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RESOURCES MANAGEMENT***

**The relationship between tourism benefits and positive
attitudes about conservation in communities around
Volcanoes National Park (VNP), Rwanda.**



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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Kigali, July 2024

APPROVAL

I, Christine Nyiramajyambere declare that this master’s dissertation “**The relationship between tourism benefits and positive attitudes about conservation in communities around Volcanoes National Park (VNP), Rwanda**” is the result of my own work in partial fulfilment of the requirements for the award of a master’s degree in Biodiversity Conservation and Natural Resource Management at the University of Rwanda, College of Science and Technology and has not been submitted for any other degree at the University of Rwanda or any other institution. All sources that I have used or quoted have been indicated and acknowledged in the references.

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DEDICATION

This research is dedicated to our Almighty God, who provided strength, knowledge, wisdom, and protection throughout this journey.

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LIST OF ACRONYMS

VNP: Volcanoes National Park

TRS: Tourism Revenue Sharing

RDB: Rwanda Development Board

CO₂: Carbon Dioxide

DRC: Democratic Republic (of Congo)

UNWTO: United Nations World Tourism Organization

US: United States

GS: Groupe Scolaire

DF: Degree of Freedom

X²: Chi-Square test

ABSTRACT

Protected areas play a crucial role in preserving biodiversity and providing ecosystem services while also offering opportunities to the communities. In Rwanda, the communities surrounding Volcanoes National Park (VNP) obtain benefits from tourism. However, how these tourism benefits affect the attitudes of local communities towards the conservation of the park is not well understood. Understanding how communities perceive benefits from nature tourism can contribute to more effective protected areas management. This study investigated the relationship between tourism benefits and positive attitudes about conservation among communities around VNP. It was intended to identify the direct and indirect benefits of tourism, to identify the relationship between tourism revenue sharing and the willingness of local communities to participate in the conservation of VNP, and to understand the perceptions of community members on the development of projects. A total of 255 interviewed participants were selected from 19 villages located in five cells of Kinigi sector between July and August 2024. Interviews were done using a structured questionnaire, administered via Kobo Toolbox/Collect to ensure accurate and consistent data collection. Results indicated that tourism benefits significantly influence positive attitudes towards conservation of VNP. The study showed that indirect benefits were numerous, and they had a more positive impact on the community to involve in conservation of VNP than the direct benefits.

Findings showed a strong relationship between proximity to VNP and willingness to participate in its conservation. The community living near the park border demonstrated limited willingness to engage in conservation efforts, whereas those who live far from the park expressed a significantly higher level of commitment to conserving Volcanoes National Park. Communities living near the park have identified negative impacts from the park including restrictions on land use and wildlife conflicts which affect their willingness to conserve VNP while communities far from the park receive tourism benefits without negative impacts from the park. Overall, most participants were satisfied with the tourism benefits, while only a small number expressed dissatisfaction. In this research, respondents expressed various strategies for enhancing conservation efforts including establishing medicinal plant nurseries, developing a conservation mobile app, funding small businesses, community prioritization based on distance from the park, and provision of conservation books in Kinyarwanda or simple flyers.

Keywords: Tourism benefits, Ecotourism, Positive attitudes, Conservation, Communities, Volcanoes National Park.

Chapter 1: INTRODUCTION

1.1. Background and problem statement

1.1.1 Background

An extraordinary feature of life is its diversity (Cardinale et al., 2012). Biodiversity loss is a serious threat to ecosystem services nowadays. As a recent and increasing direct driver, climate change has rightfully drawn attention but other factors, such as the direct exploitation of natural resources, changes in land and sea usage, pollution, and invasive alien species, continue to significantly reduce biodiversity. These direct factors most significantly affect the diversity of genes, species and ecosystems through biodiversity loss (Jaureguiberry et al., 2022).

The most comprehensive global systematic review to date highlights several key factors contributing to biodiversity loss (Diaz & Malhi, 2022). These factors encompass direct exploitation such as hunting, fishing, selective logging, and land and sea use changes, involving alterations in means of temperature, precipitation, and coastal development. Additionally, the review identified deforestation and expansion of agricultural boundaries as significant contributors to the decline in biodiversity. Invasive species, introduced either voluntarily or accidentally by humans, further increase the challenges faced by ecosystems. The review emphasizes the impact of pollution on biodiversity loss encompassing chemical pollution, acidification of seawater from elevated CO₂ levels in the atmosphere, and various forms of environmental pollution like light and noise pollution. Furthermore, the frequency and severity of extreme climatic events appear as critical factors influencing biodiversity decline. The interconnectedness of various human-induced activities and environmental changes, collectively contributing to the ongoing loss of biodiversity in ecosystems today (Diaz & Malhi, 2022).

Apart from direct drivers, indirect factors can cause biodiversity loss through social, economic, demographic, cultural, institutional and political in character and they are ultimately supported by society narratives and ideals (Diaz & Malhi, 2022). The main drivers of those threats are poverty, lack of access to resources, insufficient land and population density, population pressure, poaching and uncontrolled hunting (Luck, 2007). Citizens should have a duty to protect, maintain and promote the environment but if a population is growing, it ends up putting pressure on natural resources which leads to the loss of biodiversity (Habiyaemye et al., 2011).

Protected areas are designated regions that are managed primarily for the conservation of nature, playing a crucial role in safeguarding biodiversity. By restricting activities that could harm the environment, such as deforestation, hunting, and industrial development, these areas provide a shelter for countless species of plants and animals. The establishment of protected areas helps to maintain natural habitats, supports ecological processes, and allows ecosystems to function without significant human interference. Additionally, these areas often serve as benchmarks for the natural state of ecosystems, offering opportunities for scientific research and environmental education. The effective management of protected areas is essential for preserving the diversity of life on Earth and ensuring the sustainability of ecosystem services that are important for human well-being (Dudley, 2008).

Some approaches integrate local communities near protected areas into biodiversity conservation by promoting revenue sharing based on tourism (Stem et al., 2003). The use of revenue sharing is based on attractions of nature-based tourism that provide employment and generate revenues shared with communities which can offer alternatives to the reliance on park resources among the communities, and these benefits can in some cases promote positive perceptions or views about conservation and sustainable management of nature (Newsome & Hassell, 2014). Such approaches can reduce human-wildlife conflicts, improve local attitudes toward conservation, strengthen the living condition of the communities and provide alternatives to the park resources (Nepal & Spiteri, 2015). This creates incentives as a conservation tool that assists positively and can be effective to biodiversity conservation (Nibigira et al., 2017).

Particularly, communities can benefit directly by earning income from tourism, and employment and indirectly through development projects such as building schools, roads, and health centers which act as incentives for conservation (Sabuhoro et al., 2018). The benefits obtained by community members from tourism can improve park management and promote conservation by reducing pressure on natural resources (Karanth & DeFries, 2011). Other research has shown ecotourism as a form of tourism in which natural areas are the prime attractions and it is a responsible travel choice that prioritizes environmental protection and community well-being, but inadequate benefit sharing and participation of the communities in planning and implementation of the projects create poor linkage which can hinder effective ecotourism and conservation (Menbere & Admassu, 2020).

A common approach for integrating wildlife conservation and rural development in Africa is Tourism Revenue Sharing (TRS). Revenue sharing refers to the procedures for allocating a percentage of the protected area's earnings to local stakeholders as a means of encouraging them to support conservation (Snyman et al., 2023). Rwanda is a good example where revenue sharing was begun in 2005 to ensure that local communities specifically benefit from protected areas; it has built trust between the Rwanda Development Board (then known as the Rwanda Office of Tourism and National Parks) and encourages the conservation of wildlife and protected areas (Snyman et al., 2022).

When the Gishwati-Mukura National Park, Rwanda's fourth national park, was established in 2015, the Rwanda Development Board (RDB), Rwanda's park authority modified the TRS policy to include the new national park and in 2017 fees to hike with mountain gorillas in Volcanoes National Park were increased to US\$1,500. This rise has allowed the park management to increase the portion of revenue designated for the TRS from 5% to 10%. The 10% of combined national park earnings is presently distributed in accordance with the following ratio: 15%, Gishwati-Mukura National Park; 35%, Volcanoes National Park (among 330,000 people); 25%, Akagera National Park; 25%, Nyungwe National Park (S. S. Snyman et al., 2023). This could be used to improve local people's livelihoods, reduce illegal activities, and improve wildlife conservation by compensating for costs such as loss of agricultural productivity to animal crop raiding (Munanura et al., 2016). In addition, as the population around the national parks continues to grow the basic needs and demands on the environment increase such as firewood, bush meat, clean water, and medicinal plants (Plumptre et al., 2014; Rija, 2017). Therefore, conservationists have turned to ecotourism as a conservation tool where tourism is meant to be responsible for conserving nature and improving the well-being of the local people (Sabuhoro et al., 2017).

The increased recognition of benefits leads to a stronger perception of the link between natural resources and livelihoods, which in turn fosters more positive attitudes towards park management (Khoat, 2023). Biodiversity conservation can be achieved through the provision of tourism benefits among the community members around protected areas (Munanura et al., 2016). It is questioned whether tourism effects contribute towards conservation or if it is used to develop the tourism industry for their benefit (Newsome & Hassell, 2014). Furthermore, there is insufficient clarity

regarding whether receiving benefits from tourism and the conservation of VNP leads to increased positive attitudes and greater support for conservation among communities around the park. In this study, I focused on the Volcanoes National Park (VNP) in Rwanda, where revenue sharing has been in progress since 2005, the human population density around the park is extremely high, and pressures on the park are intense. The results of this study will have implications for the management of ecotourism and revenue-sharing programs among the communities around VNP.

1.1.2 Problem statement

Communities have a significant role in biodiversity conservation and improving the integration of conservation and development requires rethinking conservation through the ability to deal with multiple objectives and use of partnerships. For example, national parks can develop diagnostic tools that can be required for sustainable conservation of biological species (Dvornik Perhavec et al., 2015; Sumarmi et al., 2021). A study showed that attitudes towards protected area tourism was more positive among those receiving economic benefits from tourism than those not economically benefiting (Mehta & Keller, 1998). Ensuring local support for protected areas is increasingly observed as an important element of biodiversity conservation through provision of benefits from protected areas (Goodwin, 2001). Studies documenting the opinions of local communities toward conservation of biodiversity have been conducted in various parts of the globe (Berkes, 2007).

