International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 04 Apr. 2024, pp: 992-1005 www.ijaem.net ISSN: 2395-5252

Assessing The Contribution Of Community-Based Conservation Initiative On Community Development The Case Of Kinigi Sector, Musanze District,Rwanda

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Date of Submission: 20-04-2024 Date of Acceptance: 30-04-2024

ABSTRACT:
Kinigi sector's significance extends beyond tourism, encompassing the preservation of nature and culture, and the improvement of livelihoods, especially within indigenous communities. Community-based conservation has specific benefits closely related to the sustainability of natural ecosystems and community development. The overall objective of the study is assessing the contribution of community-based conservation initiative on community development in Kinigi sector with three (3) specific objectives such as to assess the contribution of Community Based Conservation initiatives (CBCI), to examine the community development of Kinigi Sector due to the CBCI and to determine the relationship between Community Based Conservation and community development. Both quantitative and qualitative methodologies (mixed method) was used. A mixed-method descriptive study was conducted to explore the relationship between Community-Based Conservation Initiatives (CBCI) and Community development. SPSS version 27 was utilized for quantitative data analysis, focusing on mean and standard deviation. Qualitative data were gathered to enrich the findings. The study targeted 144 respondents, comprising local community members and RDB staff, selected via simple random sampling and purposive respectively Primary data was collected through structured questionnaires on a 5-point Likert scale, the research found that there are areas for improvement, the program remains a vital source of support for Kinigi residents, highlighting its significance in poverty reduction and community development efforts at (μ =3.692, SD=0.942). The findings indicate that the Community-Based Conservation Initiative (CBCI) has had a significantly positive impact on the community development in the Kinigi sector, particularly around the Volcanoes National Park, the overall mean score of (μ =4.322, SD=0.649) reflects a very high level of improvement in livelihood diversification, social amenities and biodiversity conservation. Moreover, the combined influence of CBCI variables on community development accounts for 58.1% of the variance. Based on the findings,there is positive significant relationship between CBCI and community development in Kinigi sector Thus, prioritizing and strengthening CBCI initiatives is recommended to support sustainable community development, benefiting both local communities and biodiversity conservation efforts.

Key words: Community Based Conservation, community development and Kinigi sector.

I. INTRODUCTION

A third of all land is damaged or deteriorating, endangering ecosystem services like carbon storage and biodiversity. Protected areas may preserve natural and cultural resources, ensure human health and wellbeing, offer sustainable livelihoods, and assist sustainable development when they are properly managed and equitably controlled (UNEP, 2021). Engaging the local people in the preservation of the abundant biodiversity and other values of the natural environment during the past 50 years became a pillar of nature conservation practice, this is an enormous improvement from the

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early phases of nature conservation approaches (Rome, 2020).

Community engagement is recognized as a potent tool for environmental conservation and enhancing livelihoods in protected areas, yet it remains underutilized in many developing countries (Grilli, Gianluca, Curtis, & John, 2021). Global human activities exert immense pressure on protected areas, contributing to biodiversity loss (IPBES, 2019). Protected areas play a crucial role in wildlife habitat preservation and climate change mitigation, serving as ecotourism hubs that benefit local communities (IPBES, 2019).

Despite significant global efforts, biodiversity continues to decline due to inadequate management of protected areas (Convention, 2022). Community-based conservation projects, including integrated conservation and development projects (ICDPs), aim to balance biodiversity conservation with socioeconomic development (IJCCS, 2019). In Sub-Saharan Africa, community-based conservation initiatives have gained traction, addressing challenges posed by population growth and land use changes (Reid, Galvin, & Fernández, 2018).

Research in Nyungwe National Park highlighted the complexities of implementing ICDPs, with restrictions on access leading to income loss for local communities (Nicole, Rutebuka, & Donat, 2012). However, efforts to promote tourism and revenue sharing schemes aimed to offset these losses, demonstrating the potential of community-based approaches in conservation and development (Nicole, Rutebuka, & Donat, 2012).

Rwanda's Northern Province, notably Kinigi sector, drives significant tourism revenue due to its biodiversity and community engagement. While some residents benefit from development near Virunga National Park, others find park earnings insufficient. Revenue sharing, managed by the Rwanda Development Board (RDB), aims to balance conservation and community welfare, funding social services and infrastructure. However, population growth strains protected areas, leading to land conflicts. Volcanoes National Park's size reduction exemplifies the government's response to post-genocide settlement needs and agricultural demands (Afifah & Sopiany, 2017; RDB, 2015).

