COLLABORATIVE METHODOLOGY AND SUSTAINABLE WILDLIFE MANAGEMENT: A CASE OF SEMULIKI NATIONAL PARK, WESTERN UGANDA

BY

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A RESEARCH THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS IN GEOGRAPHY OF KYAMBOGO UNIVERSITY

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DECLARATION

I Namulemo Alice, declare that this research thesis titled "***Collaborative Methodology and Sustainable Wildlife Management*"** is my work and has never been handed in to any other establishment for any honor.

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APPROVAL

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DEDICATION

The work is devoted to my father Kanyope Bageya Christopher and the family of Mr. Kakaire David who invigorated me all over the period of study.

ACKNOWLEDGEMENT

I express appreciation to the Great God for giving me the gift of life.

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LIST OF ACRONYMS

APUs:	Anti-Poaching Units.
CAMPFIRE:	Communal Area Management Programme for Indigenous Resource.
CBAPUS:	Community Based Anti-Poaching Units.
CCRs:	Community Conservation Rangers.
CM:	Collaborative Methodology.
IGAs:	Income Generating Activities.
MWM:	Maintainable Wildlife Management
NP:	National Park.
NPs:	National Parks.
PA:	Protected Area
PAs:	Protected Area.
SNP:	Semuliki National Park.
TIBCO:	The Indigenous Batwa Community.
UNDP:	United Nations Development Programme.
UNEP:	United Nations Environment Programme.
UWA:	Uganda Wild Life Authority.
WCCSNP:	Warden Community Conservation Semuliki National Park.
WMAs:	Wildlife Management Areas.

ABSTRACT

The study was about collaborative methodology and maintainable wildlife management in Uganda. It is vital for all interested parties in wildlife management to work in mutual support to avoid the lessening of natural wealth in order to preserve the environment. The collaborative methodology and maintainable wildlife management are accepted as important because of the need to create trustful links amongst the wildlife managers and the neighboring societies. However, challenges of maintainable wildlife management recognize, among other things; poor government procedures and failure of collaborative protection. The objectives of the study were to find out the local communities' contribution to cooperative strategies; to establish the local community level of awareness about cooperative strategies; and to examine the local communities' perception about the cooperative strategies as far as maintainable wildlife management was concerned. The study engaged a cross sectional design. Data were assembled to judge whether the collaborative methodology could successfully maintain wildlife management in National Parks. Qualitative and computable investigation methods were used for the study. Questionnaires, focus group discussions and interview guides were used for data assembly. The interview guide was used to gather material from 200 household heads. Both content validity (0.7) and reliability at reliability value (0.84) were ascertained. A total of 200 questionnaires were administered and all were brought back. The returned questionnaires were entered using SPSS. Descriptive statistics specifically; frequencies and percentages were used to refer to the data from the questionnaires and to take a broad view of the discoveries. The outcomes displayed that it was key for the local community to contribute to cooperative strategies. In addition, the local community level of awareness about the cooperative strategies and the local community perceptions were vital in maintainable wildlife management. Lastly, the study concluded that the local communities' contribution to cooperative strategies, their level of awareness and their perceptions about collaborative strategies were required to manage wildlife at a maintainable level. The study suggested that the park specialists should increase on the household heads' contribution to sustaining Mauritius thorn hedges in order to increase partnership in the execution of maintainable wildlife management. Additional household heads needed to unite in planting chili as a substitute livelihood provider in order to stop elephants from confronting the community.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Collaborative methodology (CM) refers to the situations in which some or all the stake holders like, local communities, private and public institutions around the National Park (NP) or any other types of natural resources are involved in the management of resources. It involves the conservation authorities negotiating with the resource user group to reach an agreement to manage a certain resource or resources for the effective management of the natural resources (Borrini-Feryerabend, 1996). Murphy (1996) asserts that, CW involves contributing to the rural livelihood and development objectives.

According to Timoshyna and Rodina (2019), there was need to connect maintainable wildlife management (MWM) and its importance to collaborative methodology. In Umar's (2020) view, this was because of their reputation for biodiversity protection. Conservation administrators and adjoining communities are the principal players in the exceedingly competitive environments within and around wildlife protection areas (PAs). If wild flora and fauna was to possibly contribute to local livelihoods, there was need for its sustainability (ibid).

According to UNEP, (2018), maintainable wildlife management (MWM) is the sound management of wildlife species in order to sustain their populations and habitats over time, considering the socio-economic needs of the human populations. This requires that all land-users within the wildlife habitats are aware of and consider the effects of their activities on the wildlife resources and habitats, and on other user groups.

In the context of the current study, maintainable wildlife management has the aim of balancing the economic, ecological and social values of wildlife. It takes into account the view of protecting the interests of the present and future generations. Thus, the concept goes beyond the protection of interests related to hunting and protection for individual species, and rather focuses on wildlife as a renewable natural resource in a holistic way.

In developing countries, the original model of conserving NP during and after the colonial era was implemented through the use of the existing colonial administrative structure that involved policies being made by top administrators and later passed on to the lower structures for implementation (Mwesigye, 2012). Lack of awareness about wildlife management and restricted access to resources by park authorities led to negative perceptions towards wildlife conservation, a phenomenon that set off the beginning of conflicts between the Park authorities and the local communities living near the Park (Hulme and Muphree, 2001).

In 1970 and 1980s there was wide spread degradation of forests in the developing countries due to increased population, political instability, inadequate forest staff and insufficient funds in the forest department. This led to increased illegal activities like poaching and destruction of wild life (United Nations Environmental Programme [UNEP], 2013).

In addition, past practices adopted by conservation management authorities that excluded the local people created resentment among them, reduced the effectiveness of conservation practices and contributed to the re-occurrence of illegal activities. The ineffectiveness of the protective model led to the introduction of a new approach that emphasis involvement of the local people in management of the Protected Area (PA) (Saito, 2007).

In the 1980s, community led conservation and development approaches were spearheaded with support from international agencies such as the United Nations Educational Scientific

Cultural Organization (UNESCO), donors, Non-Government Organizations (NGOs) with the effort to link sustainable use of resources and conservation of the biodiversity and to improve rural livelihood (Khwaja, 2004).

The rationale behind collaborative approach is that by working together, people are able to achieve more than organizations working on their own, and involving those affected is likely to induce cooperation perception by the local people towards conservation activities and more acceptable solutions (Forgie et al, 2001). These desired outcomes such as increased awareness about wildlife programs, rural development, eco-tourism, land use planning, good park- community relationships and improved livelihood can in turn propel the local people reinforce positive perception towards biodiversity conservation (Ferrie, Bettinger, Kuhar, Lehnhardt, Apell&Kasoma, 2011).

Globally, a number of management plans have been put in place in an attempt to conserve wildlife through involving local communities in wildlife conservation. Such strategies have been adopted by several countries for example; Nepal, Brazil, Pakistan and India. In Nepal the Government established a variety of programs for example; creation of buffer zones, regular resource harvesting, establishment of Community Based Anti-Poaching Units (CBAPUs), awareness programs, regular conduct of wildlife population and habitant assessment in order to manage wildlife sustainably (Poudel, 2018).

In Africa many countries have adopted the methodology of Collaborative Wildlife Management (CWM) for example Communal Area Management Program for Indigenous Resources (CAMPFIRE) in Zimbabwe, Administration Management Design for Game Management (ADMADE) in Zambia and CBNRM Community Based Natural Resource Management in Botswana (Mbaiwa, 1999). In Zimbabwe it involves the sale of authorities of

the rights to wildlife enterprise who in turn market safaris to hunters and eco-tourists. It was designed specifically to stimulate the management and sustainable use of resources in Zimbabwe's communal farming areas. Resident communities were given custody over responsibility for managing wildlife resources and the right to benefit directly from their use (called appropriate Authority) (Nyasdzasha, 2017).

In East Africa community programs have been implemented in Kenya under the Kenya

Wildlife Services (KWS) and Tanzania under Tanzania National Park Authority (TANAPA). In Tanzania the Protected Area Outreach Initiatives were developed by TANAPA in the management of NP for example; Tarangire and Serengeti NP. The policy promotes wildlife management at village level by allowing rural communities and private land holders to manage wildlife and land for their own benefit. These areas always act as buffer zones around the NP which can increase wildlife habitat along boarders and keep human activities away from the Park (Wilfred, 2010).

In Uganda, CWM started from the forest reserve conservation in Bwindi Impenetrable forest in 1988 (Namara, 2006). In 1996 it was implemented in Mountain Elgon National Park (MENP) among others. The program was carried out in support of Mountain Elgon Conservation and Development Projects and World Conservation Union (IUCN) in conjunction with other institutions that provided the technical support (Chhetri, Mugisha & Sean, 2003). All conservation authorities in the country have adopted the CWM approach in their management plans to attain natural resource sustainability (UWA, 2014).

The management of Semuliki National Park (SNP) adapted Collaborative management in 1996 when the government of Uganda realized that without local people involvement, management of wild life would be very difficult. It was formally implemented through a

program called Collaborative Resource Management (CRM) rolled out in 1997 following the enactment of UWA's statute of 1996 that recognized local people's contribution to conservation and management of park resources (The Constitution of Republic of Uganda 1999).

Existing literature notes that since the adoption of sustainable management strategies in Uganda, this approach has experienced challenges such as; unclear and irregular maintenance of some parts of the boundaries, invasive tree species, poaching and illegal harvesting of resources, inadequate parameters to monitor resource use, inadequate revenue share, inadequate awareness programs and insurgency caused by intermittent rebel attacks.(Chege,, Oyango, Drazu and Mwandha, 2002) This situation has consequently created the need for re-evaluation of the existing collaborative management activities with a view of catering for the unresolved challenges that limit the subsequent change of perceptions of the local people towards wild life management (Chhetri, Barrow Edmund and Muhwezi, 2004).

Even then, despite the fact that collaborative wildlife management has been implemented in the country, specific strategies implemented in the NP, the level of the local communities about the strategies and perception of local communities about the performance of strategies is unknown. It is therefore, against this background that this study is set off to identify the strategies used in collaborative wildlife management, the level of awareness of local communities about collaborative wildlife strategies and the perceptions of local communities towards the strategies used in collaborative wildlife management around SNP.

1.2 Statement of the Problem

Semuliki National Park is one of the low laying natural forest Park in Uganda, having a unique biodiversity which is restricted, threatened, endangered and endemic and therefore requires to be conserved sustainably (UWA, 2017). The park was formally Semuliki Forest Reserve in 1932 but was later upgraded to NP status in 1993. The program of conservation of wildlife formally started in 1990 and was fully centralized in 1993 by the Government of Uganda under the Uganda Wildlife Authority (Uganda Wild life Act 1996, Cap 200). This led to evictions of local people, putting restrictive measures towards resource access, unclear boundaries, which subsequently caused conflicts between the park and local people leading to negative perceptions towards wildlife management (Chhetri et al, 2004). To salvage the situation the NP authority adopted new approach called Collaborative Resource Management (CRM). The purpose of CRM was to provide local people with a fair share and access to park resources in recognition of their rights to livelihood security, joint decision-making that had often caused adverse effects (Chege et al, 2002).

However, since the adoption of collaborative approach there is lack of buffer zones in PAs m irregular resource harvesting and continuous human wildlife conflict (UWA, 2017). This could have resulted in negative perceptions by the local people as such the study investigates collaborative methodology and the sustainability of wildlife around SNP.

1.3 Objectives of the Study

1.3.1 The general objective

To establish collaborative practices and the sustainability of wildlife in and around Semuliki National Park

1.3.2 Specific objective

i) To identify the collaborative strategies used in the management of wildlife in and around Semuliki National Park.

ii) To establish the level of awareness of the local communities about the collaborative strategies used in and around Semuliki National Park.

iii) To examine the local communities' perceptions about collaborative strategies employed in the management of wildlife in and around Semuliki National Park.

1.4 Research questions

i) What are the collaborative strategies used in the management of wildlife in and around Semuliki National Park?

ii) What is the level of awareness of the local communities about the collaborative strategies used in and around Semuliki National Park?

iii) What are the local communities' perceptions about collaborative strategies employed in the management of wildlife in and around Semuliki National Park?

1.5 Scope of the study

The scope of the study was in three perspectives, Content, Geographical and Time scope thus:

1.5.1 Content scope

The study intended to establish collaborative methodology and the maintainability of wild life: the case of Semuliki National Park in Western Uganda. Focus was put on wardens and

community members around SNP because they were responsible for ensuring collaboration for maintainable wildlife management.

1.5.2. Geographical scope

A MAP OF SEMULIKI NATIONAL PARK SHOWING THE STUDY AREA

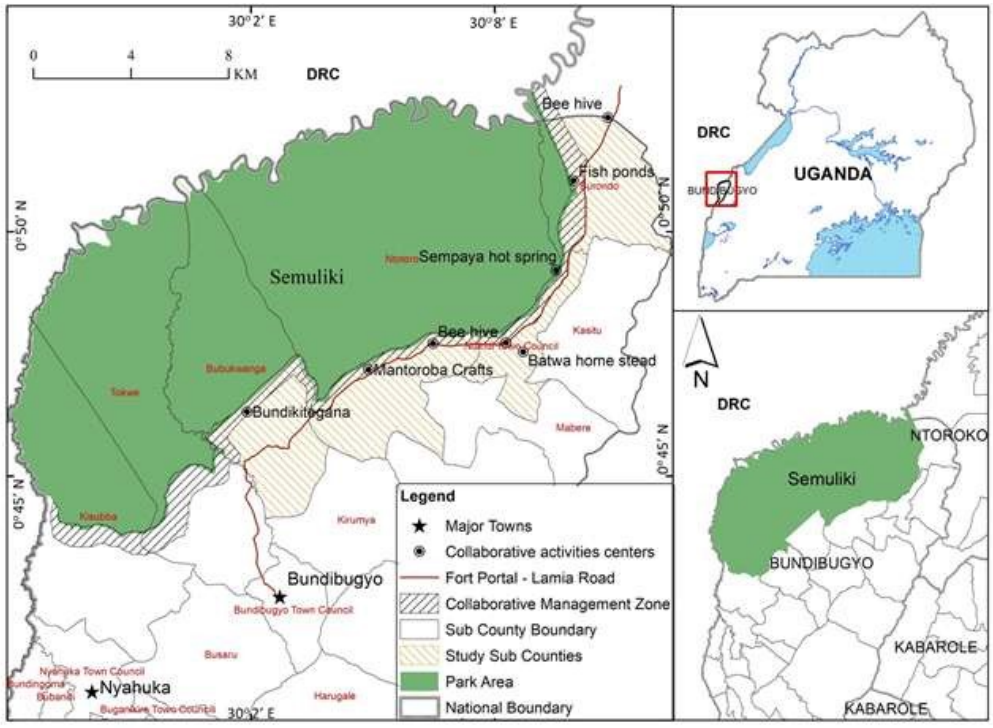

Figure 1.1: Location of the study area

Spatial data sources: ***UBOS, Google Earth engine and field survey 2019*****Source:** ***UWA, Geographical survey 2019***

Semuliki National Park lies on Uganda's border with the Democratic Republic of Congo. The Rwenzori Mountains are to the South-East of the park, while Lake Albert is to the park's North. The park lies within the Albertine Rift, the Western arm of the East African Rift. It is located on a flat to gently undulating landform that ranges from 2,200 to 2,490 ft above sea level. The temperature at the park varies from 18 to 30 °C, with relatively small daily variations. It borders the Semuliki and Lamia rivers, which are watering places for many

animals. The park has two hot springs in a hot mineral encrusted swamp. One of the springs - Mumbuga spring - resembles a geyser by forming a 0.5 m high fountain. The hot springs attract a large number of shorebirds and provide salt licks for many animals. The study area comprised of 8 villages along Fort-Portal Bundbugyo road within a radius of 2km from the park boundaries. These included: Burondo 1, Kyakatimba, Ntandi East, Bumaga 1, Bubulungu, Mantoroba Saracity and Bundikuteganwa. The area of study was chosen because it had communities that were not collaborating with wildlife authorities in maintainable wildlife management (UWA, 2017).

