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Research Article

Evaluating the Effectiveness of Natural Resource Management Policy: A Case Study of Mwami Muzuma National Forest in Pemba District

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About Article

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ABSTRACT

This study evaluates the effectiveness of Natural Resource Management Policy as a case of Mwami Muzuma National Forest in Pemba District. The forest plays a crucial role in preserving biodiversity and providing ecosystem services, which are vital for livelihoods of surrounding communities. However, increasing pressures from human activities and climate change pose significant threats to its sustainability. A descriptive research design was used and purposive sampling and Proportionate samples were drawn from the fifteen (15) forest officers and thirty five (35) local community members using systematic random sampling giving the sample of fifty (50). Focus group discussions and structured questionnaires was used to collect data. This data was analyzed using the Statistical Package for Social Sciences (SPSS) computer software in order to come up with relevant information. Understanding and improving management practices are imperative to address these challenges. The introduction of the Environmental Management Act and the establishment of the Zambia Environmental Management Agency (ZEMA) underscore the government's commitment to environmental protection. These policies emphasize the importance of environmental impact assessments, sustainable land use practices, and community involvement in resource management.

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1. INTRODUCTION

This chapter presents the background of this research related to the topic being reviewed. The problem statement clearly articulate the specific gap in knowledge the study aims to address, the specific objectives breaks down these goals into measurable tasks that helps achieve the general objective. The research questions which specify what the study aims to examine or explore. The theoretical framework provides the theoretical perspective through which the research is viewed and analyzed. The significance of the study explains the importance of this research and the operational terms which defines the key concepts used.

1.1. Background

Zambia, being a land linked country in Southern Africa, is endowed with a wealth of natural resources, including minerals, forests, water bodies, and diverse wildlife. The country's natural resource management policies have evolved significantly over the years, shaped by various socio-economic and environmental factors. Historically, Zambia's natural resources were exploited with minimal regulation, leading to significant environmental degradation and loss of biodiversity. This unsustainable exploitation was primarily driven by colonial-era policies that prioritized extraction for economic gain without adequate consideration for environmental sustainability or local community needs Chanda *et al.* (2024).

1.2. Statement of the problem

Natural Resource Management Policies play a critical role in balancing ecological sustainability with socio-economic development. The central issue under investigation is the extent to which these policies have successfully mitigated environmental degradation while promoting equitable resource use and economic development.

1.3. Objectives

i. To assess the extent to which Natural Resource Management Policies are implemented effectively, identifying strengths and weaknesses.

ii. To establish the impact of Natural Resource Management Policies on environmental conservation, the protection of biodiversity and forest.

iii. To examine the effectiveness of Natural Resource Management Policies in promoting sustainable utilization of natural resources.

1.4. Research questions

i. To what extent does Natural Resource Management Policies are implemented effectively?

ii. What impact have Natural Resource Management policies had on natural resource conservation and land degradation?

iii. How effectiveness of Natural Resource Management Policies are in promoting sustainable utilization of natural resources?

1.5. Theoretical framework

According to Vinz (2022) theoretical framework is an essential component of research that provides a structured way to understand and interpret the underlying principles of a study. It offers a lens through which the research problem is viewed, integrating theories, concepts, and ideas relevant to the subject matter. Coomes (2015) argues that human beings attribute their success or failure to something, the researcher has hence found it reasonable to adopt the Attribution. The choice of this theory is based on the fact that it states that people attribute their success or failure in terms of causes. In order to understand causation of behaviour, they search for explanations or causes. The theory further states that people attempt to maintain a positive self-image when they do well by attributing the success to their own effort or abilities but if they do poorly, they believe it is because of factors beyond their control (Slingenberg *et al.,* 2009).

2. LITERATURE REVIEW

This chapter provides a review of literature on forest management and utilization, contribution of forests, and also covers the concept of participatory forest management, its implementation and performance at global, regional and local levels. The presentation of literature will undergo the following themes: Overview of the Forest Act (No. 4 of 2015), Causes of deforestation, Consequences of deforestation, and Research gap.

