

**CONFLICT BETWEEN WILDLIFE AND COMMUNITIES
LIVING ADJACENT TO VOLCANOES NATIONAL PARK IN RWANDA**

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In Partial Fulfillment of the
Requirements for the Award of the Degree of
Master of Arts in Conflict Resolution and
Peace Building

By

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February , 2012



DECLARATION A

This thesis is my original work and has not been presented for a degree or any other academic award in any University or Institution of Learning.

Signed.....

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Date: 13/03/2012



DECLARATION B

I confirm that the work reported in this thesis was carried out by the candidate under my supervision.

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Supervisor

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13/03/2012

APPROVAL SHEET

This thesis entitled "CONFLICT BETWEEN WILDLIFE AND COMMUNITIES LIVING ADJACENT TO VOLCANOES NATIONAL PARK IN RWANDA" prepared and submitted by SISI Jean Damascène in partial fulfillment of the requirement for the degree of Master of Arts in Conflict Resolution and Peace Building has been examined and approved by the panel on oral examination with a grade of Passed.

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Date of Comprehensive Examination: 10th, February 2012

Grade: _____

Name and Signature of Director, SPGSR

DEDICATION

To victims of human-wildlife conflict in Rwanda

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SISI Jean Damascène

ABSTRACT

This study sought to assess the relationships between wildlife and communities living adjacent to Volcanoes National Park in Rwanda, in order to evaluate actions that have been taken to make it easier for people and wildlife coexist and those that should be envisaged to ensure their sustainable coexistence. A questionnaire survey was conducted within concerned communities. Both qualitative and quantitative data analyses were presented. Findings showed that there are conflicts between wildlife and humans in the limits of the VNP, where nearly 70% of respondents indicated that relationship needed to be bettered. On the one hand, animals damage crops and kill or injure people, the most problematic wildlife species being buffalo that scored 51% of the respondents; on the other hand, significant illegal activities are frequently reported. People are not duly compensated, while malefactors against the protected area are punished when captured. This persistent antagonism is of the nature to threaten the sustainability of the park.

The study suggested the use of a multi-action approach to alleviate current problems. This should include strengthening existing actions, building communities self-reliance, educating people how to coexist with wildlife through a comprehensive program of mass sensitization on environmental issues, meaningful assistance of communities in the protection of their property, and translocation of some problem-animals in order to avoid escalation of conflict and limit threats to the most endangered species, like mountain gorilla.

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LIST OF ACRONYMS

DFGF : Dian Fossey Gorilla Fund
FAO : Food and Agriculture Organization
HWC : Human-Wildlife Conflict
IUCN : International Union for the Conservation of Nature
NGO : Non-governmental Organization
ORTPN: Office Rwandais du Tourisme et des Parcs Nationaux
PA : Protected Area
RDB : Rwanda Development Board
VNP : Volcanoes National Park
WWF : World Wildlife Fund

CHAPTER ONE

THE PROBLEM AND ITS SCOPE

Background Information

Rwanda is located in the heart of Central Africa and lies between 1000 m and 4500m. Due to its varied topography and diverse climatic conditions, Rwanda contains an unmarkable variety of different habitats, flora and fauna. About half of the country is cultivated and population density is high (321 inhabitants per square km). Dramatic forest regression is due principally to an extension of agricultural land, itself caused by demographic expansion. Rwanda is now one of the most densely populated countries in Africa, yet is one of the few nations in the world to have more than 10% of the land included within protected areas, most of which lies in national Parks: the Akagera National Park located in the Eastern region, the Volcanoes National Park in the Northern region and Nyungwe National Park in the Southern part of the Country.

In Rwanda, National Parks are owned and managed by Rwanda Development Board (RDB), as a protected community resource which does not include human community. National parks in Rwanda have the statutory purposes of conserving and enhancing the natural beauty, and wildlife heritage of the area as well as promoting opportunities for the understanding and enjoyment of the park's special qualities by the public, through recreation and tourism activities.

Volcanoes National Park (VNP) is the area where mountain gorillas live. These species live only in the mountain rainforests of Central Africa - about 250 in the Volcanoes conservation area on the borders of Rwanda, Uganda and Democratic Republic of Congo - and another 250 to 300 just 25 miles away in the Bwindi

Impenetrable National Park in Uganda. A population of more than 550,841 inhabitants is currently living adjacent the Volcanoes National Park, according to 2002 census. One of the main problems in all the protected areas of Rwanda is park-people conflict. Like other National Parks, Volcanoes National Park is facing the problem of park-people conflict since its establishment in 1925.

Since its establishment in 1974, the park management kept on reporting human-wildlife conflict (Glenn *et al.*, 2010). At the same time there was no mechanism to resolve conflict such as those resulting from damage caused by wild animals albeit enforceable laws provided for penalties in case of human illegal activities within the park. Due to human activities, particularly clearing the forest for pyrethrum plantation, VNP has been reduced from original area of 340 Thⁱ to its current area of only 165Thⁱ (Kwizera and Ndayisaba, 2009).

Problem Statement

Communities living adjacent to protected areas (PA), like National Parks, frequently face problems with wildlife. Wild animals inflict damage on people, their property, crops, livestock and poultry. Inversely, Communities illegally hunt animals within the protected areas. People living adjacent protected areas are accused of poaching and destroying vegetation in search of firewood, rain water, medicinal plants and even bush meat. Antagonism between local communities and wildlife occurs, thus threatening the sustainability of the protected areas. Within Volcanoes National Park, large mammals, mainly buffaloes and elephants move through human settlements very often at night to seek for food. As they move they destroy property and occasionally kill people. People suffer from this moral harm since conservation authorities don't actually repair such damages. This has led to increased conflict between people and animals, with people developing a hostile attitude towards wildlife and wildlife conservation authorities who don't correctly face their vicarious liability.

Purpose of the study

In order to resolve the wildlife problem around Volcanoes National Park, the concept of community conservation has been initiated by the Dian Fossey Digit Fund (DFDF) working through local Non Governmental Organizations (NGOs) involved in environmental projects. These projects offer the communities support in educational, socio-economic and conservation management activities. By improving the living conditions of local communities, it is believed that pressure will be relieved from the National Park as fewer people will need to utilize its finite resources (DFDF, 1998). Despite this park management strategy, some human pressure on the park still exists given that illegal activities are currently reported and the local people have not ever stopped complaining about crop depredation by wildlife. The purpose of this study is then to examine whether current achievements are deemed enough effective in alleviating conflict existing between wildlife and people living at the shoreline of Volcanoes National Park. The issue is all about the question whether and which complementary or alternatives approaches could be used to ameliorate or alleviate the existing human-animal conflict.

Research Objectives

General objective

The general objective of the study is to assess the conflict between wildlife and communities living around Volcanoes National Park (VNP).

Specific objectives

The specific objective of the study is:

1. To establish the conflicting relationships existing between wildlife and communities around the park;

2. To evaluate the actions already taken in order to alleviate conflicts between animals, people and officials of National Parks and wildlife Management.

Research Questions

This study was guided by the following research questions:

1. How is the status of relationships between wildlife and humans around the park?
2. What actions can be taken to make it easier for people and wildlife coexist?
3. What approaches can be adopted to ensure sustainable prospects for coexistence of wildlife and local people?

Scope of the study

Geographically, the study has been conducted within and around Volcanoes National Park where local communities are prohibited from freely utilizing the resources within the protected area while they face damage inflicted by wild animals on people and their property.

The study has focused on the current conflicting relations since the creation of RDB, in 2009. Most emphasis was put on crop depredation by wildlife and illegal activities against the Park and subsequent actions taken by protected area management authorities in face of such a state. In fact, despite many efforts made by Rwandan conservation authorities with the help of Non-governmental Organizations to enable rural communities to manage and benefit directly from indigenous resources, human-animal conflict is still a major problem that has not been effectively resolved in the region surrounding Volcanoes National Park, with the result of making very harmful human-wildlife relationships in the area.

According to Craig`s statements (1990), nature reserve management for many of national parks and equivalent reserves worldwide is increasingly challenged by activities outside the site boundaries, and challenge is likely to escalate as time goes on. This study is placed in the overall context of international concern on the issue of the nature reserves preservation for the benefit of sustainable environment.

Significance of the study

The current study stemmed from the concern that conflict between wildlife and local people may jeopardize intergenerational well-being in that it is likely to cause harm to an important asset of sustainable development: environment (the World Commission on Environment and Development, 1987). The rationale for conducting this study was to contribute in finding answers to this conflict. The research was worthwhile both to the central and local government, and the villagers living adjacent to the Park in that findings and subsequent proposals should help improve the current relationship between human and wildlife in the area.