1.5.3. Time scope

The study focused on the period of 2017 to 2019 because the Chairman, Semuliki Communal Area Management Program's speech (2019) reported wide spread degradation of wildlife habitats which led to destruction of wildlife around Semuliki National Park. According to the Annual Report on community participation in wild life activities (2017), the lack of responsibility for managing wildlife resources and lack of the right to benefit directly from their use by surrounding communities affected maintainable wildlife management.

1.6 Significance of the Study

The researcher hoped that the outcomes of the study would:

Serve as a source of information for policy makers at Bundibugyo local government when designing suitable policies to conserve the wildlife in the Park.

Be used by political leaders to support wildlife policy implementation in order to enable the government to handle the challenges faced by the communities living around Park properly.

Enable UWA to acquire information regarding the perception of the local people about collaborative approach.

Be used as reference for future research work through identifying some of the gaps.

Contribute above all, to the researcher's attaining the Degree of Master of Arts in Geography of Kyambogo University.

1.7 The Conceptual Framework

In figure 1.1, it is seen that the increasing population leads to destruction of wildlife in search of land for agriculture, settlement and infrastructure development, demand for wood fuel, food and water. This leads to human-wildlife conflicts where the wild animals invade the community lands in search for food and pasture causing crop damage, injury or death of livestock and people or scaring people, famine, resource denial and disease transmission. The local people retaliate by killing the animals and destroying vegetation which leads to invasive species and reduction of endangered species.

Collaborative wildlife management is adopted to involve the local people in the management of wildlife through problem animal management, land use planning, revenue sharing, resource harvesting and sensitization programs.

This can lead to sustainable development through increased wildlife, eco- tourism, and development of infrastructure, increased employment, food security and reduction in human wildlife conflicts.

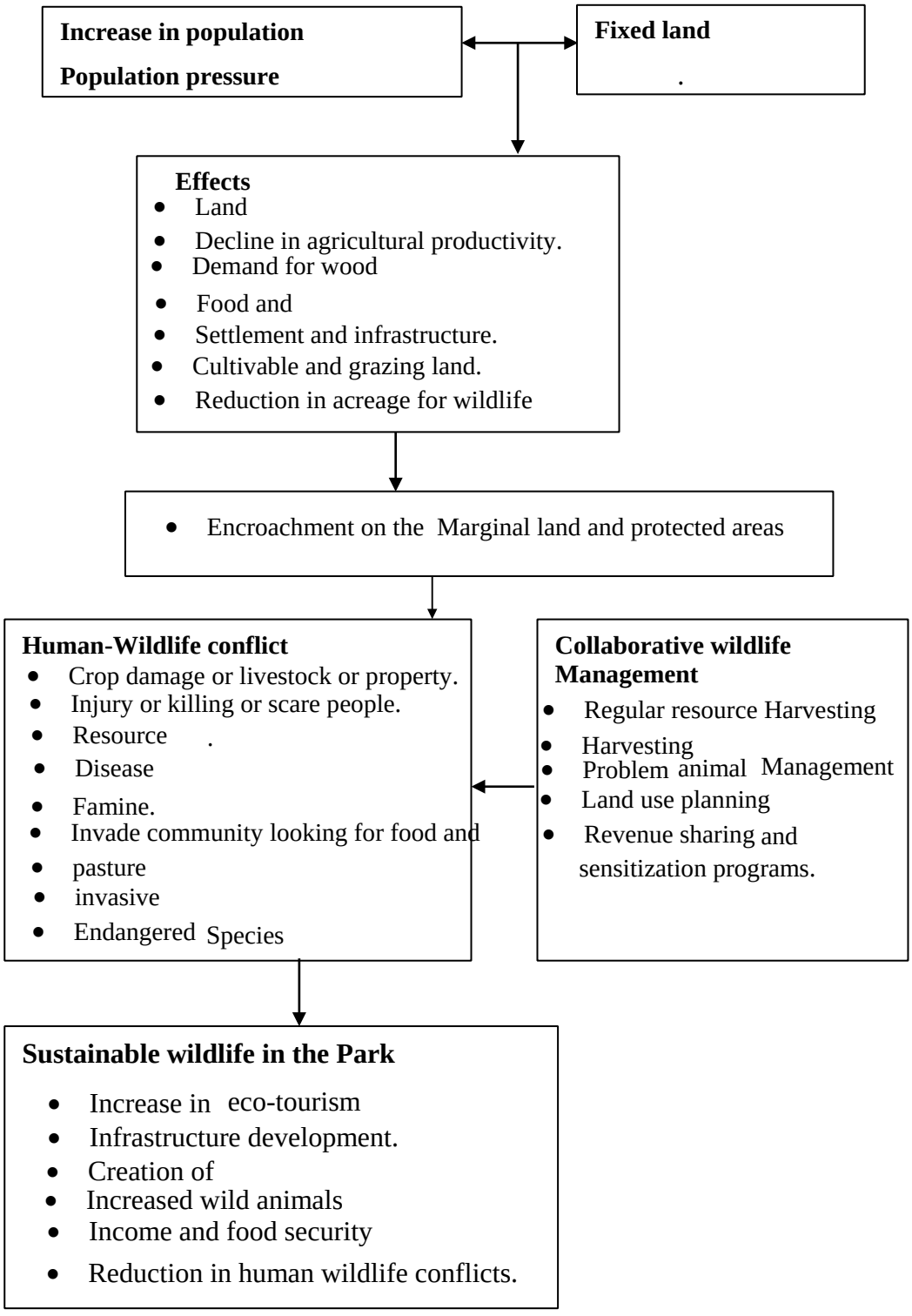

Figure 1.2 Conceptual framework

Source: Conceived by the researcher 2018 with data from (Chhetri et al, 2004)

CHAPTER TWO

LITERATURE REVIEW

2.1 Strategies employed in collaborative in promoting collaborative wildlife management

Collaborative wildlife strategies include; direct or preventive and indirect or mitigation strategies. The direct or preventive strategies include; problem animal management, land use planning, and transfer of people or animals. The major aim of the direct or preventive strategy is to decrease the cruelty and occurrence of the encounter between the people and wildlife. Indirect or mitigation strategies include; sensitization and awareness programs; benefit-sharing and compensation or consolation payment. The indirect strategy aims to increase the people's acceptance of the wildlife and co-existence (Muthuri, 2005).

2.1.1 Problem animal management

The problem animal management measures involve the planting of Mauritius thorn hedges, construction of electric fences, use of fear-provoking stimuli, and relocation of people or animals.

According to Muthuri (2005) Mauritius thorn hedges have been planted along Park borders by communities in Nepal, Botswana, Zimbabwe, Tanzania, and Kenya to prevent wild animals from crop damages and predation of livestock. For instance, Mauritius thorn hedges have been planted along with Tarangire NP in Tanzania, Amboseli NP, in Endarasha and Ol Moran in Nyeri, and Laikipia wildlife in Kenya. According to (Frank and Small, 2016) deterrents such as; electric fences have been being erected around Caprivi PA in Namibia to prevent wild animals from community lands.

Another strategy of problem animal management is the fear-provoking stimuli. According to Gathuku (2015), fear-provoking stimuli such as auditory methods are used to discourage wild animals from invading farms around Sagala, TaitaTavate PA in Kenya. It involves emitting unexpected noise such as exploders by Non-Government Organizations (NGOs) known as Wildlife Works to scare wild animals from crop farms.

Another strategy of fear-provoking stimuli involves, placing beehives along boundaries that repel elephants from farms. For instance, acoustic fences that use recorded bee sound and actual traditional bee-hive are designated around Tsavo NP and Tarangire NP to reduce crop damage (Sosiya, 2016).

Furthermore, Nakyesa (2013) states that fear-provoking stimuli such as the use of olfactory repellants such as chili are used in Kibale National Park (KNP) to scare animals from community lands. Chili pepper mixed with elephant dung is thrown in the fire which produces noxious smock; this chocks the animals which turn their way towards the park.

2.1.2 Land use planning

Land use planning involves the creation of the buffer zone, demarcating of the boundaries agriculture modification, and community forestry (UNDP and World Bank, 2007).

In Nepal strategists such as gazetting part of lands surrounding the park, pronouncing them buffer zone, planting Mauratus thorn hedges, and harmonizing biodiversity preservation through the use of locals are used in wildlife management (Department of National Parks Wildlife Conservation {DNPWC}, 2006). According to Amin et al., (2018) the buffer zones are managed by Community Forest User Groups (CFUGs) who perform activities that encourage the growth of valuable plant species for example thinning the dense areas, cutting trees to open grassland, and constructing artificial waterholes.

Akampulira, Bitariho, Mugerwa (2015) asserts that communities maintain the boundaries through the planting of unpalatable crops in the buffer zone for example tea which deter wild animals from the community land. The buffer zone can enable purposeful steps towards wildlife future and help to avert the effect of negative environmental or human influences, whether not embodies natural or cultural value (Borin, Passoni,Thiene, and Tempesa (2010). The demarcating of the park boundaries in Nepal involves planting community forestry to cut off encroachment and improve management of the wildlife (United Nations Development Program -United Nations Environment Programme (UNDP-UNEP 2009).

According Newton, Chiles and Tambara (2016), in Kenya land, has been set aside the NP for management of wildlife called conservancies with a local government structure, defined membership, rights to manage and distribute benefits. The Kenyan government recognizes the co-existence of people, their livelihoods, and wildlife integration in land management.

Local people around MENP and Kibale National Park (KNP) were involved in demarcating the boundaries through planting eucalyptus trees and Mauritius thorn hedges to reduce encroachment and conflicts (Chetri).

2.1.3 Revenue sharing

According to Moyini, Mayindo and Makumbi (2006) the local people share portion revenue generated from the gate entry fee for Income Generating Activities (IGAs). This is intended to increase strong partnership between the PA and local communities envisaged to sustainable management of wildlife and enable people living around the park to improve on the quality of life. Sosiya (2016) asserts that Local community groups with already initiated projects have benefited from the revenue share.

According to Lamsal (2012) IGAs have been initiated by communities and supported by conservation authorities and NGOs in Chitwan around NP and Baradabhera forest in Nepal. These include; such as livestock rearing, poultry, beekeeping, fruit farming, vegetable growing, cash crop growing, art and crafts, or skill training like tailoring to improve the welfare of local communities, reduced pressure on biodiversity, and improved conservation (Muthuri, 2005).

Community projects such as Kachika craft shops, women's projects, vegetable plots, and cultural villages have been initiated, the major aim of the projects is to encourage the youth to acquire traditional hard craft skills which may reduce the pressure on wildlife extraction (Gujadhur, 2000). Other community conservation initiatives include eco-tourism through lodges, campsites, and cultural centers. For example, the Perrine eco-tourism was set up by the Masaai (Chepkorir, 2015).

Despite the benefits derived from revenue sharing, few people gain incentives such as the land leases, and the initiated projects by NGOs are implemented without the consent of the local communities (Kipkeu, Wangi and Njogu, 2014).

2.1.4 Resource harvesting

Communities around the park are allowed to harvest resources regularly subject to Collaborative Resource Management (CRM) agreement and negotiations with NP management. Resources include; timber and non-timber products and visiting cultural sites in Nepal (Uyadhayay, 2013).

According to Jones (1999), the rights were granted through the CBOs in form of Community Trust empowered to manage activities such as lease land, a photographic safari, hunting and honey, fruit production, sand extraction for consumption, and manage resources directly.

This is aimed at proving incentives for communities such that they manage the sustainability of wildlife and conservation activities.

Regulated hunting is carried out in Zimbabwe, Botswana, and Namibia. The councils sell permits to village members allowing them to hunt up to four buffalos and three elephants every year (Sarre, 2017). The integrated Anti-Poaching Units (APUs) carry out regular patrols which have reduced poaching and other illegal activities (United Nations Development Programme {UNDP} & World Bank, 2007).

2.1.5 Sensitization and awareness programs

A sensitization and awareness programs play a substantial part in promoting wildlife management (UNDP and World Bank, 2007). Conservation awareness programs have been carried out to sensitize the communities about the importance of wildlife conservation, through media, programs, drama, sports icons, and documentaries are used to educate the communities living around the NP about the importance of conservation and this has led to a positive perception of the local communities about conservation leading to increased biodiversity (Bailey, 2011).

Namatovu (2015) stated that communities around MENP are sensitized regularly about the usefulness of the PA, sanitation; family planning, and management policies and laws that help to improve the existence of the local people and wildlife. The conservation authorities use venues that are convenient such as churches, schools, and market days to convey the message

Shresha (2015) noted that different groups carry out sensitization programs to communities living around Chitwan NP such as park officials, women groups, NGOs such as DNPW,

WWF, and school clubs, these groups also carrying out activities that promote wildlife management for instance tree planting, eco-tourism, and beekeeping.

According to (Nakyesa (2013) strategies that may be successful in an area may be inappropriate when used with another group. therefore, the findings created a geographical gap because what apply in Nepal may not reflect the situation in Semuliki NP. Therefore, the current research is embarking on how the wildlife is maintained around Semuliki National Park.

2.2 The level of awareness of local communities about collaborative wildlife strategies

According to Sesabo, Lang & Toi (2006), awareness is what a person thinks and understands about the reality affecting his attitude towards management. The local communities who are aware of environmental interventions are likely to participate in partnership than those who are not aware.

2.2.1 Local community awareness of resource harvesting

Different resources are harvested from the park regularly in the NPs Communities living around Chitwan NP collect firewood only once a month and grass yearly (Uyadhyay, 2013). On the other hand, the council sells permit to safari hunters in Zimbabwe and Botswana, and Namibia allowing them to hunt up to four buffalos and three elephants per year (Sarre, 2017).

According to (Cheptroki, 2015), the people employed in various activities such as game scouts, tour guides in community lodges or camps around Nairobi NP, Amboseli NP, Porrini camp, and Selenkey conservancy in Kenya, volunteer to monitor illegal activities and insecurity in and around the park.

However, the local people living around Marsabit NP in Kenya and MENP declared that they were not aware of the process used to negotiate agreements and want it contains due to limited communication between the resource user committee and the community (Shibia, 2010).

2.2.2 Local community awareness about the Problem animals

According to Uyadhya (2013) local communities around Chitwan NP in Nepal were aware of the wild animals which cause crop damages, injury, or cause death to livestock and people such as the rhinos, wild boars, elephants, and deer. The rhinos cause the greatest crop damages during the night daily while the chital and wild boars are the greatest crop raiders in the monsoon-winter season. Chhetri et al (2003) noted that the elephants and chimpanzees cause the greatest crop damages around KNP. According to Laverdiere, Baker & Ndesa-Atanga (2007), elephants cause the greatest crop damages around Hwange NP in Zimbabwe.

According to Lamsal (2012), the tiger (*Panthera tigers*), leopard (*Panthera Pardus)* python (mourus), and Jackel (canis*aureus)* are the wild animals that cause injuries or death to livestock around Chitwan NP. Packer, Ikanda, Kissui and Kushir (2005), noted that lions cause the greatest human injury or death in Tanzania. For instance, 563 people were killed and more than 308 injured from 1999 to 2004.

2.2.3 Local community awareness about awareness of land use planning

Newton, Chiles and Tambara (2016) were of the view that the concept of Wildlife Management Areas (WMAs) in Tanzania helped to provide awareness to the local communities on the value of conservation resulting into increased positive perception towards maintainable wildlife conservation. According to Sosiya (2016), the local people around Tarangire NP were aware of the development projects such as agriculture, art and

craft products sold by Maasai in Kakai villages, health and education which were being used to attain maintainable wildlife management. The studies by Newton, Chiles and Tambara, (2016) and Sosiya (2016) had content gaps in that they concentrated on awareness about the value of conservation and development projects respectively. Much as they were informative, the current study delved into local community awareness of collaborative strategies and how they helped to achieve maintainable wildlife management.