2.1. Thematic area developed from objective one

Globally, agricultural expansion remains the leading cause of deforestation, accounting for nearly 80% of deforestation, particularly in tropical regions. A study by Tombari (2021) emphasized the role of commercial agriculture in deforestation, particularly in Latin America and Southeast Asia, where crops like soy, palm oil, and cattle ranching are significant drivers. Other global factors include infrastructure expansion, mining, and urbanization. For instance, the construction of roads and dams in forested areas, particularly in tropical regions, exacerbates forest loss by providing access to previously remote areas

2.2. Thematic area developed from objective two

Deforestation remains a critical environmental issue, with significant consequences for biodiversity, climate, and livelihoods. Globally, numerous studies have sought to understand the underlying causes of deforestation, which are often linked to human activities. Agricultural expansion is widely recognized as the leading driver, as seen in a global analysis by FAO (2021), which attributed approximately 27% of deforestation to commercial agriculture, primarily in tropical regions. Further, a meta-analysis by Alves (2022). Reinforced that the expansion of monocultures such as oil palm and soy continues to threaten forests, especially in Southeast Asia and the Amazon.

At the continental level, Africa presents unique challenges. A study highlighted that shifting cultivation, alongside the expansion of commercial farming and urbanization, is driving forest loss in the Congo Basin. Additionally, logging and infrastructural developments contribute to fragmentation, leading to biodiversity loss.

2.3. Thematic area developed from objective three

In Brazil's Amazon, indigenous-managed lands have proven

to be crucial in preserving forests, as studies indicate that deforestation rates are significantly lower in indigenous territories compared to non-protected areas (Alves, 2022). These examples underscore the importance of integrating local knowledge, enhancing community rights, and providing adequate support to local communities to achieve sustainable forest management and mitigate deforestation effectively.

2.4. Research gap

There is limited comprehensive analysis of the long-term socio-economic and environmental impacts of current policies. Most studies focus on short-term outcomes, leaving a gap in understanding the sustainability and resilience of these policies over time. Additionally, there is a need for more inclusive research that considers the perspectives and experiences of local communities, especially marginalized groups whose livelihoods are directly affected by natural resource management.

3. METHODOLOGY

This chapter discusses the methodology that was used in this study. Thus, the chapter deals with different strategies that was used in the study to achieve the research objectives. It describes the research design, population, sample size, sampling procedure, research instruments, and data collection techniques, data analysis process as well as ethical considerations.

3.1. Research design

This study used a descriptive research design, for either quantitative or qualitative method (McCombes, 2019). A "descriptive research presents a picture of the specific details of a situation, social setting or relationship, and focuses on 'how' and 'who' questions".

3.2. Targeted Population

Population refers to an entire group of persons or elements that have at least one thing in common that are of interest to the researcher (Willie, 2024). The population for this study is Fifty (50) comprising of Thirty five (35) community members within Mwami Muzuma National Forest and fifteen (15) officers from the Department of forest in Pemba District.

The formula for determining sample size

$$n = \frac{Z^2 . P . (1 - P)}{e^2}$$

Where,

- n is the sample size
- Z is the Z-score (which corresponds to the desired confidence level, e.g.1.96 for a 95% confidence level)
- p is the population proportion (often assumed to be 0.5 when unknown, as this maximizes sample size)
- e is the margin of error

3.3. Sampling design

In this study purposive sampling and Proportionate samples were drawn from the forest officers and local community members using systematic random sampling.

3.4. Sample Size determination

According to Oribhabor and Anyanwu (2019) Defines a sample as a group of subjects or situations selected from a larger population. For this study a sample size of 50 was selected. This includes 15 forest workers and 35 community members, reflecting a balanced representation of both groups integral to the study around Mwami Muzuma National forest.

3.5. Data Collection methods

According to Kabir (2016) data collection methods are essential for gathering relevant and accurate information. In this study focus group discussions and structured questionnaires was used.

3.6. Data analysis

In this study, data was analyzed using the Statistical Package for Social Sciences (SPSS) computer software in order to come up with relevant information.

3.7. Triangulation

Triangulation in research refers to the use of multiple methods or data sources to develop a comprehensive understanding of a phenomenon. It enhances the credibility and validity of research findings by cross-verifying the results through different lenses.

3.8. Limitations of the study

In a research project, the term "limitation of the study" refers to the inherent constraints or restrictions that may affect the research's outcomes, validity, or generalizability. Lastly, financial resources will also be a limiting factor on the coverage of the study.

3.9. Ethical consideration

In this study, voluntary participation was ensured and before the beginning of the interview, the participants where told what the research is all about and the importance of them giving correct information, they will also informed that they have the right not to take part in this activity if they so wish. I make sure that the information gathered will only be used for the intended and stated purpose.