Moreover, along the lines of the United Nations Convention on Biological Diversity adopted by Rio de Janeiro conference in 1992, all countries are committed to halt biodiversity loss and to promote bio-safety and sustainable management of biodiversity, this meaning the variety and variability among living organisms and the ecological complexes in which they occur. Given that the conflict may lead to a total or partial destruction of VNP, the research was important in that it should help Rwandan authorities identify solutions on that conflict and thus fulfill its commitment vis-à-vis the international community.

Operational Definitions of Key Terms

Conflict: Conflict is to be understood in the sense given by Hocker and Wilmot (1985) who consider it as the disputes and disagreements or opposition that occur between people, as of interests, ideas, beliefs, etc. and result from the interaction of interdependent people who perceived incompatible goals.

Human-Wildlife Conflict (HWC): HWC is any interaction between human and wildlife that results in negative impacts on human social, economic or cultural life, on the conservation of wildlife population, or on the environment.

National Park: It is an area set aside by the government for the preservation of its natural environment. A national park has a number of particular characteristics, namely being a place with one or several ecosystems not materially altered by human exploitation and occupation, where plant and animal species, geomorphologic sites and habitats are of special scientific, educative and recreative interest or which contain a natural landscape of great beauty.

Wildlife includes all non-domesticated plants, animals and other organisms.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter aims at pointing out what other researchers have written in the area of conflict between people and wildlife. Readings allowed me to learn a lot about the concepts related to human-wildlife conflict (HWC) and its underlying causes and consequences. This step of the research helped assemble experts' ideas to be based on in order to design effective strategies for preventing or mitigating HWC. This was also the occasion of analyzing reports and findings worldwide in connection with my topic, and more specifically writings about conflict caused or incurred by communities or animals in the closest limits of Volcanoes national Park.

Concepts, Ideas and Opinions from Authors about conflict

Lamarque *et al.* (2008) argue that HWC has been in existence for as long as human have existed and wild animals and people have shared the same landscapes and resources. In fact, as stressed by Madden (2008) the main cause of HWC worldwide is the competition between growing human population and wildlife for the same declining living space and resources. Wildlife and humans increasingly compete for space, resources, and places to call home. This is especially true in Africa below the Sahara where half the people use wildlife (including fish, insects, caterpillars, maggots, snails, and rodents) as a dietary supplement (Rainey, 1967). Besides, at least half of all wood cut in the world each year is burned as a fuel (Eckholm, 1976). FAO (1981) later indicated that two billion people, three-fourths the population in developing countries, rely on wood or charcoal as a domestic energy source. Craig L. Shafer (1990) goes on saying that the grim reality is that each year less and less natural land remains

and is subjected to more and more people pressure. People are attempting to secure their livelihoods through illegal of conflict between communities living around it and the park managers. Buschholz (1993) concludes saying that the growth in human numbers is leading to a life-threatening deterioration of the environment.

Manifestations of HWC include human deaths and injuries, and very commonly crop damage. It is obvious that the impact of the activities of animals on farmers and their livelihood is often enormous and even traumatic when people are killed. Unfortunately, Madden (2004) announces that Human–wildlife conflict is increasing in both frequency and severity worldwide and will likely continue to escalate. The dire reality is that, however, the fate of wildlife depends undoubtedly on human tolerance for them (Treves, 2004). Thus, HWC is now seen as a major challenge for conservation, particularly for large animals that require large areas and often exploit the same resources as do people.

Theoretical Perspectives

As noticed above, both people and wildlife suffer from human-wildlife conflict. On the one hand, farmers suffer economically from the loss of crops and livestock. In other more serious cases, people are killed. On the other hand, for animals, some wildlife populations may decline or become locally extinct as a result of extensive human-wildlife conflict. Members of local communities that live with high levels of human-wildlife conflict often suffer a sense of insecurity. This might be due to the anxiety of potential losses that they can suffer or from the worry of physical threat to their lives and property. Theoretically, several categories of solutions on the ground of human-wildlife conflict have been conceived. Among other authors, Buschholz (19993) suggests five types of environmental conflict resolution: conflict anticipation, joint problem solving, mediation, policy dialogues, and binding arbitration.

First, the conflict anticipation refers to the early identification of potential sources of conflict so that these problems may be studied and mitigated if possible before positions become hardened and an adversarial situation develops. Second, the technique of joint problem-solving involves the making of an informal agreement among the contending parties, which can then be considered more formally for possible adoption by decision maker. This process starts early and ongoing meetings are often held to clarify and solve differences in an informal manner. Throughout the process the parties to dispute can develop an acquaintance with each other and perhaps even come to develop some degree of trust, which would serve them well at later stages when formal decisions have to be made. Third, environmental mediation as a formal process of negotiation among officially recognized representatives of affected constituencies. This process entails that all parties are willing to attempt negotiation and to implement solutions that normally are binding to them. The mediator facilitates but cannot impose a settlement on the disputants. Environmental policy dialogues involve informal fora for discussion where differences regarding governmental policies may be resolved and where advice may be provided to government agencies. The parties participating on discussions could be representatives for the different agencies that are involved in the policy-making on an issue or outside experts in that domain. Fourth, binding arbitration requires an objective arbitrator that has already some fairly positions on many environmental issues. The arbitrator imposes a binding decision to the parties, after having heard all the contending positions.

In the light of those various thoughts, a range of management practices have been developed worldwide to address human-wildlife conflict. These consist in preventative and mitigative strategies. Mitigative strategies attempt to reduce the level of impact and lessen the problem whereas preventative strategies endeavor to prevent the conflict occurring in the first place and take action towards addressing its root causes.

Preventative strategies encompass barriers (artificial and natural), guarding, and relocation or voluntary human population resettlement (Lamarque *et al.*, 2008; WWF, 2008).

Barriers have the function of preventing spatial overlapping among wild animals and local communities; they are usually man-made, but natural barriers such as rivers, coasts or mountain ranges may occur along a nature reserve boundary.

Spatial separation has been proved to be a successful strategy when physical barriers enclose a large reserve. Another option is the construction of physical barriers in human settlements to protect crop fields and livestock, while defining properties and gathering farm animals. In addition to these conventional types, electric fencing can be considered as a more sophisticated solution. It is more durable, due to the reduced physical pressure from animals; it deters a wider range of species and is more aesthetically appealing.

Guarding entails intensifying vigilance. According to Distefano, monitoring herds and active defense are essential features of animal husbandry. In East Africa, for example, human herders are effective and fearless in warding off predators. The author adds that in this region herders are reported to challenge and scare away dangerous carnivores such as lions, hyenas and cheetahs with nothing more than simple weapons like spears, knives or firearms. He shares the point of view with Lamarque *et al.* (2008) stating that the fear for man normally prevents the animals from committing damage.

Translocation, Also sometimes referred to as **relocation** or **transplantation**, is the movement of living organisms from one area with free release in another (IUCN, 1987). It may involve either wildlife or humans. In particular, Wildlife translocation consists of moving a certain number of animals from a problematic zone to a new site.

Buffer zones consist in clearing a section of woodland along the boundary of the protected area. This allow the farmer to spot approaching animals and it may act as a deterrent to approaching wildlife (WWF, 2005). Buffer zones are then a collar of land designed to filter out harmful influences from surrounding activities.

As far as mitigative strategies are concerned, these include compensation systems, insurance, Incentive programs, community-based resource management schemes, and wildlife translocation (Lamarque *et al.*, 2008).

Compensation consists in two methods: on the one hand it is a measure which aims to alleviate conflict by reimbursing people for their losses. On the other hand, the approach relies on giving out monetary payments or licenses to exploit natural resources, allowing the hunting of game or the collection of fuel wood, timber and fodder from inside protected areas. The first method seems to be privileged by Rwandan legislation, while the second, also known as settlement of rights, is not practical in the case of VNP where "ecosystem is so fragile" (IGCP, 2008). Conservationists advocate this would lead to irreversible degradation.

Insurance programs aim at covering crops and livestock from the risk of wildlife attacks. It involves the villagers and local governing bodies paying a premium share of the insurance and allows rural inhabitants to make a minimum annual cost and to be refunded in the event of crop or livestock losses. The local governing bodies are relieved of significant financial expenses, from not having to administer compensation schemes. Rather, villagers contribute monthly to the insurance program and receive compensation in proportion to the total number of livestock killed and the total amount paid into the insurance fund during the year.

Incentive programs are based on subsidies. They offset the cost of conservation and demand the adoption of conservation-friendly practices, creating tolerance towards wildlife through the exchange of benefits.

