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THE INFLUENCE OF CONDUCTED RESEARCH ON THE MANAGEMENT OF PROTECTED AREA: TOWARDS IMPROVING CONSERVATION AND MONITORING OF NYUNGWE NATIONAL PARK FROM 2005 TO 2015

A thesis submitted in partial fulfillment of the requirements for the degree of Master in Biodiversity Conservation and Natural Resources Management

By

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Huye February 2021

CERTIFICATION

I, **Dr. NIYONZIMA Theophile**, do hereby certify that this work entitled "The influence of conducted research on protected area towards improving its conservation and monitoring from 2005-2015: Case study Nyungwe National Park" was undertaken by **Mr. BARAVUGA Theodore** in partial fulfillment of the requirements for the award of Master's Degree in biodiversity conservation and natural resources management by the University of Rwanda, College of Sciences and Technology, under my supervision and guidance.

Supervisor: **Dr. NIYONZIMA Theophile**

Signature: ……

Date: 20./02/2021

DECLARATION

I, **BARAVUGA Theodore,** hereby declare that this thesis entitled "*The influence of conducted research on the management of protected area: towards improving conservation and monitoring of Nyungwe National Park from 2005 to 2015"* is my own work and it has not been submitted anywhere else for any other academic qualifications at any university or higher learning institution.

Name: BARAVUGA Theodore

Signature: .  .

Date: 20/02/2021

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ABSTRACT

Protected areas (PAs) conservation requires prominent approaches for safeguarding biodiversity and ecosystem services. Beside these services, PAs act as key source of development, poverty alleviation and employment, especially through tourism and in turn contributing to green economy. For sustaining these goods and services, there is need to continuously improve management practices using research. Therefore, this study conducted in Nyungwe National Park intended to assess the influence of conducted research on Nyungwe National Park in relation to conservation and monitoring. The main objective of the study was to assess the influence of conducted research on Nyungwe National Park towards improving its conservation and monitoring. Qualitative data was collected from local community from three sectors, park staff and researchers who conducted research on NNP, and field visits were done to acquire data for this study. The findings from the research indicated that previous research informed policymakers who took some managerial decisions such as making trails, construction of Nyungwe canopy walk way, rehabilitation of buffer zones, training guides and guards, increasing community awareness, upgrading Nyungwe to a National Park level, tourism revenue sharing, and compensation of damaged crops for local community, establishment of Kitabi College of Conservation and Environment Management (KCCEM) among others. These changes occurred as a result of new policies, laws and regulations developed and implemented. We recommend that PAs managers consider all relevant recommendations from conducted research and establish a platform for sharing researchers' results for effective conservation.

Keywords: *researchers' recommendations, conservation and monitoring, protected areas, tourism development, Nyungwe National Park*

ACRONYMS AND ABREVIATIONS

%:	Percent
CBD:	Convention on Biological Diversity
Dr.:	Doctor
DRC:	Democratic Republic of the Congo
KCCEM:	Kitabi College of Conservation and Environmental Management
KIST:	Kigali Institute of Sciences and Technology
km:	Kilometer
km^2:	Square kilometer
KNFP:	Kenya National Forest Policy
MININFRA:	Ministry of Infrastructure
MINITERE:	Ministère des Terres et des Forêts
MINICOM:	Ministère du Commerce et d'Industrie/ Ministry of Trade and Industry
NFR:	Nyungwe Forest Reserve
NGO:	Non-Governmental Organization
NNP:	Nyungwe National Park
PA:	Protected Area
PAB/REMA:	Protected Area Biodiversity project/ Rwanda Environment Management Authority
PCFN:	Nyungwe Forest Conservation Project
RDB:	Rwanda Development Board
REMA:	Rwanda Environment Management Authority
ORTPN:	Rwandan Office of Tourism and National Park (*Office Rwandais pour Tourisme et des Parcs Nationaux)*
SPSS:	Statistical Package for Social Sciences
UR:	University of Rwanda
UNEP:	United Nations Environment Program

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CHAPTER 1. INTRODUCTION

1. 1. Background of the study

Protected areas (PAs) management requires a consistent approach to maintaining and enhancing biodiversity and ecosystem services (Barnes et al., 2018). The Convention on Biological Diversity classified these services into cultural, ecological, spiritual, and scientific and provides benefits to society. The convention on Biological Diversity (CBD 2008) highlighted PAs as meaningful reason for safeguarding biodiversity as life itself is based on its intrinsic value.

For effective biodiversity conservation and its underlying services, the Government of Rwanda established National Parks in early 1918, and in 1933 all remnants of mountain forests were set aside as protected forests (ORTPN, 2005; Weber 1987). Setting aside areas to protect nature is one of the most successful responses to biodiversity loss. It is also a key source of development, poverty alleviation and employment, especially in tourism, which contributes to greening the Rwandan economy (MINICOM, 2013). This contributed to income generation and overall socio-economic development of Rwanda in general and communities surrounding protected areas specifically (MINITERE, 2003; Twagiramungu, 2006; Chemonics International, 2008; Nahayo et al., 2009 and Republic of Rwanda, 2011).

The interrelationship between protected areas and sciences make PAs one of favored sites for ecological research and monitoring (Hockings et al., 2013). It is believed that responsible and well-managed research can help to improve management effectiveness and enhance conservation outcomes (Hockings et al., 2013). Therefore, scientists assist protected area managers by delivering information and knowledge that can be used to better monitor and improve conservation of all protected area and biodiversity ecosystem in general (Cole, 2004).

The information and knowledge provided by researchers can assist managers of PAs and decision-makers to effectively manage them. Based on this context, many protected areas have research as a major objective, both for reserve management purposes and more generally to generate scientific knowledge (World Bank, 2010). Also, many countries have formalized processes for approving and monitoring research within their protected area systems (Hockings et al., 2013). For example, the Kenya National Forest Policy (KNFP) has stressed on the significance of forest research in generating knowledge, innovations and technologies for natural

resource management. This influenced the development and provision of guidelines for forest research in favor of their sustainable management. These guidelines included: (1) aligning research objectives with national priority such as poverty reduction, conservation and sustainable development, and improved livelihoods, (2) research focusing on integrating tree planting for commercial purposes and other non-timber forest products with crop production to ensure food security, (3) involve all stakeholders for improving adoptability of research findings, (4) research projects aiming at increasing environmental stability, forest productivity and production of wood and other forest products for sustainable development (KNFP, 2015).

It is believed that managing protected areas for multiple benefits require effective decision-making and implications for management that change management approaches, skills and capacities (World Bank, 2010). These changes in management expertise, knowledge and resources must be day to day improving (Dudley et al., 2018). To achieve on improved management capabilities of protected areas involve critical environmental governance, which seeks solutions to environmental challenges (REMA 2015).