4. RESULTS AND DISCUSSION

This chapter presents the findings and discussions of the findings gathered through the study made by the researcher, in this dissertation, data gathering has focused on how effective is the Natural Management Policies are to mitigate the ongoing illegal cutting down of trees for charcoal production, which causes deforestation, land degradation and soil erosion in Mwami Muzuma National Forest.

4.1. Presentation of results on background characteristics

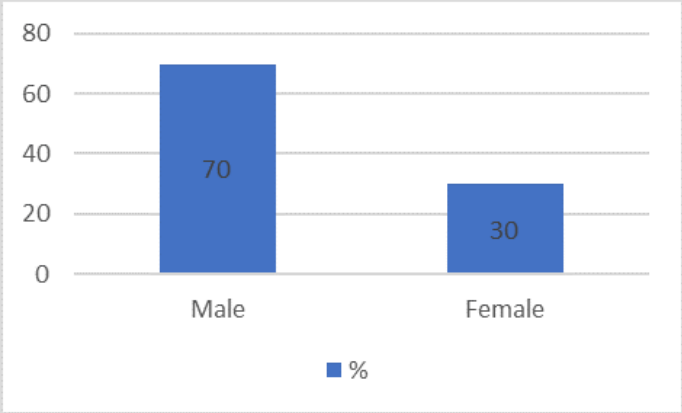

Figure 1. Gender

The figure above represents the gender imparities of the study. Out of fifty (50) participants, thirty five (35) participants were male representing 70% and fifteen (15) participants were female representing 30%.

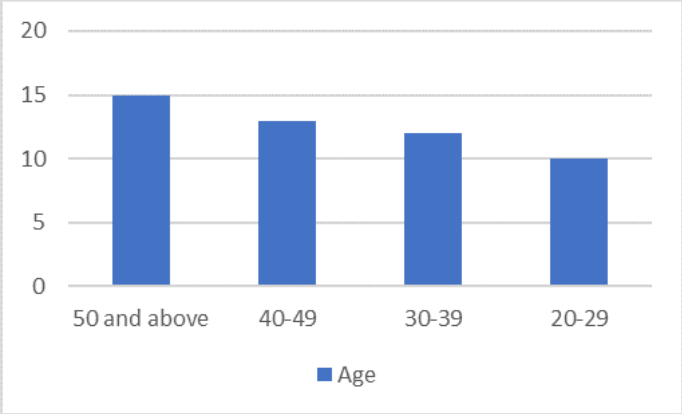

Figure 2. Age of respondents

The figure above presents the age of the respondents where 15 are on the age of 50 and above, 13 respondents are on the age of 40-49, 12 are on the age of 30-39 and 10 are on the age of 20-29 respectively.

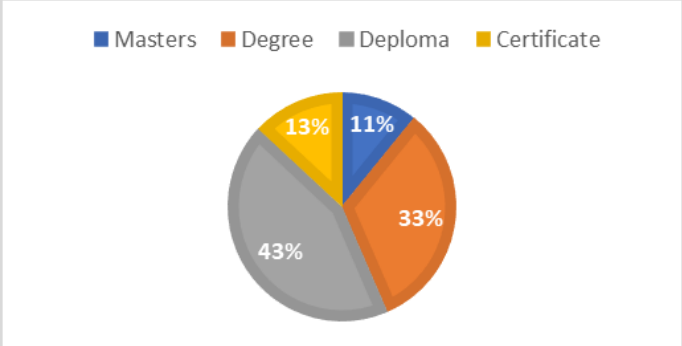

Figure 3. Education level

This represents the level of education, out of fifty (50) participants, one (1) has a Master degree, three (3) have degrees, Four (4) have diplomas and two (2) have certificates.

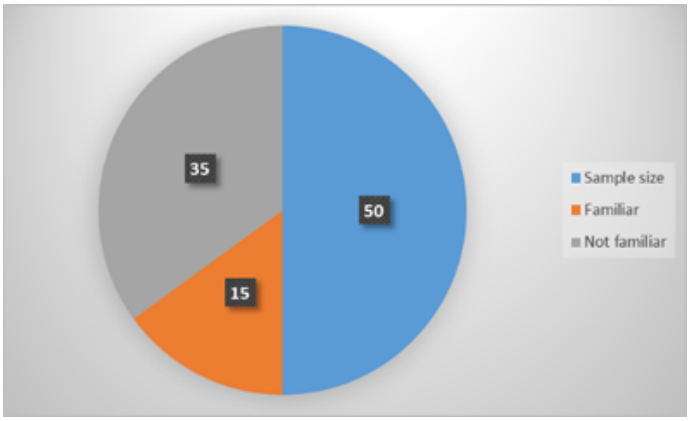

Figure 4. Familiar with NRM Policy

This figure presents how familiar the participants are with the NRM Policy, and out of Fifty (50), thirty five (35) community members from Mwami muzuma National Forest are not familiar, fifteen (15) are familiar with the policy.