The beginning of tourism has traced to the early 20th century, when naturalists, scientists and zoologists began to become interested in Rwanda's unique flora and fauna, different primates and particularly its endangered mountain gorillas. For several years, the most recognizable tourist attraction in Rwanda has always been its mountain gorillas (Mazimhaka, 2007). There is a rational approach to ecotourism and revenue sharing that has been done in the Volcanoes National Park in Rwanda. It has created advantages for both the local communities and the conservation of the park's natural resources by sharing a percentage of the tourism revenue with the communities so as to fight poverty and provision of incentives for conservation (Sabuhoro et al., 2017).

The communities around Volcanoes National Park in Kinigi sector, Musanze District, Rwanda, benefit from tourism in several ways, such as employment, income generation, and infrastructure development. However, it remains uncertain how these tourism benefits affect the positive

attitudes of the communities towards conservation of VNP. This study was conducted to investigate the relationship between tourism benefits and positive attitudes about conservation in these communities around VNP. I have used comparative approach and I documented the direct and indirect benefits from tourism among the local people around VNP, the relationship between tourism and willingness of local people to participate in the conservation of VNP and the perceptions of community members to the projects developed for them regarding protection of VNP. My focus was communities from 19 villages in four cells of Kinigi sector, Rwanda. During this study, I have targeted community members who directly and indirectly benefit from the park, and the relationship between distance community members live from the park and effect of tourism benefits on their attitudes and perceptions towards conservation.

1.2. Main objective of the study

The main objective of this study was to assess the relationship between tourism benefits and the perceptions of community members toward the conservation of Volcanoes National Park, Rwanda to help improve park management and the revenue sharing program.

1.2.1 Specific objectives

1. To identify the direct and indirect benefits of tourism among the local people around VNP.
2. To identify the relationship between tourism revenue sharing and the willingness of local people to participate in the conservation of VNP.
3. To understand the perceptions of community members about the projects developed for them related to the protection of VNP.

1.2.2 Research questions

1. What are the direct and indirect benefits from tourism received by the local people around VNP?
1. Is there any relationship between receipt of benefits from tourism and willingness of local people to participate in the conservation of VNP?
2. What are the perceptions of community members to the projects developed for them related to protection of VNP?

1.2.3 Research Hypotheses

1. Direct and indirect benefits from tourism have no relationship with community members' perceptions about park protection.
2. There is no relationship between receipt of direct benefits and willingness to participate in VNP conservation.
3. There is no relationship between distance from the park boundary and willingness to support park conservation

1.3. Literature review

Ecotourism is defined as tourism in natural settings that includes elements of environmental education, conservation and benefit sharing with local populations. It encourages the actions that assist and maintain local biodiversity and ecosystems through enhancing environmental awareness and learning opportunities among visitors and with local populations by emphasizing the significance of biodiversity preservation through environmental education. It generates net positive incentives to the local economies and the well-being of communities to make them value and protect the environment (Santarém et al., 2019).

Ecotourism is a commercial phenomenon which entails the movement of people to natural areas for environmental, social, and economic effects that effectively contributes to the conservation of biological variety while having a good net ecological impact (Poudel & Nyaupane, 2014). It has been seen as a solution in conservation through the promotion of employment and earning foreign exchanges which contribute to the conservation of natural and cultural resources (Wolf et al., 2019). It has been shown that there are three categories into which the connection between nature preservation and tourism may be divided: coexistence, conflict, and interaction. The concept of coexistence relates to the fact that those involved in environmental protection and tourism have different perspectives and have ill-defined relationships. Coexistence can, however, turn into either conflict or interaction. When tourism significantly degrades the environment or when there is minimal connection between it and conservation, a conflict arises (Buckley, 2011).

Tourism in Europe is considered as an alternative means of income in rural areas as there is a significant decrease in agriculture and forestry (Parks et al., 2002). Thus, it is important to understand the clear relationship between tourism industry and conservation of biodiversity

primarily based on the different attitudes of local people living in close proximity to protected areas (Vodouhê et al., 2010). Furthermore, Mariki (2016) argued that effective conservation development should be rooted in the views from local people about environmental conservation.

In developing countries, wildlife conservation often includes wildlife tourism that is used as a strategy to promote integrated conservation and development and it is potentially to provide local economic benefits while protecting wildlife (Munanura et al., 2016). Also, nature based tourism is an important services and it can generate support to conservation (Nibigira et al., 2017). It has the potential to provide an economic justification for conservation and it generates economic benefits directly to national economies and local people (Sabuhoro, et al., 2017). Ecotourism is the fastest growing segment of the nature based tourism industry in Africa and it remains an important tool for conservation and community development where governments, communities and tourists are able to commit the responsibilities towards to nature as well as sustainable conservation of biodiversity (Sabuhoro, et al., 2017). Furthermore, the wildlife economy has the potential to be a major driver of economic growth, development, and conservation effort in Africa. The tourism sector is the largest contributor to the wildlife economy in Africa and generating revenue estimated \$27 billion in 2019 and hunting is another important source of income for many communities in Africa, generating revenue estimated at \$2.6 billion in 2019. However, hunting is controversial and there are concerns about its sustainability. The wildlife economy can also be a powerful tool for conservation, as it provides incentives for communities to protect wildlife and their habitats. For example, in South Africa, the wildlife economy generates an estimated at \$1.5 billion per year for conservation (S. Snyman et al., 2021).

Biodiversity based on tourism can achieve success when there are strengths on tourism benefits among the local people which would motivate them to contribute to the protection of nature (Franco et al., 2019). This can happen if local people are engaged in planning and implementation of programs that aim to generate benefits to them (Sabuhoro, et al., 2017). This is to explain that tourism activities should be performed considering the direct and indirect long-term tourism benefits among the community members around protected areas. (Sabuhoro, et al.,2017), strongly clarified that the principal of regular sharing of ecotourism income with local people can serve as an alternative economy for them and reduce their dependency to the resources from nature and thus induce sustainable conservation of biodiversity.

1.3.1 Tourism and conservation benefits in Rwanda

The economic income from tourism sector in Rwanda decreased mainly during the interval of years between 1990 and 1994, when the civil conflict was at high extent and these conflicts deteriorated into war leading to genocide. It is understandable that due to the state instability, the country's tourism industry faced a significant devastating slump (Cyuma, 2009). After such difficult moments, the new Rwandan state completes its transition to stability, and it has been determined to input more effort to rebuild what was lost, and this has been accompanied by the development of the national tourism industry (Grosspietsch, 2006). Especially since 2001, the country has made a renewed commitment to tourism as this industry is considered to be a significant driver of economic development, job creation and economic stability (Grosspietsch, 2006).

Today, the tourism sector is considered as the main economic pillar and is growing at considerable extent and the country is principally known for the famous rare mountain gorillas (*Gorilla beringei*) that attract many tourists from around the world (Gray et al., 2010). The United Nation World Tourism Organization (UNWTO) considers Rwanda as a country with an excellent tourism asset. Rwanda has made significant progress in developing and managing its tourism sector in recent years, having increased tourism revenue impressively from 26 million US dollars in 2005 to 200 million US dollars in 2018 (Minicom, 2009; UNWTO, 2009; Spenceley et al., 2010). The financial benefits are used in turn to develop various infrastructures such as construction of hotels, health centers, schools, and roads which provide benefits to people in the form of employment (Nielsen & Spenceley, 2010b; Spenceley et al., 2010).

The poor local communities around the park should be given priority for poverty alleviation which in turn can help local people to be aware and understand the benefits of conservation of biodiversity (Nielsen & Spenceley, 2010b; Spenceley et al., 2010). In addition, the government of Rwanda established the principal of revenue sharing that is meant to help local communities living around VNP to gain 6% of the total annual benefits from mountain gorilla tourism (Sabuhoro et al., 2017).

1.3.2 The perception of tourism and conservation among the stakeholders around VNP

Previous park management was usually being done by imposing rules and regulations regarding the protected areas to the local residents which can contribute to the development of negative perceptions of the conservation of nature (Theses & Szell, 2012). This old conservation approach can foster nature-people conflicts (Manfredo & Dayer, 2004). Making use of the economic benefits of ecotourism may benefit conservation, promoting biodiversity generally, by ensuring that there is adequately habitat protection for a wide range of species (Burger, 2000). This approach recognizes the local people by understanding their perceptions and the potential for tourism to provide conservation benefits which are important in shaping willingness to conserve the nature (Theses & Szell, 2012). Research by (Nielsen & Spenceley, 2010a), found that indirect benefits derived from a variety of development projects implemented such as schools, roads, health centers, employment (crop rangers, anti-poachers, guides, trackers) led community members to consider parks as their own.

Chapter 2: METHODS

2.1 Study area description

This study was conducted around Volcanoes National Park (VNP) in Kinigi Sector, Musanze District, located in the northwestern part of Rwanda. VNP connects to Virunga National Park in DR Congo and Mgahinga National Park in Uganda. It is made up by Karisimbi (the highest volcano with 4,507m), Bisoke, Sabyinyo, Gahinga and Muhabura. It is recognized as one of the most critical ecosystems for conservation globally because it is a habitat of gorillas and other species that are the major sources of tourism revenues in Rwanda (Munanura et al., 2016). Kinigi sector was the focus under this study because it is adjacent to VNP. Specifically, the study took place in five administrative cells of Kinigi sector such as Nyonirima, Kampanga, Nyabigoma, Kaguhu and Bisoke which are near and far from VNP (Figure 1).

