings on use of Licenses or other kinds of permits were a typical administrative instrument for the management of natural resources and are utilized also in relation to wild animals, to authorize hunting or other kinds of uses. One of the chief instructors of game rangers said that “since the national park started use of Licenses it has contributed to management where they are effectively used to limit the number of animals which may be taken under a single license, based on a periodical assessment of sustainable levels of exploitation and adequate plans. The national park administration also uses community sensitization mechanisms through use of radio adverts on the relevancy of wildlife conservation. Similar purposes are pursued by requirements for supervision of some categories of hunters, in particular big game hunters, by hunting guides, who in turn need a special permit.

The findings on opinions of the community on what should be done to wild life conservation was that respondents requested the responsible stakeholders to design a benefit-sharing system and Incentive strategies as means of cooperate social responsibility in wildlife conservation. Benefit sharing that is community-based, or involves benefit-sharing will give local communities a stake in conserving critical habitats and species against human activities such as charcoal burning and animal grazing. Further findings were that Compensation of destroyed crops for farmers by wild animals was another opinion. It was found out that neighboring communities were fencing a

problem of wild life destruction of their farms as most of wild animals could live the park and go to people's crops where most of these animals are destructive and farmers are not compensated by the park management where respondents requested need for compensation.

Furthermore, the findings on opinion of community were that there should be need for Authorization for hunting to the community at least once in a year. Respondents argued that "in our community hunting continues to contribute to subsistence and way of living, therefore there is need to hunt to allow traditional hunting practices" as hunting is often part of customary management systems which by their nature could rarely produce negative impacts on the conservation of wildlife.

(Wild Life conservation report,2009) foreign Poachers kill for profit, for example, bear gall bladders and big horned sheep antlers are worth top dollar for their so-called medicinal properties. This past November, at the National Wildlife Property Repository in Colorado, the wildlife service destroyed six tons of ivory confiscated at U.S. borders. Elephants are killed for their tusks because, while it is possible to remove the tusks without killing the elephant, they are too dangerous to remove when they are alive.

There should be prohibitions are of different types such as limitations in the quantity of animals which may be hunted (for example under a single license, or within a certain period) are not common in the principal legislation, as they are more frequently placed in subsidiary legislation periodically adopted or incorporated as license conditions.

Finally, the study findings was that legal issues related to hunting/poaching are essential towards wildlife conservation, such as those on regulation of hunting, on licenses and on ownership of wildlife. Among the most common protection rules are those which set out prohibitions applicable to hunting. This was in line with (Forsyth, 2009) that these prohibitions are of different types. Limitations in the quantity of animals which may be hunted (for example under a single license, or within a certain period) are not common in the principal legislation, as they are more frequently placed in subsidiary legislation periodically adopted or incorporated as license conditions.

5.2 Conclusion

Finally wildlife conservation should be there to ensure that nature is now useful by the present generations and make sure it will be around for future generations to apply the available resources on earth's surface .This is again to recognize the importance of wildlife and wilderness for humans and other species alike. Wildlife conservation has become an increasingly important practice due to the negative effects of human activity on wildlife. Wildlife conservation is mainly done through tree planting, fencing, guards, game rangers, direct compensation schemes, limitation to poaching, and use of licenses.

It was concluded that Poaching is the illegal killing of wildlife, undertaken for reasons that may include revenge, meat for food or sale, tradition or money. Poachers might be poor locals from the area to foreigners capitalizing on the lucrative illegal wildlife trade. Poaching of wild animals has resulted in increased death and displacement of wild animal species. This was mostly attributed to unregulated hunting and poaching that causes a major threat to wildlife, along with this, mismanagement of forest department and forest guard's triggers this problem.(Holthuijzen, 2013) argues that Wildlife poaching has negative side-effects that affect local communities, wildlife populations, and the environment. It is a crime fueled by a lucrative black market trade market of animal parts (Bélanger, and Bédard, 2011).

The study concluded that extensive charcoal burning in wild life conservation environment has the following impacts: reduced rangeland carrying capacity, biodiversity depletion, and soil erosion, land degradation, death of wildlife species, climate change and gully formation. Moreover, development of unplanned feeder roads and unplanned watering points increases the number of settlements and increase the pastoralist's vulnerability to droughts, reduced grazing areas and create rangeland resource conflicts. The study was also concluded that, Charcoal burning produces carbon dioxide - one of the main greenhouse gases responsible for climate change/global warming settlements.