Communities maintain the boundaries through planting unpalatable crops in the buffer zone, for example, Akampulira (2015), noted that planting tea in the Nkuringo buffer zone scared the chimpanzees and baboons from crossing over to the community lands since the workers are available all the time.

Chetri et al (2003) asserted that the local communities around KNP and MENP partnered with local NGOs funded by the Dutch government and Norwegian Agency for Development Cooperation (NORAD) respectively to promote agroforestry.

2.2.4 Awareness of sensitization programs

Local people around MENP were found to be aware of various forms of sensitization such as village meetings, MDD, radio programs, and after church services, and workshops broadcast posters and roadshows (Namatovu, 2015).

UNDP-UNEP, (2009) reported that the local people around MENP were sensitized about the managing of the eco-system of Mountain Elgon Forest, the highland as a watershed of Lake Victoria, and the contribution of absorption of carbon emissions to re-afforest the formerly degraded areas under Mountain Elgon Regional Conservation Program (MEREP), FACE project partners' foundation of Netherlands and UWA. However, communities around Chitwan NP participating in cerebrations such as wildlife week, world environment

day, and sensitization by NGOs such as DNPW and WWF are carried out yearly (Shresha, 2015).

Chhetri et al (2003) noted that regular dialogue with the local communities and their political representatives provides a forum for which to discuss issues that can act as mitigation measures against wildlife invasions. (Shibia (2010) asserted that there was inadequate sensitization in the villages near Hwange NP in Zimbabwe and around Marsabit NP in Kenya unless there was a project to work on.

2.2.5 Awareness of revenue sharing

According to Moyini et al (2006) observed that communities around the PAs were aware of the revenue share but there was a general complaint that communities far away from the park boundary take the lion's share and yet they incur fewer costs of conservation of PA. According to Sosiya (2016), the local people around Tarangire NP are aware of the development projects such as agriculture, art, and craft products sold by Maasai in Kakai villages, health, and education. Kipkeu, Wangi and Njogu (2014) noted that despite the benefits from revenue few people gain incentives such as land leases and the initiated projects by NGOs are implemented without the consent of the local communities.

Twinamastiko (2014), contends that the local communities around Bwindi Impenetrable NP meet every year under the guidance of the local council 1 chairperson to identify needs and priority of IGAs funding in line with conservation. Namatovu (2015) noted that the local people in Ulusuki village around MENP were not aware of the revenue share because had never received revenue due to a limited number of tourists.

Despite the benefits from revenue sharing, the poor households marginalized groups around Bwindi NP are less aware of sustainable development projects, their importance, the process

of implementation, how much is earned and distributed (Buntaine, Brigham and Collin, 2017). All these showed an attempt to reduce the wood collection, tree planting, and hence improved grazing alongside WMAs.

This study shows a content gap in that they concentrated on awareness of the value of conservation and development projects. Therefore, information about awareness of the strategies is lacking. The study is intended to find out the level of awareness of the local people about the strategies in and around Semuliki National Park.

2.3 Perception of the local communities about the strategies employed in sustainable wildlife management

According to Namara (2001) the three components of perception are; the perceiver, the target, and the situation. The three components aid in assessing perceptions of the local people and communities.

Access to resources such as timber and non–timber products can lead to improved park community relationships which lead to positive perception towards wildlife management (Chettri, Mugisha, and White, 2003). The local people involved in eco-tourism north of Amboseli NP, Porrrini camp, Selenkey conservancy in Kenya, and Elaerai in Kilimanjaro in Tanzania such as the Masaai youth volunteers to monitor illegal activities in and around the park. This has helped to reduce illegal activities and insecurity inside the park (Niskennen, Roe Rowe Dublin and Skinner, 2018).

Denying of access to wildlife resources by the park authority is viewed negatively by the local community (Infield and Namara, 2001). The denial of the grazing in the grasslands of Kapchorwa, bamboo smocking, and collection of building materials poles in MENP was viewed negatively by the local people (Nakakaawa, Moll, Vedeld, Sjaastad& Cavanagh.

2015). Namatovu (2015) also noted that the restriction of cultural sites around MENP such as Bulecheke and Khauke caves and several burial grounds was seen negatively. According to Twaambo (2007) the restrictions placed on wildlife harvesting and denial of traditional hunting in Zambia resulted in conflict leading to continued poaching due to disappointed locals.

According to Lamsal (2012) there is a good relationship between the park and communities around Chitwan NP and Mumbwa Game Management Area in Zambia, though crop damages are rampant due to involvement in the park management in Ol Pejeta conservancy, there was a poor relationship between the poor and women due to lack of involvement in management. According to Nyashadzasha (2017), communities in Hwange NP had adverse feelings about CAMPFIRE management due to paying certain amounts of money as subscription fees per month.

Inadequate sensitizations, harassment, and ill-treatment by the locals in case of an offense led to the poor relationship between the park and communities. It was noted that the park rangers were inadequate and were trained in Paramilitary that prepares them for law enforcement dues instead of community conservation skills (Chhetri, Edmund, Barrow and Muwenzi et al, 2003).

According to Jones, (1999) the local people in Botswana had a negative perception towards conservation despite receiving benefits due to exclusion in decision making. Local people feel they have no power to speak out their views and are not involved in assisting to implement programs to protect wild animals. According to UNDP and the World Bank (2007), many new livelihoods are supplementary rather than alternatives. The IGAs take a

long time to generate income for instance the butterfly farming and sea farming in Zanzibar. This has not helped to curb the destruction of forests (Dabo, 2017).

The uncertain of revenue funds received increases the negative perception of the local people who retaliate by killing wild animals, setting bush fires, and sometimes collaborating with poachers (Sosiya, 2016).

Despite the setting up of various IGAs people still living in poverty in Zimbabwe due to insufficient training, knowledge, and cooperation about the projects which increases the challenge of curbing illegal activities. According to Niskanen et al., (2016) the delay in revenue sharing, a small amount, and capture of revenue by elites increased poaching in Zimbabwe, between 2009 to 2012, elephants 145 to 212, buffalos 91 to 460, Impala 23 to 66, kudu 50 to 74, zebra 27 to 90.

According to Chepkorir (2015) noted that local communities held a negative perception towards conservation despite receiving remarkable benefits due to lack of involvement in decision making and resource management.

According to Laverdiere, Bakker Ndesa -Atanga (2007), communities living near the NP have little sympathy for wild animals and see animals as a source of threat to the safety and food security. Farmers in Zimbabwe display a negative perception towards elephants due to losses incurred from crop damages which results in poaching (Nyashadzasha, 2017). However, despite the damages created by the one-horned rhinoceroses in Nawalparasi districts in Nepal local people have a positive perception towards its conservation due to the ecological value, contribution towards biodiversity, recreation value, and tourism benefits, this has reduced illegal hunting.

Harrison (2000) recognized that Zimbabwe was one of the countries with successful stories of community involvement in wildlife conservation. Community involvement was managed under the Communal Area Management Program for Indigenous Resource (CAMPFIRE), which started in the 1980s. It was implemented through the support of Development of National Parks and Wildlife Management (DNPWM) designed to stimulate development and management and maintainable use of resources especially in the barrier zone adjacent to the park. CAMPFIRE provided a model of maintainable wildlife management due to decentralization of wildlife management to producer communities by giving villagers access to wildlife resources which positively increased community perception about wildlife management (ibid). The literature above underscored the importance of decentralizing wildlife management to producer communities by giving villagers access to wildlife resources hence helping them to perceive wildlife conservation positively. It overlooked the fact that communities in conservation areas like Semuliki National Park in Bundibugyo District might not have had access to wildlife resources which could have affected their perception of collaborative methodology in maintainable wildlife management around the conservation areas where they lived.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

According to Creswell (2014) a research design, is a plan, structure and strategy of investigations so as to obtain answers to the research questions. A cross- sectional design was used, it involved studying the phenomena in a single point to check the prevalence.

Qualitative and Quantitative research approaches were used for the study where the qualitative approach enabled the researcher to acquire a complete appreciation of the problem under examination by way of replies that were expected to prompt the viewpoints and thoughts of the respondents; the quantitative approach was used for producing frequencies, percentages, summary tables and bar graphs that were used to present the data in statistical terms for data analysis. The design was used because it is convenient in terms of time and resources.

3.2 Population of Study

According to Amin (2005) total population of the area of study having similar characteristics is looked upon as the population of the study. In the study, the total population comprised the Warden Community Conservation Semuliki National Park (WCCSNP), 14 key informants, 6 resource user groups, and 398 household heads in the selected villages in the area around SNP in Bundibugyo District, (District Population Officer, Population Statistics, 2019).

3.2.1 Sample Size

The sample size is the number of respondents chosen to take part in the study, whose views were characteristic of the overall population from the 8 villages along Fort-Portal-Bundibugyo road within a radius of 2km from SNP boundary in Bundibugyo District. According to the Uganda Bureau of Statistics (UBOS, 2014) there were 398 households in the villages selected. The sample size for respondents arrived at was using the (Taro, 1967) calculations. The sample size comprised 199 but 1 household was added making it 200 in order to have equal probability selection from the population to avoid bias in the 8 villages.an average of 25 household heads were selected in each village. The sample size was calculated as follows using a formula given by (Taro, 1967) as follows;

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

Where N = Target population n = sample size.

e = Error limit/of significance maximum acceptance (5% = 0.05) I = Constant.

The sample size is computed as;

N is the number of employees which is equal to 199,

$(e)^2$ is the confidential interval which is equal to 0.05.

Therefore, the sample size $= \frac{398}{1 + 398(0.05)^2} =$ 199 Individuals.

Therefore, the study specifically sampled 199 individuals in the household, plus 1 household head to make it 200.

6 resource users' groups, 14 key informants in the villages, and the WCCSNP were selected purposively for the study.

3.2.2 Sampling Techniques

A sampling technique is a strategy of arriving at a sample by use of several methods such as simple random sampling, stratified sampling, or purposive sampling (Amin, 2005). In the study at hand, simple random sampling was used for determining those who would participate in the study as presented accordingly:

3.2.2.1 Simple Random Sampling

In Simple Random Sampling, everyone in the entire target population has an equal chance of being selected from the population. A way of naming or numbering the target population is required and then using some kind of draw to decide on those to make up the sample (Kothari, 2004).

In the study, Simple Random Sampling was used to select 200 household heads because each of them had an equal probability of being selected from the 398 household heads from the 8 villages along Fort-Portal-Bundibugyo road within a radius of 2km from SNP boundary in Bundibugyo District. The sampling method assisted the researcher to get a true exemplification of the larger population.

3.3.2.2 Purposive Sampling technique

It is a non-probability sampling approach whereby a researcher chooses several entities that present as items of interest from a given population to form part of the sample (Kothari, 2004). Using purposive sampling, the researcher used 6 resource users groups, the WCCSNP and 14 key informants selected purposively because they are central to resources available in SNP. Besides, by their respective positions, they are the only individuals holding those positions.

3.3 Method of data collection and Research Instruments

Field research surveys were conducted to obtain primary data. The method of data collection involved administering questionnaires, Focus Group Discussions (FGDs), key informant interviews, and observation. The instruments included; the questionnaire guide, interview guide, observation checklist, and a camera.

3.3.1 Questionnaire

A questionnaire is a set of printed or written questions with a choice of answers, devised for a survey or statistical study (Amin, 2005). The researcher used closed-ended questionnaires and open -ended. The questionnaires were administered to all respondents who were chosen from the sample of the study, of 200 respondents who are household heads along the park boundary in in Bundibugyo District. The questionnaires were given to 25 household heads that were chosen per village in 8 villages. Questions were set in English but three research assistants were employed to translate in Lukonjo, Lwamba, Lutooro, and Lutuuku which are the major languages used. The questionnaire method was preferred because it enabled the researcher to collect information within a short time.

3.3.2 Key Informant interview

It is a form of qualitative research where questions are asked about their perceptions, beliefs, opinion, or ideas. An interview in research is a conversation where questions are asked by an interviewer to elicit information from the respondent face-to-face, (Kothari, 2004). The interview guide was used alongside the questionnaire and it involved the use of a set of predetermined questions. The researcher posted a series of brief questions to the respondent. The method was chosen because of the need to obtain more information in greater depth from the Warden and the key informants to report exhaustively. The researcher chose 15 key

informants these included; the WCCSNP, chairperson resource user committee, 8 community leaders, and five scouts from the anti-poaching unit. They were selected because of specific information and the focus on CA in SWM. Probing questions guided the interviewing process. The study assumed that given their position, responsibility, education, experience in wildlife management, and maturity, they would give information that might help understand the variables under the study and reduce bias if only one instrument was used. The researcher had to meet these people at a convenient time such as lunchtime or evening hours to avoid interruption of their work. The researcher was able to get additional information which helped to formulate a version of what occurred in the SNP concerning CM in MWM.

3.3.3 Focus group discussion

A focus group discussion (FGD) involves is a method of data collection where individuals of the population have ideas of interest. It is free and open discussion gathering people from similar backgrounds or experiences together to discuss a specific topic of interest (Rubins and Rubins 2012). FGD sessions were prepared carefully by identifying the main objectives of the meeting, developing key questions, and developing an agenda, concerning collaborative methodology in maintainable wildlife management, and planning how to record the session. The focus groups were met after consultation with the local leaders in the villages and the WCCSNP. Suitable discussion participants who were the 6 Resource users' groups from the conservation area of SNP were identified, invited and questions were asked about their perceptions, beliefs, opinions, and ideas about collaborative approaches in sustainable wildlife management in SNP. These included the Bamaga Anti-poaching group, TIBCO (Batwa cultural group), Mantoroba rattan user group, Burondo 11 farmers group, Bubulongu development group, and the resource user committee members. These groups were met at convenient places such as workplaces or homesteads and discussions were

carried out on different days. The researcher facilitated the discussions to eradicate the domination of other participants. FGD focus group discussion was used as a qualitative approach to gain an in-depth understanding of social issues concerning CM in MWM. The FGDs also provided an opportunity to probe for further information.

3.3.4 Direct observation

The researcher used the observation method to identify the collaborative strategies used to promote MWM. The observation method was also used to determine the perception of the local communities, where the researcher observed the body and facial expressions of the respondents during the interview sessions.

3.3.5 Photographs

Photographs of people harvesting resources, revenue projects land uses and resource user groups were captured as evidence of the study. The researcher used a camera

3.3.6 Secondary data

Secondary data was obtained from office databases, journals, published and unpublished reports, dissertations reports, and websites via the internet

3.6 Reliability and validity of research instruments

3.6.1 Reliability

The reliability of the instruments was tested using Cronbach's Alpha by entering the data of the questionnaires into the Statistical Package for Social Sciences (SPSS) program. To enable proper values, reliability analysis was obtained. All alpha (α) coefficient values were found to be above 0.7 (70%); that is $\alpha > 0.7$ was sufficient enough for the questionnaire to be regarded as reliable.

Table 3.1: Results of the Cronbach's Alpha Reliability Coefficient for Likert-type Scale Test for Structured Questionnaire

Variables	**Cronbach Alpha**	
	Coefficient	**Number of items**
Problem animals' management	0.89	6
Regular resource harvesting	0.807	6
Land use planning	0.786	6
Revenue sharing	0.732	6
Sensitization and awareness	0.742	6
Sustainable wildlife management	0.799	6

Source: Primary data (2019)

The Cronbach Alpha Reliability Coefficient test illustrated that the results for the reliability of the structured questionnaire as a tool for problem animal management was 0.890, regular resource harvesting was 0.807, land use planning was 0.786, revenue sharing was 0.732, sensitization was 0.742 and sustainable wildlife management (dependent variable) was 0.799.

3.6.2 Validity

Validity is "the degree to which a measure accurately represents what it is supposed to", and thus validity is concerned with how well the concept is defined by the measure(s) (Kothari, 2004). In line with this study, the researcher used content validity in the assessment of the validity of the research instruments using the Content Validity Index (CVI) as explained:
CVI = K/N

C.V.I = Total No. of questions declared valid/relevant

Total No. of questions in the questionnaire Where K = Total number of questions declared valid 0.7 as the marginal level of significance.