Community based natural resource management schemes entail a system of returning benefits to rural communities in order to motivate them to protect wildlife outside protected areas and to discourage poaching. The eco-tourism industry and hunting concessions are potentially valuable for developing a local economy based on wildlife related revenues.

Related Studies

The 2003 IUCN Park congress expressed that HWC is universal. Wherever people and wildlife come into contact there is potential for conflict. HWC often leads to destruction of wildlife and wild lands or political clashes over biodiversity protection (Treves, 2004). According to some writings, each year thousands of people lose their lives and billions of dollars are lost in property because of HWC globally. Such records are reported worldwide. Everywhere, many communities bear the cost of coexisting with wildlife and continuously face a lot of losses.

For example, it has been reported that the conflict which occurred in villages bordering the two East Caprivi National Parks, in Namibia, elephant crop damage, between 1991 and 1995, amounted to a total economic loss of US \$ 31,200, while lion depredation, between 1991 and 1994, totaled US\$70,570 (O'Connell-Rodwell *et al.*, 2000). In Mali, the mean crop's surface destroyed by elephants is estimated at 1,000 hectares per year, i.e. a financial loss of about US\$ 195,230 (Lamarque *et al.*, 2008). Similarly, in the mountain area of Simao, China, in proximity to Xishuang Banna Nature Reserve, rural inhabitants claimed that elephant damage accounted for 28% to 48% of the community's annual income and the total economic losses between 1996 and 1999 amounted to US\$

314,600 (Distefano). In 2004, The US government estimated to \$1 billion in agricultural damage (Treves, 2004).

In Rwanda, such statistical data are not available but many cases of conflict between wildlife and communities living adjacent to the VNP are documented. On the one hand, people living around the park are reported to lose crops, livestock, property, and sometimes their lives. In particular, buffalos, porcupines, golden monkeys, bush pigs, rats and birds are pointed out to raid on local Irish potatoes and maize farms. On the other hand, the animals, many of which are already threatened or endangered, are often killed for diverse reasons: mainly search for trophies and commerce. The poaching of big animals such as bushbuck and buffaloes is the most common illegal activity undermining the integrity of PNV (Kwizera and Ndayisaba, 2009).

The findings like those of Glenn *et al.* (2008) revealed that, despite law enforcement, some household utilize the park for bush meat, honey, firewood and bamboos for house construction. Similarly, a research conducted by Mukanoheri (2008) stressed that a consistent desire to have access to the forests and harvest forest products was expressed by all people, and in particular by the Batwa communities who consider themselves the heirs of that forest. People's pretensions on the park manifest themselves in forbidden activities, like cutting bamboos or placing beehives.

Another source of conflict is water. This is an issue to take into consideration because water for domestic use or livestock, mainly during the drier months of the year when water sources may only be found within the boundary of the park. Access to such water is granted but conflict remains since permission for people to collect water is very limited for fear that people's activities may not be restricted to the collection of water in the case of more free movement within the park (Glenn *et al.*, 2008). The activities associated with the supply of water

from the park imply risks that must be evaluated and controlled. That control however limits access to water, thus contributing to exacerbate HWC.

In a few words, the problem that the conservation community faces, is granting access to everyone living around the forests while this will lead to their degradation. Thus, a restriction on access to PA resources remains the main source of conflict between communities and PA managers.

On the ground of conflict resolution the following initiatives from the park management are underway: community awareness on the importance of PNV and its conservation, improvement of relations between the park and communities, promotion of the community welfare and livelihoods (Kwizera and Ndayambaje, 2009). Most importantly, community conservation activities where redistribution of tourism benefits from VNP to local communities are underway, including local people as passive recipients of benefits from the park. Today under the community conservation program, 5 percent of the total incomes generated by tourism are invested in community-oriented activities. As a result, since the inception of the revenue sharing program in 2005, a total of US dollars 428,248 has been disbursed to fund local community projects, including construction of schools, water tanks and bridges in sectors surrounding VNP (Glenn *et al.*, 2009). Those intend to help influence positively behavior towards the park.

Besides that scheme aimed at resolving HWC around VNP, another approach has been experienced where since 2002 to 2007 the length of 76 m of the so called 'buffalo wall' was constructed by the conservation Department along VNP boundary in order to stop animals leaving the park (Kwizera and Ndayisaba, 2009).



Despite these efforts, Glenn *et al.* (2008) survey data point to the general perception that park-adjacent households do not get a fair portion of park benefits, though it can be perceived that they bear the bulk of the PA costs. Instead, revenue from the PA is invested at community and country levels. People hold that Community benefits cannot compensate for individual household losses, especially as a result of wildlife damage.

CHAPTER THREE

METHODOLOGY

Research Design

The study employed descriptive research design to determine and report the extent of the current human-wildlife conflict involving local communities and wildlife in area surrounding Volcanoes National Park. In order to adequately carry out the research, data were collected by the means of a questionnaire administered through communities living adjacent to the park and were completed by existing information from specialized bodies, namely RDB office, Karisoke Research Center, International Gorilla Conservation Program.

Population of study

The population of this study comprised of all officials in charge of Environment at the Sector level (12), Park senior staff (4), all farmer-groups(29) operating in Districts surrounding VNP (table 1) and known as local branches of *Urugaga Imbaraga*, this one being the umbrella of farmers associations working countrywide. It is assumed that this set of bodies is similar on salient characteristics with the whole population involved in human-wildlife conflict in the area, since both public and private stakeholders have been taken into consideration. In fact, interested parties on HWC are, on the one hand, the park management and local authorities whose mission is to protect wildlife, and on the other hand, farmers whose crops are often destructed by animals.

Sampling Technique

The sampling frame has been compiled on the basis of existing information about interested bodies, as follows: a list of senior park professionals was available at Kinigi headquarter of VNP, names of persons in charge of environment service at the sector level were collected from each administrative

entity included in the area of research, and *Urugaga Imbaraga* provided for the list of their farmer-groups in each zone of work, by July 2011. Farmer-groups were deliberately selected for the reason that they work in the closest limits of the park.

Table 1: Repartition of Farmer- Groups by Zone/District and by Sector

Zone/District	Sector	Number of groups
Zone I/Burera	Cyanika	1
	Gahunga	4
	Rugarama	3
Zone II/Musanze	Gataraga	2
	Kinigi	8
	Nyange	1
	Shingiro	2
Zone III/Nyabihu	Bigogwe	2
	Jenda	1
	Kabatwa	2
Zone IV/Rubavu	Bugeshi	3
TOTAL		29

The sample size of the study was purposely determined, where officials from local government (12) and wildlife (4) authorities were automatically included in the sample, while each farmer-group were represented by the chairing committee composed by 3 members, i.e. the chairman, the vice-chairman and the secretary. Thus, farmer-groups totaled 87 representatives (table1), and Finally 103 respondents composed the sample for the study.

Table 2: Sample size of study

Sampling Frame	Total Population
Officials	12
Farmer-Groups (chairing committee)	87
Park staff (senior)	4

Instruments of Research

The study was based on primary data collected by means of questionnaire submitted to sampled people. Both open-ended response format and *Likert* type scale response formats were used (see appendix IV). Respondents were asked to rate their relationships between them and VNP, to indicate factors influencing those relationships, be it from them or wildlife, and to indicate whether or not and how improvements should be made. In particular, Likert type questionnaire intended to help score conflicting issues like illegal activities, problematic animals, and potential remedies.

Validity of the Research Instrument

Questionnaire has been chosen to serve as the research instrument. The validity of this instrument lies in that items within the questionnaire principally related to potential sources of conflicts around VNP and possible alternatives on the ground of their resolution. Questions was simply formulated and in the native language so that every respondent feel confident when delivering his responses. The barrier of illiteracy was also out of question owing to everyone`s position. The questionnaire form has been administered to each individual hand by hand to prevent against conformism among respondents.

Reliability of the research Instrument

Given that the research offered to the respondents an opportunity to freely give their personal responses on a crucial issue for their day-to- day livelihood and

also that each of them was part of the problem on hand - they were either farmers or local leaders and conservationists - they unanimously participated on the study by fully answering the questions and sending back their form to the researcher. Information so collected, supplemented by data picked from existing literature and official reports, enhanced the accuracy and meaningfulness of the results.