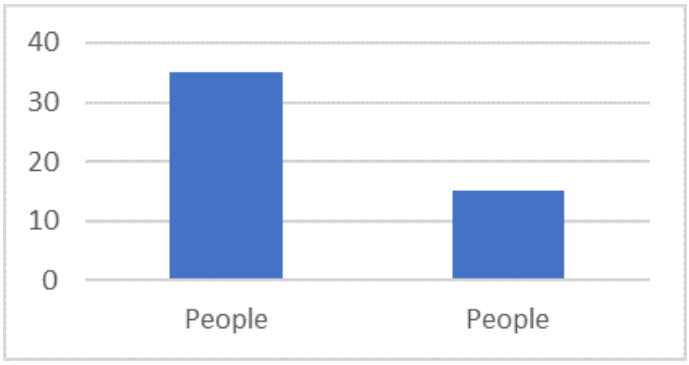

Figure 5. How people perceive NRM Policy

This presents how people perceive NRM Policy to adequately address the conservation and sustainable forest management. Out of fifty respondents, 35 showed that the current policy is not adequately, and 15 indicated that 2015 policy at least addresses the conservation and sustainable of natural resource.

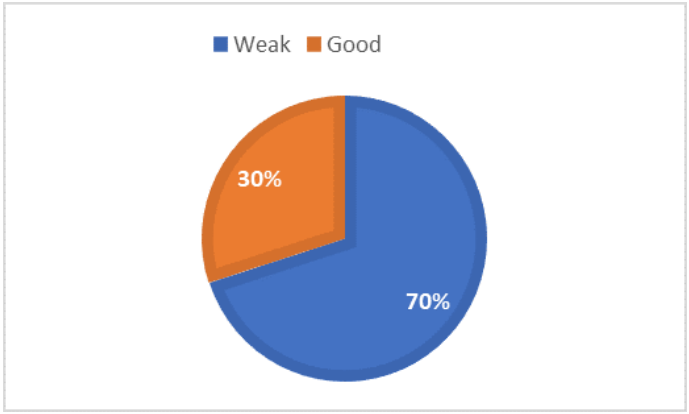

Figure 6. Strength of NRM Policy

The figure above presents the strength of the Natural Resource Management Policy, and out fifty (50) respondents, thirty five

(35) indicated that Natural Resource Management Policy is weak representing 70% and fifteen (15) said it is good representing 30%.

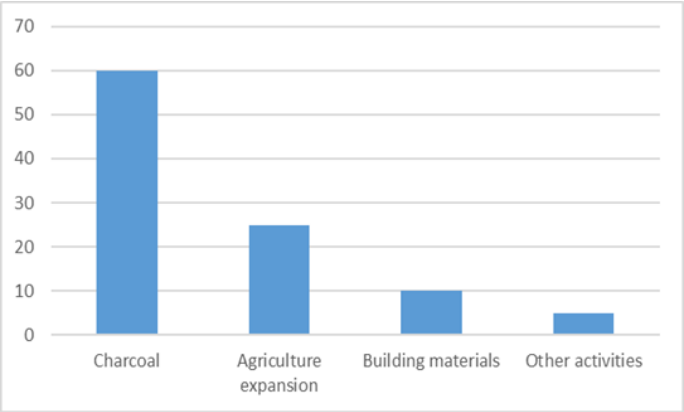

Figure 7. Challenges on implementation of NRM Policy

The figure above shows challenges which are trees are being cut down by the local people for various reasons like 60% for charcoal production, 25% for farming expansion, 10% for building materials and 5% for other activities.