Table 3.2: Content Validity Index for Likert- type scale Test for the Structured Questionnaires

Variables	**Cronbach Alpha**	
	Coefficient	**Number of items**
Problem animals' management	0.788	7
Regular resource harvesting	0.854	6
Land use planning	0.921	6
Revenue sharing	0.791	6
Sensitization and awareness programs	0.862	6
Sustainable wildlife management	0.84	6

Source: Primary data (2019)

The content validity index for the structured questionnaire as an instrument for problem animal management was 0.788, regular resource harvesting was 0.854, land use planning was 0.921, sensitization 0.862, revenue sharing was 0.791 and sustainable wildlife management (dependent variable) was 0.840.

All C.V.I values found to be above 0.7 (70%); that is CVI> 0.7 is sufficient enough for the questionnaires to be regarded valid for data collection (Kothari, 2004).

During data analysis the interview guide was to check the feedback from the respondents, noting the relationship between the given questions and the answers provided to the questions. Data analysis helped the researcher to make conclusions of the stated hypothesis.

3.7 Data Analysis and Presentation

Data were analyzed using various statistical instruments in different computer tools. The questionnaire responses were coded and analyzed using the Statistical Package for Social Science (SPSS) version 21 package for the social survey. Most of the calculations were made on this software. Quantitative data were analyzed using descriptive tables, percentages and bar graphs. A qualitative form of data was used to explain the results of quantitative data. Content from the observations from the field, key informants, and focus group discussions enabled the researcher to analyze data.

3.8 Ethical Consideration

An introductory letter was obtained from the Department of Geography and social studies, introducing the researcher to the local leaders and the Uganda Wildlife Authority SNP. The main ethical issues which were considered when conducting the research included the voluntary nature of participation ensuring confidentiality and privacy of participants. The names of the respondents were not used in the report and taking photographs was voluntary. This was done to avoid suspicion from the respondents.

3.9 Study Limitations

As a result of the wide research schedule, some of the respondents were found busy at work. However; the researcher was patient with them until they respond to the questionnaires. Due to the sensitivity of the topic under study, respondents had feared when discussing the issues

such as revenue and the monthly subscription fee. However, the researcher assured them of total confidentiality in reporting the findings that their names will not be used.

Some respondents expected rewards from the researcher but she justified that the research was for academic purpose even though the Batwa group insisted that they wanted money and threatened to confiscate the researcher's bag before they would interact with the researcher. The inaccessibility of some areas due to severe flooding limited the viewing of some areas such as the Batwa trail and the bee-hives in Bubulongu village Ntotoro sub-county.

CHAPTER FOUR

PRESENTATION OF THE FINDING

4.1 The collaborative strategies employed in promoting sustainable wildlife management in and around SNP

Based on the SNP annual reports 2014-2018, information from the Warden Community Conservation Semuliki National Park (WCCSNP) interview, and field observation made during the study Semuliki National Park is using five strategies to promote sustainable wildlife management. These include; problem animal management, land use planning, revenue sharing, resource harvesting, and sensitization programs. These strategies are referred to as indirect or preventive measures and indirect or mitigation strategies (Muthuri, 2005).

These strategies are presented below.

4.1.1 Problem animal management

Problem animal management these are the measures that are taken to decrease the interruption to everyday living caused by wild animals they lower the quantity of crop damages and increases high income to the community.

The interview with the WCCSNP indicates that the problem animals which destroy crops, property and injure or cause death to human beings include; elephants, buffalos, bush pigs, baboons, and vervet monkeys.

The WCCSNP further, revealed that the problem animal management preventive measures such as; scare shooting, planting of Mauritius thorn hedges (*Ceasalpanea decapitate*) along the boundary, and erection of elephant deterrent boardwalk.

(a) Mauritius thorn hedges

Planting of Mauritius thorn hedges (*Ceasalpanea decapitate*) is one of the strategies employed to manage the problem animals around SNP. The WCCSNP affirmed that Mauritius thorn hedges (*Ceasalpanea decapitate*) have been planted along the park boundaries to deter wild animals from invading the community lands. According to SNP annual reports, the practice involved planting seedlings 50cm in three rows and 30cm apart in Burodo 1 and Kyakatimba villages experiencing severe crop raids in 2004. The project was mainly funded by Kibale Semuliki Conservation Development Project (KSCDP) and other funders like World Vision provided protective gears and tools.

Local communities living near the park provided voluntary labor and they were paid an allowance of 0.44 US dollars per day towards their labor contribution and a lunch allowance of 0.11 US dollars per day he further explained that the park employs some local people to maintain the thorn hedges.

This is in agreement with a report by UNDP and the World Bank (2007) that the Mauritius thorn hedges planted along the NPs in Tanzania, Kenya, prevented wildlife from crop damages and depredation of livestock.

Mauritius thorn hedges (*ceasalpanea decapitate*) planted along the park edges on the side of the community land in Burondo parish; Burondo II village.

Plate 4. 1: Mauritius thorn hedges in good conditions and portion lacking Mauritius thorn hedges

Plate 4. 1 shows a portion of the park boundary in good conditions in Burondo 11 village Burondo Sub County which hinders wild animals from invading the community lands and one of the local people employed to maintain the boundary. In the same village a small portion is lacking thorn hedges thus exposing the community to wild animal invasion.

(b) Scare shooting

Another strategy of problem animal management involves scare shooting. This is an emergency strategy that is carried out by park rangers after the local people reporting cases of invasion by the elephants or buffalos. The local people are supposed to report to the local councils who alert the WCCSNP before a scare shooting is carried out in order not to cause panic in the community. Gathuki (2015) also found out that exploders were used to scared wild animals in community farms around Sagala Taita Tevate in Kenya.

c) Elephant deterrent board walkway

Furthermore, the WCCSNP also revealed that the NP management has erected the elephant deterrents board walkway in the trucks or hot spots of elephants with the help of local communities to deter elephants from invading the community lands

Beehives were also erected along the boardwalk away with wires attached such that when the elephants hit the wires the bees buzz, which scares the elephants from encroaching the community land. He further explained that the deterrent covers a distance of one kilometer (1km) in Ntotoro Sub County and one and a half kilometers (1½) in Ntandi Sub County. The bees are ecologically friendly because this concurs with King (2014) who asserted that bee-hives were erected around park boundaries in Kenya to scared away the elephants from the community land.

Plate 4. 2: Elephant deterrent in good conditions and Elephant deterrent in bad conditions deterrent

Plate 4.2 Shows the elephant deterrent board walkway in good conditions in Bubulongu village which hinders elephants from approaching the community land. In the same village shows a part of the destroyed deterrent which gives way for the elephants to invade the community lands.

4.1.2 Land use planning

Land use planning involves demarcating the park boundaries, agricultural diversification, and planting trees. Land use aims to control and minimize land disputes but also facilitate law enforcement.

(a) Boundary demarcation

Basing on the (UWA, 2017) it is revealed that, SNP boundaries were demarcated as follows; 68.5 km international boundary is demarcated by river Semuliki and Lamia, 13.5 kilometers is marked by Fort-Portal–Bundibugyo road, and 22.7 kilometers marked by pillars and trees. The WCCSNP revealed that the local communities were involved in the planting of live fences around SNP.

(b) Unpalatable plants

The WCCSNP affirmed that the park has introduced the growing of unpalatable crops like chili in areas surrounding the park. The main aim of growing chili is to reduce crop damage and provide an alternative source of income to the youth.

Field observations showed that that unpalatable plant (chili growing) was only found in one Bubulongu village and by the time of the research chili was in the nursery bed.

Plate 4. 3: Chili in the nursery bed in Bubulongu village

Plate 4.3 shows a youth from the Bubulongu development farmers group removing weeds from the chili plants in the nursery bed. Nakyesa (2013) found out that chili pepper mixed

with elephant dung if thrown in a fire produces noxious smock, this chocks the animals which turn their way towards the park.

(c) Woodlots or tree planting

The WCCSNP affirmed that the park authority has encouraged local communities surrounding the Park to grow trees to reduce pressure on the park for providing firewood, poles, medicinal plants, and income.

Field observation showed that the Mantoroba rattan cane users in Ntotoro Sub County had two plots of woodlots or trees with over 1000 eucalyptus trees. One plot was located near the Mantoroba art and craft workshop and another plot was near Mantoroba primary school. Local people had planted some trees such as bottle brushes in their homestead and schools had planted trees such as the Burondo primary school in their compounds.

(d) Agro-forestry

Agro-forestry has been encouraged by the park supported by stakeholders such as Esmie Shuttered Company (ESCO) Uganda Limited who provided the seedlings to the communities. The main aim of agroforestry is to maintain soil fertility in cocoa farms and reduce the pressure of providing timber, firewood, and fodder from the NP. Trees species such as; silk oak bottle brush, were planted in the cocoa farms in all the sub-counties surrounding the park. (Hinchley, Turyomurugendo and Kato et al, 2000) also noted that agroforestry around MENP has helped to maintain soil fertility and reduce pressure from the park.

4.1.3 Revenue sharing

The SNP annual reports 2014-2018 indicate that the local communities living near the SNP get 20% of the tourism entry fee for use in (IGAs. This is intended to enable the local people

living adjacent to the park to protect wildlife, reduce illegal activities such as poaching, encroachment, unsustainable resource exploitation, and improve their quality of life.

The SNP reports further show that revenue share is given to local community groups with already existing projects, not individuals. In 2017/2018 a total of 59,026,167 shillings was submitted to the Bundibugyo district account and distributed to six sub-counties.

Table 4. 1: Revenue sharing distribution among sub-counties in 2018

Sub county	**Amount**	**Project**
Bubukwanga	13,711,927/=	Beekeeping and tree planting
Ntotoro	10,922,764/=	Goat rearing and tree planting
Ntandi town council	6,351,089/=	Goat rearing
Burondo	10,012,027/=	Goat rearing
Tokwe	8,820,126/=	Goat rearing
Kisuba	15,640397/=	Goat rearing
TOTAL	**59,026,167**	

Source SNP- Annual reports 2014-2018

Bubukwanga sub-county received 13,711,927/=, which was distributed in four groups as follows: Sara city village in Bubukwanga parish received 3,639,882/= invested in a beekeeping project, Sara Kihombya received 3,639,882/=, for beekeeping and goat rearing, Bundikuteganwa in Mampongya parish received 3,075,332/= for goat rearing and tree planting and Bundikulya 1 in Humya parish received 3, 356831/= which was invested in tree planting.

Ntotoro sub-county received 10,922,764/=, to benefit three groups as follows Kirumya trading center within Nyansolo parish received 3,091,313/=, Bundimukelelwa village

Nyansolo parish received 4,215,756/= and Kabuga village in Kabuga parish 3,615,695/=. All the groups invested in goat rearing.

Ntandi town council received 6,351,089/=, one group from Ntandi west cell benefited. The project funded was goat rearing.

Burondo Sub County received 10,012,027/=, three groups benefited, that is Burondo Central

Farmers Group, Burondo United Farmers Group, KiryambogoTweheyo women's group. The group received an equal share of three million each (3,000,000/=) and all the groups invested in goat rearing. One million, shillings (1,012 027/=) facilitated the procurement committee and monitoring team. Tokwe and Kisuba Sub Counties received 24, 470, 523/= for goat rearing.

Field observations revealed IGAs such as; art and craft (skill training) and tree planting are carried out by the Mantoroba rattan cane group, fish farming carried out by the Bubulongu farmers development group in Ntotoro Sub County, and by the Bamaga cultural group (Anti-poaching group) in Ntandi town council.

Plate 4. 4: Mantoroba Rattan cane resource users making chairs

Plate 4.4 shows the researcher and the Mantoroba rattan cane users in Mantoroba village along the Fort-portal Bundibugyo road making chairs made of rattan cane for sale to the tourists.

Plate 4. 5: Fish pond in Bubulongu

Plate 4.5 shows the chairperson (gentleman) with two members from the Bubulongu development farmers group involved in fish farming standing beside their fish ponds.

4.1.4 Resource harvesting

Resource harvesting involves the regulated accessing of timber and non-timber from the park.

The WCCSNP asserted that local communities living around the park are allowed to harvest resources from the Park subject to Collaborative Resource Management (CRM) agreement, negotiation, and request from the park. In turn, the resource users voluntarily monitor illegal activities and control resource harvesting. He further, explained that resource harvesting is intended to control illegal activities, encroachment on the park, controlling attacks and injury of local people. The local communities are supposed to harvest resources within a radius of 2km (collaborative zone).

Resources harvested include; firewood, exotic trees (eucalyptus and cassia), rattan cane (*calamus serratus*), spear grass (*Imperatacyclidrica*), palm leaves (*Phoenix reclinata*), medicine, mushrooms, water, and visiting cultural sites.

Field findings revealed that, fallen dead wood is harvested by women (see plate 4.6 below).

Plate 4. 6: Firewood collection in Burondo 11 village

Plate 4.6 shows women harvesting fallen dead wood from the park, they are arranging it in bundles in the pathway to be taken home

4.1.5 Sensitization programs

The purpose of sensitization is to help the local people co-exist with the park.

4.1.5.1 Methods used for sensitization

The WCCSNP affirmed that a variety of sensitization programs are being used such as community meetings, radio programs, Music Dance and Drama (MDD), after church service meetings, market day sensitization, and education programs for schools. He further asserted that sensitization programs are carried out by the WCCSNP, Community Conservation

Rangers (CCRs), NGOs as World vision Caritas, Marie Stopes, and local community MDD groups such as the Mantoroba drama group. Namatovu (2015) also noted that communities around MENP were sensitized regularly about how to manage the park.

(a) Community meeting

Community meetings are carried out at village levels. The local council 1 is responsible for the mobilization of village members for meetings. Sensitization is carried out at least once a year in every village surrounding the park or any time if there is an issue to resolve such as arresting of members in the community who have carried out illegal activities. The venues of the meeting are schools or local council's residential place, schools, or churches.

(b) Radio

The SNP annual reports 2014-2018 show that sensitization programs on the radio are carried out in the evenings when all people are at home, aired on Development radio in Bundibugyo, Voice of Tooro, Beat FM, and Life radio in Fort-Portal. The sensitization on these radios is carried out by the WCCSNP or by one of the CCRs. It is carried out once a month aired for 20 to 30 minutes on any of the above radios. Programs are sponsored by carrying American Relief Every Where (CARE) and Caritas. Broadcast collaborative conservation programs are aired in the local languages of Rutoro, Bunyoro, Rukiga, and Runyankole. Listeners are encouraged to participate by phoning in during broadcast or sending letters or sharing their views and experiences about their co-existence with wildlife. This method of sensitization is encouraged because it covers a large geographical area and the local people feel free to ask questions and clarifications.

(c) Music Dance and Drama (MDD)

The SNP annual reports 2014-2018 indicate that MDD groups circulate messages in form of songs, plays, and dances to portray messages to the local people during important occasions such as World wildlife day and National environment day. This has strengthened working relationships, which has encouraged members to embark on other conservation activities.

The WCCSNP confirmed that there various MDD groups such as the Bubulongu farmers' development group involved in fish farming, bee-keeping, and chili growing, Mantoroba drama group involved in tree growing, art and crafts, Bamaga cultural group (anti-poaching group) maintains the boardwalk and carry out cultural rituals, The Indigenous Batwa Community (TIBCO) for making cultural artifacts and presenting cultural dances.

(d) Church services

This method is mainly carried out after church services. The opinion leaders such as the priests are responsible for mobilizing the people. However, a small group may be captured since some community members may not be able to attend church service or belong to different denominations. It is mainly used to address the TIBCO.

(e) Market days

Sensitization programs, during market days, are carried out quarterly in the various center surrounding the park. It is carried out on Tuesdays in Ntandi town council, on Sundays in Burondo trading center, and Mondays in Bubukwanga town council. The purpose is to capture many people who come to buy foodstuffs and other essential materials in the market and investigate whether bush meat is sold in the market.

4.2 Level of local communities' awareness about collaborative strategies in sustainable wildlife management in and around SNP.