Data Gathering Procedure

To collect data, a questionnaire was used. The researcher devised the questionnaire to be administered through a selected number of park wardens, upon the Chief warden's authorization. The wardens were designated according to each one's usual zone of work, meaning that in total four (4) zones corresponding to the number of Districts around the park. Before the field work, the researcher met leaders of *Imbaraga* Farmers' Association on 6th July 2011 who agreed to collaborate by involving different farmer-groups operating around the park. Then, on the 20th of July, 2011, I sent a letter to the President of *Urugaga Imbaraga* at the level of the Northern Province in order to formalize our understanding. Afterwards other meetings were organized zone by zone where all farmer-groups' committees got information about the research underway. These meetings were scheduled to be achieved by mid-August 2011, and they all took place in presence of a representative from *Urugaga imbaraga* and were presided over by myself. Questionnaire was then administered at the end of all sessions, and collected back by the end of September 2011. Questionnaire for local authorities and park staff was directly sent irrespective of session periods.

Data Analysis Procedure

In this research, two types of data analysis were used: quantitative and qualitative data analysis. Quantitative data analysis helped in putting together data by means of tables referring to information submitted by questionnaire

respondents. It was the case when dealing with the following issues: relationship between humans and wildlife, illegal activities against the park, Crop Raiding Cases Around VNP, Identification of problem animal, Remedy from conservation authorities in case of damage caused by wildlife species, Sanctions incurred by malefactors towards the park. Both percentage and frequency measures of intervening variables determined the way of analysis.

Data were analyzed qualitatively by interpreting each table or figure as to understand whether the responsibility of the conflict between wildlife and communities around the Volcanoes National Park is beard by animals or by people and vice-versa, or both people and animals, and why. This exercise, coupled with literature review, allowed me to make recommendations about the preferable environmental strategies to be adopted in a bid to improve relationships between wildlife and people living adjacent to the Park, for prospective coexistence of wildlife and local people.

Ethical Considerations

Since the research was conducted in close collaboration with local authorities, park management officials, and local population through their representatives selected within various groups and associations, the study is deemed a shared collection of ideas. Moreover participation on this study was voluntary and no respondent was forced to answer or participate against his/her conviction or will. As a researcher, I guaranteed respondents that collected data through questionnaire will be kept in accurate place and that absolute confidentiality will be observed, more particularly in regards with their current thoughts towards wildlife and the conflict itself. I told them the study was done only as a requirement for the award of the degree of Master of Kampala International University.

Limitations of the Study

The two following limitations would be pointed out:

1. Doubtful feelings of farmer-groups about the foreseen outcomes of the current research;
2. Risk of biased answers by respondents in a bid to hide the causes of conflicts since responsibility was likely shared both by people and animals.

Given that almost of the respondents were likely involved, in a manner or another, in some illegal activities in the protected area, they presumed the study to be conducted with the ultimate aim of either prosecuting them or investigating for the opponents of the environment national policy. Thus, they felt unwise to reveal their true point of view, and biased answers may have been registered. But hopefully, such a presumption may have changed thanks to two meetings held at the very beginning of the research. The first meeting was organized by the researcher with leaders of farmer-associations on 6th July 2011 at *Imbaraga* Farmer`s Training Center in Musanze District. This meeting aimed at explaining the objectives of the current study as well as the researcher`s expectations. It was stressed that the results could help decision-makers to better relationships of the forest and farmers living adjacent to the park. The second meeting with the same objective was held with the farmer-group committees in every zone of research. Information delivered about the purpose of the research helped minimize potential fear from some of respondents and thus reduce limitations of the study.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the findings and their interpretation with the aim of knowing and understanding respondents' views in relation with the research questions of the study. Data were analyzed following the methodology described in chapter three.

Evidence of the Conflict between Wildlife and Humans around V.N.P.

Table 3: Relationship between Volcanoes National Park and communities living around the area (n=103)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Good	18	17.5	17.6	17.6
	Average	9	8.7	8.8	26.5
	Could be much better	68	66.0	66.7	93.1
	Indifferent	7	6.8	6.9	100.0
	Total	102	99.0	100.0	
Missing System		1	1.0		

Respondents were asked to rate the relationship existing between them and the park. According to table 3, 66, 7% of respondents held that relationship could be much better, meaning that it needs improvement, while only 17.5% considered that the relationship was good, the remaining respondents being either indifferent or doubtful. The present results further confirmed evidence of the conflict existing between the park and local people, given that, on the one hand,

98% of respondents accused animals of being the cause of property destruction and even for human deaths in communities living around Volcanoes National Park (table 4), and on the other hand, people threaten animals and use illegally the forest, according to table 5 where 71.8% of respondents affirmed having witnessed cases of illegal activities against the park.

Table 4: Responses on whether or not animals negatively influence relationship between humans and wildlife (n=103)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	100	97.1	98.0	98.0
	Not	2	1.9	2.0	100.0
	Total	102	99.0	100.0	
Missing System		1	1.0		

Tables 4 and 5 human -wildlife illustrate that conflict exists in one form or another, both people and wildlife standing on its basis. As said above, since humans and wild animals share the same landscapes and resources HWC is likely to occur. That is the case for the park and communities living in its closest limits.

Table 5: Witness of illegal activities against the park (n=103)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	74	71.8	81.3	81.3
	Not	17	16.5	18.7	100.0
	Total	91	88.3	100.0	
Missing System		12	11.7		

Identification of problem animal

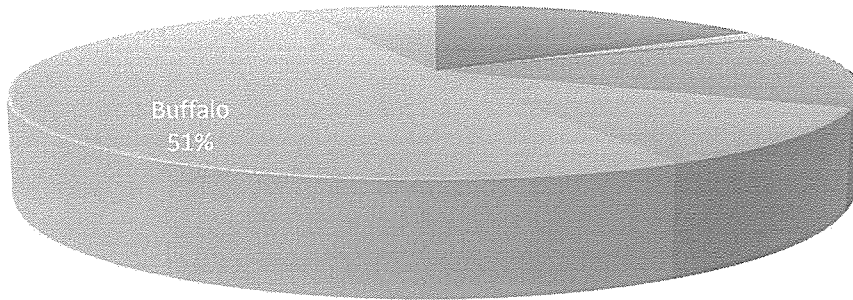


Figure 1: Identification of problem animal

The issue of great concern being damage caused by wild animals from the protected area, it was worth knowing the ones that were considered to constitute the major source of threats to people and their property, in other words, the problem animals i.e. the ones that habitually target and damage the property of people in spite the preventative methods used by the victims.

As shown in figure 1, buffalo comes at the first place stated by 51.5% of the respondents, while porcupines and monkeys scored 14% each species. Gorilla, one of the most endangered species, as said above, was stated by only 10% of the respondents.

These results are consistent with the findings of a survey conducted by ORTPN in 2004 (Kwizera and Ndayisaba,2009) indicating that the majority of the respondents stated that among other animals, buffalos (42.9%), elephants (3.4%), bushbucks (24.6%) and porcupines (11.9%) were considered the main problem animals in the park.

The data in the present research also agree with findings of WWF (2005) saying that in Africa the large wildlife species including herbivores, like elephant and buffalo, and large mammalian carnivores, like lion and wild dog, are traditionally defined as problem-causing animals and responsible for most of the human-wildlife conflicts.

Table 6: Information about Remedy from conservation authorities in case of damage caused by wildlife species (n=103)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	26.2	27.0	27.0
	Not	73	70.9	73.0	100.0
	Total	100	97.1	100.0	
Missing System		3	2.9		

Table 6 shows to what extent people are informed on measures taken by conservation authorities in case of damage caused on property or persons by animals from the forest. The majority of the respondents (70.9%) answered negatively. Only 26.2% received information about remedy provided by park authorities. It is mainly because even those who get remedy consider it not to be significant enough to deserve any mention. The remedy usually consists of medical care for injured persons and reconstruction of houses that have been destructed by animals. At the same time, people strongly held that they were very impoverished due to the loss resulting from animal depredation in comparison with what they get in terms of compensation.

Table 7: Evaluation of remedy in case of damages (n=103)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	5.8	6.7	6.7
	Not	84	81.6	93.3	100.0
	Total	90	87.4	100.0	
Missing System		13	12.6		

As shown in table 10, a large number (81.6%) of respondents considered that the remedy provided by conservation authorities in case of damage caused on property and persons by animals from that forest was not relevant while 5.8% of them answered positively. The remedy is considered unbalanced vis-à-vis damage caused by wildlife species. According to the findings of Mukanoheri (2008), animals destroy crops and people are not compensated, they are not allowed to kill, and they are angry. As a result, they attempt to secure their livelihood through various illegal ways. In the same line, Lamarque *et al.* (2008) argue that daily costs inflicted on local communities by the presence of wildlife population can erode local support and tolerance. Thus, there is a need to increase the damage tolerance level among the affected communities and prevent them taking direct action themselves. Furthermore, Wildlife Conservation Society (2004) affirms that the killing of wild animals in retaliation for incidents of human-wildlife conflict is a common reaction.