Nyungwe National Park was first established in 1903 as a forest reserve referred as Nyungwe Forest Reserve (NFR). From 1958 to 1973 it was downsized due to fires, woodcutting, poaching, and small-scale agriculture (Crawford et al., 2012). In 1988, the Rwandan Office for Tourism and National Parks (ORTPN) was given the mandate to enforce conservation regulations in the forest like to control illegal mining, hunting and forest clearing (Masozera, 2002). The conservation efforts in the NFR were strengthened when the Wildlife Conservation Society (WCS) began working in Nyungwe in 1986.

The conservation of NFR also was facilitated by established buffer zones in 1984 as of protecting the reserve and its ecosystems from resource exploitation and reducing contact between the reserve's wildlife and the local population (Crawford, et al., 2012). Moreover, the conservation success results from real information provided by researchers. Either individual or public conducted research can influence the management of protected area towards improving its conservation and monitoring by making practice and suggesting recommendations in the result of these conducted researches (Jepson et al., 2002).

Different studies have been conducted in national parks and reserved ecosystems in Rwanda including Nyungwe National park and pointed out challenges they faced (REMA, 2011; 2015). Both public and private institutions, Non-Governmental Organizations (NGOs), and independent researchers have conducted researches in Nyungwe National Park. They provided recommendations and some of them reflecting on sustainable management of the park, such as upgrading it to a national park, developing its management plan, buffer zone rehabilitation, training guards, building capacity of and providing alternative source of income to the neighboring communities among others.

1. 2. Problem statement

In the face of the growing biodiversity crisis, resource managers and conservationists are looking for innovative management strategies that could ensure community stability and survival of protected areas (Gilmour 1995). In doing this, inputs from researchers play a central role. This might be the reason why many protected areas have research mainly as two-fold objectives: reserve management purposes and generating scientific knowledge (World Bank, 2010).

This is achieved when research is carefully planned and undertaken in collaboration with protected area managers and local communities (Hockings et al., 2013), and can yield important new information with immediate practical application to support management (Barnes et al., 2018).

Beginning in the 1990s, heads of state and multilateral organizations intensified efforts in international environmental law and policy in response to growing scientific evidence concerning the loss of biodiversity and the degradation of ecosystems and habitats (Lausche, 2011). Scientific evidences are generated through carefully planned researches. There are several researches conducted in Nyungwe National Park; providing recommendations some of them reflecting the sustainable management of the forest. Implementation of such recommendations depends on how they are being integrated in rules, regulations, laws and policies. Little is known on the extent by which researchers' recommendations were integrated into policies, laws and regulations for being put into actions to ensure sustainable conservation and monitoring of NNP.

Therefore, assessing the relationship between researchers' recommendations and effectiveness of conservation and monitoring of NNP is critically required as little is known on how conducted researches influence decision-makers to integrate them into policies and regulations for effective conservation.

1.3. Objectives of the study

1. 3. 1. General objective

The main objective of this study was to assess the influence of conducted research on Nyungwe National Park towards improving its conservation and monitoring.

1. 3. 2. Specific objectives

The specific objectives of this study are:

1. To make an inventory of the recommendations proposed by different studies relevant to the conservation and monitoring of NNP;
2. To identify important conservation and monitoring achievements in NNP from 2005 to 2015,
3. To determine the impacts of researchers' findings in terms of influencing decision-making for sustainable management of NNP.

1. 4. Research questions

This research answered the following research questions

1. Are there any relevant researchers' recommendations to NNP conservation and monitoring?
2. What are the conservation and monitoring achievements in NNP from 2005 to 2015?
3. To what extent did researchers' recommendations influence the decision-making and contribute to improved management sustainability of the NNP?

1.5. Research hypothesis

We hypothesized that managers of NNP considered researchers' recommendations, integrated them in conservation guidelines/policies while ensuring conservation and monitoring activities.

1.6. Significance of the study

This study is of great importance academically and for all stakeholders in conservation. Academically it helps the researcher to fulfill the requirements of Award of Master's Degree in biodiversity conservation and natural resources at University of Rwanda. The results and recommendations will help future researchers interested in this topic. This will help to deepen understanding on how researchers' recommendations influence development of new guidelines and regulations necessary for sustainable management of protected areas. For PA conservation, this study will help NNP managers and other PAs managers in Rwanda and elsewhere around the world. Recommendations could also be used in the adoption and implementation of new strategies for monitoring protected areas.

1.7. Scope and Limitation of the Study

Due to a short time and financial limitation this study was carried out on one protected area. The present study was carried out on Nyungwe National Park, located in the Southwest of Rwanda. It considers the period ranging from 2005 to 2015.

1.8. Organization of the Study

The report is organized in five chapters. The first chapter that is the general introduction includes the background of the study, problem statement, objectives and research questions, study significance, scope and study limitation as well as the structure of the study. The second chapter is about "Research methodology". It describes the research design, study area, population, sample size, sampling techniques, research instruments, and data analysis. The third chapter presents the findings. The fourth chapter pertains to "Discussions" attempting to compare obtained results with findings from literature while highlighting their implications. The last chapter presents the "Conclusions and recommendations".

CHAPTER 2. RESEARCH METHODOLOGY

2.0 Introduction

According to Grinnell and Williams (1990) the research methodology deals with data collection that includes both primary and secondary data collection methods. This chapter presents the data collection techniques and approaches, and the entire process that was used to conduct research. It presents area of the study, research design, data collection instruments, population of the study, data analysis, validity and reliability, and ethical considerations.

2.1 Description of study

This study was conducted in Nyungwe National Park. It is located in the southwest of Rwanda. It covers an area of 1,013 km² of the main forest block.