In the study, awareness is the knowledge of a situation about collaborative wildlife strategies around SNP. The respondents were interviewed to find out whether they were aware of the collaborative strategies in sustainable wildlife management. Results are shown in Table 4.4 below;

Table 4. 2: Showing the level of local communities' awareness about collaborative strategies in sustainable wildlife management in and around SNP

(N= 200)

Collaborative wildlife strategies	**Awareness**	**Not aware**
Regular resource harvesting	200 (100%)	00 (00%)
Problem animal management	191 (96.0%)	09 (4.5%)
land use planning	185 (93.9%)	15 (7.5%)
Sensitization and awareness programs	166 (83.3%)	34 (17%)
Revenue sharing	109 (54.7%)	91 (45%)

Source: field data 2019

From table 4.2 it can be seen that the majority of the Household heads were aware of the regular resource harvesting, 96.0% indicated problem animal management, 93.9% stated land use planning, 83.3% identified sensitization and awareness program, and 54.7% mentioned revenue sharing. The majority of household heads were aware of the resource harvesting.

One member of the Burondo 1 farmers group said that*;*

"At least every household around the park has been involved in resource harvesting member in each household around the park has benefited from resource harvesting every household around the park while revenue share is given to groups with already established projects after writing a proposal".This was also confirmed by the WCCSNP.

4.2.1 Awareness of regular resource harvesting

Resource harvesting is the strategy used by all households neighboring the park. The communities neighboring the park reach an agreement with the park authority to access selected resources for use. The main aim is to involve the local people in the protection and rehabilitation of the park.

The respondents who were involved in regular resource harvesting as one of the sustainable strategies were asked to mention the type of resources harvested in SNP.

Results are shown in figure 4.1 below;

(N=199)

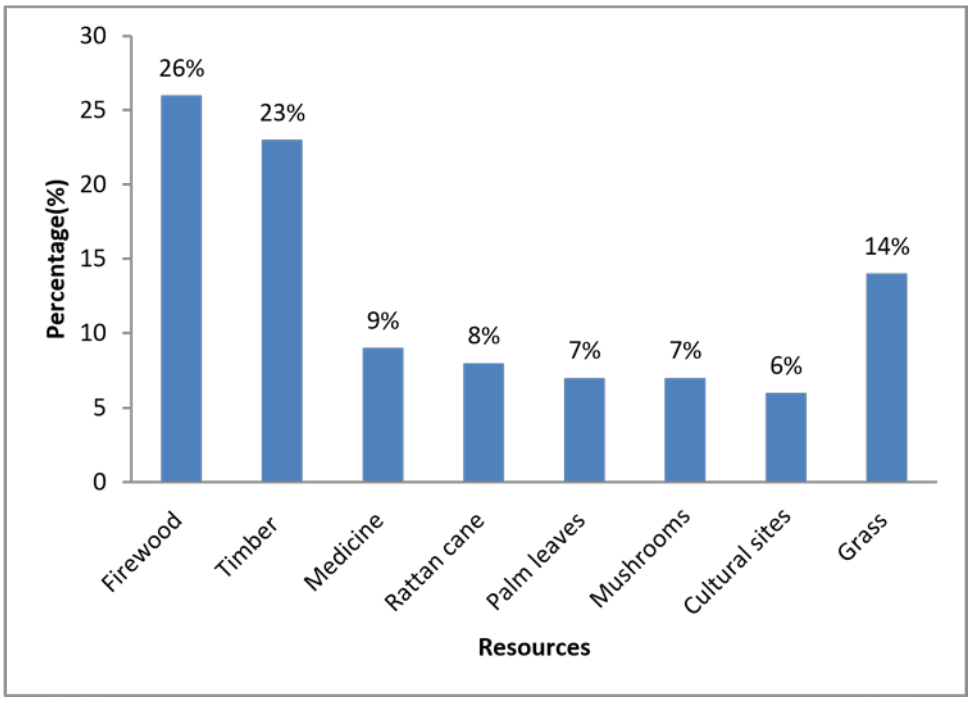

Figure 4. 1: Bar graph showing awareness of resources harvested from the park

Source: field data 2019

From figure 4.1, it can be seen that 26% of respondents indicated firewood as the resources harvested, 23% identified timber, 14% mentioned grass, 9% indicated medicine, 8% said Rattan cane (*calamus derratus*), and 7% palm leaves, 7% mushrooms, and 6% mentioned visiting cultural sites. The most accessed resource is firewood and the least accessed are the cultural sites. This is in agreement with Jones, (1999) who stated that rights to resource harvesting included; photographing, safari hunting, honey gathering, fruit production, and sand extraction.

A local leader in Bumaga 1 village said that;

‘’All the women living around the park are involved in firewood harvesting but the cultural sites are visited by small groups, the Bamaga and TIBCO’’.

Categories of people who harvest the resources

Household heads were aware of categories of people supposed to harvest resources secretary resource user committee said that;

‘’women harvest firewood (fallen dead wood), men harvest rattan cane, phoenix leaves, and timber. Uganda Peoples Defense Force (UPDF) harvests grass and any local person living around the park upon asking for permission from the park authority. Mushrooms and medicinal plants are harvested by all categories of people. Sempaya hot springs are visited by the Bamaga cultural group while the Kaweelo cultural site by TIBCO.’’ This was confirmed by the WCCSNP.

(b) Frequency of resource access by communities

The local people were found to be aware of the frequency of resource access, all women in the village surrounding the park harvest firewood once a month on the second Thursday of each month for the whole day. While rattan cane and palm leaves (*phoenix reclinata*) are

harvested twice a month.. Similarly, Uyadhayay (2013) also found out that local people living around Chitwan NP collect firewood once a month and grass yearly. TIBCO visits the Kaweelo burial ground and the forest at any time because they are the original dependents of the forest. They carry out their traditional activities of hunting small animals such as monkeys, antelopes, harvest firewood, poles, honey, and palm oil in the forest. On the other hand, the Bamaga visit the hot springs anytime upon request and carry out cultural rituals once a year in November. This was also confirmed by the WCCSNP. This is in agreement with Sarre (2017) who noted that local communities in Zimbabwe, Botswana, and Namibia are allowed to hunt four buffalos and three elephants per year.

(c) Monitoring harvesting of resources

The household heads were found to be aware of who is supposed to monitor the harvesting of the resources. One scout from the anti-poaching group said that*; the park rangers* are responsible for monitoring the harvesting of resources.

A local leader from Bundikuteganwa said that;

"*A part from the park rangers, community members are responsible for monitoring the harvesting of the resources"*. This was confirmed by the WCC SNP.

(d) Responsible for signing the Resource User Agreement (RUA)

The household heads were not aware of who is responsible for signing the RUA on behalf of the community and what it contains.

This was also confirmed by the FGDs conducted that, they were not aware of who is supposed to sign the agreement on behalf of the community.

It was revealed from the WCCSNP that, chairperson resource users' signs on behalf of the community and the local council 3 of the sub-counties. Similarly, Shibia (2014) also found out that local people living around Marsabit NP in Kenya claimed that they were not aware of the process used to negotiate agreements

4.2.2 Awareness about problem animals

Problem animals are the major source of dispute between the local communities and SNP. They destroy crops, cause injury or death to human beings and livestock.

To capture information about the problem animals, the respondents were asked to mention the problem animals around SNP. Results are presented in figure 4.2 below;

(N= 191)

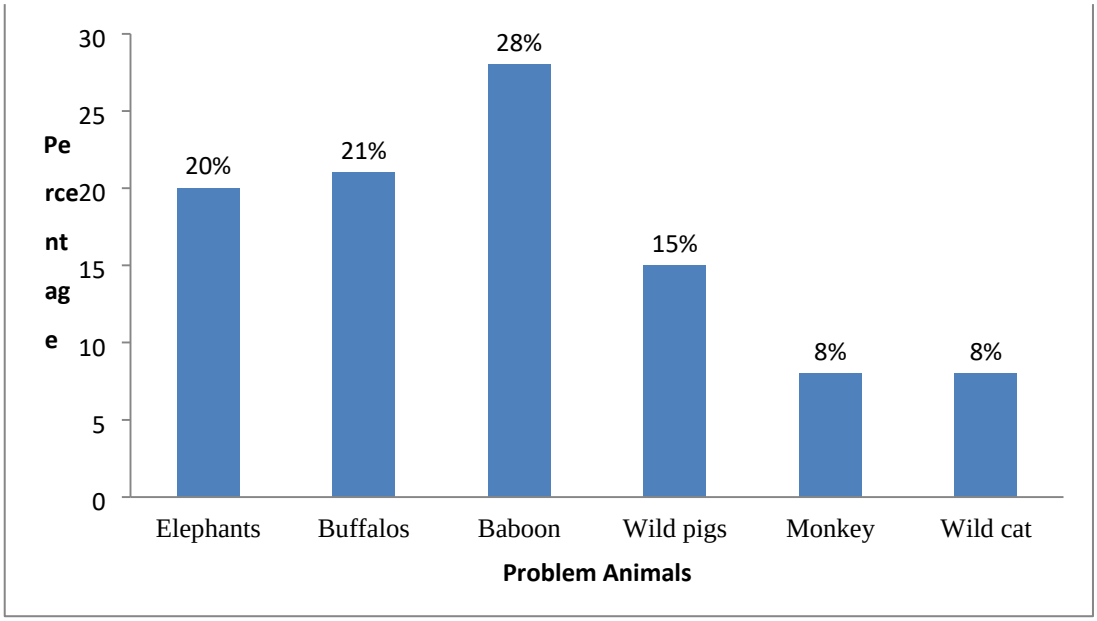

Figure 4. 2: Bar graph showing the Problem animals around SNP

Source: field data 2019

From figure 4.2, it is seen that 28% of respondents mentioned the baboons, 21% identified buffalos, 20% said elephants, 15% stated wild pigs, 8% said wild cats, and 8% mentioned

monkeys. The baboon causes the greatest damages and wild cats and monkeys cause the least damages.

It was further revealed from the chairperson resource committee that baboons are aggressive in terms of destroying crops, injuring people, and causing death to livestock. This view was also confirmed by the WCCSNP.

4.2.2.1 Awareness about the nature of damages caused by wild animals

Crop damages, injury, or death of people and livestock are some of the problems which wild animals inflict on the local people. The respondents were asked to list the wild animals that damage or destroy crops, and those that kill or injure people and livestock. Results are presented below;

(a) Animals that destroy crops

Various wild animals destroy crops around SNP. They destroy young and mature crops. Respondents were asked to list the wild animals that destroy crops. Results are shown below in figure 4.3;

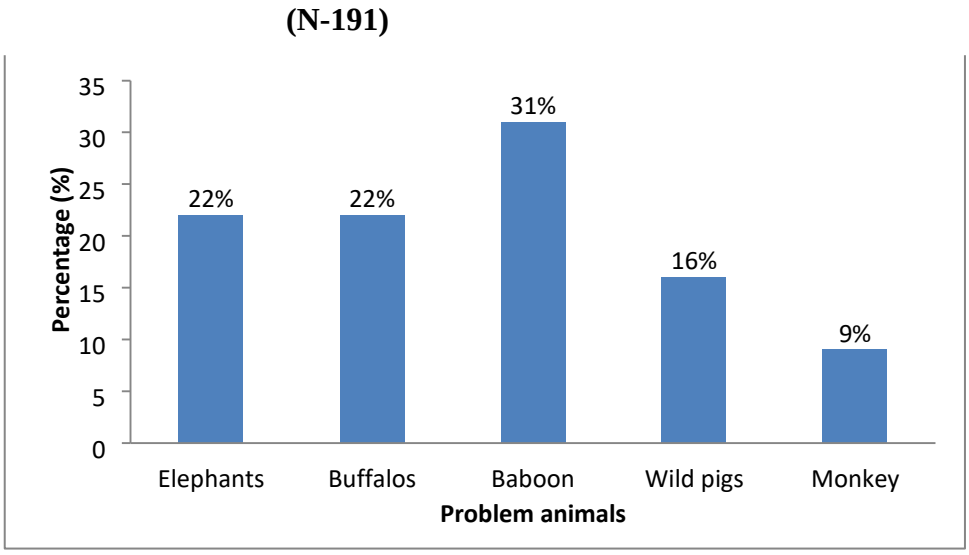

Figure 4. 3: Bar graph showing the Problem animals that cause crop damages.

Source: field data 2019

From figure 4.3, it can be seen that 31% of the respondents identified baboons as the problem animals that cause crop damages, 22% identified buffalos, 22% indicated elephants, 16 % stated wild pigs, and 9% mentioned monkeys. The baboons cause the greatest *A* crop damages and the monkeys the least damages.

A member from Bundikuteganwa village said that*;*

"The baboons move in a big group and thus destructive. Monkeys on the other hand are selective crop raiders and move in a small group which is easy to manage by guarding. Another local leader said that; Crop damages are rampant from September–November by elephants and buffalos due to flooding of the park".

This was confirmed by the WCCSNP that baboons move in a troop of 30-50 and monkeys move in a group of 5-10.

(b) Animals that kill or injure livestock

The respondents were asked to mention the wild animals which cause injury or kill livestock. Results are shown in figure 4.4 below;

(N- 191)

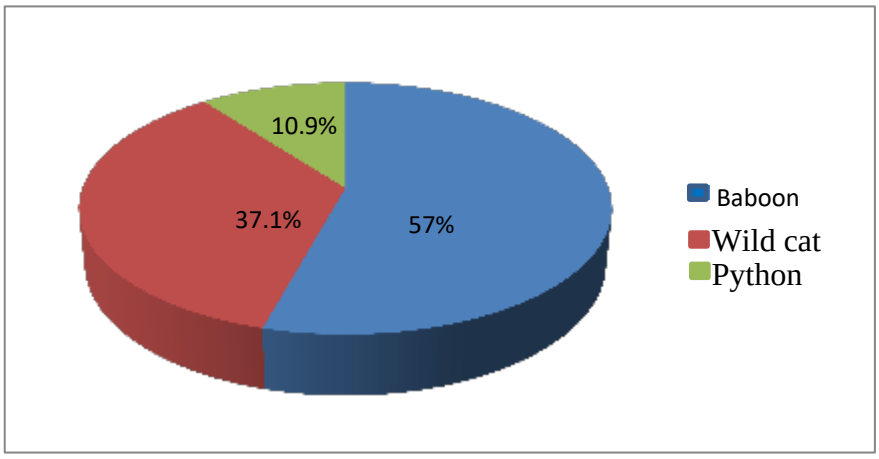

Figure 4. 4: Pie chart showing problem animals that cause injury or kill livestock

Source: field data 2019

From figure 4.4, it can be revealed that 57% of respondents indicated baboons as the wild animals which cause injuries or death on livestock, 37.1% identified wild cats or leopards and 10.9% mentioned the python. Baboons cause the greatest injury or death to livestock and the python cause the least damages. There were no reports about livestock killed by wild animals

A member of the Bubulungo farmers group said that;

"Baboons cause injury or death to livestock because they move during the daytime and cross over to the community land. Python lives in a wilderness zone where livestock is restricted". This view was also confirmed by the WCC SNP.

(c) Animals that cause human injury or death.