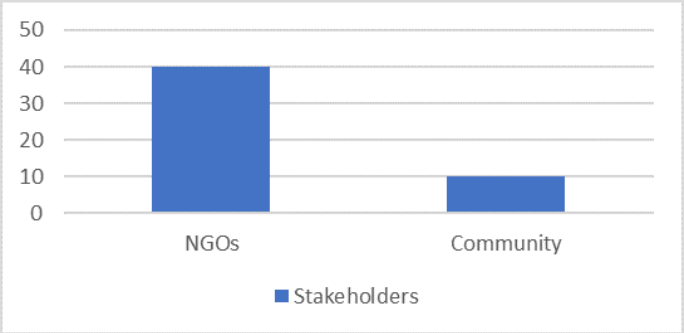

Figure 8. Stakeholders engagement

The figure above shows whether stakeholders are involved in formulation and evaluation of NRM Policies, and 40 responded that only Non-Governmental Organizations are involved and 10 indicated that even local community is involved.

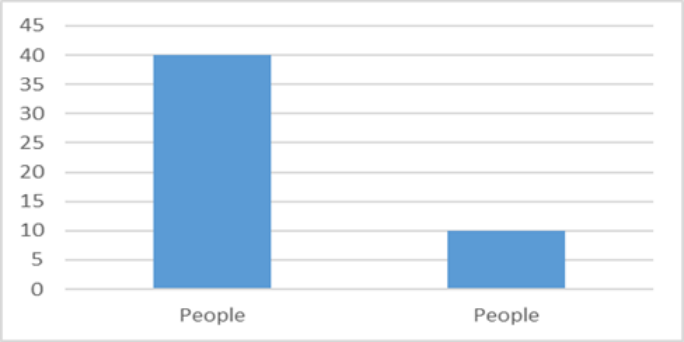

Figure 9. Gaps

This figure above represents the gaps on NRM Policy, and forty (40) respondents indicated some gaps are there and ten (10) respondents indicated no gaps on the implementation NRM Policy.

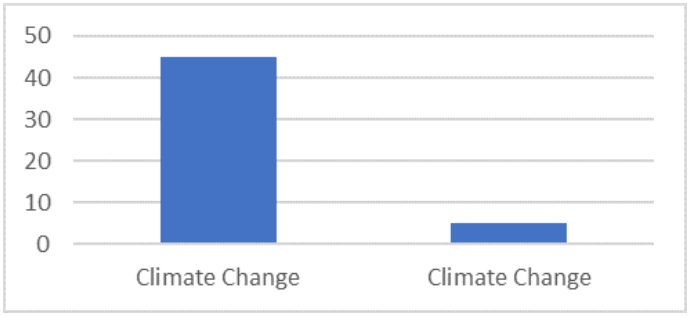

Figure 10. The impact of Climate Change

The figure above represents if the NRM Policy adequately address the impact of climate change. Out of 50 respondents, 45 indicated that the current NRM policy does not adequately address climate change and 5 indicated that it does.

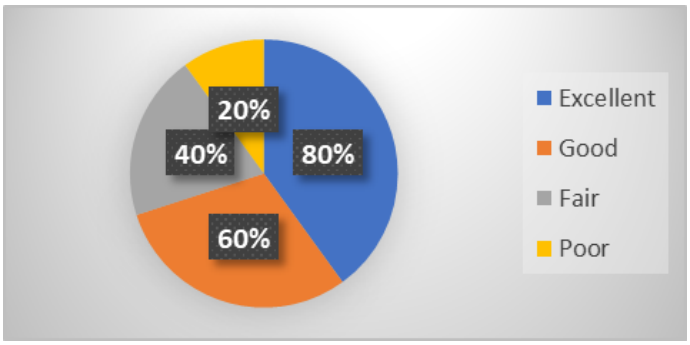

Figure 11. Enforcement and compliance of NRM Policy

The figure above shows the enforcement and compliance percentages of NRM Policy, 40 respondents indicated poor translating 20% and 10 respondents indicated fair representing 40%.

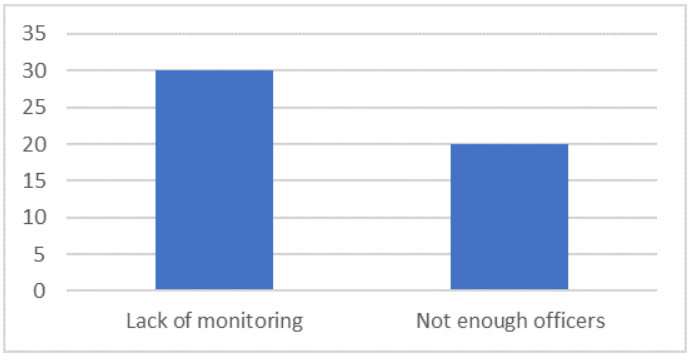

Figure 12. Explanation of figure 11

The figure above is an explanation pf figure 11, 30 responded that people are not complying because of lack of monitoring and 20 indicated that forest officer are not enough to do the work accordingly.