Ranking of illegal activities towards the park

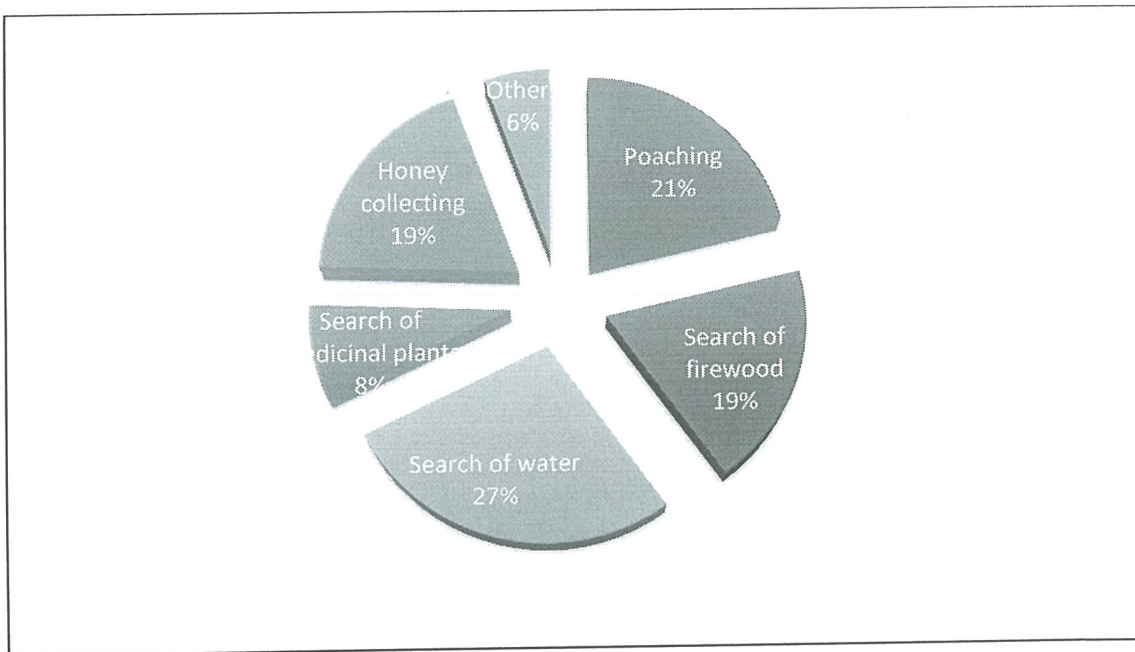


Figure 2: Ranking of illegal activities towards the park

As seen above (table 8), illegal activities are witnessed. Questioned about the most frequent illegal activities towards Volcanoes National Park, respondents pointed out search of water at the first place (27%), then come poaching (21%), honey collecting (19%), search of firewood (19%) and medicinal plants (8%). Other activities (6%) included domestic animal grazing as well as search of grass and manure. Burning fire was also reported but as happening rarely and accidentally.

Whatever the responses related on they all depicted the dependence of communities in addressing their basic needs. Illegal activities are then supposed to stem from the desire of satisfying physiological requirements in terms of food, shelter, and water. It is easy to understand how far that kind of needs can contribute to worsen relationship between communities and the park management.

Findings of Kabubo-Mariara's study (2009) assume that forest lands are of vital importance to the livelihoods of a vast number of people in many African

countries. In particular, forest resources can contribute significantly to poverty reduction by providing useful products and additional income for rural people. But environmental policy and legislation actually contrast with communities' needs.

Mukanoheri's findings (2008) revealed that since the establishment of protective laws, the population who used to exploit the forest was prohibited from the forest resources, causing them to encounter different problems such as scarcity of timber, food, medicinal plants, water, and other commodities currently occupied by wildlife.

As a reminder, Human-wildlife conflict occurs when the needs and behavior of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife.

Madden(2004) argued that the conflict can escalate when local people feel that the needs or values of wildlife are given priority over their own needs, or when local institutions and people are inadequately empowered to deal with the conflict.

Sanctions incurred by malefactors towards the park

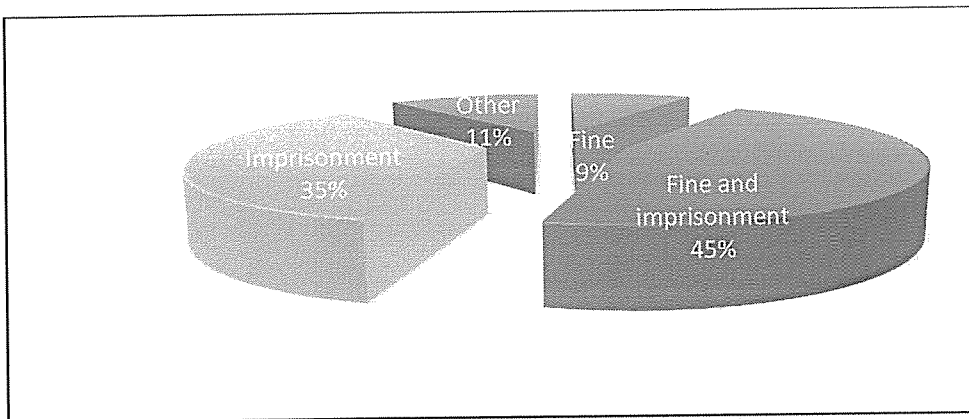


Figure 3: Ranking of Sanctions incurred by malefactors towards the park

Respondents ranked the penalties imposed by courts to those convicted of illegal activities against the park, as shown in figure 3. Imprisonment coupled with a fine was reported to be the most frequent sanction incurred by malefactors (45%). The same sanctions imposed separately maintain the prominent position, with 35% for the imprisonment and 9% for the fine. Other penalties related on simple destruction (snares, beehives, bush meat) or confiscation of any material having been used to commit illegal acts.

For some respondents, penalties imposed against malefactors, were judged weak, while for others they were unjustified, the latter manifesting their feelings that authorities seem to be more concerned about protecting wildlife over people`s interests, and the former their concern about environment degradation if current legislation is not reviewed and more severe sanctions imposed.

In that, the present findings agree with Mhlanga (2001) saying that among other causes of conflict is the residents` perceptions that authorities seem to be more concerned about protecting wildlife at the people`s expense and do not seem to show any concern over loss of human life and destruction of property. This is evidenced by what has already been shown above on the issue of remedy provided by authorities in case of damages caused by wildlife.

Actions to better Relationship between Volcanoes National Park and communities living around the area

In the short run, actions were proposed in order to address illegal activities towards the park and safeguard species from possible elimination because of a kind of continuous retaliation against damage caused by any animal or simply for the survival needs.

Table 8: Actions for improving people`s coexistence with wildlife (n=103)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Building of fences/barriers	2	1.9	1.9	1.9
	Compromising	10	9.7	9.7	11.7
	Equipping people with techniques of collecting water	□H1.0	1.0	1.0	12.6
	Medical care	5	4.9	4.9	17.5
	Indifferent	3	2.9	2.9	20.4
	Other	31	30.1	30.1	50.5
	Pecuniary compensation	51	49.5	49.5	100.0

In table 8, slightly less than half of the respondents (49.5%) strongly indicated that pecuniary compensation should be provided for death and/or property damages caused by animals from VNP while 9.7% went further, précising that the remedy should result from a compromising process by park officials and victims. 4.9% of the respondents highlighted the need of medical care in case of injury. This also might be interpreted as an indirect compensation proper to that category of victims. Other thoughts expressed by respondents relate inter alia to the following: strengthening existing barriers, providing areas and techniques for beekeeping activities, providing skills for entrepreneurship and increasing the number of park wardens. In clear, here all is about the need of compensation and some other possible alternatives to counterbalance poverty that is more likely on the basis of human encroachment into the park.

The present results show how compensation, and related ideas, is mostly suggested by respondents to be the best solution for improving coexistence between wildlife and people nowadays and perhaps for the future. The findings agree with the option clearly adopted by Rwanda Governmental authorities, as provided for by the law nr 26/2011 of 27/07/2011 on compensation for damages caused by animals whose purpose is to determine compensation to any person damaged by any animal encountered in the National Parks or other protected area (...), and any person damaged by animal on the list established by an order of the Minister in charge of Conservation of National Parks or outside another protected area. This law provides for the compensation for pecuniary and moral loss together with transport fees to and from the competent authority during the process of claiming for compensation.