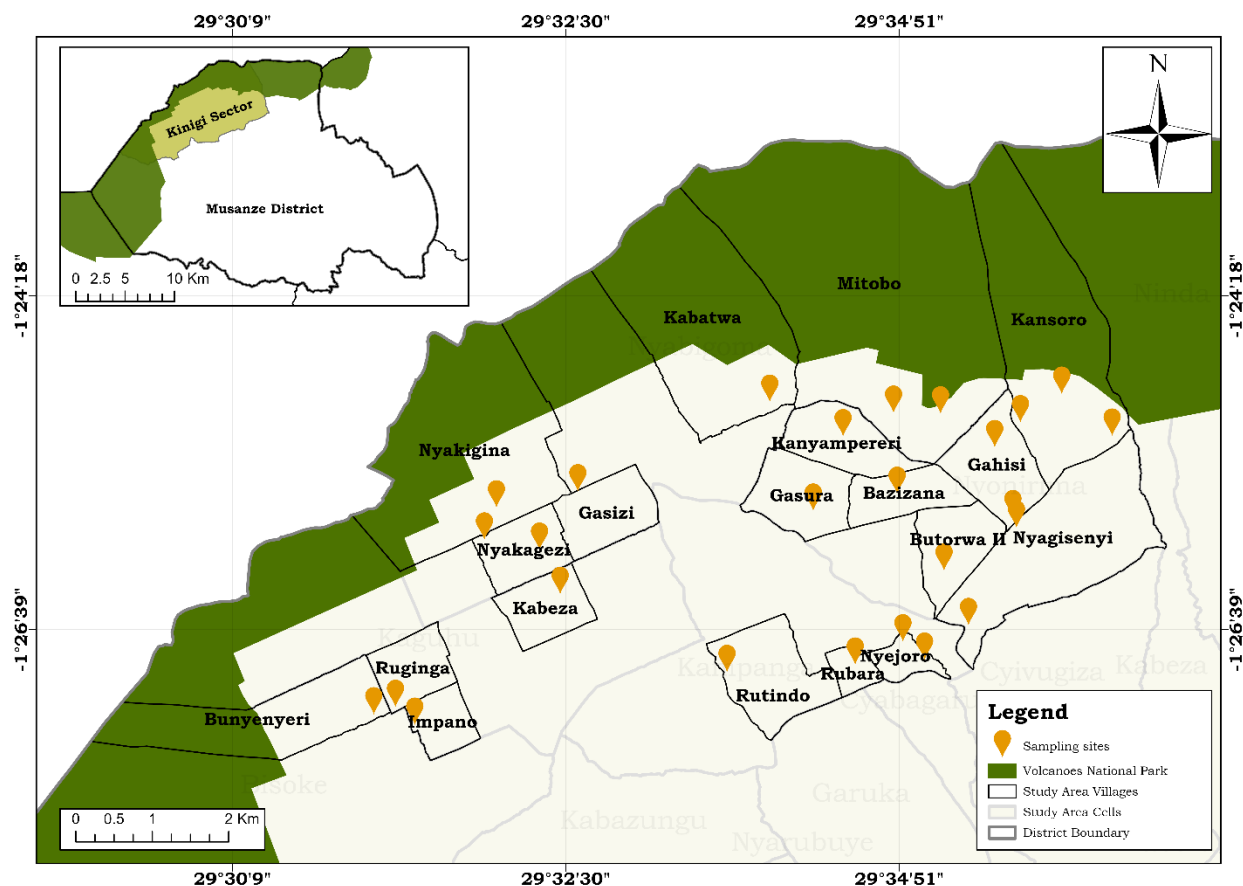


Figure 1: Map of study area and villages surveyed in Kinigi sector, Musanze District around the boundary of Volcanoes National Park, Rwanda

2.2.1 Sampling design

Primary data were collected using structured questionnaires; 255 interview participants were selected randomly from the selected 19 villages within Kinigi sector to be administered the questionnaires. A questionnaire is used to gather quantitative data on social research where a series of questions is asked to individuals to get statistically useful information (Roopa & Rani, 2012). The questionnaire included closed-ended questions using a Likert scale which helped to get data from large number of respondents and open-ended questions allowed the respondents to express their views in their own words with full information including economic benefits, social benefits, level of willingness to participate in conservation, the root causes of the negative attitudes of VNP conservation and the ways of participating in conservation of the park. These questionnaires were divided into three sections. The first section focused on gathering information about the respondents' socio-economic background, including their gender, age, marital status, education level, duration of involvement in revenue sharing, and their distance from the park and how they participate and contribute to the conservation of VNP. The second section collected information about the link between tourism benefits and positive attitudes towards conservation within communities around VNP, benefits they receive from tourism, and their willingness to engage in VNP conservation efforts. The third section focused on important questions related to three main points: recognizing the direct benefits of tourism by categorizing them as immediate impacts on community members and identifying the indirect benefits of tourism by classifying them as secondary impacts on the local community surrounding VNP, identification of the relationship between tourism revenue sharing and the willingness of local people to participate in the conservation of park and to understand the perceptions of community members on the projects developed for them related to the protection of VNP. The questionnaires were translated into Kinyarwanda, the sole local language spoken in Rwanda, to ensure that participants could understand the questions during the survey.

This research aimed to investigate the relationship between tourism benefits and positive attitudes about conservation in the communities around VNP. In this study, I evaluated the social benefits, including social cohesion by examining the level of participation in conservation and tourism-related activities within the community around Volcanoes National Park (VNP). The community's

ability to resolve wildlife conflicts without harming the animals helped me to understand how cohesive the community is in supporting park conservation. These dimensions collectively helped me to social cohesion and its influence on positive conservation attitudes. Therefore, sample size was crucial for a range of experience within the communities and to ensure the diversity of opinions and attitudes of the communities about tourism benefits and conservation of VNP. I have used Yamane formula for calculating sample size where Where: **n** is the sample size, **N** is the total population size and **e** is desired level of precision or margin of error (Israel, 1992).

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

I have used the 2022 population census data from the National Institute of Statistics Rwanda for the Kinigi sector, which indicates a total population of 32,297. In this context, **n**: sample size, **N**: was population size (32,297) and **e**: was margin of error (0.0624 %), $n = 32,297 / 1 + 32,297(0.0624)^2 = 254.7 \sim 255$. This is how I came up with this number of people and this sample size has represent a subsets of the total population of 19 villages from 5 Cells of Kinigi Sector.

The participants of this study were selected from 19 villages using simple random sampling where every community has equal chance to be selected but also their location from the VNP. This was to ensure that the study included a representative sample of people from different villages and their willingness to participate in conservation. These cells were Nyonirima, Kampanga, Nyabigoma, Kaguhu and bisoke. The villages from Nyonirima will be Kanyampereri, Butorwa II, Bazizana, Gasura, Gahisi, Kansoro and Nyagasenyi. While the villages in Kampanga cell will be Nyejoro, Rubara and Rutindo. The villages from Nyabigoma will be Mitobo, Nyakigina, Nyakakagezi, Gasizi, kabatwa while the villages from Kaguhu cell will be Kabeza, Ruinga, Impano and Bunyenyeri village from Bisoke cell.

2.2.2 Data collection

In this study, I utilized KoBo Collect, a convenient tool for remote data collection that operates offline. It allows researchers to create surveys and forms using a drag-and-drop interface or by uploading an XLSForm, a standard format for designing forms in Excel. These forms can be

deployed on mobile devices through the KoBoCollect app or via a web browser. Data is collected using a 'one-click method' and can be compiled based on the predefined criteria of the research. KoBo Toolbox is an ideal tool for data collection, simplifying the process for researchers by providing high-quality data, enhancing the speed and efficiency of field activities, and reducing the overall cost of data collection (Lakshminarasimhappa, 2021).

I have used both quantitative and qualitative methods to examine the relationship between tourism benefits and positive attitudes about conservation among the communities around VNP. Quantitative data were collected through structured questionnaires with Likert scale items, administered to a representative sample of community members. These questionnaires measured the extent of tourism benefits (economic, social, environmental) and attitudes towards conservation. Qualitative data were gathered through in-depth interviews with selected participants to provide their insights related to tourism benefits and conservation. This combination of data collection methods enabled a comprehensive understanding of people's beliefs, experiences, attitudes, behaviors, and interactions concerning the conservation of VNP.

Furthermore, individuals were only included as participants after they gave consent to participate in sharing information about their positive or negative attitudes about conservation. Random sampling technique is a type of non-probability sampling that is most effective when one needs to study a certain perception domain with knowledgeable experts within (Tongco, 2007). Random sampling is more applicable to research exploring the opinions of people about something and its impacts to their life now and in the future. I met with them in their homes and farms, and I have included men and women to know different insight on the impact of tourism benefits on conservation but also adults and youth were considered so as have different perspective on tourism and conservation. The findings are expected to inform sustainable conservation strategies and provide practical recommendations for policymakers, researchers, and community stakeholders.

2.2.3 Data Analysis

The data about the relationship between tourism benefits and positive attitudes about the conservation in the community around VNP has been analyzed using Micro soft excel where the statistical analysis has been done through Chi-square tests, correlation analysis, and regression and to determine whether relationships between variables are statistically significant. The relationship between direct and indirect tourism benefits and community members' perceptions of park

protection were examined using a Chi-square test for independence, where a contingency table compares benefits received and perceptions. Similarly, the relationship between direct benefits and willingness to participate in conservation efforts has been assessed through a Chi-square test to see how receiving benefits influences participation in conservation. In addition, the relationship between distance from the park boundary and willingness to support conservation was tested using correlation analysis where distance served as the independent variable and willingness to support as the dependent.

Chapter 3. RESULTS

3.1 Demographic structure of communities who participated in the research

A total of 255 local community members were participated in the study including both women and men, with a notable portion being between the ages of 31 and 40. There was lower participation from individuals aged 60 and above. More than half of the participants were married. Additionally, most respondents had completed their primary education (Figure 2).

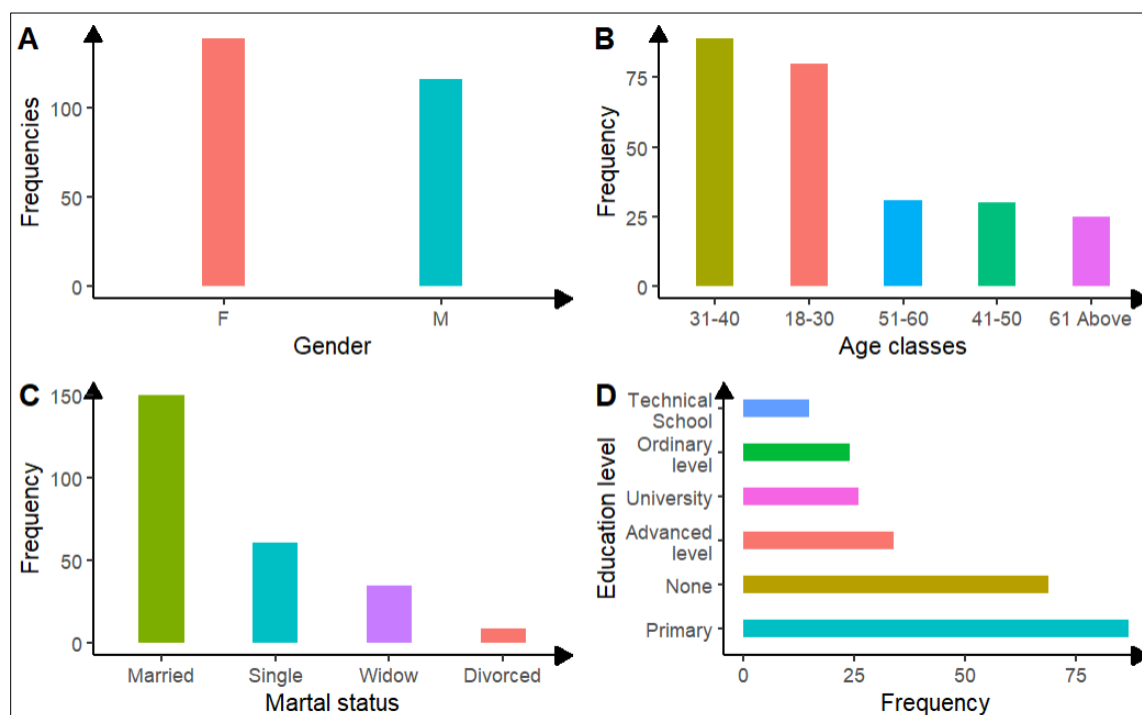


Figure 2: Demographic structure of communities who participated in the research

3.2 Direct and indirect benefits from tourism among the local people around VNP

3.2.1 Direct and indirect tourism benefits obtained among the community around VNP

The study revealed that tourism contributes to community development through provision of both direct and indirect benefits. Significantly more respondents mentioned receiving indirect tourism benefits ($\chi^2 = 333.76$; Df = 9, and P value = 1.75×10^{-66}). Only three direct benefits were identified in this study (shown in Figure 3).