Problem statement

In accordance with the Rwandan government's revenue sharing policy, as one of the CBC's implementation approaches, 10% of the total gross revenue made in each Rwandan park is to be Development.

merged into a national fund, at least a portion of which is to be utilized for poverty reduction (RDB, 2020). The high density of impoverished smallholder farmers around the parks, however, makes this initiative seem insignificant (Michel, 2017), Because populations receive less benefits and participate less in management procedures, community-based conservation may have limited success (Clark & Gibson, 2019.).

Some evidence shows the development in Kinigi sector but there is a gap of knowledge that shows the role community-based conservation initiatives in the development of the community around Kinigi sector.

Research Objectives

i.To assess the contribution of Community Based Conservation Initiatives (CBCI) in Kinigi Sector.
ii.To examine the community development of Kinigi Sector.
iii.To determine the correlation between Community Based Conservation and community development.

Research Hypothesis

$H0_1$: CBCI in Kinigi involved Community Engagement in Conservation, Cooperative formation and empowerment and Tourism Revenue Sharing Program
$H0_2$: CBCI has significantly contributed to community Development in Kinigi sector (livelihood diversification, social amenities and biodiversity conservation).
$H0_3$: There is positive significant relationship between Community-Based Conservation Initiatives (CBCI) and community development (CD).

Significance of the study

The study explores the link between community-based conservation and development, offering insights for researchers and policymakers. It assesses conservation initiatives in Kinigi Sector, suggesting best practices for replication. Collaboration with local stakeholders enhances community engagement, benefiting both research and development. The findings inform curriculum development, boosting the university's reputation in conservation research. Evidence-based recommendations aid policymakers in improving current initiatives, aligning conservation policies with community needs for inclusive, sustainable outcomes. Community involvement fosters empowerment and active participation in decision-making, shaping development pathways.

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Conceptual framework

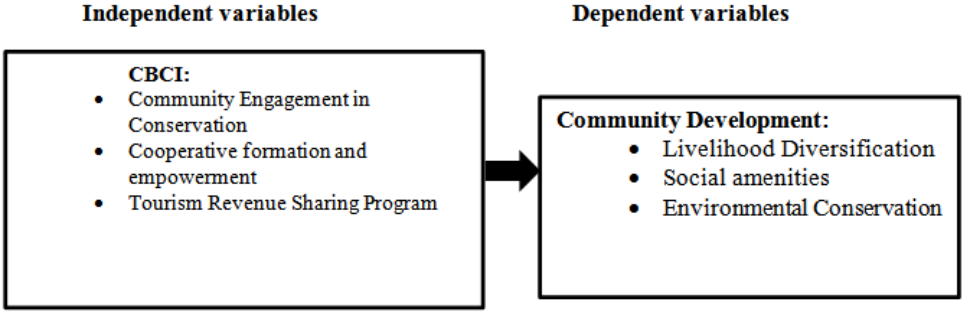

Figure 1.1: Conceptual framework

II.LITERATURE REVIEW

Community Engagement in Conservation

Conservation practitioners engage communities for effectiveness and rights-based reasons. Initially, it aimed to improve conservation delivery and reduce costs by garnering community support. Recent engagement aligns with moral principles, reacting to global human rights initiatives (Infield & Tolisano, 2019).

Conservation practitioners adapt community inclusion based on context and organizational stance. Recognition of human and community rights is crucial, even if not directly linked to conservation outcomes. Various strategies like "community conservation" and "integrated conservation and development" prioritize community engagement, with diverse implementation worldwide (Treves et al., 2005).

Cooperative formation and empowerment

In the Kinigi Sector, twelve cooperatives, each with seventy-five members, were formed from former Volcanoes National Park residents or poachers. They sell products made from local materials and offer mentoring programs. "Iby'iwacu," comprising ex-poachers, engages in various activities like food preparation and tourism, running cottages for income (Kayihura & Sentama, 2019).Most residents in the region reported that revenue-sharing programs manifested as community-wide development ventures and sporadic individual contributions like cattle and goats. For example, the Kinigi community commercial complex, aimed at generating off-farm income, is operational and contributes to the local community's finances, especially benefiting craftsmen. Additionally, from 2005 to 2013, a total of 186 small rainwater tanks were built for communities, with 100 in Burera and 86 in Nyabihu, helping alleviate the area's water scarcity issue.

Additionally, classrooms and projects involving cows and sheep were established, with 2900 sheep and 200 cows being given to underprivileged individuals and cooperatives that work to conserve parks between 2008 and 2013 (Afifah & Sopiany, 2017).

Tourism Revenue Sharing

Community participation in tourism, facilitated by benefit-sharing practices, is crucial for equitable distribution of tourism revenues. Studies highlight tourism's role in poverty reduction, emphasizing the need for fair distribution of benefits. While no standard participation level exists, benefit sharing is essential for effective community tourism programs (Timothy, 1999; Tosun, 2000; Li, 2005; Zhao & Ritchie, 2007; Tusabe & Habyarimana, 2010).