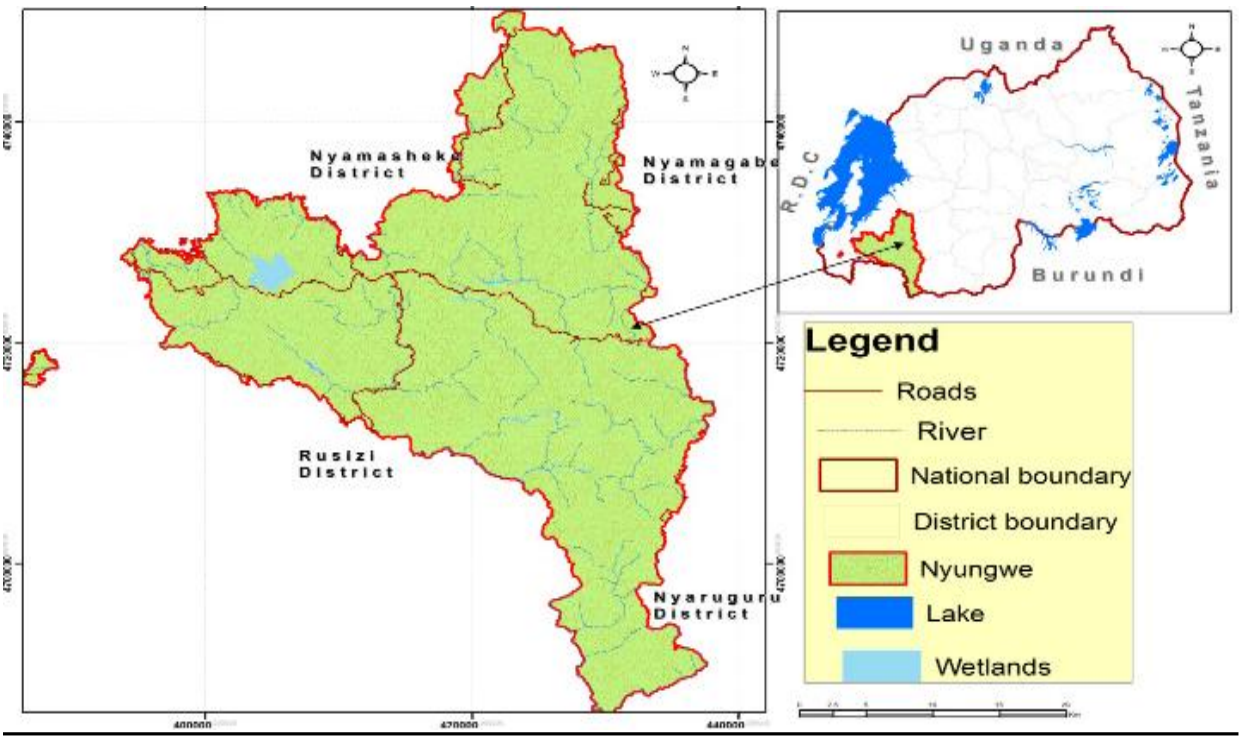

Figure 1: Nyungwe National Park Location (Source: UNEP, 2011)

It is sometimes estimated to cover 1,019 km^2 when including the Cyamudongo, a small forest relict located at 10 km far from Nyungwe forest, and some other associated forest patches such as Gisakura natural forest. It is contiguous with Kibira National Park in Burundi (Kambogo et al., 2015). NNP is a tropical mountain rainforest along the Congo-Nile Crest, and a biodiversity

hotspot of the Albertine Rift (Gapusi, 2007). It is an area of large conservation importance in research and an excellent tourism destination in Rwanda and across eastern Africa due to its large size, pristine habitats, a rich biodiversity, physical characteristics, and conservation efforts (Majyambere, 2018). The figure 1 shows the location of Nyungwe National Park in Rwanda.

2.2. Research Design

According to Grinner and Williams (1990), research design concerns entire process of the study, the problem formulation through dissemination of findings. In this study, both primary and secondary data were used. The qualitative data was collected using interviews schedules and direct field observations. We have used comparative and correlational methods (Kothari, 2004). According to Kim (2016), a correlational study is a research method that describes and predicts how variables are naturally related in the real world, without any attempt by the researcher to alter them or assign causation between them.

2.3. Primary data

The primary data were collected by interviews and field observations. The interview guide was designed and used when interviewing selected respondents from three sectors (Bushekeri and Rangiro sectors in Nyamasheke district and Kitabi sector in Nyamagabe district) around Nyungwe National Park. Interview was also conducted with researchers that did research in NNP, staff from RDB and WCS.

2.3.1. Study Population

A population is defined as a totaling of persons or objects within which a study is conducted, while sampling is the selection of a small number of respondents to represent the total population (Grinnell and Williams, 1990; Ranjit, 2005; Ellis, 2010). The total population of this study was 2707; consisting of heterogeneous people including local community members, researchers, and conservationists from both public and private institutions working in NNP. The aforementioned population makes a valuable partner with the Rwanda Development Board and Wildlife Conservation Society for Nyungwe National Park management and conservation.

2.3.2. Selection of interviewees from the population

The main preliminary research task for field data collection consisted in selecting in each category of our study population a certain number of individuals to be interviewed. Table 1 presents different categories of our study population and the number of people retained for interview.

Table 1: Interviewees

S/N	Population category		Population number	Number of interviewees
1	Local community around NNP in three sectors	19 people from KITABI Sector	2,707	63
		19 people from BUSHEKERI Sector		
		19 people from RANGIRO Sector		
2	Staff from both RDB and WCS (about 10% of them)		90	15
3	Different researchers on NNP		30	18

Source: Author

In this study, a total of 96 people were selected for interview. Among them, 63 were from local community within the 3 sectors surrounding NNP (Kitabi, Bushekeri and Gisakura); 18 were from researchers who conducted research on NNP and 15 belong to the group of NNP staff. The main criterion used to select interviewees was to check if the person in question has been around NNP during the period of consideration that was from 2005 to 2015.

2.3.3. Field observations

The field observations were conducted through field trips and observations by overseeing the status of conservation and achieved activities in conservation and monitoring at NNP. It helped me to observe on site the changes in conservation practices of NNP.

2.4. Secondary data

The secondary data were compiled by extensively studying and reviewing published and unpublished documents including reports, journals, newspapers, books, encyclopedias and policy documents relevant to the study. These included research and project reports on NNP and in relation to conservation and monitoring. The review of literature enabled to discover findings

from different research conducted on NNP. This was later compared with policy changes and management practices that followed the recommendation from conducted research.

2.5. Validity and reliability

According to Golafshani (2003), the reliability focusses on whether the result is replicable while validity refers to whether the means of measurement are accurate and whether they are actually measuring what they are intended to measure. For getting reliable information about the role of researchers' recommendations on sustainable conservation of NNP, data from 2005 to 2015 was used. The selection of respondents from the study area ensured variability in responses provided.

2.6. Data analysis and interpretation

The data were processed and analyzed using qualitative methods. This enabled to establish a link between researchers' recommendations and the impact in terms of changes in management practices that contributed to the sustainability of conservation at NNP.

2.7. Ethical Consideration

Confidentiality concerning the information from key informants was kept by making sure undesirable biases are avoided. Interviewees were given an overview of the research and granted confidentiality of information they provided by especially not putting their names on recorded information once transcribed. For reducing burden to respondents, interview schedules were organized and conducted at a convenient date for the interviewee as recommended by de Jong et al., 2016.

CHAPTER 3. RESULTS

3.1. Introduction

This chapter presents the results obtained from this research. The results are presented in three sub-sections: the first is concerned with presenting some researchers recommendations, the second part focused on rules and regulations, and policies developed for conservation and monitoring NNP. And lastly, we presented data from interviews and field observations.

3.2. Types of researches conducted in NNP

Several researches have been conducted on Nyungwe with various purposes: academic, project evaluation, NGO research and reports, government research and reports. They are summarized in table 2 below.

Table 2: Types of research conducted in NNP

Types of research	Frequency
Academic	36
Project evaluation	8
NGO research	23
NGO Report	9
Government research	16
Government report	9

The table 2 above indicates that among 101 researches conducted in NNP assessed; 36 were for academic purposes, followed by NGO research that accounted 22 in total, and the least recorded were for project evaluation purposes (8).