Human injury or death occurs when local people are guarding farms or sometimes when the animals are attacked. Respondents were asked to list the wild animals which cause human injury or death. Results are presented in figure 4.5 below

(N=191)

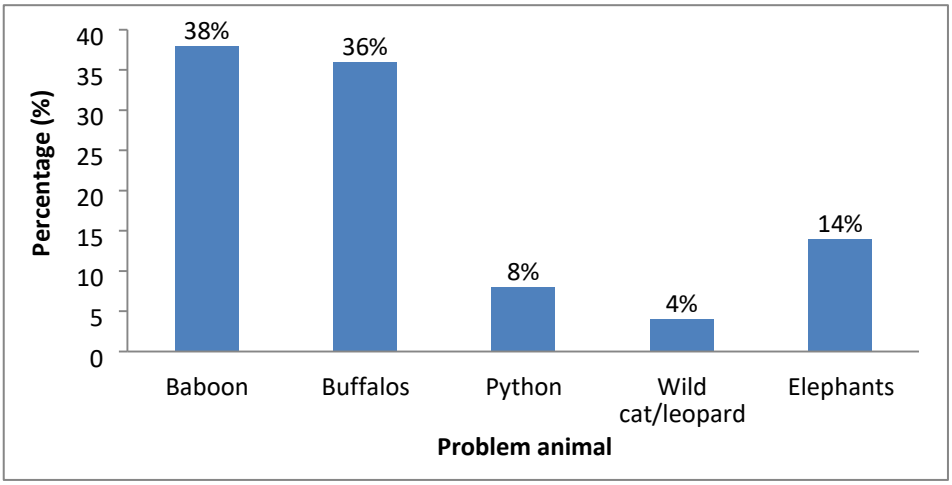

Figure 4. 5: Bar graph showing wild animals which injury or cause death

Source: field data 2019

From figure 4.5 it can be seen that 38% of respondents indicated that baboons, 36% said buffalos, 14% identified elephants, 8% indicated pythons and 4% indicated wildcats or leopards. The baboons cause the greatest injury to human beings and wild cats or leopards have the least injuries.

A youth employed by the park said that*;*

"*Baboons cause injuries during day time when people are involved in different activities like farming; they also scare women and young children. Wild cats or leopards move at night when people are in their homes*". This was affirmed by the WCCSNP.

4.2. 3 Awareness of land use planning

Land use planning is another strategy used to reduce encounters of people and wild animals. Respondents were asked to mention the land uses introduced by the park to minimize encounters with wild animals. Results are shown in figure 4.6 below:

(N=185)

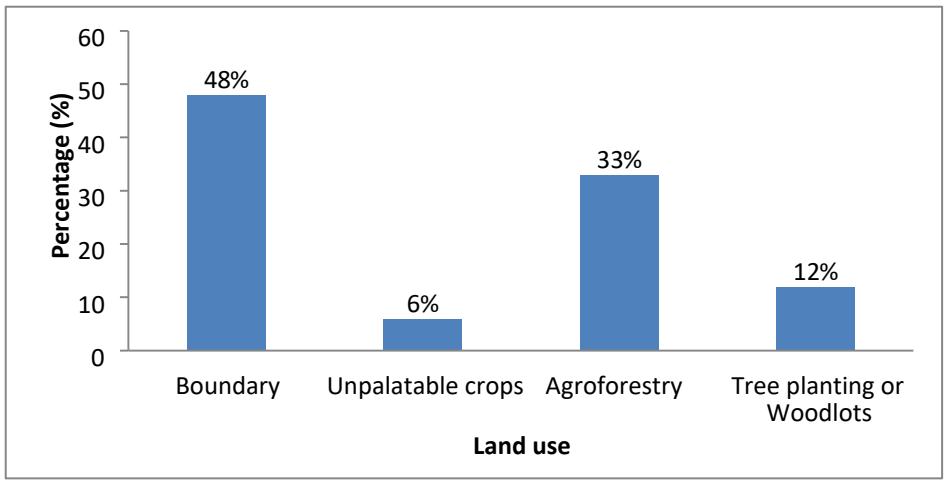

Figure 4. 6: Bar graph showing land uses introduced by the park

Source: field data 2019

From figure 4.6, it can be viewed that 48% of respondents indicated park boundary as a land use planning used to minimize encounter with wild animals, 33% indicated agro-forestry, 12

% mentioned tree planting or woodlots, and 6% indicated unpalatable crop. The majority of the respondents were aware of the park boundary and the minority was aware of the unpalatable crops.

The chairperson anti-poaching unit said that*;*

"That, majority of the household heads were aware of the park boundary because if you are found in the park without permission you are liable to prosecution or punishment by law but chili farming had just been introduced by the park and was in the nursery bed". It was confirmed by the WCCSNP.

(a) Park boundaries

The park boundary is one of the land-use planning strategies used to reduce encroachment on the park and invasion of wild animals in the community lands**.**

The youth fromt the bamaga Anti- poaching unit said that;

"The marks of the park boundaries, for instance, Mauritius thorn hedges, (ceasalpanea decapitate) in Burondo Sub County, tarmac road in Ntandi town council, and Ntotoro, acacia and eucalyptus trees in Bubukwanga Sub County. The pathways are found in Bubukwanga and Burondo sub-counties while concrete pillars are found in all sub-counties neighboring the NP. The park boundaries differ from Sub County to sub-county.''

(b) Woodlot or tree planting

Another strategy under land use planning involves the planting of a tree for firewood or timber extraction. The respondents were found to be aware of the eucalyptus trees planted by the Mantoroba rattan cane users in Ntotoro sub-county, tree planting in school compounds and homesteads for example bottle brush, fig tree and moonflower.

(c) Agro-forestry

Furthermore, agroforestry is another land use planning strategy that is used to reduce pressure on the park. The Household head communities were found to be aware of the agro-forestry sustained by Esmie Shuttered Company (ESCO) Uganda Limited which provided the seedlings but they said it is not a park initiative. The trees have different purposes such as providing fodder, firewood, timber, medicine, and maintain soil fertility. Similarly, the reports by Uyadhayay (2013) revealed that local people around Chitwan NP in Nepal were involved in demarcating the boundary through planting eucalyptus trees and Mauritius thorn hedges to cut off encroachment and improve management efforts. Hinchley, Turyomurugendo and Kato (2000) also noted that agroforestry around MENP has helped to maintain soil fertility and reduce pressure from the park.

(d) Unpalatable plants

Lastly, an unpalatable plant-like chili is another strategy that has been introduced by the park to reduce crop damages and attacks. The local communities in Bubulongu village Ntotoro Sub County were aware of the nursery bed of chili.

The member of the resource user committee said that*;*

‘’Chili growing had just been introduced and was still in the nursery bed. They further explained that chili will be used as a repellant to scare wild animals from crop damages and provide an alternative source of income but on the other hand the local people in other sub-counties were not aware of chili farms.’’ The WCCSNP confirmed this view.

4.2.4 Awareness about sensitization and awareness programs

(a) Forms of sensitization

The respondents who were aware of sensitization and awareness programs as a strategy used in collaborative wildlife management were asked to mention the forms of sensitization and awareness programs. Results are shown in figure 4.7 below;

(N=166)

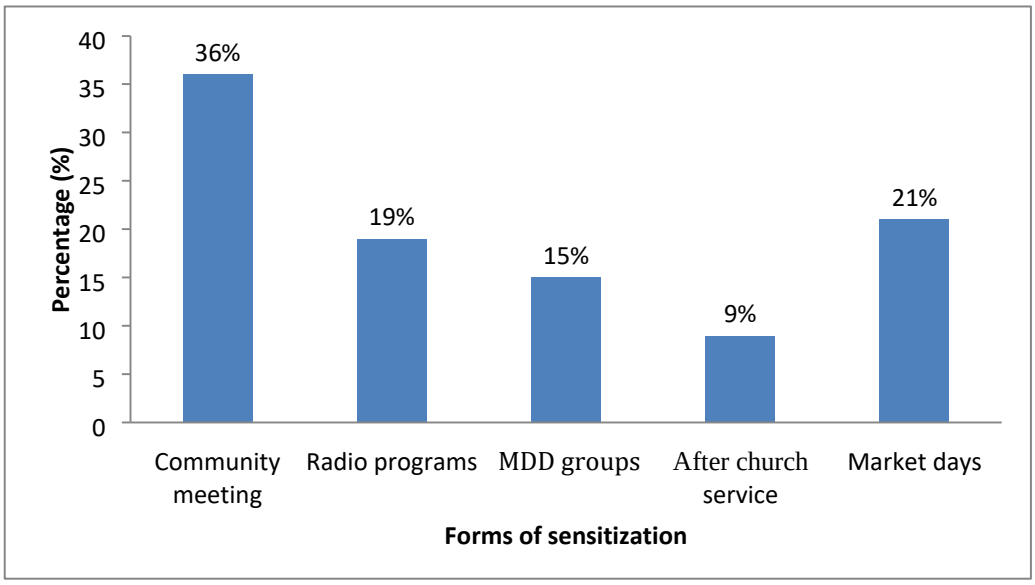

Figure 4. 7: A bar graph showing Awareness about forms of sensitization

Source; field data 2019

From figure 4.7, it is seen that 36% of respondents indicated the form of sensitization is a community meeting, 21% stated market days, 19% said radio programs, 15% mentioned MDD, and 9% indicated after church service. Community meetings are the most form of sensitization which is used and the least form of sensitization is after church services.

It was further confirmed from the chairman anti-poaching unit that;

''Mobilization of the community meeting is carried out with the help of the local Council 1 who can reach every member of the community. After-church service meeting mobilization is done by opinion leaders such as priests. Sensitization is carried out in each village at least once a year''.

(b) The purpose of sensitization

The respondents who had attended the sensitization meetings were asked the purpose of sensitization. Results are shown in figure 4.8 below;

(N=166)

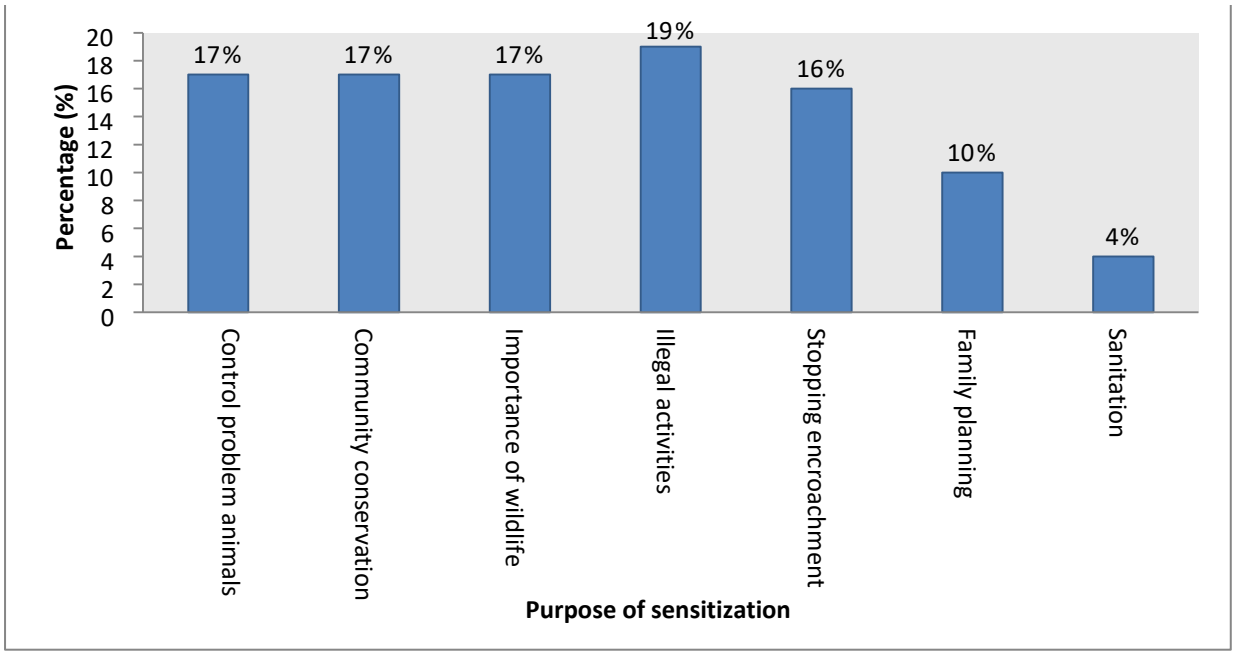

Figure 4. 8: Bar graph showing the purpose of sensitization.

Source: field data 2019

From figure 4.8, it is revealed that 19.0% of respondents indicated that the purpose of sensitization was how to address illegal activities, 17% identified the importance of wildlife, 17 % stated how to control problem animals, 17% said the role of community in conservation, 16. % mentioned stopping encroachment on the park, 10% indicated family

planning, and 4% mentioned sanitation. The major purpose of sensitization is to address illegal activities and the least purpose is sanitation.

A local leader in Kyakatimba village said that*;*

''illegal activities such as harvesting firewood, timber, mushrooms, medicinal herbs, and poaching pigeons (Kapapala) are rampant. On the other hand, sensitization programs about sanitation are carried out by stakeholders such as Caritas, Adventist Development Rural Association (ADRA), and World Vision''.

(c) Time when sensitization is carried out

The household heads were found to be aware of the time when sensitization programs are carried out. Results from the respondent revealed that community meetings are carried out once a year in each village surrounding the park or when there is a problem to resolve with the communities. Bailey (2011) also found out that stakeholders carry out sensitization programs to the communities living around the PAs, through media programs, drama, sports icons, and documentaries. Shresha (2015) noted that communities in Nepal participate in awareness programs on environment days while NGOs such as DNPW and WWF sensitize communities once annually in Nepal. On the contrary (Chhetri et al, 2003) noted that regular dialogue with the local communities and their political legislatures provides an opportunity can act as mitigation measures against wildlife invasions

From the FGDs conducted it was revealed that*;*

"many villages are surrounding the park and yet the people supposed to carry out these programs are few". This was confirmed by the WCCSNP.

(d) Involvement of community members in the meeting

Results from the respondents revealed that they are not involved in the discussions since they are passive listeners they are just lectured.

From the FGDs conducted it was revealed that park officials arrange a meeting with their agendas, for example threatening arrest of local people community problems is not addressed.

This was confirmed by the WCCSNP.

4.2.5 Awareness about revenue sharing

This is the least known strategy in collaborative wildlife management, communities neighboring the park are given a share of 20% from the gate entry fee for IGAs to increase the value attached to the park and reduce illegal activities.

The respondents were asked to mention how revenue is used, the percentage shared, and how often they meet to discuss issues of revenue share.

(a) How revenue is used

The respondents who identified revenue share as one the collaborative wildlife strategy was asked to state how revenue share from the park is used. Results are presented in figure 4.9

(N=109)

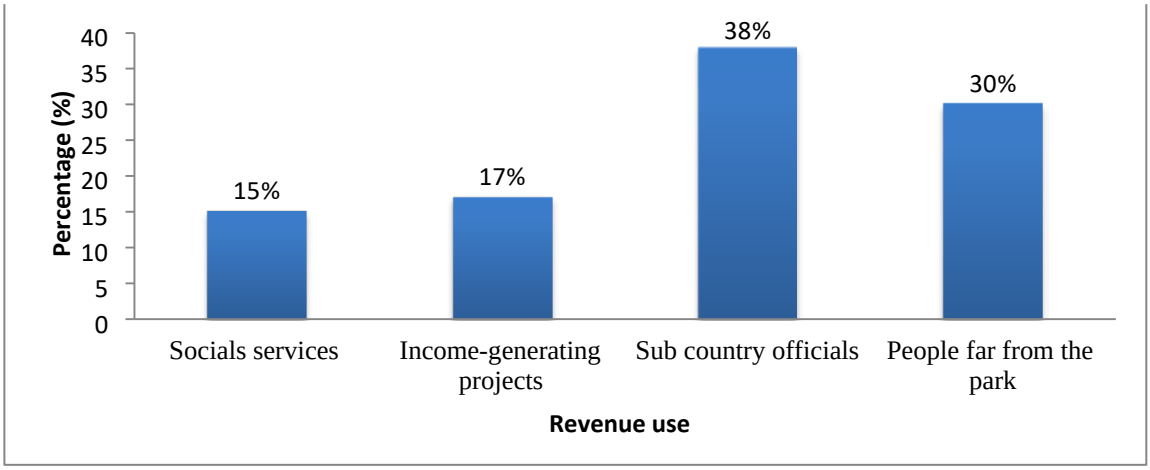

Figure 4. 9: Bar graph showing revenue share is used

From figure 4.9, it can be revealed 38% of respondents indicated that the revenue share is used by the sub-county officials, 30% mentioned people far from the park, 17% indicated developing social services, and 15% mentioned IGAs. Sub-county officials are responsible for the revenue share and IGAs are short-lived. Moyini, Mayindo and Makumbi (2006) also revealed that local community groups living around the park with already initiated projects have benefited from the revenue. On contrary, Namatovu (2015) found out that the local people in Ulusuki village around MENP were not aware of the revenue share because had never received revenue due to a limited number of tourists.