Nevertheless, most authors disagree with the compensation scheme saying that it is not an efficient strategy and has often failed. Cases of failure have been reported in most of in Sub-Saharan Africa including countries like Mozambique, Burkina Faso, Kenya, and Namibia, where compensation programs were tried and abandoned or suspended soon after their implementation, because the system became unworkable. At best, the system appeared to be little operational due to the time lag between the complaint and the scarce indemnifications.

Lamarque *et al.* (2008) attributes the failure of most compensation programs to bureaucratic inadequacies, corruption, cheating, fraudulent claims, time and costs involved, moral hazard and the practical barriers that less literate farmers must overcome to generate a compensation claim.

According to Treves (2007), since compensation means payments after losses have occurred, it is particularly subject to fraud, corruption and inequity; it discourages investment in defense of property and can forestall investment in

more permanent solutions; once begun, its costs inevitably rise and it is very hard to terminate.

In general, the critics hold that compensation schemes are difficult to manage, requiring for example reliable and mobile personnel and logistics to verify and objectively quantify damage over wide areas. The tenants of this thesis argue that for compensation approaches to be reliable and effective, and finally help in human-wildlife conflict, they need to base themselves on concrete information, ensure the payment of the appropriate amount of compensation, and be fair, timely, transparent and sustainable. And this may be a big challenge for many park management authorities.

Strategy for sustainable relationship between wildlife and communities living adjacent to Volcanoes National Park

When asked about how to put an end on park-people encroachment and to reach a sustainable solution on HWC around Volcanoes National Park, respondents suggested some strategies in the long run and held that comprehensive research should be conducted on the all workable alternatives by Rwandan government.

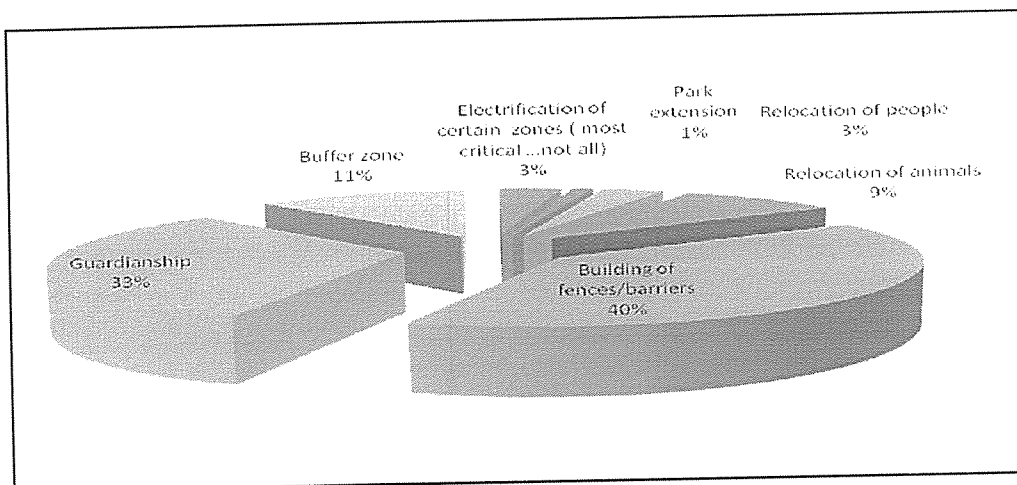


Figure 4: Suggestions for sustainable solution to HWC in the closest limits of the park

Over all the sample, the first ranked sustainable solution to the conflict was building barriers or fences(40%), followed by guardianship(33%), creating buffer zone(11%), relocation of animals(9%), relocation of people(3%), electrification of the most sensible zones of the park limits(3%), and finally park extension(1%).

The construction of stone wall to control crop raiding has been adopted by the park management authorities. The stone wall known as buffalo wall has been constructed since 2002 and people witnessed its positive impact. Nevertheless, due to the fragility of that wall and ravines left unconstructed, the most of animals in crop raiding are still causing problems to communities, despite the real reduction of these animals in some areas. But since people have experienced such protection, they believe that the reinforcement of buffalo wall and its extension to the remaining areas will have a significant impact on stopping animals from crop raiding. The general idea is that the current wall is short and not well constructed.

The present findings also concur with survey work of Glenn et al. (2009), in that the project of buffalo wall was ranked first whose impact were found very beneficial either through participation-e.g. income from building the wall, or directly experiencing the intended benefits of the project-e.g. lower crop raiding.

As far as guardianship is concerned, the present findings concur with results of the survey conducted by Mukanoheri (2008) where respondents wished for the increase of the guard number so as to stop animals from devastating their crops.

Distefano reported that guarding is, for example, a popular strategy in some parts of India where the majority of farmers ranked it as the most efficient and common measure to protect their crops.

Respondents ranked third the approach of creating buffer zone but previous researches proved that local people`s land loss for buffer zone establishments

was a critical cost felt by communities (Glenn et al., 2009). That is certainly the reason why even in this research the solution did not score highly.

Animal relocation or translocation scored 9% of the respondents. Thus, people seemed not to believe much in such approach. Further readings revealed that where an animal population is under pressure, living close to humans and having frequent negative encounters with those humans, and from the situation or otherwise results in conflict, translocation can be a solution: the animal is removed from the area, and consequently, the problems that are associated with it are also removed; local people are pleased to be rid of the animal problem, the animal problem is not under threat from the communities and the conflict is resolved.

IUCN's position (1987) on translocation is clear and states that, if precautions needed to avoid the disastrous consequences of poorly planned translocations are taken, translocations are powerful tools for the management of the natural and manmade environment which, properly used, can bring great benefits to natural biological systems and to man. It may be recalled that Akagera National Park was the site for one of Africa's first mass elephant translocations in the 1975. In time, due to more and more population settlement in the Bugesera region and beyond, young elephants were translocated from there to the Park.

Relocation of people has been also pointed out as a solution to the conflict. In fact, Distefano assumes that relocation of local communities to areas offering better access to natural resources and socio-economic opportunities can be an adequate solution to HWC. In addition to that, Lamarque et al. (2008) advocated that resettlement schemes aiming to prevent the overlap between wildlife and people, can be successful in the long run if some essential assumptions are met: firstly the villagers should gain substantial benefits, such as better access to resources, secondly they should be relocated to an area where the risk of losing property is lower and thirdly they should not face any political, social or cultural

opposition. I think that this scheme scored low (3%) because people naturally dislike moving from a place to another for fear of uncertainty. Moreover, Rwandans have a lot of resettlements as a result from war and insecurity, but also from the precarious lifetime of consecutive exile in neighboring countries. Thus, could it be adopted, this solution is likely to be unpopular. Furthermore, land in the volcanic region is reputedly the most fertile in the whole countrywide. People would dislike being deprived from their most beneficial property.

As for electrification of certain zones in the limits of the park boundary, it is worth saying barriers solution indistinctly refers to the different enclosures in defending livestock from animal attacks, whatever materials are used, including many types like fencing, electric or not, calving areas, and constructing walls. Therefore, the 3% of respondents who talked about this option shared the same views as those who suggested constructing barriers.

Park extension is the last ranked option by respondents and with a very low score (1%). This is certainly because the extension should mean for farmers the loss of their land located at the closest surroundings of the protected area. It could have the same effect as the option of relocation of people with the related consequences and perceptions. It is presumed that buffer zone could be more acceptable than park extension, with almost the same effects as far as HWC resolution is concerned.

CHAPTER FIVE

FINDINGS, CONCLUSIONS, RECOMMENDATIONS

The overall objective of the study was to assess the existence of conflict between wildlife and communities living around the Volcanoes National Park (VNP). The research aimed also to find out the conflicting relationships existing between wildlife and communities around the park, and to evaluate the actions already taken in order to alleviate conflicts between animals, people and officials of National Parks and wildlife Management. In order to achieve its objective, data were gathered on basing on specific questions that have been submitted to different stakeholders, including farmers` associations, local leaders and park management authorities. The data so collected were completed by the use of available documents through NGOs operating on the field and official bodies both at national or local level.

Findings

Nearly 70% of the respondents suggested that conflict between VNP and communities living around its limits was a reality, indicating that relationship between both humans and wildlife needed to be seriously improved. The conflict was further evidenced by responses given about the status of such bad relationship. For 97.6% of respondents, animals were on the basis of the conflict because they bear the responsibility of property destruction and sometimes for human deaths in the surrounding area of the park. 51.5%, 14%, 14% and 10% of the respondents considered buffalos, porcupines, monkeys and Gorillas, respectively, to be the most problematic animals. Buffalos are particularly dangerous, as when they get out the park they damage and destroy crops, and occasionally kill people. Others only damage property in search of food.