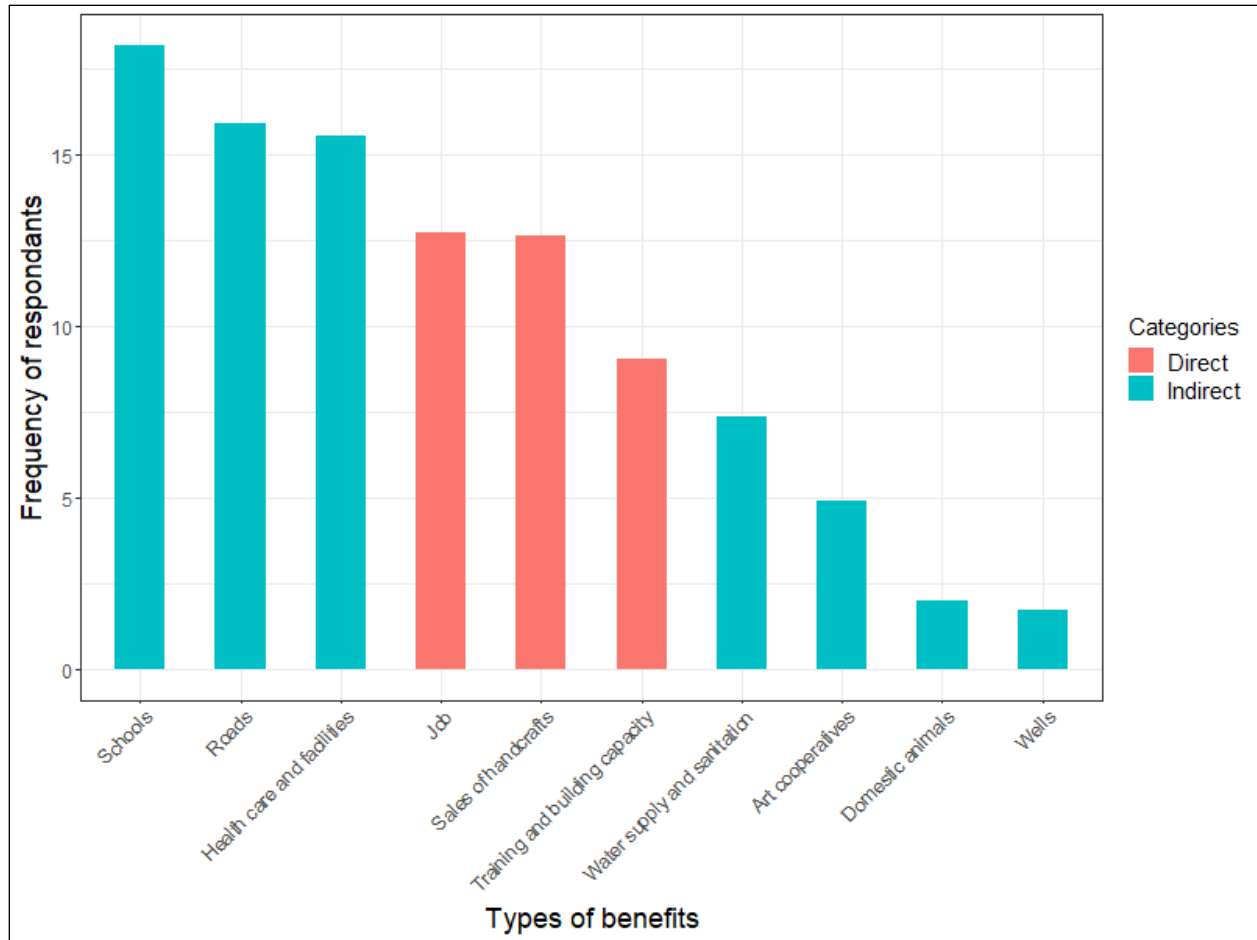


Figure 3: Category of direct and indirect tourism benefits obtained among the communities around VNP

3.2.2 Social benefits from tourism in the community around VNP

During the interviews, participants highlighted social benefits from tourism activities such as cultural preservation and social cohesion. There were highly significant differences between the types of social benefits identified by people in the study ($\chi^2 = 109.42$, $Df = 4$, and $p < 0.0001$). The study found that culture exchange was the most common social benefit mentioned by respondents, followed by cultural preservation (Figure 4).

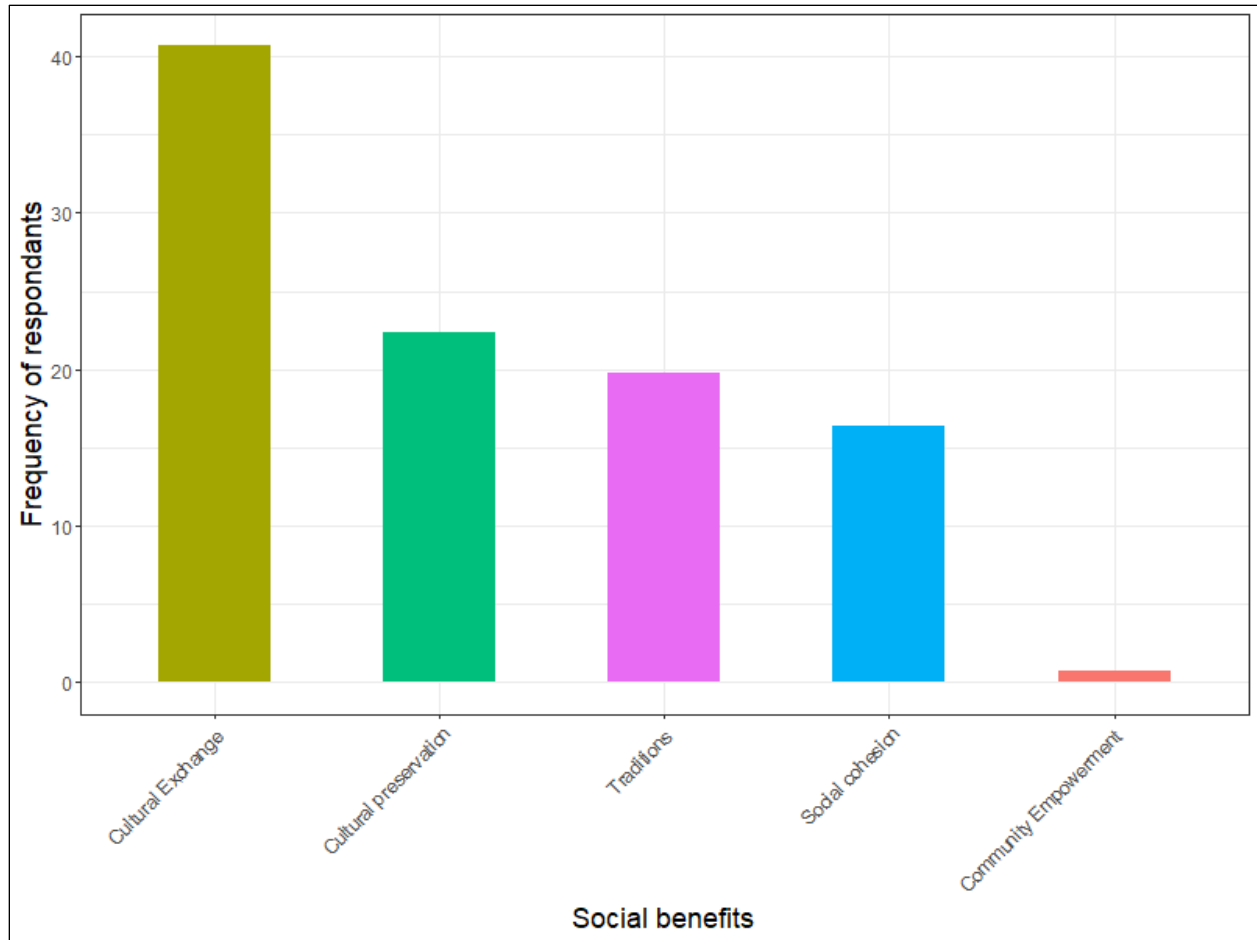


Figure 4: The social benefits from tourism among the communities around VNP

3.3 The relationship between tourism revenue sharing and willingness of local people to participate in the conservation of VNP

3.3.1 Income generation activities among the community around VNP

Income-generating activities among the people living near VNP included a variety of pursuits. According to the study, farming is the most common income generating activity, while handicrafts were also important to more than 20% of the respondents, and this activity is related to tourism (Figure 5).