Tourism Revenue Sharing (TRS) initiatives aim to involve local communities, sustain natural resources, and enhance human welfare by allocating a portion of wildlife-based tourist earnings to infrastructure projects (Archibald & Lisa Naughton-Treves, 2001). Examples like Tanzania's Community Conservation Services (CCS) ensure communities benefit from tourism while engaging in conservation efforts (Melita & Mendlinger, 2013).

Various protected areas across Africa implement initiatives to aid local populations through development projects, often sharing tourism benefits with neighboring communities. For example, Jozani National Park in Zanzibar allocated a significant portion of its tourism earnings to community development, leading to increased community engagement in conservation and reduced human-wildlife conflicts (Makame & Boon, 2008).

Community development

Livelihood Diversification theory suggests that households diversify income sources to enhance resilience to environmental and socioeconomic changes (Ellis, 2000). Diverse livelihood strategies spread risks, increase adaptive capacity, and promote sustainable development. Activities include

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agriculture, non-farm employment, and micro-enterprises. Understanding this theory aids in assessing how conservation initiatives impact community livelihoods and development (Ellis, 2000).

Amenities, unique to an area, influence its appeal for living and working. They encompass human-generated, like culture, and natural factors, such as climate (Smith, 1977). While natural amenities were traditionally emphasized, attention is shifting towards man-made amenities (Wong, 2002; Welch, 2007). Urban civilizations produce diverse amenities, including public goods, private services, transportation, and cultural institutions, fostering external economies (Harvey, 1973; Tolley, 1974).

Environmental conservation involves carefully managing natural resources to ensure their sustainable use. Practices include waste management, recycling, tree conservation, and prioritizing renewable resources (Barbier, 1989). Collective ownership of natural resources is emphasized to maintain Earth's ecosystems and avoid depletion (Elimam, 2021). The Qur'an advocates for responsible stewardship of the planet and its resources, inspiring modern environmental movements (Elimam, 2021)

III.METHODOLOGY

Study area description

Kinigi sector in Rwanda's Musanze district is famed for its mountain gorillas, situated near the entrance of Volcanoes National Park and the Congolese border. At an altitude of 2,200 meters, it encompasses five villages and twenty-eight sub-villages, covering 15.3% of Musanze's total surface area. The community relies on subsistence farming, particularly of Irish potatoes (REMA, 2022).

Kinigi sector offers diverse tourism activities like Musanze cave visits, gorilla and golden monkey trekking, and hiking Bisoke and Dian Fossey trails. Enjoy the tranquil natural environment and community living. With an average temperature of 15.9°C, Kinigi experiences moderate weather. The sector has a dynamic demographic landscape with a population density of 400.1 persons per km² and a 1.7% annual population change from 2012 to 2022 (MeteoRwanda, 2021).

Kinigi sector near Volcanoes National Park offers a remarkable gorilla encounter and cultural immersion, showcasing the interplay between traditional and modern lifestyles. Visitors experience authentic Rwandan culture, including traditional dances, farming, and banana wine making at the Iby'iwacu community. The sector features attractions like the Igikari and traditional medicine centers. Kinigi's proximity to the volcano makes it an ideal pre- or post-gorilla safari destination, highlighting Rwanda's rich heritage and community dynamics (RDB, 2022).