Over 70% of respondents recognized that residents also threaten animals and are responsible of activities in the park, despite being prohibited by law. They denounced human encroachment into the park for the main following reasons: search of water (27%), poaching (21%), honey collecting (19%), search of firewood (19%) and medicinal plants (8%).

While sanctions are inflicted to malefactors vis-à-vis national park, independently whether they are justified or not, the majority of respondents (81.6%) considered that the actions achieved by conservation authorities to remedy the damage caused on property or persons by animals from the forest were perceived by victims as inconsistent with the loss and harm suffered by them. As a result, people's feelings are that authorities seem to show more concern over loss of properties and human life. Thus, they attempt to secure their livelihood by the use of forest resources, taking the risk of being apprehended for illegal activities. This situation helps to exacerbate conflict within the region.

More than 60% of the respondents indicated that pecuniary compensation and similar remedies could improve the relationship between humans, the park management authorities and consequently the park itself. Although, Rwandan government has taken this of option in favor of victims of damages caused by wild animals, experience seen elsewhere in Sub-Sahara African countries proved that solution unworkable for most all of them. All stands as if respondents were aware of the weakness of this approach since they indicated it could work in the short run, efficient only as a measure to better Relationship between Volcanoes National Park and communities living around the area.

On the question of sustainable solution to HWC around the park, a rating of nearly 45% indicated barriers, including electrification and the like, as the most appropriate. That score suggests that the buffalo wall already constructed by authorities in charge of conservation is approved by people but also this approach needs improvement, for example in terms of strength, solidity, height

and spatial coverage. Guardianship was ranked second and more interestingly respondents advocated for more implication of communities in that activity, recommending more collaboration between park management authorities and local leaders both in planning actions and implementing them. These two solutions are likely the most popular and perhaps the most effective ones. Other options are less representative of the respondent's views, but they do deserve to be considered when in search for sustainable solutions on HWC concerning VNP.

In general, study results were consistent with the very accepted thoughts according to which Human-wildlife conflict is highly variable and there is no single management option or solution that can successfully deal with the problem. Madden (2003) stressed that any given tool, technique, or approach is more likely to succeed if it is incorporated into a full arsenal of conflict mitigation strategies and applications with flexibility to change as conditions change.

Conclusions

The evidence shows that human –wildlife conflict is causing harm to communities living around the park and the park itself, both sides encounter damages due to one another. Finding a right balance between conservation and social welfare of individuals is a very big challenge for the park management but problems need to be solved for sustainable development of the whole country. Several schemes are being used for minimizing the conflicting issues like buffalo wall, introduction of a program of revenue sharing funds to meet the community need, guardianship by park wardens, but conflicting issue is still unsolved. Hopefully direct compensation provided for by Rwandan legislator will help mitigate the conflict. Nevertheless, direct compensation of losses resulting from animal attacks to humans or crops is not believed to definitely put an end to this conflict, as it appears from other countries' experience. All stakeholders, including government, local authorities, national and international expertise,

NGOs, need to joint efforts and set innovative strategies for the long run preferably involving more participation of communities in problem solving, like the self-insurance scheme approach where farmers pay a premium for cover against a defined risk, such as predation of livestock, or the formation of co-operative guarding groups where farmers become real partners in conservation policies, instead of constituting government`s burden.

In the light of this study, it may be assumed that multiple tactics could be imagined and applied together to ensure success. For instance, in addition to current approaches, why not to envisage translocation of animals that have been identified as problematic, namely buffaloes. As a reminder, buffalo has been pointed out by 51% of respondents as the first problem animal. Thus, moving the problem animal could help reduce considerably the conflict around VNP, and at the same time mitigate the threats to the remaining animals, principally the mountain gorilla as a key species in the area. Given that the area is the only place worldwide where live these endangered species, it deserves the greatest protection from any threats for the reasons of its scientific and environmental interest. Akagera National Park where live other buffaloes could be an appropriate area for release. For sure studies should precede, to indicate their degree of genetic similarity and make sure of the accuracy of such solution.

For Madden (2003), at a more general level and in the context of overall conflict mitigation strategies, complex and multifaceted solutions are needed to address the reality of HWC situations. Parke`s point of view stresses that the best way to reduce conflict with wildlife is to use a combination of different methods: combining a number of tactics, tools, and techniques, can strengthen and improve the chances of overall success in mitigation efforts of HWC.

It may be said that findings of this research were consistent with other related studies in that respondents revealed options that could be used to put an end or

at least alleviate the conflict between wildlife and communities living adjacent to VNP. It is up to competent authorities, policy makers included, to assemble and consider a lot of suggestions generated from the responses. Adequate conservation approaches should be developed to secure the livelihood of both the people and the wildlife. I believe that both-gain approach is possible and is the best one for the common good, given that, as suggested by Buffett (2008), we are all connected, humans with every species of flora and fauna –each is part of the whole.

Recommendations

Recommendations are directed to RDB, local authorities and communities living adjacent to Volcanoes National Park. They are all deducted from research findings.

Recommendations to Rwanda Development Board:

To provide a mechanism allowing communities easy access to funds, in order to help them in creating new projects of self development. In fact, some people are still involved in illegal activities into the park, as their unique alternative to address their poor status.

To put in place a reliable permanent commission in charge of the effective implementation of the compensation scheme provided for by Rwandan legislation, in a bid to avoid bad lessons learnt elsewhere.

To strengthen the wall so that it becomes a more effective tool of alleviating crop raiding, and consequently related conflicts. As saw above, buffalo wall was considered short, fragile, and lacking in certain zones.

To realize a study on how to relocate some problem-animals from VNP to another site and thus ensure more security to the mountain gorillas, as a species more endangered.

To put in place a comprehensive program of mass sensitization and education on environmental issues, including curricula related to conservation of nature in schools at all levels.

Recommendations to local leaders:

To advocate that communities should be granted entrepreneurship skills in order to build their self-reliance and sustain farmer cooperatives already engaged in various income-generating activities.

To learn much about the vital importance of conservation of nature and wildlife in order to involve themselves in their communities` sensitization and education programs.

Recommendations to Communities living adjacent to VNP:

To organize themselves in cooperatives aiming at protecting their own properties with, if needed the help from park authorities and other partners like NGOs involved in conservation program. The help will consist for example in providing adequate equipment like rain-coats, torches and batteries, boots, traditional arms, etc. Without excluding joint patrols by park wardens with the Communities, this approach could build people`s ownership and in return, this will help to reduce conflict and change attitude towards the issue of the protection of environment as a shared responsibly for everyone.

Suggestions for Further Research:

Further research can be undertaken on the following issues:

1. Assessment of the effectiveness of the compensation scheme for damages caused by animals as provided for by Rwandan legislation;
2. The conflict between humans and wildlife in Akagera National Park;
3. The socio-economic costs of human-wildlife conflict in National Parks, Rwanda.

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APPENDICES

APPENDIX I: TRANSMITTAL LETTER



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OFFICE OF THE ASSOCIATE DEAN, FACULTY OF SOCIAL SCIENCES
COLLEGE OF HIGHER DEGREES AND RESEARCH (CHDR)

December 14th 2011

Dear Sir/Madam,

**RE: REQUEST BY SISI JEAN DAMASCENE MCR/2010/82/DF
TO CONDUCT RESEARCH IN YOUR ORGANIZATION**

The above mentioned is a bonafide student of Kampala International University pursuing a Master of Arts in Conflict Resolution and Peace building.

He is currently conducting a field research whose title is **"Conflict between Wildlife and Communities Living Adjacent to Volcanoes National Park in Rwanda."**

Your organization has been identified as a valuable source of information pertaining to his research project. The purpose of this letter, therefore, is to request you to avail him with the pertinent information he may need.

Rest assured any information shared with him from your organization shall be treated with utmost confidentiality. I very much thank you in advance for your cooperation.

Very truly yours,

Dr. Roseann Mwaniki
Associate Dean, Social Sciences, (CHDR)

"Exploring the Heights"

APPENDIX II: INFORMED CONSENT

APPENDIX II: INFORMED CONSENT

SISI Jean Damascene

sisdamascene@yahoo.fr

Date: 20th May, 2011

To: Mister KAREGEYA Apollinaire
President of Farmers' Association
URUGAGA IMBARAGA
NORTHERN PROVINCE


Dear Sir,

RE: Permission to conduct research with farmers' help.