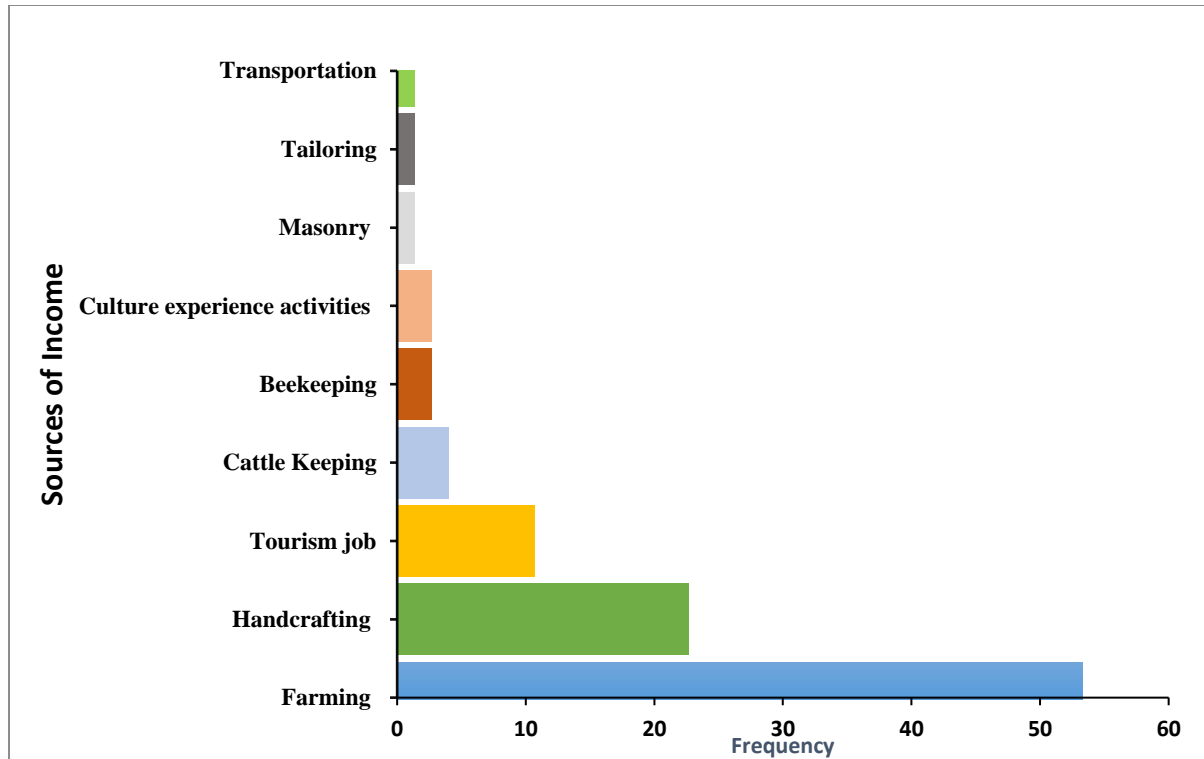


Figure 5: Income generation activities among the community around VNP

3.3.2 Estimated income from different tourism outcomes

The research showed that the estimated incomes from various tourism-related jobs among the community near VNP vary by position, with some tourism operation and hotel cleaner roles offering earnings at the higher end, while others fall within a mid-range. Handcraft positions also vary with earnings that can be slightly lower or higher than those of other tourism-related jobs. Overall, income can range from small to large depending on the specific role and responsibilities (Table 1).

Table 1: Estimated income from different tourism outcomes

Tourism Job	Income from tourism	Count	Percent
Tourism Operation	20,000-30,000	3	0.23
	50,000-60,000	3	0.23
Hotel cleaner	20,000-30,000	2	0.15
	50,000-60,000	2	0.15
Handcraft	20,000-30,000	1	0.08
	40,000-50,000	1	0.08
Tourism operation	30,000-40,000	1	0.08

3.3.3 The level of willingness to participate in conservation of VNP

The willingness of people living in the landscape around VNP to participate in conservation varied. Most people were willing to participate in the conservation of VNP (Figure 6).

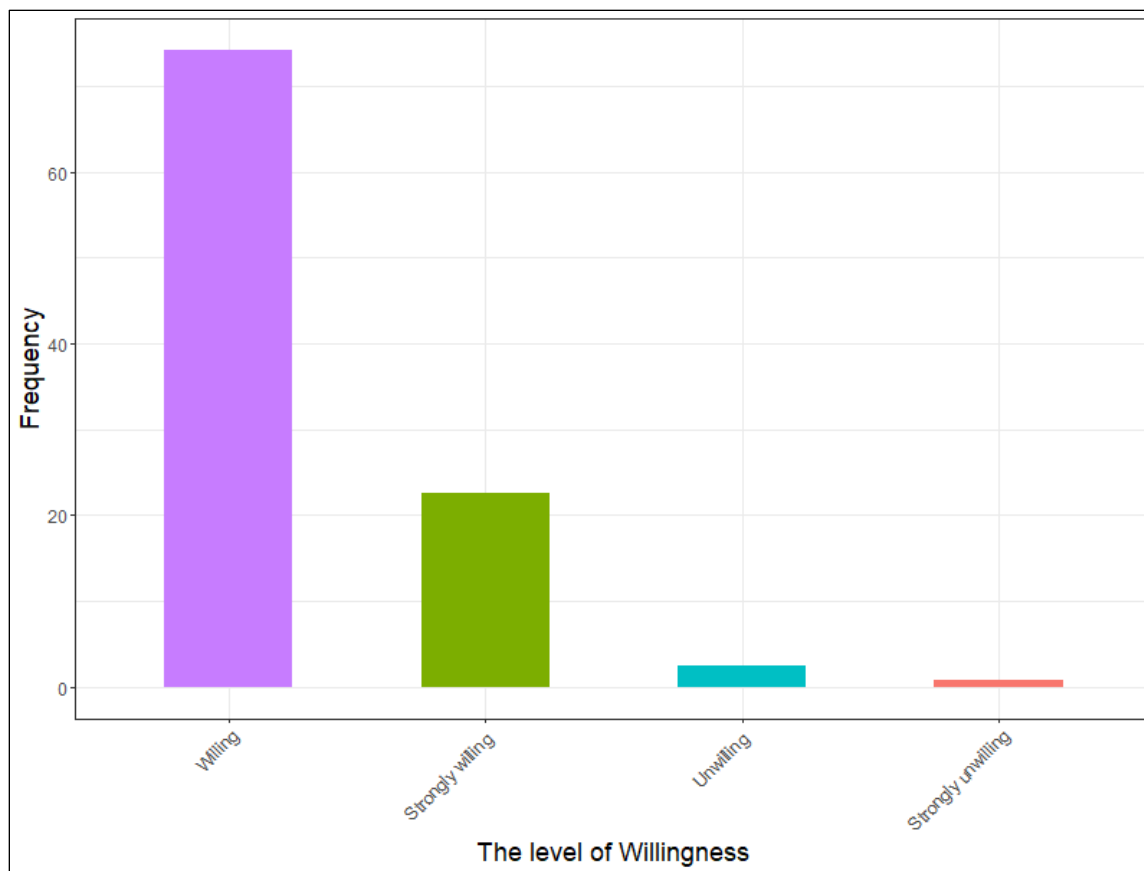


Figure 6: Level of willingness to participate in conservation

3.3.4 The willingness to participate in conservation and distance from the park

There was a significant relationship between the proximity to VNP and willingness to participate in its conservation. The distances were categorized into short (within 1 kilometer), medium (about 3 kilometers), and long distance (~6 kilometers). Those living far from the park border exhibited the highest level of willingness to participate in conservation of the VNP (Figure 7). Communities living near the park have identified negative impacts from the park including restrictions on land use, wildlife conflicts, and limited access to resources which may affect their willingness to conserve VNP.

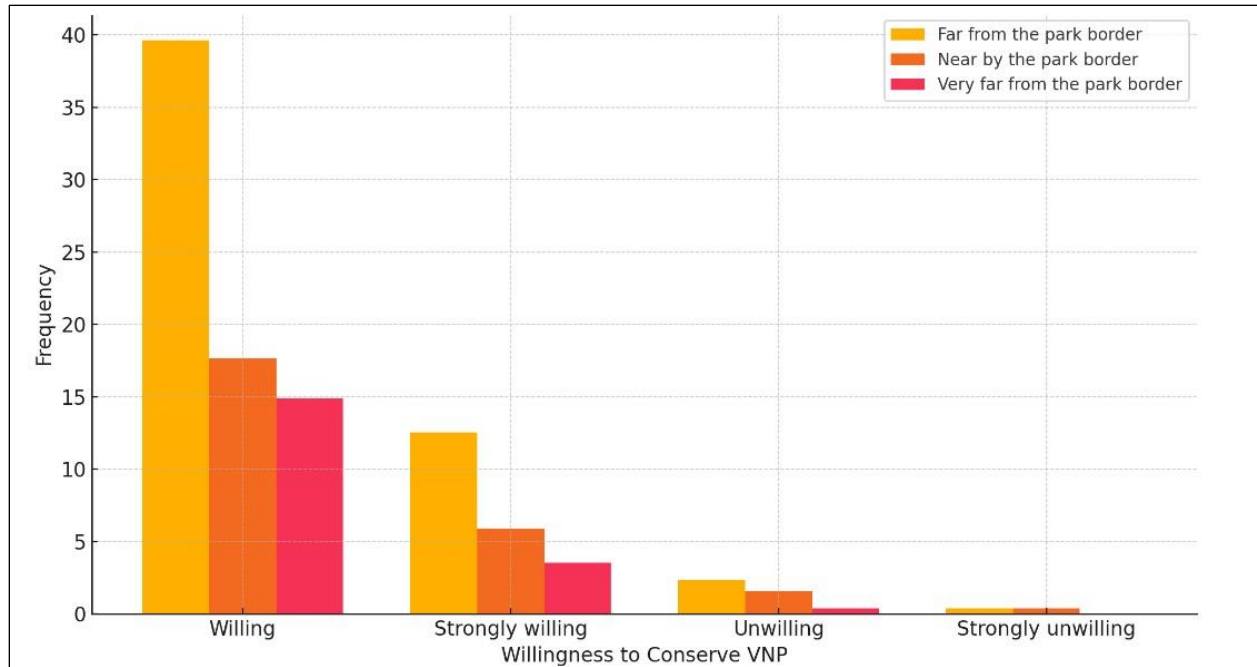


Figure 7: The level of willingness to conserve VNP and distance from the park border

3.3.5 The level of satisfaction with the tourism benefits from the VNP

The statistical analysis revealed a significant difference (Chi-square test = 269.06, Df = 3, P value = 4.9×10^{-58}) between tourism benefits and communities' satisfaction. Most respondents were satisfied, and only a few were strongly unsatisfied with tourism benefits from the VNP (Figure 8).