A member of Mantoroba rattan cane group said that;

Sub-county officials are the ones responsible for the distribution of revenue share and implementation of IGAs. They further explained that revenue share is given to groups with already existing projects after submitting a proposal which is vetted for funding by the Community committee. This was confirmed by the WCCSNP.

(b) Percentage shared

Results from the respondents who had benefited from revenue share revealed that they are not aware of the percentage which they are supposed to share from the park entry fee.

It was further clarified from the FGDs that the local people are supposed to get 20*% of* the gate entry fee. This was confirmed by the WCCSNP.

(c) Frequency of meeting

Local communities are supposed to meet to decide on how revenue share is supposed to be used. Results from the respondents who had shared revenue from the park indicated that they had never met to discuss how revenue should be spent**.** On the contrary, Twinamastiko (2014) observed that communities around Bwindi Impenetrable NP meet every year under the guidance of the local council 1 chairperson to identify needs and priority of IGAs funding.

4.3. Perception of the local communities about the strategies employed in sustainable wildlife management in and around SNP.

To ascertain the opinion of the local people on the benefits of the strategies used in collaborative wildlife management around SNP the respondents were asked whether the strategies were helpful at all Results are presented in table 3 below:

Table 4. 3: Showing how the local people perceived the collaborative strategies employed in sustainable wildlife management in and around SNP.

(N= 200)

Perception about the strategies	**Yes**	**No**
Reduction in encroachment.	158 (79.4%)	42 21%
Protection and rehabilitation of the park.	157 (78.9%)	43 (21.5%)
Improved park-community relationship	61 (30.6%)	139 (69.5%)
Improvement on the quality of life of the local people.	21 (10.6.)	179 (89.5%)
Reduction in crop damages	19 (9.5%)	181 (90.5%)

Source: field data 2019

From table 4.3 it is revealed that 79.4% indicated that the strategies have helped to reduce encroachment on the park, 78.9% stated that strategies have helped to protect and rehabilitate the park, 30.6% mentioned that has helped to improve the park-community relationship, 10.6 % said that has helped to improve on the quality of life of the local people and 9.5 % said that has reduced on crop damages.

4.3.1 Reduction of encroachment

The majority of the respondents (79.4%) indicated that the strategies employed such as demarcating of the park boundaries, sensitization agroforestry, planting of trees and woodlots have helped to reduce encroachment on the park by the local people. The local people are involved in maintaining the boundaries this has motivated them to reduce encroachment. Studies carried out by (Poudel, 2017) observed that the planting of trees has helped to reduce pressure on the park and increased bird species in Nepal.

On contrary, the lack of the buffer zone and the alternative land uses such as unpalatable crops like chili has not reduced crop damages.

A resource user in Ntandi town council said that;

"Fort-Portal-Bundibugyo tarmac road cannot prevent wild animals from crop raid. UWA cares about wild animals when a ranger finds you on the side of the park they harass, cane, or make you pay a fine, or arrest you but when wild animals destroy your crops the park does nothing. Many young people have been sent in prison because of green pigeons (kapapala)".

4.3.2 Protection and Rehabilitation of the park

The rehabilitation of the park involves the removal of invasive tree species of (exotic trees) maintenance of the boardwalk and construction of the trails.

The local people are involved in the felling of the invasive tree species (exotic trees) and non-invasive trees for timber such as; *Terminaliasuperbia, Sennaspectabilis,* Senna*siamea,* and *Cedrellaordurata* around the park boundaries, community settlements, parts which were degraded in the 1970s, to allow the forest to develop naturally and remain in its low land semi-deciduous forest state.

According to the WCCSNP, the local communities are also involved in the de-barking of selected exotic trees, uproot young wildlings, and sapling of the exotic trees.

Local people especially the youth are involved in the maintenance and rehabilitation of the boardwalk to the hot springs and maintaining the trails used for a forest nature walk and bird watching around the Sempaya area.

Plate 4. 7: Shows a youth repairing a boardwalk to the male hot spring in Sempaya village Burondo sub-county

Plate 4.7 showing a youth from the Bamaga clan (anti-poaching group) rehabilitating a work board using hardwood to the male hot spring in Sempaya village Burondo in sub-county.

4.3.3 Improved park- community relationship

Results from the FGDs conducted revealed that resource harvesting has led to an improved park-community relationship. The resource users such as the Mantoroba rattan cane users and the Bamaga clan anti-poaching unit volunteer to monitor resource harvesting through reporting of illegal activities, reporting unknown people found in the park, remove snares, hunting traps, and arresting offenders. Niskennen, Rowe, Dublin, Skinner*et* (2018) also noted that the youth employed in tourism related activities around conservancies volunteer to monitor illegal activities around the PAs.

This was approved by the warden community by availing data on damaged snares, wild wires, and bird net snares. Results are presented in figure 10 below;

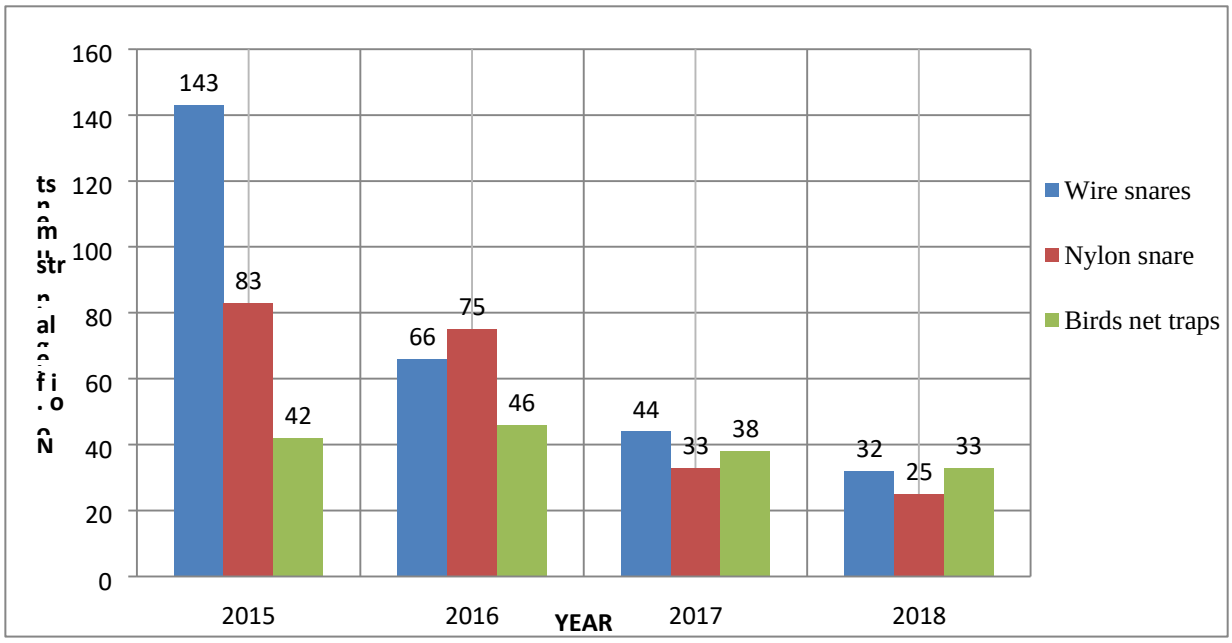

Figure 4. 10: Bar graphs showing reported cases of damaged wire snares, nylon snares, and bird net traps from 2015-2018

Source: SNP Annual reports 2015-2018

As seen in the figure 4.10 there is a decline in the wire snares, nylon snares and bird net traps due to cooperation in resource management

It was found out from the WCCSNP that resource harvesting is a challenge due to many people who come to harvest on the day of harvesting, inadequate staff, and the seasonal flooding of the park. This leads to failure of following the rules in MOUs like carrying out illegal activities such as poaching of the green pigeons (kapapala) and harvesting resources such as palm nuts, firewood, and timber beyond the collaboration zone.

It was found out the harvesting of resources such as firewood has saved the local people from buying firewood, timber and has led to the development of skills like such as art and craft which have improved the park community relationship. On the contrary, even though the household heads were not happy about the monthly subscription fee which restricts them from accessing the resources in the park even on the days when they are supposed to harvest resources. Men had a negative perception towards the long process of getting the permit for harvesting timber and the rangers who ask for a bribe to process the permit. However, Chhetri, Mugisha and White (2003) noted that the CCRs around MENP and KNP were trained in Para-military training that prepares them for law enforcement duties, but not community conservation which is more demanding in terms of skills and staff capacity. There is a need to train staff in community conservation skills for effective management of wildlife.

Furthermore, it was also revealed from the FGDs conducted by TIBCO it was revealed that they were not happy due to the restriction of hunting wild animals and the failure of park development eco- tourism.

One of the community members said that,

"We used to guide tourists to our burial ground (Kaweelo king burial place), practice cultural dances, and sell our crafts to European tourists who used to give us money but the park rangers have stopped to bring them yet they evicted us from our land. The park benefits government officials and rangers".

The WCCSNP revealed Batwa village will be established inside the park for eco-tourism, sensitization is being carried out for the Batwa youths to work as ranger guides and train them to generate income.

4.3.4 Improvement in the quality of life

Results from the FGDs show that groups that have benefited from the revenue sharing such as Mantoroba rattan cane users, Bamaga anti-poaching group, and Bubulongu have a positive feeling about the revenue projects. They further explained that it has improved their quality of life.

The secretary of the rattan cane users said that;

> *"Art and craft (skill training project) has helped to create employment which provides an alternative source of income. Through making furniture and skill training, I have managed to pay tuition fee for my studies at the university."*

Chairperson of rattan cane users said that*;*

"Through revenue share, we acquired land and planted woodlot (eucalyptus trees) which provides timber, firewood, and medicinal herbs. This has increased our income through the sale of timber and timber products".

Studies carried out by Niskennenet *al,* 2018) observed that the local people who are employed in tourism-related projects around Amboseli NP, Tarangire NP, Botswana earn

salaries or wages which helped them to buy their basic needs. Sisoyi (2015) also found out that various IGAs are carried out around Tarangire NP to provided supplements on the park resources.

On the contrary, the groups which had not benefited in the revenue projects claimed that lack of funds, sensitization, training, and follow-up led to the failure of the projects for example goat rearing in the Ntandi sub-county which were sold off and bee-keeping in Burondo sub-county which swarm away (plate 4.8).

A member of the Burondo11 farm's group explained *that*;

"After providing the bee-hives they did not provide the gadgets like the protective gears such as gloves and helmets which discouraged the farmers from caring for the bees."

Plate 4. 8: Deserted beehives in Burondo 11 village Burondo Sub County

Plate 4.8 shows a deserted beehive in Burondo 11 village Burondo sub-county due to lack of protective gears.

It was further confirmed by the WCCSNP that, revenue share is too small and irregular, not all the villages around the park have the MoU to share the revenue in a given period. This park authority keeps on alternating the villages which should get revenue due to few tourists who visit the park due to limited tourist attractions and frequent insecurity. This limits

collaboration. Sosiya (2016) also asserted that the uncertain of revenue funds received increased the negative perception of the local people Similarly, a report of (Newton et al, 2016) also shows that delay in revenue sharing, small amounts, and capture of revenue by elites in Zimbabwe increased poaching of the mammals between 2009 t0 2012 elephants 145 to 212, buffalos 91 to 460, impala 23 to 66, kudu 50 to 74 and zebras 27 to 90. Dabo (2017) also reported that butterfly farming and sea farming in Zanzibar take along to generate income which has led to continuous encroachment on the forests.

A resource user in Sara city said that;

> *"We are living in poverty my family only has one meal a day, sometimes we take porridge because all the crops grown are destroyed by the wild animals. We buy food imported from other areas if you have no money you cannot eat".*

The local communities in Ntandi, Burondo, and Ntotoro Sub County have benefited from free tap water from rivers and streams flowing from the park. This has improved their quality of life and reduced the encounter of local people with the wild animals when looking for water in the park. On the other hand, communities far away from Fortportal-Bundibugyo tarmac road such as Sara city and in Bundikutenganwa have not benefited.

A local leader in Bundikutenganwa said that:

> *"We have not benefited from clean water. We draw water from the wells which are unsafe the children and women suffer mainly during the dry spell looking for water in the park and have high risks of injuries in search for water, being attacked by diseases due to sharing water wells with wild animals. The wild animals after destroying the crops, clean themselves especially the chimpanzees and baboons in the water source.*

4.3.5 Reduction in crop damages

From table 4.3 it can be seen that only 9.5% of the respondents indicated that the problem animal management strategies have not wild animals especially elephants from invading the crop farms.

A local leader from Burondo 1 said that "*the Mauritius thorn hedges in a few parts have gaps that aid the wild animals to pass through and such as the bush pigs which drill holes while baboons and monkeys jump over"*. Akampulira*et al*, (2014) also noted that Mauritius thorn hedges have managed to control big animals such as elephants, baboons, and bush pigs from crop damages but are less effective in controlling small animals from crop raids.

It was further confirmed from the FGDs They further, asserted that Mauritius thorn hedges have not been planted along all the park boundaries for example sub-counties like Ntandi town council, Ntotoro, and some parts of Bubukwanga sub-county, this leads to continuous animal invasions. This was confirmed by the WCCSNP. According to the report from (Frank et al, 2016), it was observed that electric fences have helped prevent elephants' invasions in Caprivi Namibia but elephants break fences in Aberdare NP and baboons jump over.

The elephant deterrent board walkway helps to control the elephants but some parts of the deterrents in Bubulongu village Ntotoro sub-county have been destroyed by elephants thus leading to crop damages. And scare shooting is rarely used. (See plate4.4 page 41).

Furthermore, it was also revealed from the FGDs that even though scare shooting reduces crop damages. On the other hand, before the firecrackers are exploded protocol is followed, the local council 1 is supposed to write a letter to the WCCSNP or make a telephone call, this delays the process which leads to crop damages. It was further, revealed that scare shooting is rarely used due to frequent insecurity by the Allied Democratic Force (ADF) and

Rwenzururu inter-tribal conflicts. This was confirmed by the WCCSNP. However, scare shooting is a temporary method it can diminish over time, and animals such as elephants can become habitual to noise (Nakyesa, 2013). Chhetri *et al* (2003) also asserted that scare shooting was discouraged around MENP and KNP as it would cause alarm among people already plagued by periodic rebel activity..

Results from the household heads revealed that before the implementation of CWM. Wild animals invaded the community land frequently because they were few and local people used to kill them. This was further, confirmed From the FGDs conducted that, the local communities had encroached on the wildlife habitats which reduced the wild animals hence fewer wild animal attacks. This was confirmed by the WCCSNP.

Results from the respondents indicated that the wild animals invade the crop farms very frequently after the implementation of the CWM especially the baboons. This is because of the increase in the numbers.