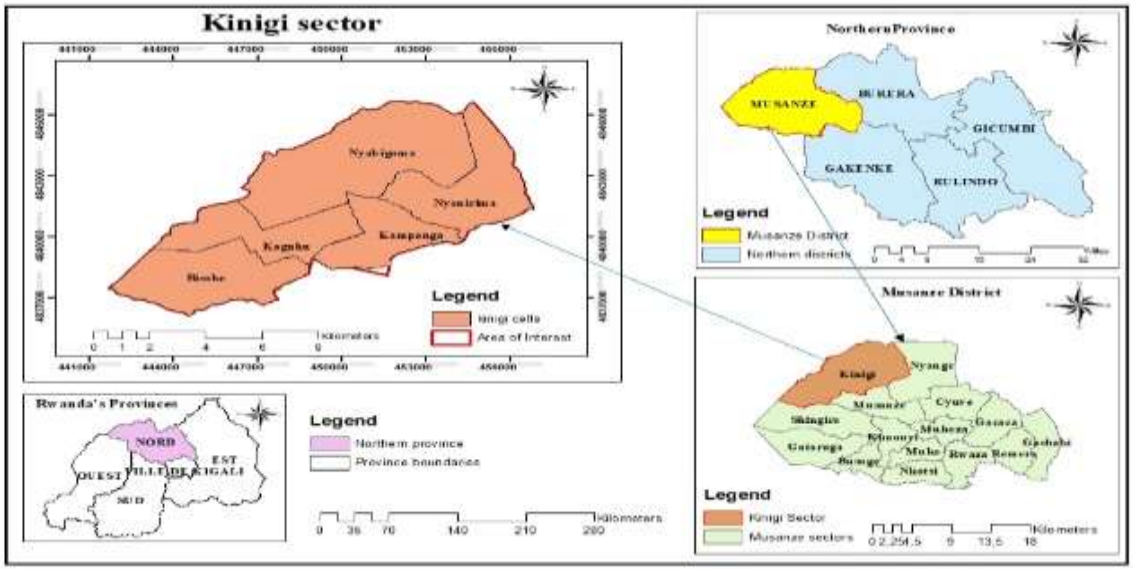

Figure 3.1.Study area description

Source:(Primary data, 2024)

Research design

The study employed a descriptive research design to investigate the relationship between Community-based Conservation Initiatives (CBCI) and community development. This approach, combining quantitative and qualitative methods, allowed for a comprehensive understanding of the topic. Quantitative analysis involved assessing

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means and standard deviations of variables, while qualitative methods provided contextual insights. Data was collected via questionnaires for quantitative analysis and through qualitative exploration of respondents' perspectives on the CBCI and community development link.

Table 3.1:Target population

Population	Frequency
Local community(Kinigi population)	138
RDB Staff	6
Total	144

Data source:(Primary data,2024)

Sample size

The sample size of the actual responders was determined using Yamane's (1967) methodology. Yamane's formula is as follows:

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

Where;
n=sample size
N=target population; and
e=0.05 sampling error

$$n = \left(\frac{138}{1 + 138(0.05)^2}\right)$$

$$n = \left(\frac{138}{1 + 138(0.005)}\right) = 103$$

Table 3.2:Sampling techniques

Category	Sampling techniques
RDB Staff	Purposive sampling
Local Community	simple random sampling

Source:(Primary,2023)

Sources of data

Primary data

Primary data, gathered firsthand, is original and unique (Thody, 2016). Quantitative data was collected via questionnaires distributed to local communities near Virunga National Park, while qualitative data involved semi-structured interviews with Rwanda Development Board (RDB) officials. This approach allows for flexibility and insightful conversations.

Collected responses were organized, entered into a data management system (SPSS v.27), and analyzed using descriptive statistics like frequencies and percentages. Inferential statistics such as regression analysis tested hypotheses and explored variable relationships**.**

Secondary data

Secondary data sourced from previous research underwent statistical analysis (Bryman & Bell, 2003). In the proposal phase, diverse secondary data from sources like textbooks, journals, and websites were accessed economically. This data facilitated connections between literature and findings discussions, enhancing understanding of CBCI and community development trends.

Data collection techniques

Questionnaires

The researcher employed a self-administered survey method to collect primary data, ensuring confidentiality and allowing respondents to complete the questionnaire at their own pace. The questionnaire, utilizing a Five-Point Likert Scale, addressed demographic background, study variables, and respondent suggestions. It comprised both open-ended and closed-ended questions, facilitating the collection of easily measurable data from a broad range of respondents. SPSS Version 27

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was used to analyze the quantitative data, aiming to quantifyrelationships, trends, or patterns.

Interviews

Interviews with RDB staff offered flexibility for in-depth discussions, exploring perspectives on Community-Based Conservation Initiatives' contribution to community development. This qualitative data collection method aimed to understand subjective experiences and contexts, analyzed using interpretive or thematic approaches to identify patterns or narratives.

Reliability and Validity of Instruments

Table 3.3: Research Reliability

Construct Variable	Cronbach's Alpha	Number of items
Community engagement in conservation	0.83	4
Cooperative formation and empowerment	0.75	5
Tourism Revenue Sharing program	0.72	5
Community development	0.93	9
Mean	**0.808**	

Source: Primary data, 2023

The reliability mean was determined to be 0.808, affirming the internal consistency (reliability) of the instrument.

A panel of judges was be selected to evaluate the validity of each item in the tool.The inter-judge coefficient validity was computed using the formula CVI = (number of judges who deemed the item valid) / (total number of judges involved in achieving an acceptable average for the study using the research instrument). The resulting CVI value of 0.809 exceeds the minimum threshold for a valid instrument, which is 0.7. This indicates the validity of the instrument.