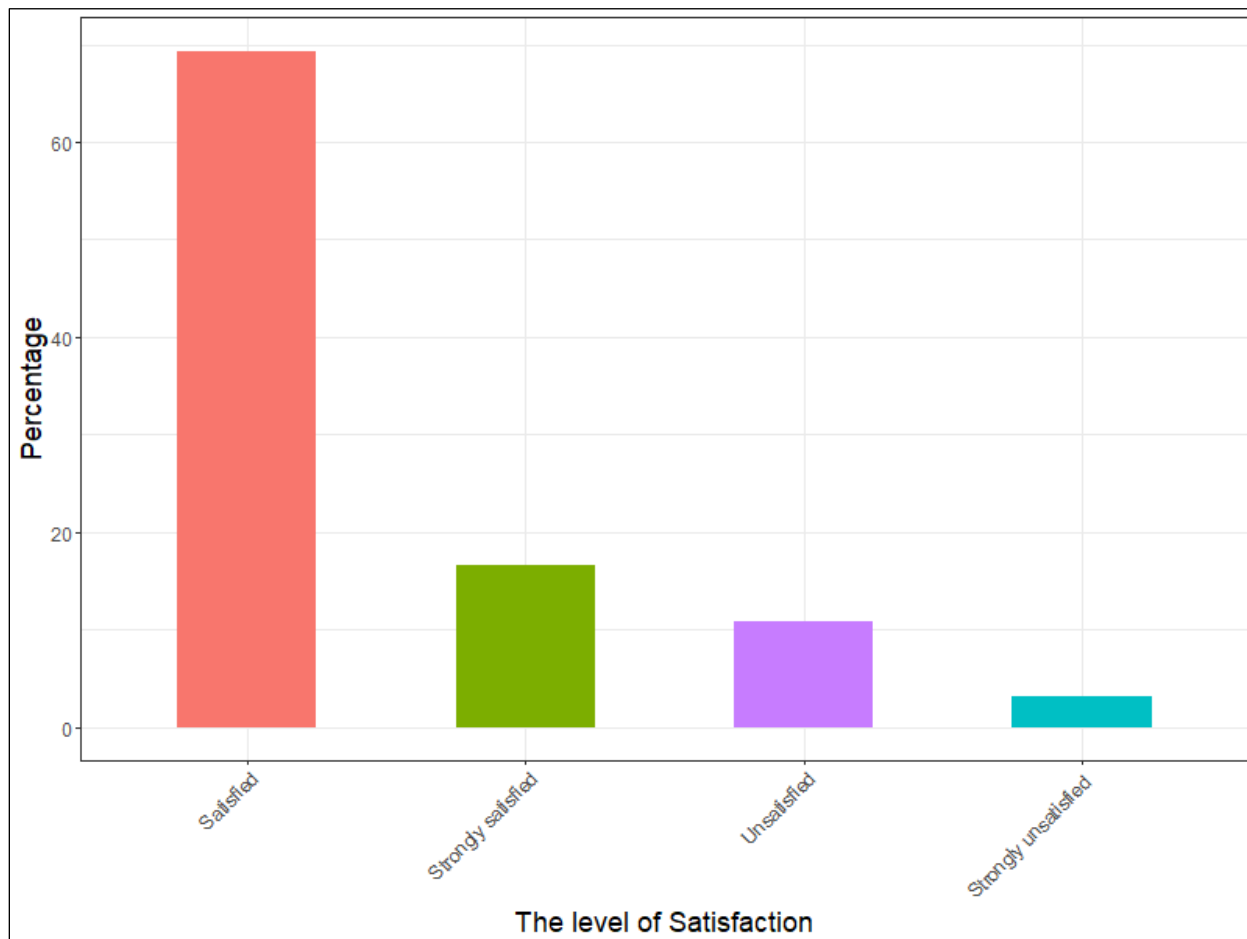


Figure 8: The level of satisfaction with tourism benefits among communities living around the VNP, Rwanda

3.3.6 Participation in conservation of VNP among the community

There was a significant difference in how communities became involved in conservation (P value = 0.002014, Chi-square test = 18.89, Df = 5). The results indicated the ways people became involved in the conservation of VNP including active volunteer to promote protection of VNP among the community was the most common way, followed by to contribute in the environmental

education among the youth for future generation, advocacy about conservation and the community engagement, to motivate the community about proper wastes disposal (Figure 9).

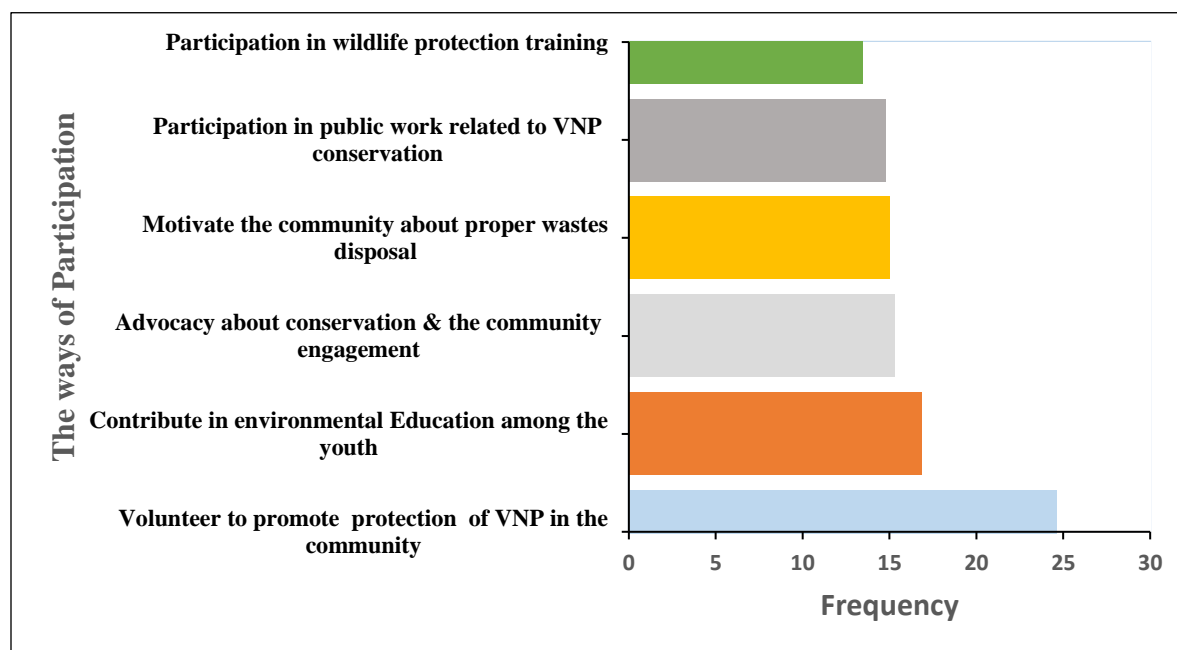


Figure 9 : The way of participation in conservation of VNP

3.3.7 Sources of development projects in the community around VNP

There was a significant difference (Chi-square test = 182.47, Df = 3, P value = 2.58×10^{-39}) in the sources of development projects; Rwanda Development Board (RDB) provides the largest share followed by Non-Governmental Organizations (NGOs) (Figure 10).

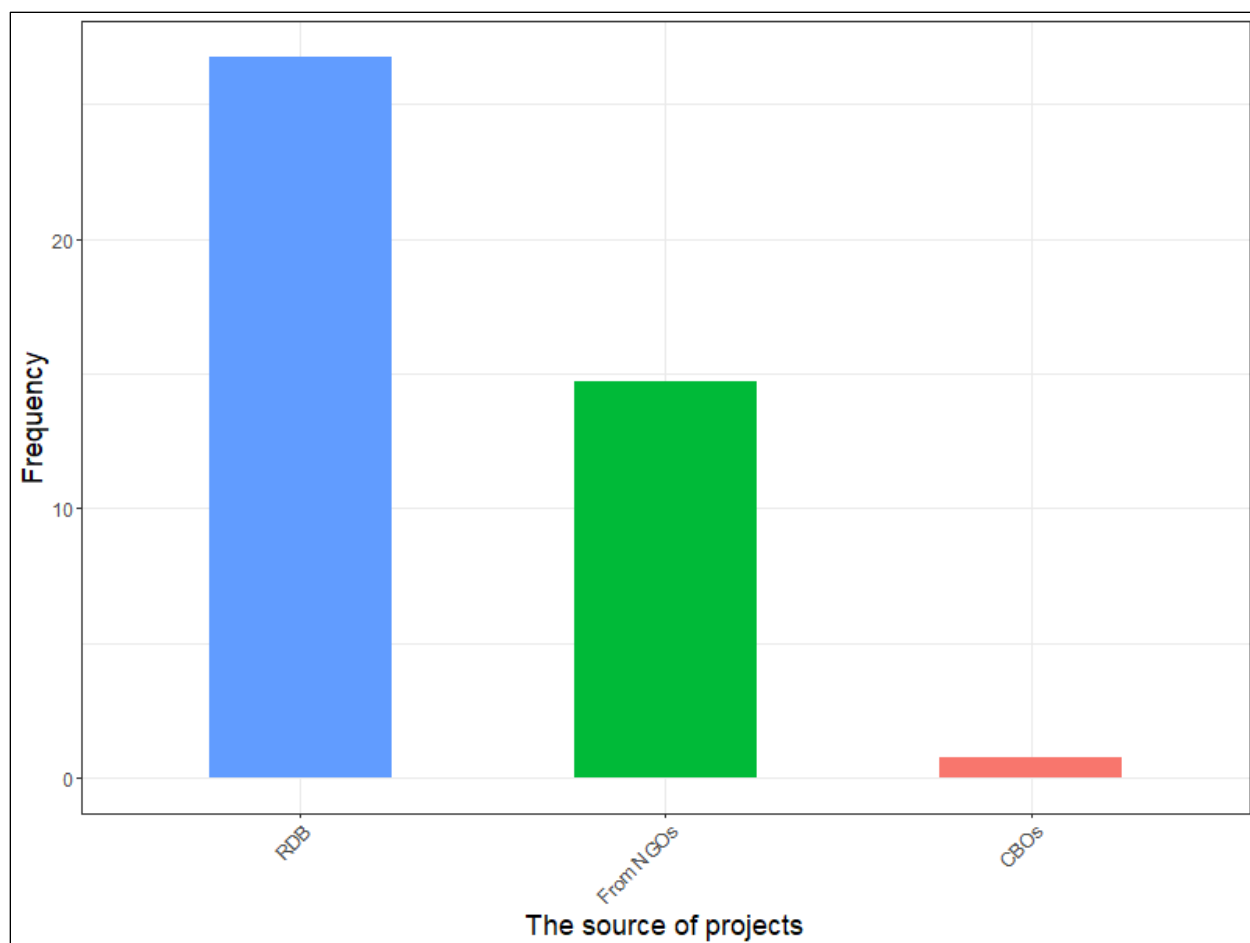


Figure 10: The source of development projects around VNP

3.3.8 Desirable and restricted natural resources from the VNP

Medicinal plants were the most mentioned important resource coming from the park (Chi-square test =69.21, Df = 3, P value = 6.27×10^{-15}). Water, wood and honey are also an important resource from the park (Figure 11).