From the FGDs held it was found out that, the wild animals have increased due to persistent crop damages, which limits collaboration. This was confirmed by the WCCSNP that the park lacks updated biodiversity inventory, due to the failure of the assessment group to provide data of census in 2015. The WCCSNP approved that crop damages are a challenge by availing data of estimated cropland and reported cases of crop damages from 2014 -2018. Results are presented in figure 4.11 below;

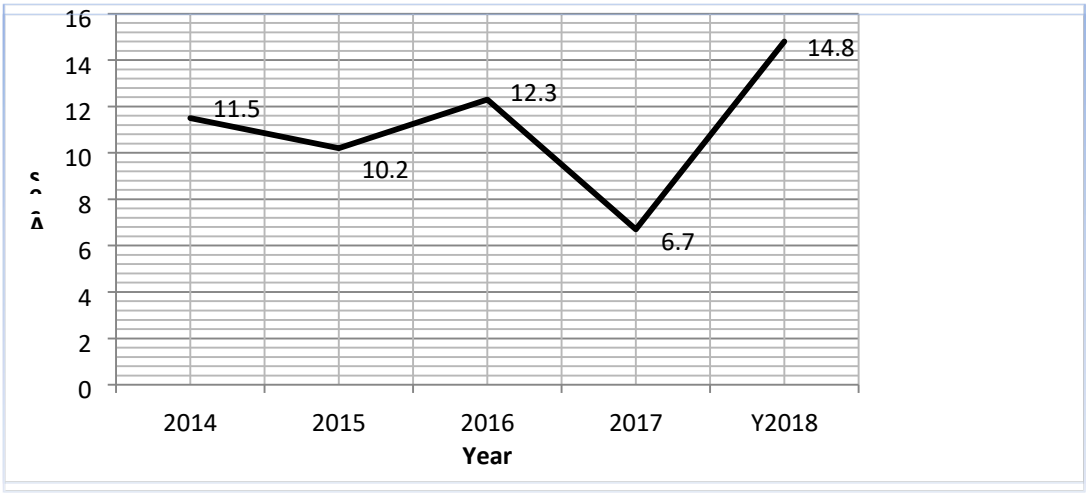

Figure 4. 11: Line graph showing acres of cropland destroyed from 2014- 2018

Source: SNP annual reports 2014-2018

From figure 4.11 it can be seen that 11.5 acres of cropland were destroyed in 2014, 10.2 acres in 2015, 12.3 acres in 2016 and 6.7 acres in 2017, and 14.8 acres in 2018 due to an increase in wild animals.

Results are presented in fig 12 below:

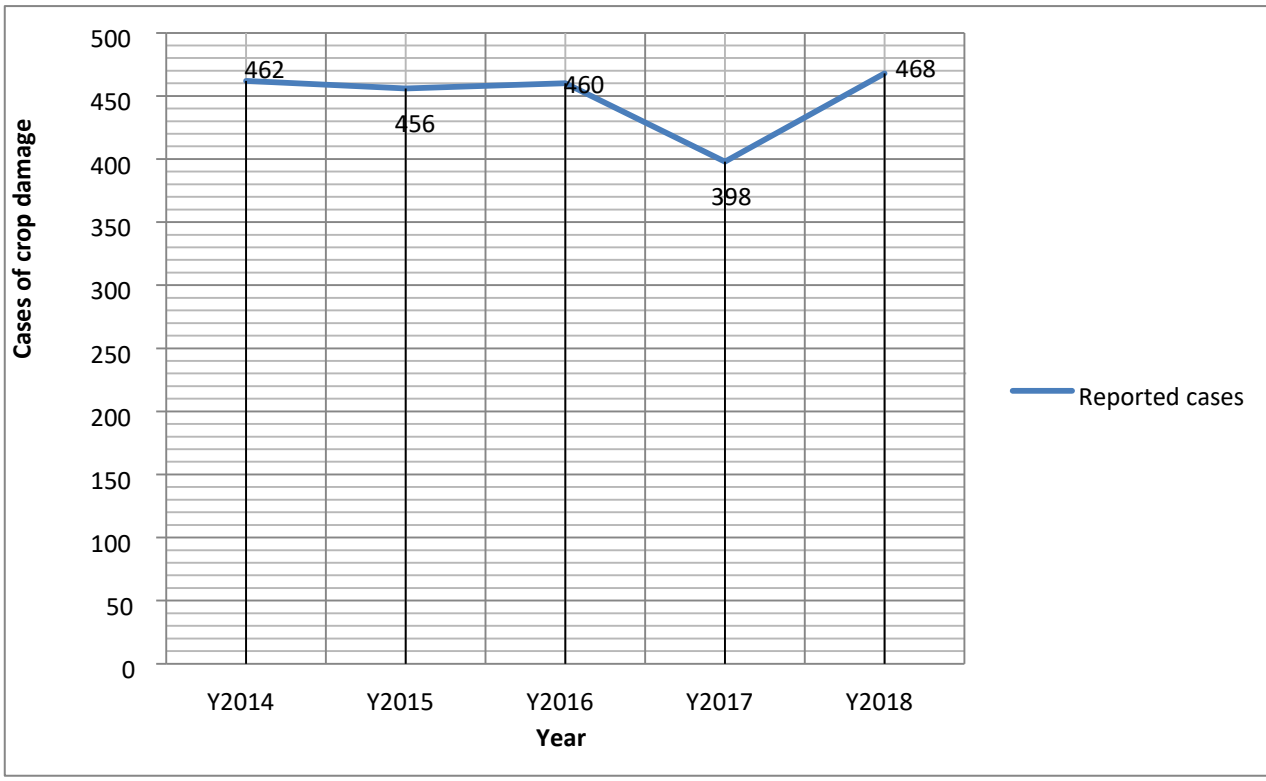

Figure 4. 12: Line graph showing cases of crop damages reported to UWA

Source: SNP annual reports 2014-2014

As seen in figure 4.12, crop damages are rampant in the community lands surrounding the SNP. 462 acres of cropland were destroyed by wild animals in 2014, 456 acres in 2015, 460 acres in 2016, 398 acres in 2017, and 468 acres in 2018.

Local communities feel that the park has left the responsibility of managing the wild animals to them through guarding.

The chairperson resource user committee said that;

"collaborative wildlife management has not reduced the anger of the local community towards wild animals such as the baboons which are referred to as Nkukulu (notorious) or ADF rebels which requires to be killed, but there is a lack of active Problem Animal Control Unit (PACU) at the sub-counties".

A report by Laverdiere et al (2007) also shows that the communities living near the NP in Africa have little sympathy for wild animals and see animals as a source of threat to the

safety and food security. Farmers in Zimbabwe display a negative perception towards elephants due to losses incurred from crop damages which results in poaching (Nyashadzasha, 2017). On the contrary, (Saraswati, 2012) asserted that the one-horned rhinoceros causes the greatest crop damages in NawalParasi districts in Nepal but the local people have a positive perception about its conservation due to its ecological value, contribution towards biodiversity, recreation value, and tourism benefits.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

5.2 Collaborative strategies employed in promoting sustainable wildlife management in and around SNP.

The study revealed that the household heads are involved in the management of wild animals in and around the park. Different strategies are being used strategies being used in the management of wildlife in and around SNP. These include; problem animal management resource harvesting land use planning, revenue sharing, and sensitization programs.

The local people were involved in the planting of the thorn hedges along the park edges. The thorn hedges are environmentally responsive, act as a habitat for wild pigs and birds. The household heads cooperated with the park rangers whenever there was a need to scare away herds of buffalos and the obstinacy of elephants in the community land. This reduces the retaliation of people who kill and poison wild animals and also prevents the people from being killed or harmed by the wild animals.

There were various land uses that have been introduced by the park; they also act as alternative livelihoods to the people for example woodlots or trees, agro-forestry and chili. Chili is a repellant to wild animals such as elephants. Other alternative livelihoods include income-generating activities generated from revenue share such as art and craft, fish farming, and beekeeping.

Communities access resources from the park regularly. This has helped to reduce human-wildlife conflict thus enabling the people to cooperate with the park authorities in the management of wildlife.

Objective 2 levels of local community awareness about collaborative strategies employed in sustainable wildlife management in and around SNP

The local people were aware of the strategies being used in and around the park.

The awareness of the problem of animals has helped them to cooperate with the park authorities to reduce the disruption to the daily living caused by the animal and this lowers the damages caused by wild animals.

The local people were aware of the resource harvested from the park, categories of people who harvest, and the frequency of resource harvesting. This reduces the suppression of wild plants, human-wildlife conflict and increases the value to the park, However, household heads were less aware of the revenue share, the Resource User Agreement (RUA), and sensitization programs which are carried out by the NGOs as park initiatives for instance agroforestry, population control, water, and sanitation programs.

Objective 3 is the perception of the local people about the collaborative strategies in sustainable wildlife management in and around SNP.

The employment of the local people to maintain the boundaries and regular sensitization about wildlife management effect of illegal activities have reduced encroachment.

The communities were happy about alternative livelihoods such as art and craft. this has created employment and increased income. This has improved security and park-community relationship.

The joint management of wild animals has regulated the harvesting of timber and non-timber product. The resource users volunteer to control illegal activities and encroachment. This has

led to the regeneration of vegetation and increased wild animals but there was a lack of recent biodiversity inventory to show the trend.

The thorn hedges have not been planted along the park edges, while where they were planted, they have gaps. This has led to increased crop damages in the area. while chili is only found in one village. This lives a gap hence continuous damage, inadequate food and poverty.

5.3 Recommendations

The following recommendations were made based on the conclusions from this study:

The Park authorities should increase the Household heads' contribution to maintaining Mauritius thorn hedges to avoid animals that could easily invade the villages especially in areas where the hedges had died and in areas where they are non-existent to increase collaboration in the implementation of wildlife programs.

More sensitization and awareness programs should be encouraged especially the stakeholders involved in the management of wildlife around the park.

The Park authorities should encourage the communities around NP to plant chili to scare away elephants to reduce human-wildlife conflicts because it is capable of reducing crop damages. The gaps in the NP, through which elephants cross through, will reduce because they will be scared by the chili gardens, thereby reducing the misunderstandings on the part of the communities leading to sustainable wildlife management.

Further research should focus on the impact of resource management on the livelihood of the local people.

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APPENDICES

APPENDIX I: LETTER OF INTRODUCTION AND CONSENT

UGANDA WILDLIFE AUTHORITY

OFFICE OF THE EXECUTIVE DIRECTOR
PLOT 7 KIRA ROAD KAMWOKYA
P. O. Box 3530, Kampala, Uganda

Our Ref: COD/96/05 — 8th November 2019

Namulemo Alice
Kyambogo University
KAMPALA

RESEARCH APPLICATION APPROVAL

I am in receipt of your application dated 6th November 2019 seeking permission to carry out a study titled ***"Collaborative Approach and Sustainable Wildlife Management in Semuliki National Park".***

I wish to inform you that your research application has been approved with effect from 1st January 2020 to 20th January 2020. You are expected to submit to Uganda Wildlife Authority a progress report by March 2020 and a final report of your findings by end of May 2020. In case you are unable to work within these dates, please notify us in writing. Kindly, note that any researcher failing to submit reports will not be allowed to come back to Protected Areas for further research.

You will be required to pay to Uganda Wildlife Authority an application fee of **UGX 20,000.**

Please report to the Senior Warden Semuliki National Park on arrival for registration and further guidance.

Conserving for Generations
Yours Sincerely

EXECUTIVE DIRECTOR
UGANDA WILDLIFE AUTHORITY

John Makombo
FOR: EXECUTIVE DIRECTOR

CC: Chief Warden, KCA

CC: Senior Warden, SNP

Received on 5/1/2020

AWCC
Please kindly work with this student where she needs any assistance

APPENDIX II: QUESTIONNAIRE

My name is NAMULEMO ALICE a master student of Kyambogo University. I am carrying out a study entitled ***"Collaborative Approach and Sustainable Wildlife Management".*** The information sought is purely for academic purposes and will be treated with confidentiality.

Part A: Demographic Particulars of House Holds or Demographic Data

i) Date……. ii) Questionnaire number……

iii) County…….. iv) Sub county…….

v) Parish……..……vi) Village……

1. Age i) 18 ii) 30- 40 iii) 40- 50 iv) 50- 60 v) 60 and above
2. Gender i) Male ii) Female
3. What is the highest level of education?
4. What is your occupation?
5. What is the distance of your home from the National Park?
   i) 1 kilometer ii) 2 kilometers iii) 3 kilometers iv) others specify
6. How long have you stayed in this village?
   i) less than 1 year ii) 5 –10 years iii) more than 20 years iv) moved from other place

PART B: 1. Awareness about collaborative management strategies a) Awareness about problem–animal management

1. Are you aware of the problem animals? **Yes** **No**
2. If yes can you list them?
3. What are the wild animals which destroy crops?
4. What are the wild animals which kill livestock or cause injury?
5. What are the animals that cause human injury or death?
6. How often did the problem animals attack before the collaborative wildlife management?

i) Very frequently ii) frequently attack iii) rarely attack iv) others specify…….

7. How often do these animals attack after implementation of the collaborative wildlife management? i) Very effective ii) frequently iii) rarely attack iv) others specify……

8. What has the National Park done to reduce the attacks?

b) Awareness of land use planning

Are you aware of land use planning? Yes No If yes mention the land uses introduced by the park.

What are the signs of the park boundary?

Who is responsible for demarcating the park boundary?

What agriculture measures were introduced by the Uganda wildlife authority to promote wildlife conservation?

c) Awareness about revenue benefits

Have you ever benefited from the revenue share? Yes No

If yes what percentage is given?

4. How often do you meet to decide how the revenue is spent?

5. How is the revenue used?

d) Awareness about regular resource harvesting.

1. Does the park authority allow the communities to access resources from the park? Yes No

2. If yes what are the resources which are harvested?

3. What are the categories of people who are permitted to harvest the resources?

4. How often do you access the resources?

5. Who is responsible for monitoring the harvesting of the resources?

6. Are you aware of the signing of the agreement for resource use? Yes No 7. If yes who is responsible for signing the agreement on behalf of the community
8. Who is responsible for installation of the clean water?

e) Awareness about sensitization programs

1. Do the park officials conduct sensitisation programs about wildlife management? Yes No
2. What are the forma of sensitization which are carried out If yes how often are the sensitization carried out
3. What extent are the communities members involved.

i) actively involved ii) involved iii) excluded iv) others specify

4. What is the purpose of conducting the sensitization programs?

2. Perception of the local communities towards the strategies of wildlife management

1. Has the problem animal management helped to reduce crop damages? Yes No

   Explain…….

2. Has the land use planning reduced encroachment on the park? Yes No

   Explain ……..

3. Has the revenue sharing activities helped to reduce pressure on the park by producing substitutes? Yes No

Explain ……

4. Has the resource harvesting enabled the park to access resources? Yes No

Explain……

5. Has the sensitization programs helped to reduce on the tolerance of wildlife. Yes No Explain……..

Thanks for the response

APPENDIX III: QUESTIONNAIRE TO THE WARDEN COMMUNITY CONSERVATION

i) Date……. ii) Questionnaire number……..……

1. What are the strategies which use to promote collaboration wildlife management?
2. What was the aim of introduction of these strategies?
3. Have the strategies helped in the management of wild life?
4. What are the challenges of using the strategies?
5. What is the relationship between the local communities and the park officials?
6. How have the local communities contributed towards the protection and rehabilitation of the park?
7. How has collaborative approach improved on the quality of the local communities?
8. How has the collaboration helped to maintain the traditional knowledge among the indigenous resource dependents?
9. What is the trend of the wildlife since the interception of collaborative wildlife managements?

11. How best can collaborative be improved?

Thanks for your response

APPENDIX IV: QUESTIONNAIRE GUIDE TO KEY INFORMATS

1. In which collaborative management strategy do you belong?
2. What is your role in collaboration?
3. Are you aware of the signing of the resource use agreement?
4. How have the strategies helped in the management of wildlife?
5. In case there is destruction of property how do you respond to the attack?
6. Have the strategies improved on the park community relationship?
7. What is the wildlife population trend since the interception of collaborative management?
8. What are the factors that limit collaborative wildlife management?
9. How best can collaborative wildlife management be addressed?

Thank for your responses.

APPENDIX V: OBSERVATION CHECK LIST

1 Farm land destroyed by wild animals

2. Forest management practices performed by communities for example community forests.

3. Boundary signs of boundaries.

4. Water sources for the local people.

4. Firewood collection.

5. Income Generating Activities (IGAs) carried out by local people.

6. MDD groups.

Thanks for the response

APPENDIX VI: FIELD PHOTOGRAPHS

WCC SNP carrying out crop assessment

Traditional beehive

The King of the Batwa and the Researcher

Park ranger supervising harvesting of exotic trees

A youth from the Anti-poaching unit maintain a board walk way

Plate 4. 9: TIBCO (Batwa cultural group)