Data analysis

Data analysis involves examining information from surveys or experiments to draw conclusions and inferences. Quantitative analysis, per Denscombe (2003), interprets numerical data using descriptive and inferential statistics. Field data was edited and coded based on study objectives, with qualitative data from open-ended questions and quantitative from closed-ended ones. Demographics were analyzed using frequency and percentage tables. SPSS Version 27 generated descriptive statistics for objectives one to three, followed by simple and multiple regression analyses to assess CBCI's impact on Kinigi sector's community development. Results were presented using tables and figures.

Quantitative data analysis

The analytical tools used are detailed below:

The Mean ($\overline{X}$)

According to Aggresti (2009), Mean ($\bar{x}$): is the average value calculated by adding up the values of each case for a variable and dividing by the total number of cases.

$$\overline{X} = \frac{1}{n}\sum_{i=1}^{n} xi$$

Where, $\overline{X}$ = mean; n = number total of respondents;

xi = sc i: value of respondent

Standard deviation (SD)

The standard deviation is a value which indicates the degree of variability of data. It indicates how close the data is to the mean. The formula of standard deviation is: $(S) = \sqrt{S^2}$

Where: $S^2 = \frac{1}{n-1}\sum_{i=1}^{n}(xi - \overline{X})^2$

Qualitative data analysis

The process of qualitative data analysis typically involves several steps, including data preparation, data coding, theme identification, and interpretation. Researchers immerse themselves in the data, often through techniques like reading and re-reading, to gain a deep understanding of the content.

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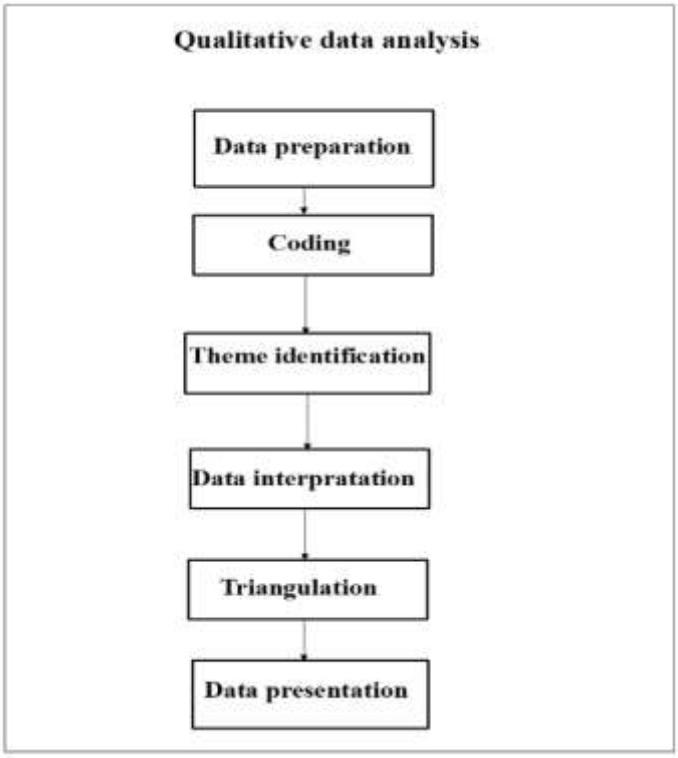

Figure 3.2: Qualitative data process

Source: (Barney,1960)

Regression model

The formula for multiple regression model, which determines the relationship between one independent variables (X) and one dependent variable (Y), is expressed as:

$Y=\beta\ 0 +\beta\ _1X_1+ \beta_2X_2+ \beta_3X_3+\varepsilon$

Where:

Y is the dependent variable (response variable)

X is the independent variable (predictor variable)

β_0 is the intercept (the value of Y when X is 0), β1, β2…,βn are the coefficients (intercept and slopes) representing the relationship between each independent variable and the dependent variable also β_1 is the slope (the change in Y for a one-unit change in X)

ε is the error term (the difference between the observed Y and the predicted Y)

Gender identification

Table 4.1: Gender of respondents

Respondents	Frequency	Valid Percent
Male	63	61.17
Female	40	38.83
TOTAL	**103**	**100**

Source: Primary data, 2024

Age's Respondents

Table 4.2: Age of the Respondents

Response	Frequency	Valid percent
18- 30	32	33.98
30-40	44	42.72
40- 50	17	19.42
50+	4	3.88
Total	**103**	**100**

Source: Primary data, 2024

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Educational background

Table 4.3: Education of Respondents

Education level	Frequency	Valid percent
Primary education	65	63.11
Certificate	17	16.50
Diploma	13	12.62
Bachelor	7	6.80
Masters	1	0.97
PHD	0	0.00
Total	**103**	100

Source: Primary data, 2024

IV.RESULTS AND DISCUSSIONS

To assess the contribution of Community Based Conservation initiatives (CBCI) in Kinigi Sector
Community engagement in Kinigi sector