3.3. Overview of some researchers' findings

This section reviews some of researchers' findings regarding Nyungwe conservation and monitoring. Some of these recommendations are about tourism development, upgrading it to a national park, buffer zone rehabilitation, training of guards and guides, revenue sharing, and raising awareness of neighboring communities.

3.2.1. Tourism development

Nyungwe as remnant natural forest rich of biodiversity attract more tourists. Mukazana (2003) conducted research and produced a report on Industrial Training Conducted in Nyungwe Forest Reserve (NFR). She concluded that there was need to market NNP mainly by creating a website to enable local and worldwide access. She also estimated that concerned leaders should create a safe environment to satisfy the needs of tourists; train staff for reaching the overall goal of promoting tourism in Rwanda. She added that the surrounding community would get to know that conserving Nyungwe Forest Reserve is their richness that would either directly or indirectly contribute to their wellbeing, thus it would be used wisely avoiding unlawful exploitation.

Sangano (2003) on the other hand recommended that skilled people in nature conservation must collaborate with WCS to develop a tourism planning, and develop advertisements on newspapers, radio stations and televisions. He said that it was highly needed to build a hotel because tourists had to cross the forest and go to Kamembe about 30km from the forest. This presented a challenge for tourism development. The other hindrance was that tourists could not find water at tourist reception. Later, Krajewski (2007) conducted a research on response on chimpanzees to Habituation and Human-Chimpanzee Encounters in Cyamudongo Forest, and recommended that it would be beneficial if the interior roads within Nyungwe forest were improved and connected.

3.2.2. Buffer zones rehabilitation

Masozera and Avalapati (2004), pointed out that the introduced exotic species (Eucalyptus and pines) planted in the buffer zones around Nyungwe were threatening these natural forests, and illegal harvesting of bamboos for handicraft and construction was becoming a threat to Nyungwe Forest. Thus, they recommended that protected areas management had to be consistent with overall socio-economic development plans. Towards this end, pine plantations in the Nyungwe

Forest Reserve buffer zone could be replaced with an agroforestry system producing tea, as a potential solution to ensure biodiversity and address subsistence needs of local communities.

32.3. Training guides and guards

William (2006) recommended that training guides on the ecology of some classes of wild animals was essential as it could enable and provide tourists with reliable and interesting information.

In addition, Nsekeyimana (2008) recommended that there was need to solve the problem of guards who were unable to read or write by providing them with various theoretical and practical training in monitoring, use of GPS, enabling them to collect reliable data. The increase in the number of guards was also found essential, because the Nyungwe National Park is larger and presents a topography that is difficult to control if the number of guards remained too low. This would also lead to an increase in the number of patrol posts for effective coverage of the NNP, (for example in Gahurizo) between the Kitabi post and that of Nshili, for effective monitoring).

3.2.4. Upgrading NFR to NNP

Ewango (2001) stated that mountain forest ecosystems are important for their biological biodiversity. He recommended the zoning process to be undertaken and management of the Nyungwe natural forest to support the proposal to upgrade NFR to a National Park level which would boost the conservation of its biodiversity.

3.2.5. Revenue sharing

In the past, local communities had been restricted from entering the park, for enhancing the sustainable management of the park. As a form of compensation, it was recommended that community members should get a share of the revenue from the forest. In 2003, Sangano has recommended that leaders should set a clear program that had to show how the surrounding communities could have a share of the revenue generated by the forest to make them feel rewarded and get motivated to contribute in the preservation of forest species.

3.4. Some policies developed for conservation and monitoring PAs

Protected areas are governed by law, policy, regulations. Findings from conducted studies have been providing useful recommendations that served as inputs into laws, policies and regulations. This section reviews some of policies, law and regulations that were developed with some inputs from conducted studies. This contributed to the sustainability of conservation and monitoring of NNP.

- The Rwanda Vision 2020 provides guidance for the development of the overall national policies, regulations, strategies and programmes including those related to biodiversity conservation. It states that Rwanda will implement adequate land and water management techniques, coupled with a sound biodiversity policy, in order to ensure sustainable development.

- The revenue sharing was initiated in Rwanda in 2004 with the overall goal of the Revenue Sharing Programme to ensure sustainable conservation of the National Parks with the participation of the neighboring communities by contributing to the improvement of their living conditions. The Revenue Sharing policy and implementation guidelines are guided by Rwanda Wildlife Authority's (RWA) mission, which is: *"To conserve Rwanda's rich biodiversity for sustainable development of the country and as global heritage through the application of sound ecological principles and the cultivation of strategic partnerships with local communities and other stakeholders"* (ORTPN 2005).

- Law N°22/2005 of 21/11/2005 establishing Nyungwe National park. This law determines the limit of the park, regulation and management.

- Rwanda National Forest Policy 2010: its overall goal is to make the forestry sector one of the bedrocks of economy and national ecological balance for sustainable benefits to all segments of the society. Among specific objectives one can mention: to "*Promote forest extension to enable farmers and other forest stakeholders to benefit from forest management approaches and technologies; Promote forest research, training and education to ensure a vibrant forest sector"* (Ministry of Forest and Mines 2010). The Rwanda Biodiversity Policy (2011) was formulated based on a growing body of scientific knowledge and emerging consensus and partnerships, to promote and support the

maintenance and restoration of the integrity, functioning, and health of natural systems. Its goal is to conserve Rwanda's biological diversity, to sustain the integrity, health and productivity of its ecosystems and ecological processes, whilst providing lasting development benefits to the nation through the ecologically sustainable, socially equitable, and economically efficient use of biological resources. This policy highlighted strengthening training opportunities, particularly through the Kitabi College of Conservation and Environmental Management (KCCEM), which was established, managed and operated as a Strategic National Institution for the provision and upgrading of conservation knowledge and skills (ROR 2011).

- Prime ministerial order n° 26/03 of 23/05/2012 determining the rates, calculating method and criteria for determining compensation to the victim of damage caused by an animal (Official gazette n° 25 of 18/06/2012.

- National Biodiversity Strategy and Action Plan (NBSAP) 2014; the overall objective has been worked out as to preserve the national biodiversity in order to ensure that its various components are utilized in a sustainable manner for attending socio-economic development of the nation and ensuring better livelihood of Rwandans. NNP was given high priority for conservation, and it was proposed to make the corridor linking Nyungwe main forest to the remnant forest of Cyamudongo for enhancing the conservation of chimpanzee and other wildlife inhabiting Cyamudongo that are more likely to use a large area.

- Rules and Regulations for Research Activities in Rwanda (MINEDUC 2015): the goal was to inform researchers who are intending to carry out research activities in Rwanda of the rules and regulations governing the research clearance process. These rules and regulations referred to any research activities taking place in Rwanda.

3.5. Stakeholders Review on the influence of Research on NNP conservation and monitoring

This section intends to assess how respondents view the contribution of research conducted on the sustainability of NNP conservation and monitoring.

3.5.1. Effectiveness of conducted research

The researches undertaken in NNP regardless of their purposes provided recommendations that significantly contributed to improving conservation. The table 3 below shows their effectiveness.

