

BINDURA UNIVERSITY OF SCIENCE EDUCATION DEPARTMENT OF NATURAL RESOURCES

STAKEHOLDERS' PERSPECTIVES ON THE EFFECTIVENESS OF THE ELEPHANT
MANAGEMENT PLAN IN NORTH WEST MATEBELELAND REGION FROM 2021 TO
2023.



MLAUZI TANYARADZWA MICHELLE

B212815B

***A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS OF THE BACHELOR OF SCIENCE HONOURS DEGREE IN
NATURAL RESOURCES MANAGEMENT.***

2025

DATE: JUNE 2025

DECLARATION.

The undersigned certify that they have read this research project and have approved its submission for marking in relation to the department's guidelines and regulations.

STUDENT: Tanyaradzwa Michelle Mlauzi

SIGNATURE:

DATE: 17 October 2025

SUPERVISOR: Doctor A Mureva

SIGNATURE:



DATE: 17/10/2025

CHAIRMAN:

SIGNATURE:

DATE:

Acknowledgements

I want to genuinely and sincerely thank the host organisation and several people whose help and direction were crucial to this report and my attachment experience. I also want to express my profound thanks to Hwange Main Camp for kindly hosting my attachment; the opportunity to observe the day-to-day operations and the friendly atmosphere greatly enhanced my education and career advancement. My sincere gratitude goes out to my supervisor, Ms. Nobesuthu Ngwenya, for her unwavering support, wise counsel, and priceless mentoring. Her experience, helpful criticism, and readiness to impart her knowledge greatly influenced my knowledge and abilities. I immensely appreciate my hardworking co-workers; their camaraderie was a constant source of motivation, and their collaborative spirit, shared insights, and mutual encouragement created a positive and productive working environment. Thank you, the Bindura University of Science Education and my academic supervisor, Doctor A. Mureva, for allowing me to participate in this rewarding academic journey and for their support. Finally, without my parents' unwavering love, support, and encouragement, none of this would have been possible; their faith in me has sustained me throughout my academic career. I am beyond grateful for all of this.

Dedication

I dedicate my research project to all who have supported and assisted me during this endeavour. This work was built on your unwavering belief in my abilities, encouragement, and support, which fosters an environment where curiosity thrives, and hard work is rewarded. I want to express my gratitude to my family, mentors, and co-workers, whose constant support, insightful discussions, and endless patience were invaluable during my journey. This endeavour demonstrates your profound impact on my academic and personal growth. This work also honours the pursuit of knowledge and the individuals affected by the subject matter, whose inquisitiveness fueled my passion for the research and sustained me through all the challenges, transforming failures into teaching moments. Reflecting on the collaboration that made this study possible, I think it will significantly expand our understanding of natural resource management.

Abstract

Sustainably coexisting with animals is crucial for life on Earth, but it can be difficult, especially when huge mammals are involved, and many human-wildlife conflicts occur. The Zimbabwe Parks and Wildlife Authority introduced an Elephant Management plan to reduce these conflicts. However, the effectiveness of this plan is not well known. This study investigates the opinions of stakeholders regarding the effectiveness of the Elephant Management Plan in Zimbabwe's North West Matebeleland region between 2021 and 2023. To comprehend the complex environmental and socioeconomic concerns affecting elephant conservation today, this study utilised a critical social theory. It emphasises the need for an efficient and inclusive management plan in light of the growing elephant population and the associated problems of human-elephant conflict. Structured questionnaires (n=86) were used to gather data from various stakeholders, including NGOs, government representatives, and travel agencies. Significant differences in opinions on the EMP's effectiveness are found in the analysis, especially concerning implementation tactics and stakeholder engagement. Results show that collaboration strengthens conservation efforts, as evidenced by the strong correlation between stakeholder engagement and conservation capability. Despite the reasonable overall satisfaction ratings, the results also show significant stakeholder awareness and communication gaps. The study emphasises the need for more cooperation, transparency, and adaptive management frameworks to improve conservation outcomes.