Table 4.4: Descriptive statistics of community engagement in Kinigi sector

Statement	Mean (μ)	Standard Deviation (SD)	Description
The community actively participates in conservation activities in Kinigi Sector	4.4000	.68056	Very great
I personally involved in any conservation-related projects or activities within Kinigi sector	4.5000	.68825	Very great
Community engagement in conservation contributed to the overall development of the Kinigi Sector	3.1500	.81273	Great
There is community-led initiatives or events that promote conservation awareness in Kinigi	4.4500	.60481	Very great
Overall Average	4.1250	0.6966	Very great

Source: Primary data, 2024

The findings from Table 4.4 highlight a commendable level of community engagement in conservation activities within the Kinigi sector, indicating a strong commitment to environmental preservation and sustainable practices. With high mean scores for both community participation and efforts. These findings align with the conceptual framework, emphasizing the importance of community empowerment and active participation in achieving successful conservation outcomes. Overall, the results support the effectiveness of individual involvement in conservation projects, coupled with the positive reception of community-led initiatives promoting conservation awareness, the results underscore the pivotal role of local communities in biodiversity conservation

community-based approaches to conservation, emphasizing the need for continued collaboration and engagement to ensure the sustainable development and preservation of natural resources in the Kinigi sector.

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Cooperative formation and empowerment in Kinigi sector

Table 4.5: Descriptive statistics of cooperative formation and empowerment

Statements	Mean (μ)	Standard Deviation (SD)	Description
There are cooperatives formed in Kinigi sector as a result of community-based conservation initiative	4.3500	.67082	Very great
I know someone in my community actively participate in a community-based conservation-related cooperative in Kinigi	3.6500	1.03999	Great
Cooperative formation has an impact on local economic activities and development	3.6000	1.18766	Great
CBCI improved empowerment through community-based conservation initiatives that affected gender roles and equality in community	3.1000	1.11921	Moderate extent
CBCI is highly support the empowerment of individuals in Kinigi Sector	2.7500	1.11803	Moderate extent
Overall Average	3.49	1.0271	Great

Source: Primary data, 2024

The findings presented in Table 4.5 highlight the significant impact of cooperative formation and empowerment initiatives resulting from community-based conservation efforts in the Kinigi sector. The data indicates that cooperatives formed as a result of these initiatives are perceived very positively by the community, with a mean score reflecting a high level of satisfaction and effectiveness. Furthermore, there is widespread agreement among respondents regarding the presence and importance of these cooperative initiatives in the community, underscoring their perceived value in fostering local economic activities and development. While the data also suggests moderate levels of empowerment resulting from CBCI, particularly in addressing gender roles and equality, there is still room for improvement in this area. Overall, the findings underscore the importance of cooperative formation and empowerment in enhancing community engagement and participation in conservation initiatives, ultimately contributing to sustainable development in the Kinigi sector

Tourism Revenue Sharing in Kinigi sector

Table 4.6: Descriptive statistics on Tourism Revenue Sharing program

Statement	Mean (μ)	Standard Deviation (SD)	Description
Revenue-sharing programs is associated with community-based conservation initiatives in Kinigi Sector	4.3500	.74516	Very great
My community directly benefited from revenue-sharing programs linked to CBCI	3.4000	1.23117	Moderate extent
There are transparency and accountability mechanisms in place for the distribution of revenue-sharing benefits	2.8500	1.18210	Moderate extent
There are improvements made to enhance the effectiveness of the revenue-sharing program	2.9000	1.29371	Little extent
There is changes in community well-being as a result of the financial benefits derived from revenue sharing	3.8000	1.05631	Great
Overall Average	**3.46**	**1.1017**	Moderate extent

Source: Primary data, 2024

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The findings from Table 4.6 shed light on the Tourism Revenue Sharing program's impact on the Kinigi community, revealing both positive and moderate perceptions. While the community views the program as highly beneficial overall, particularly in terms of its association with community-based conservation initiatives, there are some areas of concern regarding transparency, accountability, and effectiveness in benefit distribution. Despite these criticisms, the program has led to tangible improvements in community well-being, including increased agricultural production through the acquisition of resources like cattle and manure. Overall, while there are areas for improvement, the program remains a vital source of support for Kinigi residents, highlighting its significance in poverty reduction and community development efforts.

Interviews with RDB staff focused on conservation initiatives in Kinigi Sector. Staff outlined various initiatives, including habitat restoration, anti-poaching patrols, community education, sustainable agriculture, and reforestation. These efforts aim to safeguard natural habitats, wildlife, and ecosystem integrity while fostering community engagement and sustainable resource management.