Table 3: Effectiveness of conducted researches to NNP conservation and monitoring

Effectiveness of research in conservation	Frequency
Strongly agree	5
Agree	6
Neutral	1
Disagree	0
Strongly disagree	0
Don't know	3

The table 3 above depicts how park staff views the effectiveness of conducted researches to NNP conservation and monitoring. A six-scale assessment was used; 6 of 15 park staff interviewed agreed that researches contribute to NNP conservation, 5 strongly agree, 1 was neutral, where no respondent disagree nor strongly disagree, while 3 of them replied that they are not sure whether researches contributed to NNP conservation and monitoring.

3.5.2. How research contributed to NNP conservation and monitoring

The conducted research in NNP is believed to influence its overall monitoring and evaluation over the past ten years. The table 4 shows different ways by which researches conducted in NNP contributes to its conservation.

Table 4: **Table 4: Ways by which projects contribute conservation and monitoring NNP**

How research help NNP conservation	Researchers	Park staff
Policy development	10	3
Employment to local community	4	3
Awareness to local community	3	5
Supporting CDPs	1	4

The table 4 above summarizes the views of respondents on how researches contribute to NNP conservation and monitoring. Among 18 interviewed researchers, 10 confirmed that researches contributed to policy development, 4 stated boosting of employment, 3 stated they created awareness among community, while 1 respondent mentioned supporting community driven projects. Park staff mentioned various ways by which projects engage community in conserving NNP such as; awareness to local community (5), supporting CDPs (4), policy development (3), and employment opportunity to local community (3).

3.5.3. Change of wildlife in NNP over the past 10 years

Researchers' recommendations were found to be helpful to the conservation and monitoring of NNP, thus this is confirmed by interviewees who responded to the question about the variation of wildlife over the past ten years. The findings are summarized in the table 5.

Table 5: **Table 5: Wildlife status in NNP over the past ten years**

Change of wildlife over 10 years	Frequency
Increased in number	29
Decreased in number	14
Remained the same	12
I don't know	23

The table 5 shows the point of view of respondents. The increment of wildlife was mentioned by 29 respondents while those stating that wildlife decreased were 14. About 12 confirmed no change throughout the period of consideration, while 23 were not sure of the change.

3.5.4. Causes of wildlife change over the past 10 years in NNP

The respondents that confirmed that there was an increase in wildlife throughout the period (35), they were asked to pick 5 primary reasons from the list that are associated to such increase. The table 6 below presents the responses given.

Table 6: Causes of increasing of wildlife status over the years

Causes of wildlife increase	Frequency
Government rules that excluded people from the wildlife	26
Climate change	2
Proposed recommendations of researchers in their report	7
Good relations between NNP management and neighboring communities	20
Decreasing of hunting activities	23

From table 6 above, the increase of wildlife is attributed to governmental rules excluding people from wildlife was the most provided (26 respondents), followed by decreasing of hunting activities stated by 23 interviewees; a good relation between NNP management and neighboring communities (20 respondents), proposed recommendations from researchers (7 respondents). Climate change is found not to influence much wildlife increase (2 respondents).

3.5.5. Emergence actions for welfare of wildlife in NNP

All of our respondents were asked what they preferred to see being done about the wildlife situation in NNP. The given responses are not different from government strategy. The table 7 summarizes the findings.

Table 7: Boosting the welfare of wildlife in NNP

Emergence actions for wildlife welfare	Frequency
Retain all animals inside NNP	10
Fence off NNP	12
Bringing more animals in NNP	3
Planting new feeding trees	13
Restore and repair buffer zones	8
Community education and outdoor training	15
Alternative source of income to local community	35

Respondents pointed out that among needed actions for improvement of welfare of wildlife in NNP there was the provision of alternative sources of income to neighboring community (35 interviewees), community education and outdoor training (15 respondents), planting new feeding trees (13 respondents), bring more animals in NNP as required for sustaining the park (3), retaining animals inside the park (10 respondents), and fencing off NNP (12 respondents). Proposed actions could not only help in retaining animals inside the park, but also limiting the anthropogenic activities from the surrounding communities.

3.5.6. Actions to be focused on for effective monitoring NNP

Development of any park depends on how it is monitored. Thus, we have assessed the opinion of researchers and park staff concerning which mechanisms could be taken or encouraged for monitoring NNP. The responses are presented in the table 8.

Table 8: Actions to be focused on for effective NNP monitoring

Actions	Frequency
Park protection	12
Increasing park guards	11
Building capacity of local community	3
Conducting focused research	6
Not sure	1

Referring to table 8 above, for effective monitoring NNP, park protection was the most stated (12 interviewees); followed by increasing number of park guards (11 interviewees); conducting deep research especially those related to monitoring (6 interviewees), building capacity of local community (3 respondents)while only 1 interviewee was not sure of what should be done.

3.5.7. Proposed options for future researches in NNP

A question was asked about which options of research can be undertaken in NNP so as to contribute to its sustainable monitoring. The responses from researchers and park staff are presented in the table 9.

Table 9: Future researcher's priorities

Future researchers' options	Frequency
Deep research on NNP conservation and monitoring	10
Collaborate with local community in their research	5
Identify critical areas of intervention key partners required for sustainable conservation of NNP	17
Assessing benefits and interests in conserving NNP	1

Referring to the table 9 above, 17 interviewees (park staff and researchers) pointed out that researchers should focus on identifying critical areas of intervention key partners required for sustainable conservation of NNP, 10 respondents highlighted that researchers must deepen research on conservation and monitoring of NNP; 5 respondents suggested collaboration with local community; while 1 respondents suggested the assessment benefits and interests in conserving NNP.

CHAPTER 4. DISCUSSIONS

Conservation and monitoring based on inputs and recommendations from researchers are the best way towards the sustainability of protected areas. Protected areas are favored sites for ecological research and monitoring and responsible well-managed research can help to improve management effectiveness and enhance conservation outcomes. This might be the reason why many countries have set processes to deliver permits and monitor researches within PAs (Hockings et al., 2013). To know how park development is linked to research, 15 park staffs in NNP were interviewed and 11 of them have shown that most of the achievements such as tourism development infrastructures and protection resulted from recommendations from researchers. These researches also include those that were undertaken by ORTPN that was directly in charge of protected areas management.

To strengthen the positive impacts of researches to PA management and conservation, Rwanda Environment Management Authority recommended that PA authorities must support and use research sector, just because that aim to contribute to science-evidenced management of the protected areas (PAB/REMA, 2009). The emergences of new scientific information influence the development of laws and policies in response to changing societal needs. This happens only if there is collaboration and partnership both among scientists and between policy-makers and researchers, and more importantly when researchers focus their researches on solving problems and challenges the region faces (His excellent Kagame Paul, speech, 15 November 2016).