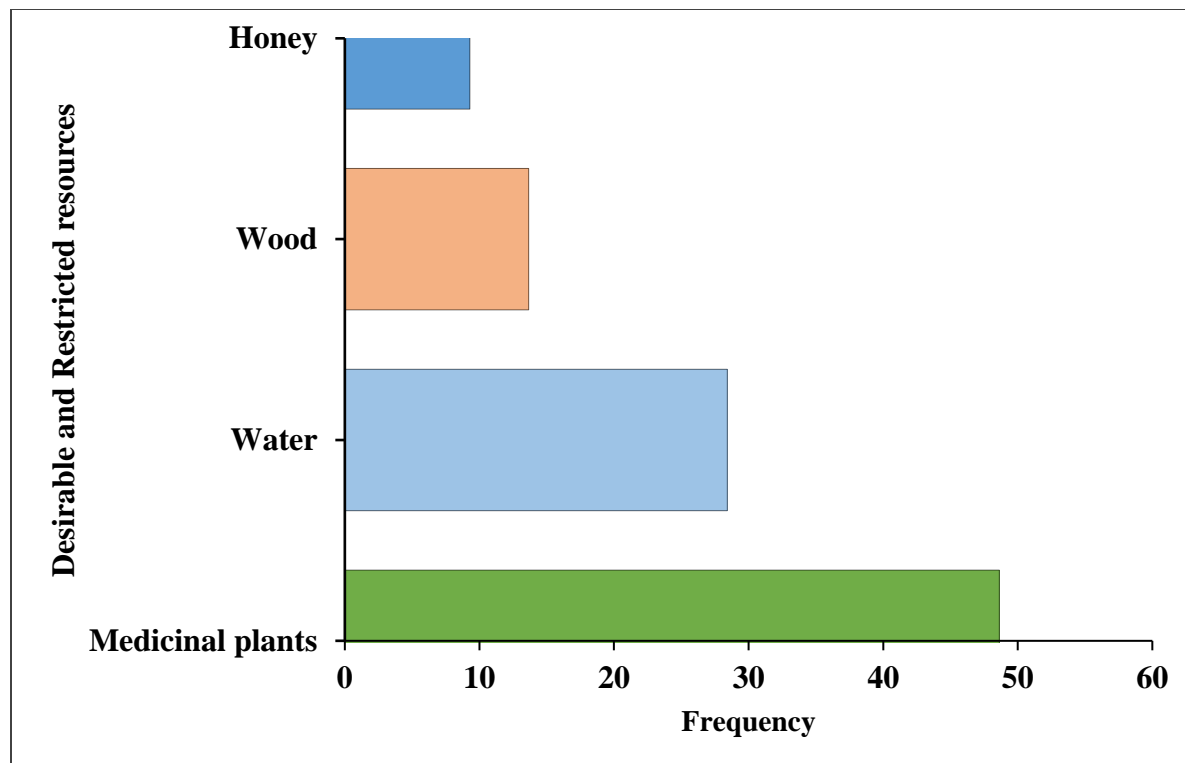


Figure 11: Desirable and restricted resources from the VNP

3.4 Perceptions of community members to projects developed for them regarding the protection of VNP

3.4.1 Perception of communities to the development projects and conservation of VNP

There was a significant difference in the development and conservation projects mentioned by respondents as strategies to enhance conservation efforts, attitudes and willingness to conserve VNP among community members (Chi-square test =102.62, Df = 21, P value = 6.97×10^{-17}) (Table 2). Establishment of nurseries for medicinal plants, fence around the park, and job creation were the most important strategies mentioned by community members.

Table 2: Suggested strategies from the community members to improve conservation

The perception of community to the projects	Proportion
Establishment of tree nurseries of medicinal plants	16.81
Fence construction in all areas	14.29
Job creation in community around VNP	12.61
Community participation activities	9.24
Create and fund small business	9.24
Creation of activities which prevent poaching	7.56
Community prioritization in projects	6.72
Conservation mobile app to track animals out of the park	3.36
Improve compensation fees	3.36
Raising of Conservation awareness	2.52
Increase Infrastructure (wells and roads)	2.52
Create anti-poaching club	1.68
Establish environmental club	1.68
Discount on tourism visiting fees in the community around VNP	1.68
Planting many trees around the VNP	1.68
Enhancing tourism skills through school for future generation	0.84
Expand VNP area	0.84

Provision of conservation books in Kinyarwanda or simple flyers	0.84
Reinforce punishment for illegal activities	0.84
Report conservation threats	0.84
Raise of conservation awareness	0.84

3.4.2 The root cause of the negative attitudes toward to VNP conservation

Human wildlife conflict was the most mentioned cause for negative attitudes about the park (Chi-square test =26.64, Df = 3, P value =7.004*10⁻⁰⁶). This is followed by a lack of sense of ownership lack of perceived benefits were also important factors (Figure 12).

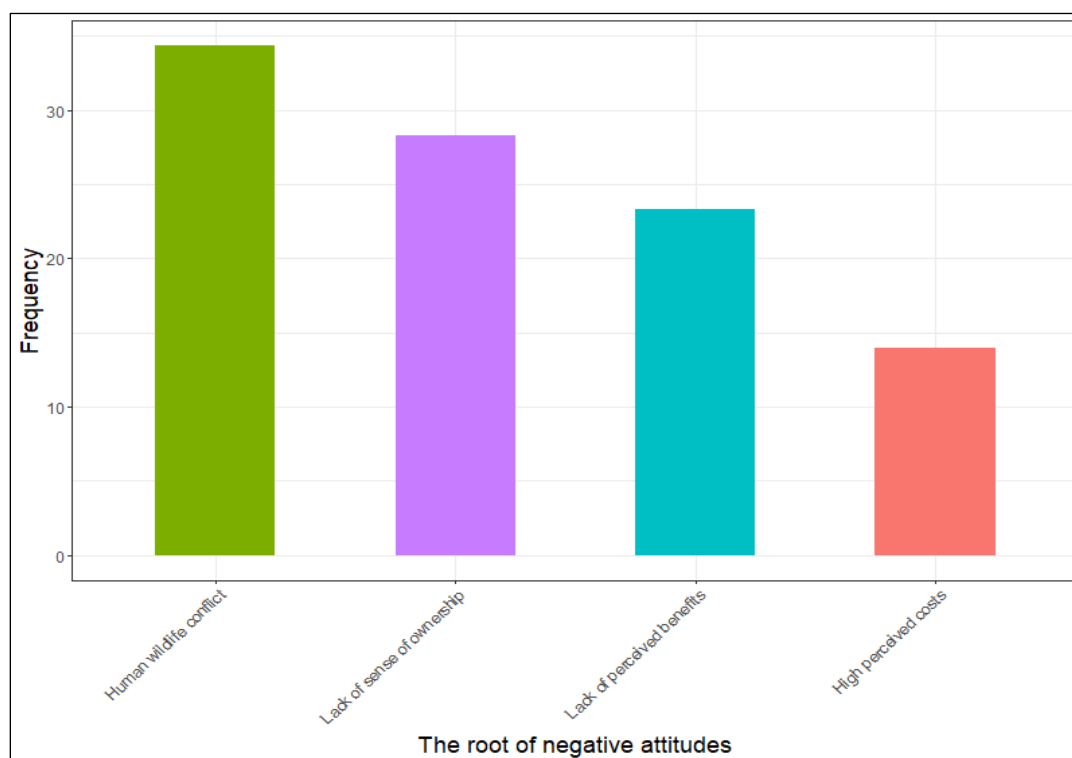


Figure 12: The root causes of the negative attitudes of VNP conservation

Chapter 4. DISCUSSION

The study revealed how tourism benefits affect community attitudes towards conservation around Volcanoes National Park (VNP). It found that perceptions of these benefits vary and influence support for conservation. Some community members appreciate infrastructure improvements linked to tourism, which fosters a positive view of conservation. However, those living closer to the park face direct challenges, such as restrictions and conflicts, which can lead to resistance. In contrast, individuals residing further away often see more positive impacts without encountering these difficulties, leading to stronger support for conservation. The study also identified various factors contributing to negative attitudes and suggested ways to enhance community involvement in conservation and improve perceptions of development projects around VNP.

The study showed that there are both direct and indirect benefits tourism benefits where the direct benefits included the creation of jobs, the sale of handicrafts, and opportunities for training and capacity building. Indirect benefits encompass a wider range of community improvements such as provisioning of schools, roads, healthcare services, water supply and sanitation, art cooperatives, domestic animals, and the construction of wells which enhance positive attitudes towards to conservation of VNP. According to Munanura et al. (2019), in recent years, new strategies have been developed that utilize tourism as a way to reduce human-related threats to wildlife, tourism has provided various opportunities, including jobs, income from small businesses, and local markets, along with indirect benefits such as the development of health centers, schools, and roads. These improvements have fostered support for conservation efforts and may help compensate for the challenges of living alongside wildlife, thereby positively influencing local attitudes towards wildlife conservation.

The communities in this study mentioned indirect benefits more commonly available than direct benefits which discourage them to be engaged in conservation of VNP and a sense of exclusion from decision-making processes. Karanth & DeFries (2011) highlighted that the direct benefits such as jobs, providing domestic animals, trainings and building capacity are still few compared to indirect benefits from tourism. These improvements have not only increased the community's willingness to conserve VNP. The study findings revealed a significant relationship between the proximity of communities to Volcanoes National Park (VNP) and willingness to participate in its conservation. Those living far from the park border exhibit the highest level of willingness to

conserve VNP compared to the people living near the park. Respondents who participated in this research indicated that people living near the park may experience more direct negative impacts from conservation efforts, such as restrictions on land use, wildlife conflicts, and limited access to resources. In contrast, individuals living farther away perceive the benefits of conservation, such as tourism revenue and environmental protection, without facing these direct challenges, leading to a higher willingness to support conservation initiatives. Munanura et al. (2016) has demonstrated that unequal distribution of benefits isolates the residents who have the most direct impact on wildlife, and this has been recognized in research as a limitation of incentive-based conservation efforts. For instance, when animals damage the crops of those living near the park, residents further away are unaffected, prompting those closer to the park boundaries to resort to illegal activities as a means of securing their livelihoods from protected areas.

Human wildlife conflict includes impacts on safety of local communities and economic impacts such as crop loss, livestock depredation, and property damage which lead to significant financial strain on already marginalized communities, fostering negative attitudes towards wildlife and conservation efforts (Guinness, 2014). Community members who participated in the research for my study revealed several reasons for their negative attitudes towards the conservation of VNP including the direct negative impacts of conservation efforts, such as restrictions on land use, wildlife conflicts, and limited access to resources. Additionally, a lack of sense of ownership over the conservation initiatives and the absence of perceived benefits contribute to these negative attitudes. High perceived costs associated with conservation efforts also play a significant role in shaping these unfavorable views. These factors collectively contribute to the community's reluctance to fully support conservation efforts for VNP.