RDB staff outlined the resources allocated to CBCI in Kinigi Sector, including human and financial aspects. Human resources comprise trained park rangers, conservation educators, and community liaisons overseeing program implementation, patrols, community engagement, and educational activities. Financial resources include funding from government grants, donors, and tourism revenue, utilized for operational expenses, community projects, infrastructure maintenance, research, and capacity building.

The CBCI in Kinigi Sector has evolved significantly, transitioning from traditional conservation practices to a holistic approach integrating community development, socio-economic empowerment, and sustainable resource management. This evolution led to increased collaboration, cooperative ventures, and revenue-sharing programs. Notable improvements include enhanced community engagement, strengthened capacity, improved infrastructure, and biodiversity conservation outcomes. Technology and data-driven strategies contributed to effective monitoring and enforcement, reducing poaching and habitat degradation, fostering a symbiotic relationship between conservation and community well-being.

To examine the community development of Kinigi Sector
Contribution of CBCI on Livelihood diversification

Table 4.7: Descriptive statistics of Livelihood diversification

Statements	Mean(μ)	Standard Deviation (SD)	Description
The availability of diverse employment opportunities outside of agriculture became crucial for reducing dependency on natural resources and promoting sustainable development in Kinigi.	4.2000	.83351	Very great
Livelihood diversification strategies, such as engaging in multiple income-generating activities, are essential for sustaining households in Kinigi	4.4000	.59824	Very great
There are new economic activities that have emerged as a result of CBCI such as Small-scale enterprise, handcraft activities, Education and training services.	4.6500	.48936	Very great
Overall average	**4.4167**	**0.640**	**Very great**

Source: Primary data, 2024

The findings underscore the importance of diversifying employment opportunities beyond agriculture for sustainable development in Kinigi. Community members emphasized the need for diverse job options and livelihood strategies to sustain households. The establishment of the Sabyinyo Lodge under CBCI exemplifies efforts to create alternative economic avenues, generating revenue for socio-economic and conservation projects. The emergence of new economic activities further demonstrates CBCI's positive impact on livelihood diversification and sustainable development in Kinigi.

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Contribution of CBCI on Social amenities

Table 4.9: Descriptive statistics of social amenities

Statements	Mean (μ)	Standard Deviation (SD)	Description
There has been improvement in local infrastructure (e.g. Roads, schools, healthcare facilities)	4.5000	.51299	Very great
Communities access to social services changed since the introduction of CBCI	4.1500	.81273	Very great
There is other new community programs or services that have been established	4.4500	.68633	Very great
Average	**4.367**	**0.671**	**Very great**

Source: Primary data, 2024

The findings from Table 4.9 indicate substantial enhancements in local infrastructure and access to social services in the Kinigi sector due to the Community-Based Conservation Initiative (CBCI). Renovations facilitated by CBCI have notably improved the functionality of the Kinigi Health Center, leading to increased patient numbers. The establishment of Groupe Scolaire Kampanga has also improved access to education. Additionally, the creation of the Kinigi IDP model village has provided housing and essential amenities, contributing to community sustainability and well-being.

Contribution of CBCI on Environmental Conservation

Table 4.11: Descriptive statistics of Environmental conservation

Statements	Mean (μ)	Standard Deviation (SD)	Description
CBCI has positively impacted the local environment	4.5000	.51299	Very great
There are community led efforts for environmental conservation that you have participated in	4.4500	.51042	Very great
I have noticed changes in biodiversity or natural resources since the CBCI implemented	3.6000	.88258	Very great
Average	**4.183**	**0.635**	**Very great**

Source: Primary data, 2024

The findings suggest that the Community-Based Conservation Initiative (CBCI) has notably improved the local environment in the Kinigi sector, particularly around the Volcanoes National Park. Community-led efforts have led to a significant reduction in poaching activities, deforestation, and other harmful human actions, preserving vital habitats for wildlife. Sustainable land management practices promoted through CBCI, such as reforestation and sustainable agriculture, have further enhanced environmental conservation. Overall, respondents widely agree on CBCI's positive impact on environmental stewardship, emphasizing the effectiveness of community-based approaches in promoting environmental responsibility.

RDB staff highlighted various key indicators of community development in the Kinigi Sector during interviews. These include livelihood diversification, improved access to social amenities like healthcare and education, enhanced environmental conservation efforts, increased economic opportunities, infrastructure development, and an overall improvement in the living standards of local residents.

Since the initiation of the Community Based Conservation Initiative (CBCI), the socio-economic status of the community in Kinigi Sector has notably improved. These improvements include increased household income from alternative livelihoods, reduced dependency on natural resources, better access to education and healthcare services, enhanced infrastructure development, and greater participation in sustainable economic activities like eco-tourism ventures and cooperative enterprises.