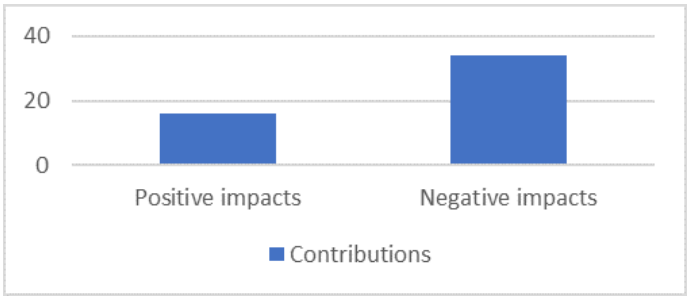

Figure 13. Positive and negative contributions

The figure above illustrates the positive and negative impacts the communities contribute to the forest, 34 respondents indicate that negative impacts are more than the positive and 16 indicate positive impacts.

Figure 14. How effective are the NRM Policies.

The above pie chart illustrates how effective are the policies in promoting biodiversity conservation within forested areas and 100% very effective, 80% effective, 60% fair and 40% representing poor. The explanation for this is on figure 15 below.

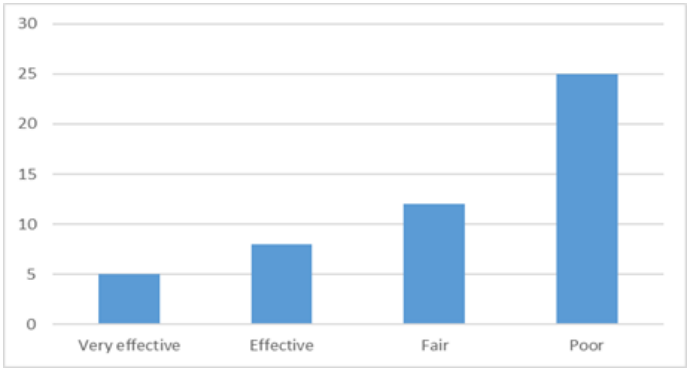

Figure 15. Explanation of figure 14

On the figure above 25 indicated poor, 13 fair, 7 effective and 5 very effective on how effective the policies are in promoting biodiversity conservation within Forest.

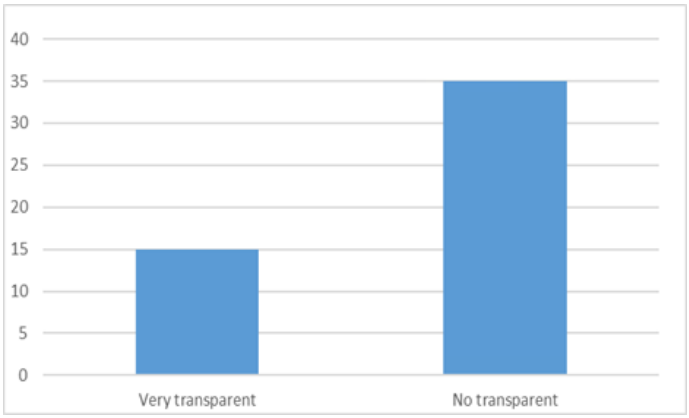

Figure 16. Transparent and accountable

Out 50 respondents 35 indicated no transparent and 15 transparent on governance and decision making processes related to Natural Resource Management Policies.

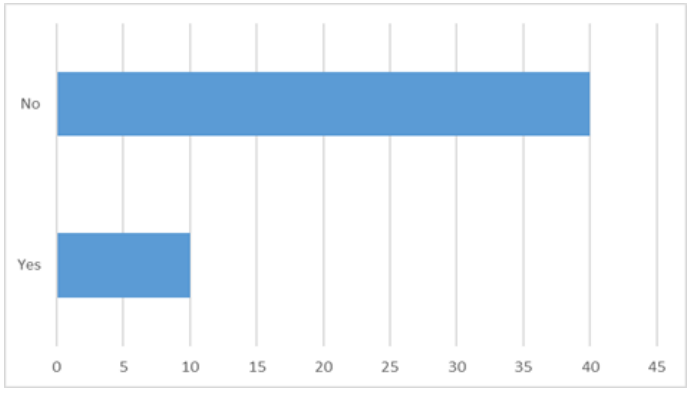

Figure 17. Mitigation of deforestation

The figure above illustrates if the current Natural Resource Management Policy sufficiently mitigate risks of deforestation, illegal logging and wildfire in forest areas. 40 responded no and 10 responded yes.