The contribution of research generates new scientific information that in turn influence the emergence of laws and policies for improving protected areas (Lausche, 2011). More respondents from local community, researchers and park staff stated that Nyungwe forest was like other forests where resources were exploited without limits. Researchers and park staff highlighted that after upgrading Nyungwe forest as reserve forest in 1903, there was a positive change comparing with past. The processes of upgrading it to a National park in 2005 can be attributed to researchers 'recommendations that showed alarming evidences that triggered the surgent need for protection.

These evidences continue to emerge that included anthropogenic activities that never ceased to occur mainly through agriculture encroachment, fires, woodcutting and poaching that resulted in

its downsize to about 150 square kilometers from 1958 to 1973 (Crawford *et al*. 2012). These activities also affected its biodiversity and ecosystem goods and services it provided. Before being declared as a national park, community have not acknowledged the need for protection of Nyungwe and viewed it as a way of limiting them from getting basic needs in the forest. In addition to that no tourism revenue or an incentive for protection was allocated to local community. The low level of protection of Nyungwe was also due with limited law enforcement, inadequate policy.

For overcoming these challenges, in 1988 the ORTPN was given mandate to enforce conservation regulations like controlling illegal mining, hunting and forest clearing (Masozera, 2002). This was strengthened by Wildlife Conservation Society (WCS) that began working in Nyungwe in 1986. With time, research was undertaken in it, improvements started being noticeable in terms of clarifying its value in biodiversity richness, ecosystem goods and services that benefited neighboring communities, touristic sites, ecotourism development, engaging communities in sustaining the integrity of the forest.

In 2001, Ewango stated that mountain forest ecosystems are important for their biological diversity. He recommended the zoning process to be undertaken and management of the Nyungwe natural forest. He supported the proposal to upgrade NNP to a National Park level which would promote the conservation of its biodiversity. Later, in 2005 a Law N°22/200t5 of 21/11/2005 establishing Nyungwe National park was released, and NNP became the third park in Rwanda. This law determines the boundaries of the park and its buffer zones. However this increased the restrictions on access to these natural resources leading to substantial loss of income to communities (Namara, 2005), that negatively aggravated the human-wildlife conflicts. To sustainably conserve Nyungwe forest, many activities have been undertaken including those related to tourism development, awareness creation among local community, infrastructures development as well as socio-economic development of the neighboring communities.

The buffer zone was created to reduce these conflicts. However the issue of crop raiding continued to evolve that causing some lands staying unexploited. The value of forest was highlighted by 22 respondents that showed that for improving welfare of wildlife there is need to fence off the park and retain animals inside the park. In 2004, Masozera and Alavalapati

recommended that it is important to manage Nyungwe Forest Reserve the way that benefit community, by planting tea around buffer zones and replace invasive and exotic species like pine and Eucalyptus species in the buffer zone by an agroforestry system producing tea, as a potential solution to ensure biodiversity and address subsistence needs of local communities. Later in 2013, farmers were allowed to plant some perennial crops such as tea (Bizoza and Ndangiza, 2013).
The planted tea in the buffer zones of NNP is essential in boosting the wellbeing of surrounding community. Improving community's livelihoods is one of the best ways towards sustainable PAs conservation and monitoring. Respondents highlighted that tea planted benefited community in various ways since tea is not raided by wildlife at the same time increasing revenue to local farmers by selling tea leaves. The increased tea plants directly benefited community through employment and indirectly from export revenue. This increased the way people viewed Nyungwe forest and it provision of goods and services.

Among goods and services provided by protected areas like Nyungwe include recreational services and outdoor experiences that are gained through tourism. Sangano (2003) in his report of practical training on industrial training conducted in Office Rwandais du Tourisme et des Parc Nationaux (ORTPN)-Nyungwe has recommended that skilled people in nature conservation must collaborate with WCS to develop a tourism planning, and develop advertisements for the sake of NNP sustainability and tourism development. Also, Nsekeyimana (2008) recommended that there is need to solve the problem of guards who cannot read or write by providing them with various theoretical and practical training in monitoring, use of GPS that will enable reliable data provision. To cope with these recommendations, the National Biodiversity Strategies and Action Plans (NBSAP 2011) were developed. In this NBSAP, for enhancing the conservation of NNP, the Government of Rwanda through Rwanda Development Board (RDB) by establishing Kitabi College for Conservation and Environmental Management (KCCEM) as an academic institution operating under the Rwanda Development Board working on conservation and environmental management projects within the park and the greater Albertine Rift Region (Mulindahabi and Ntare, 2015).

KCCEM trains people and give rise to conservational professionals that play an important role in park protection, raising awareness of local community, creating local conservation initiatives like community based organizations, NGOs and cooperatives that focus on Nyungwe conservation at

the same time improving the livelihood of community and sustainable conservation of the park. The establishment of KCEEM also responded to the recommendation of William (2006) who recommended that training guides on the ecology of some major classes of wild animals is essential as it can enable and provide tourists with reliable and interesting information. These have a direct impact on tourist experience as more tourists are attracted.

In 2003, Mukazana in her report of industrial training conducted in Nyungwe Forest Reserve (NFR) has recommended that concerned leaders should decide what to put into action to create a safe and conducive environment for tourist to maximize their satisfaction and staff to ultimately reach the overall vision of promoting tourism in Rwanda. Later in 2007, Krajewski conducted a research on responses to chimpanzee's habituation and human-chimpanzee encounters in Cyamudongo Forest and come up with a recommendation that it would be beneficial if the interior roads within Nyungwe forest are improved and connected. Improving roads inside the forest not only was important in easing access by researchers, tourists but also helped in effective monitoring biodiversity of the forest. These recommendations were aligned with the vision of Rwanda to develop resources-based economy where tourism industry grow succinctly, attracting more tourists and generating more income.

Later in 2010, the canopy walkway was launched by Rwanda Development Board (RDB) to diversify tourism products and experience in the Nyungwe National Park. This is the first ever hanging platform above a steep and deep valley stretching across the massive forest, allowing therefore tourists to view different animal species in Nyungwe Forest by taking them through the green foliage of the tree top thus providing a panoramic view of the surroundings (Kambogo and Bizimana, 2016). Improving tourism products contributed to the increase of the number of visitors in Nyungwe rainforest and stimulated RDB interest in positioning NNP as an adventure tourism destination (Cowles et al., 2013). That correlated with increased revenue generation.

However if neighboring communities are not benefiting from it, there cannot be a sustainable tourism since the community cannot willingly abide to regulations. Sangano (2003) has recommended that there is need to introduce ways in which neighboring community to NNP can benefit from tourism activities as a better way of engaging them in conserving it and improving their socioeconomic development. In 2005, the Revenue Sharing policy was launched by

ORTPN and implementation guidelines are guided by Rwanda Wildlife Authority's (RWA) whose mission is *"To conserve Rwanda's rich biodiversity for sustainable development of the country and as global heritage through the application of sound ecological principles and the cultivation of strategic partnerships with local communities and other stakeholders"* (ORTPN 2005).