Community development projects directly linked to the CBCI in Kinigi Sector encompass initiatives promoting livelihood diversification, including beekeeping cooperatives, agroforestry

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projects, and handicraft enterprises. Programs aimed at improving access to social amenities, such as the construction of schools, health centers, and clean water supply systems, are also evident. Moreover, environmental conservation projects like reforestation efforts, habitat restoration programs, and wildlife monitoring initiatives play a crucial role in CBCI, ensuring community development while preserving natural resources.

To determine the relationship between Community Based Conservation and community development.

Table 4.12 Regression model summary

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**St. Error of the Estimate**
1	.762[a]	.581	.575	.63186
a. Predictors:(Constant), Community engagement in conservation, Cooperative formation and empowerment, Tourism Revenue Sharing				

Source: (Primary data, 2024)

The R Squared coefficient for the influence of all three independent variables on community development was calculated to be 0.581. It indicated that the three variables of Community based conservation initiative such as Community engagement in conservation, Cooperative formation& empowerment and Tourism Revenue Sharing accounted for 58.1% of the variation in community development. This indicates that the variables rate of effect on community development are accepted.

Table 4.13: Analysis of Variance

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	119.953	3	39.964	100.148	.000[b]
	Residual	86.637	100	.359		
	Total	205.590	103			
a. Dependent variable: Community Development (livelihood diversification, social amenities, environmental conservation).						
predictors: (Constant), Community engagement in conservation, Cooperative formation and empowerment, Tourism Revenue Sharing						

Source:(Primary data, 2024)

The ANOVA section shows that there is further evidence to support the idea that there is a considerable amount of influence. The p value of test was determined to be 0.000, which is less than 0.05. The result was that the sum of the variables had a considerable impact on community development. The study's findings suggest that there is significant relationship between community-based conservation initiative and community development.

Table 4.14. Regression coefficient

Coefficientsa						
Model		Unstandardized Coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.396	.181		2.187	.000
	Community engagement in conservation	.155	.059	.141	3.623	.009

International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 04 Apr. 2024, pp: 992-1005 www.ijaem.net ISSN: 2395-5252

	Cooperative formation and empowerment	.248	.060	.267	4.139	.001
	Tourism Revenue Sharing	.415	.058	.456	7.093	.000
a. Dependent Variable: Community Development (livelihood diversification, social amenities, environmental conservation).						

Source:(Primary data, 2024)

Unstandardized Coefficients and Standardized coefficients: from regression coefficients it was revealed that holding Community engagement in conservation. Cooperative formation and empowerment, Tourism Revenue Sharing (TRS) to a constant zero, community development (livelihood diversification, social amenities, environmental conservation) would be at 0.396, a unit increase in Community engagement in conservation would result to an increase in community development by a factor of 0.155, unit increase in Cooperative formation and empowerment would have to an increase in community development by a value of 0.248. a unit increase in Tourism Revenue Sharing (TRS) would lead to an increase in community development by a value of 0.415.

At a significance level of 5% and a confidence level of 95%, Community engagement in conservation exhibited a p-value of 0.009, Cooperative formation and empowerment demonstrated a p-value of 0.001, and Tourism Revenue Sharing displayed a p-value of 0.000. Overall, these findings suggest that CBCI significantly impacts Community Development (encompassing livelihood diversification, social amenities, and environmental conservation) in the Kinigi sector.

V.CONCLUSION ANDRECOMMENDATION

Conclusion

The research findings indicate that community-based conservation initiatives (CBCI) have significantly benefited community development in the Kinigi sector. These initiatives, including community engagement, cooperative formation, and participation in revenue-sharing programs, have led to positive outcomes in livelihood diversification, social amenities, and environmental conservation. Livelihood diversification strategies have been crucial for sustaining households, fostering economic development, and improving infrastructure. Additionally, CBCI implementation has resulted in tangible improvements in biodiversity conservation, with reduced poaching and deforestation. The calculated R-Squared coefficient of 0.581 highlights the substantial impact of CBCI on community development, affirming a strong relationship between the two.

Recommendations

The research findings highlight the significant positive impacts of community-based conservation initiatives (CBCI) on community development in the Kinigi sector. Based on these findings, it is recommended that policymakers, stakeholders, and organizations involved in conservation prioritize and enhance CBCI efforts. This entails allocating sufficient resources, providing support, and fostering collaboration among stakeholders to ensure the sustainability and scalability of CBCI programs. By strengthening CBCI initiatives, policymakers and stakeholders can effectively promote sustainable community development while conserving biodiversity and natural resources for future generations.

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