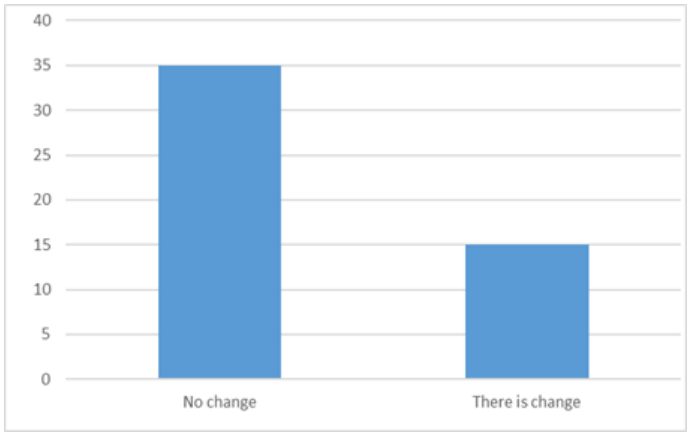

Figure 18. Changes in ecosystem

Out of 50 respondents, 35 indicated no changes and 15 responded there is change in ecosystem as the climate change has impacted the country.

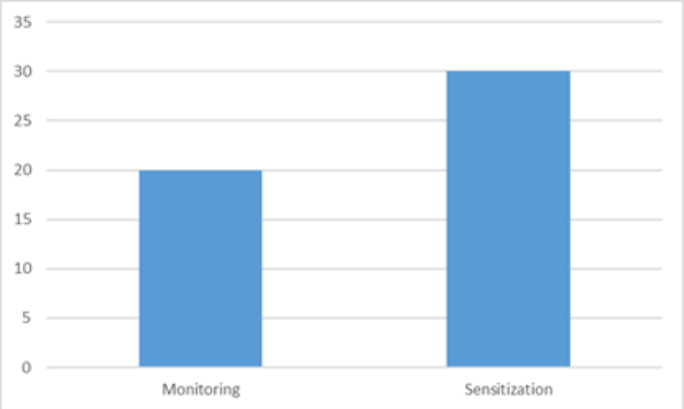

Figure 19. Suggestions for improvement

On the improvement thirty (30) respondents suggested the sensitization of community members and twenty (20) suggested the monitoring process to see compliance on the implementation of Natural Resource Management Policy.

4.2. Presentation of results based on a thematic area developed from objective one

The gender imparities of the study indicates that out of fifty (50) participants, thirty five (35) participants were male representing 70% and fifteen (15) participants were female representing 30%, this is so because women shine away from participating in any Programme.

The study covered all the ages of the respondents where 15 are on the age of 50 and above, 13 respondents are on the age of 40-49, 12 are on the age of 30-39 and 10 are on the age of 20-29 respectively to avoid biasness. The level of education, out of fifty (50) participants, one (1) has a Master degree in environmental science, three (3) have degrees, Four (4) have diplomas and two (2) have certificates.

The results shows how familiar the participants are with the Natural Resource Management Policy, and out of Fifty (50) respondents, thirty five (35) community members from Mwami muzuma National Forest are not familiar, fifteen (15) forest officers are familiar with the policy.

4.3. Presentation of results based on a thematic area developed from objective two

The study reviewed how people perceive NRM Policy to adequately address the conservation and sustainable forest management. Out of fifty respondents, 35 showed that the current policy is not adequately, and 15 indicated that 2015 policy at least addresses the conservation and sustainable of natural resource.

4.4. Presentation results based on a thematic area developed from objective three

This thematic discussion will delve into possible solutions, focusing on policy interventions, community engagement, alternative energy sources, and reforestation initiatives.

4.5. Discussions

The findings of this study reveal a complex interplay of factors driving deforestation in Mwami Muzuma National Forest. Agricultural expansion, primarily driven by the need for more farmland, emerges as the leading cause, with 60% (30 out of 50) of respondents identifying it as a primary driver.