The respondents of this study expressed negative attitudes towards conservation by mentioning human-wildlife conflicts as a significant cause. Similarly, according to a study in Ethiopia, negative attitudes towards conservation were primarily driven by human-wildlife conflict, causing significant economic losses from crop damage and livestock predation (Yazew, 2022). The study also identified restrictive conservation policies as aggravating factors, limiting access to natural resources that negatively shape community perceptions and attitudes towards wildlife conservation in the region (Yazew, 2022).

In this study, respondents provided some insights to enhance attitudes toward conservation including advocacy campaigns, training initiatives, fencing, establishing conservation cooperatives, forming anti-poaching clubs, funding for small businesses, public works projects, infrastructure improvements, sustainable project development, enhancing compensation mechanisms, promoting conservation awareness, expanding protected areas, fostering community engagement, offering tourism fee discounts, and organizing tree planting campaigns. These diverse strategies reflect a comprehensive approach to fostering community support and engagement in conservation efforts.

Chapter 5: CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

This study aimed to investigate how tourism benefits influence community perceptions towards conservation efforts at Volcanoes National Park (VNP), Rwanda. The findings indicated a relationship between tourism benefits and positive attitudes regarding VNP conservation. Both direct benefits, such as immediate revenue and employment within the tourism sector, and indirect benefits, including improved infrastructure and economic diversification, were identified as significant drivers to have a positive attitude towards to the conservation of VNP. The study emphasized that direct benefits play a crucial role, indirect benefits often have a more profound impact by enhancing community well-being and fostering a sustainable local economy. These factors contribute to a positive outlook on VNP conservation among residents. The study also noted that community members surrounding the park show varying levels of willingness to participate in conservation activities. While many engage through volunteering, advocacy, conservation training, and public works, there are notable concerns that contribute to negative attitudes toward VNP conservation. These include human-wildlife conflicts, perceptions of inadequate benefits, and perceived costs associated with conservation efforts. To address these challenges and enhance community participation, respondents proposed several strategies. These recommendations encompassed advocacy efforts, awareness-raising initiatives, and practical measures such as fencing, establishing conservation cooperatives, and forming anti-poaching clubs to protect wildlife and habitats. Supporting local economies through funding for small businesses and infrastructure projects, implementing sustainable practices, ensuring fair compensation policies, and promoting conservation awareness were also highlighted as crucial steps.

Additionally, expanding park areas, involving the community in decision-making processes, offering tourism incentives, and organizing environmental initiatives like tree planting campaigns were suggested to further engage residents and foster sustained support for conservation efforts at VNP.

5.2 RECOMMENDATIONS

The study acknowledges the positive effects of tourism but also points to opportunities for further involvement by government agencies, NGOs, and community-based organizations (CBOs). The findings indicated that communities living near the park are less willing to conserve VNP compared to those living farther away. Therefore, policymakers of the Rwanda Development Board (RDB) should consider prioritizing the distribution of benefits to residents living close to VNP, as they are likely to be the most affected by wildlife.

The respondents have suggested alternatives to use in conservation of Volcanoes National Park, such as establishing nurseries for medicinal plants. They also proposed developing a conservation mobile app to aid in quick responses to wildlife incidents outside the park, thereby reducing human-wildlife conflicts. Other recommendations included enhancing tourism skills through school for future generation, provision of conservation books in Kinyarwanda, forming environmental clubs, constructing park fences in all areas around the park, park extension, community involvement in different activities related to the park management, enhance awareness on conservation, create and fund small businesses. These initiatives aim to enhance conservation awareness and create employment opportunities within the local community, thereby fostering more positive attitudes and willingness toward the conservation of VNP.

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APPENDIX

QUESTIONS GUIDE FOR THE LOCAL PEOPLE

INFORMED CONSENT

Researcher Names: Christine NYIRAMAJYAMBERE

Project Title: The relationship between tourism benefits and positive attitudes about conservation in the communities around Volcanoes National Park (VNP), Kinigi sector, Musanze District, Rwanda.

This research has the objectives such as to identify the direct and indirect benefits from tourism among the local people around VNP, to identify the relationship between tourism revenue sharing and willingness of local people to participate in the conservation of VNP, and to understand the perceptions of community members to the projects developed for them regarding protection of VNP. Therefore, you are invited to participate in this research so as to exchange the ideas regarding to tourism benefits, the perception and willingness to participate in conservation of VNP.

In addition, the information gathered will contribute to a better understanding of the impacts of tourism benefits and conservation initiatives. Your participation is entirely voluntary and your response will be kept confidential and the information will be used only for the purpose of the research.

If you have any question about the study, please contact: **+250780929249; +250782621509 or on email: christinejyambere@gmail.com**

I have read and understood the information provided, I agree to participate voluntarily in the research study described above.

Participant's signature:....Date

SECTION ONE: IDENTIFICATION OF RESPONDENT**1. Sex:**Female: Male: **2. Age:**18-30 31-40 41-50 51-60 61 above **3. Civil status:**Single Married Divorced Widow **4. Level of education:**None Primary Technical school O' Level A'level University Masters **5. How many years have you been involved in revenue sharing activities?**< 5 years 6-10 years 11-15 years 16-20 years 20 years above

Others, specify

6. How far do you live from edge of the park?

Small distance, within about 1kilometer

Medium distance, within about 3km

Long distance, within about 6km

7. What is your relationship to the VNP region?

Native (historical, ancestral)

Returnee (Cultural or ancestral ties, educational initiatives, Advocacy)

Newcomer (Residency and community integration, Employment opportunity, education,business,ventures)

Others,specify.....

8. What is your land ownership?

Sole ownership

Joint ownership

Leasehold

Government ownership

Others, specify

9. Based on your opinion, do you have interactions with the park?

Examples, cultural experiences and craft market, revenue sharing programs, community development projects, collaboration with the park.

Strongly agree

Agree

Disagree

Strongly disagree

10. What types of interaction with VNP?

Direct (revenue, job, schools, health care facilities, roads, water supply and sanitation, training and building capacity)

Indirect (Increasing of local business opportunity, improved infrastructure, cultural preservation, environmental conservation, networking and collaboration)

Special grant fund (crop raiding, livestock predation)

No-interactions

Are there additional interaction that I have missed? If yes, specify them

.....

11. How do you participate in projects related to the park conservation?

- Active volunteer work
- Educational outreach for conservation
- Advocacy and lobbying to support conservation
- Participation in workshops and training
- Others, (specify).....

12. What are the kinds of participation in projects related to conservation of the park?

- Volunteering
- Advocating for conservation**
- Educating others**
- Observing the rules and regulations about conservation and the park
- Others, specify

SECTION TWO: THE RELATIONSHIP BETWEEN TOURISM BENEFITS AND POSITIVE ATTITUDES ABOUT CONSERVATION IN THE COMMUNITIES AROUND VNP.

1. Do you benefit from tourism? If yes how do you benefit?

- Employment
- Cultural Exchange
- Infrastructures development (roads, schools, wells, clinics, cooperatives, domestic animals)
- Business opportunity (Restaurant and accommodation to the visitors)
- Education and training (hospitality and guiding)
- Improved infrastructure (roads, electricity, water supply, and sanitation)
- Others: (Specify)

2. Do you benefit from conservation of VNP? If yes, how do you benefit?

- Economic benefits (Tourism revenue, job creation, infrastructure development)
- Social benefits (Cultural preservation, Community empowerment, awareness of environmental issues, social cohesion)

Environmental benefit (Biodiversity preservation, habitat protection, climate change mitigation, preservation of endangered species, sustainable use of resources, reduction of pollution)

If there are others, specify them

3. What are the activities that contribute to your income?

Farming

Cattle keeping

Beekeeping

Handcrafting

Masonry

Transportation

Tourism job

Other (specify).....

4. If you have a tourism job, what kind of tourism job do you have?

Tour guide

Hotel manager

Hospitality manager

Activity manager

Park ranger

Other (specify).....

5. How much money do you make monthly in tourism or park related to income activities?

20,000-30,000

30,000-40,000

40,000-50,000

50,000-60,000

Other (specify).....

6. Is it easy to get a job in tourism industry?

Strong agree

Agree

Disagree

Strong disagree

7. What are your suggestions which may enhance the management of VNP and your livelihood?

.....

8. What is your contact with tourists through work?

Frequent

Infrequent

Not at all

9. Are you satisfied with the tourism benefits from the VNP?

Strongly satisfied

Satisfied

Unsatisfied

Strongly unsatisfied

Others (specify).....

10. Are you willing to participate in conservation of VNP?

Strongly willing

Willing

Unwilling

Strongly unwilling

11. How are you willing to participate in conservation of VNP?

Become a community ranger

Get involved in community based tourism

Share traditional conservation knowledge

To educate others about conservation

To support conservation organization

Others (specify).....

12. What is the origin of any conservation projects you are aware in your area?

From NGOs

From tour companies

From revenue sharing of the government

Others, specify.....

13. What are other factors that negatively affect your attitudes towards conservation?

Lack of perceived benefits

High perceived costs

Lack of sense of ownership

Others, specify

14. What are the costs that impact your attitudes and willingness to support conservation?

Prohibited access to resources (water, wood, medicinal plants, honey, fruits)

Crops raiding and animals' predation

Others, specify

SECTION THREE: OPEN ENDED QUESTIONS

1. How does benefit sharing affect your willingness to participate in conservation of VNP?

2. What are the direct and indirect benefits that you receive from tourism?

Examples; schools, roads, health centers, employment (crop rangers, anti poachers, guides, trackers)

3. What are your perceptions of the projects developed regarding protection of VNP?

4. How is your living condition affected by tourism and conservation of VNP?

5. What are some of the ways that tourism could be improved to help conservation efforts?

6. Why are you or not satisfied with the tourism benefits from VNP?

7. What are some of the ways that tourism could be improved to help your communities?

8. In your opinion, what are the reasons to conserve VNP?

9. What are the achievements in park conservation?

10. What are your hopes and concerns for the future of tourism in VNP?

SOME PICTURES TAKEN DURING THE RESEARCH

1. Some pictures of development activities from tourism around VNP



(a) Park border in Mitobo Village



(b) VNP Fence in Nyakigina village



(c) Roads Nyabigoma cell



(d) Electricity Energy in Gasura cell



(e) School in Kansoro Village



(f) Bisate maternity by Diana Fossey