In sharing revenue, top beneficiaries are poorer and people in disadvantaged group in zone of influence defined as sectors neighboring each park were considered. The income is combined into a national pool and distributed to surrounding community in the proportion of 40% for Volcanoes National Park, 30% for Akagera National Park, and 30% for Nyungwe National Park. "The revenue sharing played an important role in improving infrastructures like schools reducing the distances travelled by the students, health centers that enabled to get health access instantly" as this is confirmed by the community members.

NNP offered opportunities for income-generating activities that are directly linked to threats reduction such as beekeeping, energy efficient stoves, and livestock to ex-poachers associations. For example, beekeeping cooperatives generated 18,000,000 RWF in 2012 (ROR 2014).
In National Biodiversity Strategies for Action Plan (2016), NNP was given high priority for conservation, and it was proposed a corridor linking Nyungwe main forest to the remnant forest Cyamudongo for enhancing the conservation of chimpanzee and other wildlife inhabiting Cyamudongo that are more likely to use a large home range. Research was fundamental in informing managers about the evidence-based ways of protection and managing protected area; and the substantiation of their effectiveness.

From the above perspectives, researchers' recommendations were useful in sustainable conservation and monitoring of Nyungwe National Park, like other protected areas. The input from previous research suggested that a well-planned research and carefully conducted, with the collaboration from park managers and local community can generate useful information with immediate application for sustainable PAs conservation and monitoring. The findings of this study revealed positive interrelationship between researchers' recommendations to policy development, rules and regulations that addresses the NNP conservation and monitoring.

CHAPTER 5. CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This study has been conducted in and around NNP, with mission of exploring influence of conducted research on protected area towards improving its conservation and monitoring from 2005-2015. Based on data collected, and the results and discussions presented above, the following conclusions and recommendations are drawn.

5.2. Conclusions

Researchers are important in generating knowledge and skills responsible for ensuring positive change towards the sustainable management of PAs. The contribution of researches is achieved through recommendations and suggestions provided that influenced the policy development. Policies, laws and regulations developed based on inputs recommendations from researchers are the best way towards sustainable protected areas. The present study linked some of researcher's recommendations provided by researchers with policies and laws enacted as well as direct field observations, published documents and their recommendations with undertaken activities as well as management practices in NNP.

We have found that researches and projects undertaken in NNP were dominated by academic and NGO research purposes. All of the considered researches and projects confirmed the effectiveness of input from research undertaken towards the improvement of conservation and monitoring of NNP; where 6 of 15 park staff interviewed agreed that researches contribute to NNP conservation and monitoring. The role of researches to NNP conservation and monitoring has influenced the development of regulations concerning conservation practices. At this point, we have noticed that some of their recommendations have been integrated into policies, plans, and laws. From these policies, park authorities implement guidelines and contribute to the improvement of conservation and management practices of Nyungwe National Park.

Different research projects have been undertaken in NNP as a response to researchers' recommendations. They include upgrading NFR to a national park level (NNP) that was

recommended by Ewango in 2001, a construction of Nyungwe canopy walkway for improving and creating trails for improving the ecotourism in NNP. Converting Eucalyptus in the buffer zone into agroforestry especially tea plantation for increasing biodiversity and alleviating the effects of exotic species; increasing posts for guards to ensure the effective monitoring of NNP and reduce frequency of anthropogenic activities. Among other achievements suggested by research, there was the building capacity for guards and guides, establishing of KCCEM ensuring professionalism in conservation and monitoring of Nyungwe National Park.

Community education was strengthened alleviating in turn human-induced threats through acknowledgement of the intrinsic value of NNP in terms of biodiversity, ecological and socio-economic of community, country and world in general. The role of local community in conservation of NNP was strengthened by revenue sharing that started in 2005 by the Government of Rwanda, playing a role in supporting community projects, constructing basic infrastructure like schools, health centers, and roads.

Overall, researchers' recommendations are essential in promoting sustainable conservation and monitoring of NNP as they are integrated into laws and policy that are implemented towards reaching a more stable protected area.

5.3. Recommendations

After analyzing the influence of conducted researches on protected area towards improving NNP conservation and monitoring, the following recommendations are formulated:

- Need to conduct similar studies on other PAs in Rwanda and worldwide to expand the knowledge and enable decision-makers in developing research-based management plans.
- PAs authorities should assess the gap and make a research plan in favor of conservation and monitoring of PAs and ensure the results and recommendations are taken into consideration for future plans.
- Decision-makers and all stakeholders of Pas should have systematic ways of sharing the finding and making them accessible online.

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APENDICES

Field data collection tool

University of Rwanda

College of Science and Technology

Msc. Biodiversity Conservation and Natural Resources Management

Transmittal letter

Dear Respondents;

My names are Mr. Theodore BARAVUGA; I am a student at University of Rwanda, college of science and technology, MSc. Biodiversity Conservation and Natural Resources Management

As a finalist student of masters level, I am undertaking an academic research project entitled *"*Influence of Conducted Researches on Protected Area towards Improving its Conservation and Monitoring from 2005-2015" Case of Nyungwe National Park.

I kindly request you to spare your priceless time and respond to the questions as genuinely as possible. I wish to further request you to answer all questions if possible.

God bless you

Mr. Theodore BARAVUGA

INFORMATION FROM PREVIOUS RESEARCHERS, CONDUCTED RESEARCH IN NYUNGWE NATIONAL PARK

INSTRUCTIONS,

Being a participant in this research, you must be one of the researchers who were conducted a research in NNP and with self-agreement.

SECTION 1: *PROFILE OF RESPONDENTS*

1.1 AGE:

20-30 ☐

31-40 ☐

41-50 ☐

51 -60 ☐

61 and above ☐

1.2 Gender: Female ☐ male ☐

1.3 Marital status: Single ☐ Married ☐ Divorced ☐ Widowed ☐

1.4 Educational level: University ☐ Post G/Masters ☐ PhD and above ☐

SECTION 2: *QUESTIONS RELATED TO THE OBJECTIVES OF RESEARCH*

2.1 Your research, was conducted for.....?

a) Academic purpose
b) Project evaluation
c) NGO research
d) NGO report
e) Government research
f) Government report
g) Other, (Specify).....

2.2 Please indicate your understanding about contribution of research industry in conservation and monitoring of NNP over past ten years?

a) Very good
b) Good
c) Neither good nor bad
d) Bad
e) Very Bad

2.11 What is your wish to see from researchers as far as management of NNP?

a) Deep researches on conservation and monitoring
b) Publish more documents related to PA conservation and monitoring
c) Collaborate with local community in their research
d) Collaborate with NNP decision maker in their research
e) All of the above
a) Others (Specify).....

2.12 What are your suggestions by which the researches can contribute to NNP conservation and monitoring? .....

.....

2.14: As a researcher, what could you tell to the NNP decision makers for having sustainability in conservation and monitoring of NNP?

.....

.....

Thank You!!!!!

INFORMATION FROM LOCAL COMMUNITY AROUND NYUNGWE NATIONAL PARK

District..... Sector.....