The dependence on the forest for energy resources is also apparent, with 50% (25 respondents) relying on firewood collection and 30% (15 respondents) involved in charcoal production, further contributing to deforestation. Illegal logging activities, though reported by 40% (20 respondents), still pose a significant threat, indicating a need for stricter enforcement of existing regulations. Population growth and the resulting pressure on land and resources are recognized as underlying factors, with 20% (10 respondents) attributing deforestation to this issue.

The environmental consequences of deforestation are readily apparent to the respondents. The loss of biodiversity, marked by a decline in plant and animal species, is a major concern, with 70% (35 respondents) observing this decline.

Soil erosion, resulting from the removal of tree cover, is also widely observed, with 60% (30 respondents) reporting this issue, leading to land degradation and potentially impacting agricultural productivity. The effects on water resources are evident, with 50% (25 respondents) noting decreased water availability in rivers and streams, likely due to reduced water retention capacity of the deforested areas. A perceived increase in local temperatures is reported by 40% (20 respondents) and a decline in air quality by 30% (15 respondents), suggesting broader environmental and health implications.

Promoting sustainable agricultural practices that minimize the need for forest clearing is seen as crucial by 60% (30 respondents), along with the adoption of alternative energy sources to reduce reliance on firewood and charcoal, supported by 50% (25 respondents). The importance of environmental education and awareness campaigns is recognized as a key element in fostering a sense of responsibility and promoting sustainable practices, with 40% (20 respondents) emphasizing this aspect.

Demographic information reveals a relatively balanced sample in terms of gender, with 28 males and 22 females participating. The age distribution skews slightly younger, with the largest group (18 respondents, 36%) falling between 26 and 35 years old. Married individuals constitute the majority of respondents (25, 50%), reflecting the demographics of the area. Educational attainment varies, with a notable number of respondents possessing secondary education (15, 30%) and a smaller, but significant, portion holding higher education diplomas/ certificates (12, 24%).

The institutional affiliations of respondents show a diverse range of involvement in natural resource management, with representation from government ministries (10, 20%), local NGOs (8, 16%), farming cooperatives (5, 10%), and private forestry companies (4, 8%). A significant portion of respondents (10, 20%) were unemployed, while others (13, 26%) represented various other institutions. The split between public (25, 50%) and private (15, 30%) institutions highlights the diverse stakeholders involved in forest management.

Awareness and perception of natural resource management

policies are mixed. While 10 respondents (20%) reported being very familiar with the policies, a larger group (20, 40%) indicated only moderate familiarity, and a significant minority (20, 40%) expressed limited or no familiarity. Opinions on the adequacy of the policies are divided, with 20 respondents (40%) believing they adequately address conservation, 20 respondents (40%) disagreeing, and 10 (20%) feeling they partially address the issues. Reported strengths and challenges related to policy implementation would require further thematic analysis to identify key trends.

Stakeholder engagement appears to be a point of contention. While 30 respondents (60%) reported stakeholder involvement in policy formulation and evaluation, a significant minority (20, 40%) reported limited or no involvement. Perceptions of policy effectiveness in addressing climate change are also mixed, with only 15 respondents (30%) believing they do so adequately. Enforcement of regulations is perceived as a weakness, with 15 respondents (30%) rating it as "fair" and another 15 (30%) as "poor."

Socio-economic impacts of the policies require further thematic analysis of open-ended responses. Perceptions of policy effectiveness in promoting biodiversity conservation are largely negative, with 30 respondents (60%) rating it as either "fair" or "poor." Transparency and accountability in governance related to natural resource management also require further qualitative analysis.

The perceived effectiveness of the policies in mitigating risks like deforestation and illegal logging is low, with 25 respondents (50%) believing they are insufficient. Observed changes in forest cover and ecosystem health are predominantly negative (20, 40%), indicating potential shortcomings in policy implementation.

5. CONCLUSION

The Natural Resource Management Policies are not addressing some of the challenges faced by natural resources in the country particularly Mwami muzuma National Forest, because community members are still cutting trees any how to make charcoal and sell in order to earn a living, which promotes deforestation and soil erosion that results in climate change. It can be concluded that the policy does not effectively address the negative impacts posed by human's economic activities for the government to achieve the intended goals in terms of conservation, sustainable use, or economic development.

ACKNOWLEDGMENTS

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