3.3 Recommendations

3.3.1 Objective one

Based on the major findings made by this study, the rate of poaching was too high in the Park, control measures should be directed towards the main reasons why these activities were on the increase hence, the surrounding communities should be given sufficient entrepreneurial skills so as to broaden their sources of livelihoods in order to discourage them from these unwanted activities that was found to be negatively affecting the Park.

The local communities should be given a sort of privilege to hunt some animals in the Park so as to discourage them from poaching illegally.

The National Park should be made very convenient for the wildlife to reproduce naturally so as to maintain their population. According to (Watson, 2000), tree planting that later turns into natural and artificial forest has the following advantages to wildlife: They provide habitat which is the most obvious, they provide breeding grounds for species that aren't typically common to forests.

Strict surveillance of the Park should be provided so as to prevent poaching.

As discovered by this study, Game Rangers who were responsible for protecting the Park were also found to be involved in poaching activities in the Park hence; these sets of people should be well paid so as to discourage them from poaching on wild animals in the Park.

In order to discourage staff of the Park from engaging in or assisting others to poach, staff remunerations should be made more attractive.

3.3.2 Objective two

This study was also able to find out that the rate of charcoal burning in the Park was relatively high usually with adverse consequences on the wildlife conservation. Just as in the case of poaching, in order to bring end to it and to cushion its effects on the wildlife conservation, the main reasons why charcoal was being burnt should first be targeted. The surrounding communities should be given sufficient entrepreneurial skills so as to broaden their sources of livelihoods in order to discourage them from these unwanted activities that were found to be negatively affecting the Park.

Charcoal was mainly needed by the local people as a source of energy for cooking and heating hence, to control the act of charcoal burning in the area, other sources of fuel such as kerosene should be made readily available and at cheaper prices.

Tree planting campaigns should also be embarked upon in the National Park so as to replace lost trees and to enrich the forests' plant diversity.

Strict surveillance of the Park should be provided so as to prevent felling down of trees for charcoal burning

Similarly, in order to cushion the effects of charcoal burning in the Park, animal grazing which further exacerbates the situation should be well regulated.

In order to discourage staff of the Park from engaging in or assisting others to poach, staff remunerations should be made more attractive.

5.3.3 Objective three

Based on this objective which studied the control measures put in place by the Park authorities, it was discovered no effective measures were there in place hence, it is hereby recommended that:

The government lack resources to equip and train rangers, and rangers typically earn very little. Some go months without receiving their salary or seeing their families that prompt them to be bribed by poachers therefore, game Rangers on the ground must be well-better equipped to avoid poaching activities and they also need support beyond backpacks and boots. They must be respected and supported by their bosses and national laws against poaching enforced.

Although some part of the Park was fenced in order to protect it from human encroachment, the idea of fencing such areas was not always welcomed because sometimes such fences affect the normal movement of the wildlife.

Sufficient control tools and equipment should be also provided in order to enable the Game Rangers do their works effectively.

A lack of enforcement and political will often means such regulatory activities are not effective therefore Regulation on wildlife conservation needs to be complemented by policy measures

which provide incentives to actors to conserve biodiversity and promote sustainable development.

The local communities should be well enlightened on the impacts dangerous human activities such as poaching and charcoal burning on the entire environment as well as how they can live side by side in harmony with the Park. They should also be well informed they can benefit from the resources in the Park in very legitimate ways.

Provision of Licenses or other kinds of permits to carryout human activities such as charcoal burning and poaching can be a typical administrative instrument for the management of natural resources and can be utilized also in relation to wild animals, to authorize hunting or other kinds of uses. Licenses can contribute to management where they are effectively used to limit the number of animals which may be taken under a single license, based on a periodical assessment of sustainable levels of exploitation and adequate plans. Provisions which clearly relate the number of animals can allow to be taken under licenses to surveys or management plans, while ample discretion tends to be left to the administration in this regard.

5.4 Areas for Future Thesis

Although, the present study has offered some contributions to our understanding of the impact of human activities on wildlife conservation in Kahuzi-Biéga national park, different study undertaking needs to be looked at that is;

It is also suggested that future thesis should examine the impact of wild life conservation on human activities, since most complaints were raised that wild animals are destructive to their properties.

Further studies can be undertaken to further understand the role of game rangers in wildlife conservation.

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Appendix A: Questionnaires for Respondents

Questions addressed to the local community members, CBOs, NGOs cultural leaders and local government representative towards the assessment of the impact of human activities on wildlife conservation in Kahuzi-Biéga national park in Democratic Republic of Congo.