Cell.....Village.....

Instructions

Being a participant in this research, you must be at least 18 years old, living around Nyungwe National Park for at least 6 months and with self-agreement

SECTION 1: *PROFILE OF RESPONDENTS*

1.1AGE:

18-30 ☐

31-50 ☐

51 and above ☐

1.2 Gender: Female ☐ male ☐

1.3 Marital status: Single ☐ Married ☐ Divorced ☐ Widowed ☐

1.4 Educational level: Illiterate ☐ Primary ☐ Secondary ☐ University ☐

1.6) Years of living in this region:

Under 1 ☐

1-3 ☐

4-6 ☐

7-10 ☐

Over 10 ☐

SECTION 2: *QUESTIONS RELATED TO THE OBJECTIVES OF RESEARCH*

2.1 Over the past ten years, how do you rate the change of wildlife?

a. Increased in numbers all over the region
b. Increased in numbers only in NNP
c. Decreased in numbers all over the region
d. Decreased in numbers only outside of NNP
e. Remained the same all over the region

2.2 If you have noticed that wildlife population has changed over the past ten or more Years, what do you think are the five primary causes of these changes? Please mark five Causes that you know are the causes.

a) Involving community members in the management of NNP
b) Changes in climate
c) Government rules that excluded people from the wildlife
d) Proposed recommendations of researchers in their report
e) Good relations between NNP management and neighboring communities
f) Reduction of forest by increasing the land of agriculture by peoples
g) Increased human population
h) Poor farming practices
i) uncontrolled poverty and lack of food
j) Conflictive relations between neighboring community and NNP management
k) Increasing in hunting activities
l) Decreasing of hunting activities

2.3 What would you like to see being done about the wildlife situation in NNP?

……

…….

.

2.5 What can researcher do to contribute to sustainable conservation of NNP?

……

……..

Thanks a lot!

INFORMATION FROM NYUNGWE NATIONAL PARK STAFF

Name of Organization.....

Title of Respondent.....

INSTRUCTIONS

Being a participant in this research, you must have any part or appointment in the way NNP is managed and with self-agreement.

SECTION 1: *PROFILE OF RESPONDENTS*

1.1 AGE:

20-30 ☐

31-40 ☐

41-50 ☐

51 -60 ☐

61 and above ☐

1.2 Gender: Female ☐ male ☐

1.3 Marital status: Single ☐ Married ☐ Divorced ☐ Widowed ☐

1.4 Educational level: primary ☐ Secondary ☐ University ☐ Post G/Musters ☐ PHD and above ☐

SECTION 2: *QUESTIONS RELATED TO THE OBJECTIVES OF RESEARCH*

2.4 Did the recommendations in the previous researches were concerned to the available challenge on conservation and monitoring of NNP?

a) Strongly agree
b) Agree

c) Strongly disagree
d) Disagree

2.1 a) Did the researches conducted in NNP contributed to its conservation and monitoring?

a) Strongly agree
b) Agree
c) Strongly disagree
d) Disagree

2.2 Over the past ten years, how do you rate the change of wildlife?

a. Increased in numbers all over the region
b. Increased in numbers only in NNP
c. Decreased in numbers all over the region
d. Decreased in numbers only outside of NNP
e. Remained the same all over the region

2.3 If you have noticed that wildlife population has changed over the past ten or more Years, what do you think are the five primary causes of these changes? Please mark five Causes that you know are the causes.

m) Involving community members in the management of NNP
n) Changes in climate
o) Government rules that excluded people from the wildlife
p) Proposed recommendations of researchers in their report
q) Good relations between NNP management and neighboring communities
r) Reduction of forest by increasing the land of agriculture by peoples
s) Increased human population
t) Poor farming practices
u) uncontrolled poverty and lack of food
v) Conflictive relations between neighboring community and NNP management
w) Increasing in hunting activities
x) Decreasing of hunting activities

2.4 What would be your recommendations to improve the interaction between the NNP management board and the findings from researchers?

.....

.....

2.5 What changes would you wish to see from researchers as far as management of NNP?

……

……

……

Thank you!!!!!!!!!!

LIST OF BOOKS REFERRED FOR RECOMMENDATIONS

No	Author (s)	Title	Reason and place	Year
1	Corneille EWANGO	Flore et végétation de la forêt naturelle de Nyungwe, Rwanda in Systematics and Geography of Plants	Publication	2001
2	Claudine MUKAZANA	Report on Industrial Training Conducted in Nyungwe Forest Reserve	Kigali Institute of Science, Technology and Management (KIST) Department of Hospitality and Tourism Management	2003
3	Bonaventure SANGANO	Report of Practical Training on Industrial Training Conducted in ORTPN-Nyungwe	Kigali Institute of Science, Technology and Management (KIST) Department of Hospitality and Tourism Management	2003
4	William Apollinaire	Contribution a l'Etude Ecologoque du Comportement et du Regime Alimentaire d'un Groupe de Singes, Colobus angolensis dans la Foret Naturalle de Gisakura (Nyungwe	Contribution a l'Etude Ecologoque du Comportement et du Regime Alimentaire d'un Groupe de Singes, Colobus angolensis dans la Foret Naturalle de Gisakura (Nyungwe	2006
5	Augustin BIMENYIMANA	Analyse de la Structure Dimensionnelle des Especes Ligneuses d'Interet Biologigue dans la Conservation de la Biodiversite dans le Park National de Nyungwe	En vue de l'obtention du grade de Licencié en Education a l'Universite National du Rwanda, Faculte d' Education, Departement de Science Option Biologie.	2006
6	Julie L. Krajewski	Response Chimpanzees to Habituation and Human-Chimpanzee Encounters in Cyamudongo Forest	Master of Science Degree in Conservation Biology and Sustainable Development, at the University of Wisconsin-Madison	2007
7	Nicolas NTARE	Contribution a l'Etude Ecologoque du Regime Alimentaire et du comportement du Cercopithecus hamlyni au Park National de Nyungwe	En vue de l'obtention du grade de Licencié en Biologie, a l'Universite National du Rwanda, Faculte des Science, Departement de Biologie	2007
8	Josiane NIWENSHUTI	Etude Ecologoque et Sociale du Colobe, Colobus angolensis du Park National de Nyungwe	En vue de l'obtention du grade de Licencié en Biologie, a l'Universite National du Rwanda, Faculte des Science, Departement de Biologie	2008
9	Jean de Dieu NSEKEYIMANA	Rapport de Stage	En vue d'obtention du diplôme d'Ingénieur (a1) en Gestion de l'Environnement dans l'Institut Supérieur de Gestion et de Management (ISGM) Bukavu	2008
10	Siméon KWIZERA	Physico-Chemical and Microbiological Analysis of Water of Kamiranzovu River, Nyamasheke District, Western Province	Bachelor's Degree in Science with Education, at Kigali Institute of Education (KIE) Department of Biology, Chemistry, Physical Education and Sports	2010