I hereby apply to be allowed to do my research with the help of farmers groups associated with URUGAGA IMBARAGA, in the fulfillment of the requirement of the award of Master's in Conflict Resolution and Peace Building at Kampala International university. The research topic is, "**Conflict between Wildlife and Communities Living Adjacent to Volcanoes National Park in Rwanda**". I assume the research will be helpful to the whole community, decision makers, local and central government since it intends to identify the sources of that conflict, to assess effects of wild animals on communities around the park and to suggest for the future ways of improving relationship between wildlife and people living at the shoreline of Volcanoes National Park.

The study is expected to provide data to be based on by policy makers involved in protected areas management and as such is of much concern for your members.

Yours faithfully,


SISI Jean Damascene

Accepted by:


KAREGEYA Apollinaire

APPENDIX III: RESEARCH INSTRUMENT

Dear respondent,

The purpose of this questionnaire is to facilitate a study on the topic entitled "Conflict between wildlife and communities living adjacent volcanoes National Park in Rwanda". With this regard may I ask to sacrifice part of your time in responding the questions as honestly as possible. Your responses will contribute to the success of this study. I assure you that information delivered will be treated confidentially and used only for the academic purposes. Thank you for your kind cooperation.

With best regards,

SISI Jean Damascene

Student at Kampala International University

- I. How do you rate the relationship between you and the Volcanoes National Park?

Direction: Please underline the response that best fits and justify your choice:
Good; average; could be much better; indifferent.

- II. Wild animals are accused of being the cause of property destruction and even for human deaths in communities living around the Volcanoes National Park?

a) Is that true? Explain /give more details.

b) If so, which animal do you consider as being the major source of threats to your property/being:

Gorilla 1 2 3 4 5

Buffalo	1 2 3 4 5
Elephant	1 2 3 4 5
Others	1 2 3 4 5 (specify)

Direction: Please circle the number that best describes your feelings about the most threatening animal: 1. Strongly disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. Strongly agree.

- c) In case of damage caused on property or persons by animals from the forest, do people get any remedy from conservation authorities? If any, is it relevant? What should be done to better that remedy?

III. Are you aware of illegal activities towards the Volcanoes National Park? If so, what are the most frequent illegal activities towards the Volcanoes National Park?

Poaching	1 2 3 4 5
Search of firewood	1 2 3 4 5
Search of water	1 2 3 4 5
Other (specify)	1 2 3 4 5

Direction: Please circle the number that best describes your feelings about the most frequent illegal activities towards the Volcanoes National Park: 1. Strongly disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. Strongly agree.

IV. Are there sanctions provided for against malefactors?

- a) Cite some of them, by their frequency order.

b) Do you feel those sanctions are justified/fair? If not, what measures would you suggest?

V. What should be done to eradicate illegal activities towards the Volcanoes National Park?

VI. What should be done to prevent/ to put an end to such occurrence:

Relocation of people	1 2 3 4 5
Relocation of animals	1 2 3 4 5
Building of fences/barriers	1 2 3 4 5
Guardianship	1 2 3 4 5
Buffer zone	1 2 3 4 5
Other solution	1 2 3 4 5 (specify)

Direction: Please circle the number that best describes the most relevant solution, according to you: 1. Strongly disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. Strongly agree.

Thank you for your kind cooperation.

APPENDIX IV: BUDGET

Items	Quantity	Cost per unit (US \$)	Total amount (US \$)
Hiring clerical assistance (one person per day)	10 days	20	200
Perdiem and transportation for collaborators (one person per District),data collection, and communication	10 days	40	1600
Stationery (papers, pens,photocopies, flash disk, printings ...)			125
Contingencies: 10% of total (for inevitable unforeseen costs)			192
Total cost for thesis			2117

Appendix V: TIME FRAME

Activity	Month/period
Submission of thesis proposal	May 2011
Feedback from the Supervisor	May 2011
Elaboration of instruments of research	June-July 2011
Meetings with collaborators and other stakeholders	Mid-July-August 2011
Research on field	Mid-August - September 2011
Data collection	Mid-August-September 2011
Literature review	May-October 2011
Data analysis	October
Report drafting	October 2011
Reporting date/period to the Supervisor	End-November 2011
Work editing	November-December 2011
Handing in of the final work	January 2012



Appendix VI: RESEARCHER'S CURRICULUM VITAE

I. Personal Profile

Name: SISI

First name: Jean Damascene

Father: Gafaranga Claver

Mother: Nyiramuhundwa Therese

Status: married (6 children)

Spouse: Habyalimana Savera

Date of birth: march 1951

Place of birth:

Sector: Cyanika

District: Burera

Province: North

Country: Rwanda

Current residence:

Sector: Cyuve

District: Musanze

Province: North

Country: Rwanda

Phone number: +250) 0788518094

E-mail: sisdamascene@yahoo.fr

II. Educational background

From 2009 to 2011: Kampala International University, Master`s of Conflict Resolution and Peace Building.

2004-2007: Institut d'Enseignement Supérieur de RUHENGARI (Ruhengeri Institute of Higher Education), Rwanda.

Award: bachelor`s degree in Law (Licence en Droit).

1974-1976; Centre d'Etudes et de Recherche des Industries Alimentaires et du Tourisme(CERIA), Enseignement Supérieur Economique, Belgique.

Award: Graduat en Tourisme (AI).

1966-1972: Secondary school at College Saint Andre-Nyamirambo (Kigali) Rwanda.

Award: Certificate/ Certificat des Humanités Générales (A2).

1959-1965: Primary school at Butete Primary school and Gitare Primary School.

III. Professional Background and Work experience

1976-1994: civil servant in Office Rwandais du Tourisme et des Parcs Nationaux, O.R.T.P.N. (Rwandan Office of Tourism and National Parks).

1994-1996: Exile to Zaire in the aftermath of the 1994 genocide against tutsi in Rwanda.

May 1998-January 2002: Deputy Governor in Charge of Social and Cultural Affairs in Ruhengeri Province (Sous-Préfet Charge des affaires Socio-Culturelles en Prefecture/Province de Ruhengeri).

1990-2006: Chairman of Provincial Commission for Fighting against HIV (CPLS-Ruhengeri) in Ruhengeri Province.

From January, 2002 to June, 2002: Officer in charge of commerce, industry and tourism in Ruhengeri Province.

June, 2002-march 2006: Representative of the National Electoral Commission in Ruhengeri Province, in quality of Coordinator of elections at the level of Ruhengeri Province.

Since September 2007 up to now: facilitator of the Research and Dialogue Institute for Peace (Institut de Recherche et de Dialogue pour la Paix) in Musanze District.

Since November 2008 up to now: Lecturer at Ruhengeri Institute of Higher Education (Institut d'Enseignement Supérieur de Ruhengeri).

IV. Trainings and certificates

January-February, 2005: Leadership management and Training of Trainers Skills development Course by Institute of Administration and Management, RIAM, Murambi-Rwanda.

February-March, 1993: Workshop organized by The World Tourism Organization (WTO), on Marketing of Tourism Arusha-Tanzania.

March-October, 1986: Training in Management of a Travel Agency, ACOTRA-Voyages, Brussels-Belgium.

September, 1982: Workshop organized by The World Tourism Organization (WTO), on Public Relations and International Markets, Aoxtepec-Mexico.

July-December, 1978: Training in Management of Tourism Enterprises, Tunis-Tunisia.

February-July, 1974: Formation en matière de Promotion et Commercialisation du tourisme (marketing of tourism), Ecole Internationale de Bordeaux, France.

V. Other relevant data

Participation on international travel exhibitions: Berlin (1978-1994), Bruxelles (1978-1994), Paris (1982-1994), Utrecht (1982-1990).

Participation on the UN World Conference on Environment and Development, Rio de Janeiro (Brasil), 1993.

Workshops and official missions: Mahe(Seychelles),Arusha (Tanzania), Dar-es-salaam (Tanzania), Bujumbura (Burundi), Libreville (Gabon), Kampala (Uganda), Kinshasa (Zaire/RDC), Nairobi (Kenya), Addis Ababa (Ethiopia), Abidjan (Ivory Coast), Acapulco (Mexico),Nice (France), Rio de Janeiro (Brazil),Niamey (Niger), Lome (Togo),Blantyre (Malawi), Harare (Zimbabwe), Dakar (Senegal), Bonn and Berlin (Germany), Cotonou (Benin) and Madrid (Spain).

VI. Languages and ICT

Kinyarwanda, French, English and Spanish.

Microsoft Word/ PowerPoint/ Excel.

Internet.

I declare on my honor that information here high well stocked is sincere and in conformity with the reality.