Dear respondents,

I am *Ndaruhuye Gatambaraa* Master's student of Kampala International University Main campus conducting a research on "*the impact of human activities on wildlife conservation in Kahuzi-Biéga national park in Democratic Republic of Congo*". This questionnaire is designed to help me gain a clear understanding of the impact of human activities on wildlife conservation in Kahuzi-Biéga national park. You are considered as one of the resourceful person and as such you are kindly requested to spare sometime and respond to the questions frankly and honestly. Your response will be treated with utmost confidentiality.

N/B

This research is intended for academic purposes only.

PROFILE OF RESPONDENTS

1) Gender

- a) Male
- b) Female

2) Age

- a) 20-29 years
- b) 30-39 years
- c) 40 years and above

3) Highest level of education

- a) Diploma
- b) Bachelor’s
- c) Master’s degree
- d) PhD Level

4) As an employee, for how long have you been working with Kahuzi Biéga National Park?

- a) Under 1 year
- b) 1-5 years
- c) 6 and above

5. Which department do you belong to?

.....

.....

.....

How poaching has affected wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo

Instruction: As honestly as you can, indicate the extent to which poaching impacts on wildlife conservation.

6. Is there any poaching carried out in the park?

a) Yes ☐ b) No ☐

If yes to question 6 why it is that poaching is carried out in the national park?

.....

.....

.....

7. Which type of people is engaged in poaching?

.....

.....

.....

8. (a) Do you think that there is a problem with poaching in this national park?

a) Yes ☐ b) No ☐

b). If yes what is the problem?

.....

.....

.....

c). If no why is not there a problem?

.....

.....

.....

d). What is the most common type of wildlife animals being poached by poachers?

.....

.....

.....

e). Why do people carryout poaching in the national park?

.....

.....

.....

1. (a) Are there any policies put in place to prevent poaching activities in this park?

a) Yes ☐ b) No ☐

b). If yes to question 11(a) above, mention and explain these policies put in place to prevent poaching in the national park

.....

.....

.....

2. (a) Are these policies effective enough to conserve wild life against poaching?

a) Yes ☐ b) No ☐

(b). If no to question 12 (a) above, give reasons as to why these policies are not effective to fight against poaching in the national park.

.....

.....

.....

Democratic Republic of Congo

13.(a) Is there any charcoal burning activity carried out in the national park?

A) Yes ☐

b) No ☐

b). If yes to question 13 (a), give reasons for the increased charcoal burning in the national park

.....

.....

.....

14. What type of people are practicing charcoal burning in the national park?

.....

.....

.....

15.(a) Do you think that charcoal burning as human activity has negative impact on wildlife conservation?

A) Yes ☐

b) No ☐

b). If yes to question 15 (a) above, mention these problems that results from charcoal burning as a response to wild life conservation

.....

.....

.....

6.(a) Do you think that charcoal burning can be controlled and reduced to ensure that wildlife are well protected?

a) Yes ☐ b) No ☐

b). If yes to question 16 above, what do you think can be done to curb the problem of increased charcoal burning in order to ensure wildlife conservation?

.....
.....
.....

The measures that have been put in place against human activities to ensure wildlife conservation in Kahuzi-Biéga National Park in Democratic Republic of Congo.

7.(a) Is there any mechanism in place to ensure that wild life are protected from human activities?

a) Yes ☐ b) No ☐

b)If yes to question 17 above, mention those mechanisms that are put in place to protect wild life against human activities?

.....
.....
.....

8. In your own views what do you think should be done to protect wild life from harm due to human activities?

.....
.....
.....
.....

19.(a) Is the government of the Democratic Republic of Congo fighting human activities going on in the national park?

A) Yes ☐ b) No ☐

b). If yes to question 19 above, how are they controlling these human activities?
.....
.....
.....

c). If no to question 19 above, why is it that the government is not restricting these human activities going on around and within the national park?
.....
.....
.....

Thank You for Participation.

Appendix B: Proposed Budget

The research will involve a lot of movements from one area to another. So as to gather adequate information about the topic, following amount will be required to accomplish my research;

Description/item	Amount (USHS)
consultation of literature	100,400
Designing and developing research instrument	103,500
Collection of data	208,300
Accommodation	100,000
Finalizing research instrument	50,000
Data processing and report writing	150,000
10% contingency and institutional costs	80,000
Questioners printing costs	100000
Research assistants	200,000
Total	1092200

Appendix C: Work Plan

Time Schedule of Activities

QH195.13
N3375
2018

ACTIVITY	MONTH											
	J	F	M	A	M	J	J	A	S	O	N	D
Topic selection & submission for approval												
Research designing												
Literature review												
Typing & editing the proposal												
Representation of the proposal for marking												
Data collection												
Report writing												
Representation of report for marking												
Submission of the report												