Keywords: Elephant Management Plan, Human-Elephant conflict, Stakeholder perspectives, conservation strategies, North West Matebeland.

Table of Contents

Declaration.....	1
Acknowledgements.....	2
Dedication.....	3
Abstract.....	4
Table of Contents.....	5
List of tables.....	8
List of Figures.....	9
List of acronyms.....	10
CHAPTER 1: INTRODUCTION.....	11
1.1 Background to the study.....	11
1.2 Problem Statement.....	12
1.3 Objectives.....	13
Main Objective.....	13
Specific Objectives.....	13
1.4 Justification.....	13
CHAPTER 2: Literature Review.....	14
2.1 Stakeholder perspectives on the EMP.....	14
2.2 Effectiveness of Elephant Management Plans.....	17
CHAPTER 3: Materials And Methods.....	23
3.1 Location and description of the study area.....	23
3.2 Study area map.....	24

3.2.1 Other Elephant Management Regions.....	25
3.3 Research Design.....	25
3.4 Target Population and Sampling Methods.....	26
3.4.1 Target Population	26
3.4.2 Sampling Framework	26
3.4.3 Stakeholder Categories	27
3.5 Data Collection Methods.....	27
3.6 Statistical Analysis Framework.....	28
3.6.1 Analytical Software and Environment	28
3.6.2 Statistical Analysis	29
CHAPTER 4: Results	30
4.1 Demographics of respondents	30
4.2 Percentage in positive responses given by various stakeholders with a positive affirmation towards the implementation of the EMP.....	31
4.3 Response rate in the five thematic areas.	32
4.4 The correlation heat map in the five thematic areas.....	34
4.5 Effectiveness of the EMP to the stakeholders	35
4.6 Comparison of the GVT vs. NGO perception analysis.	36
4.7 Support vs. Conservation Capacity Relationship.....	36
4.8 Satisfaction Score Distribution.....	37
4.9 Response Rates by Organisations	38
Chapter 5: Discussion	40
5.1 EMP Stakeholder Perceptions.	40
5.2 Percentage of positive responses.....	41
5.3 Response rate in the 5 thematic areas.....	41

5.4 Implementation.....	41
5.5 Correlation.....	42
5.6 Challenges in Translating Support into Action.	42
5.7 Varied Effectiveness Ratings and the NGO Perspective.	42
Chapter 6: Conclusion and Recommendations	44
6.1 Conclusion.....	44
6.2 Recommendations	44
References	46
Appendices.....	50
Elephant Management plan Questionnaire.	50
Partial Python software analysis	51

List of tables

Table 1 EMP factors vs. Kruskal-Wallis P Value.....	32
--	-----------

List of Figures

Figure 3. 1 the North West Matebeleland Region.....	24
Figure 4. 1 Organisation type questionnaire distribution.....	30
Figure 4. 2 Positive responses in the 5 thematic areas.....	31
Figure 4. 3 Response rate of stakeholders in the thematic areas.....	33
Figure 4. 4 The correlation heat map.....	34
Figure 4. 5 Implementation for the stakeholders.....	35
Figure 4. 6 Gvt vs. NGO mean ratings comparison.....	36
Figure 4. 7 Support vs Conservation Capacity Relationship.....	37
Figure 4. 8 Satisfaction Score Distribution.....	38
Figure 4. 9 EMP effectiveness: Positive response rates.	39

List of acronyms

ZPWMA – Zimbabwe Parks and Wildlife Management Authority

EMP – Elephant Management Plan

KAZA TFCA – Kavango -Zambezi Trans-Frontier Conservation Area

CITES – Convention on International Trade in Endangered Species of Wild Fauna and Flora

SADC – Southern Africa Development Community.

CBNRM – Community Based Natural Resources Management.

NWMR – North West Matebeleland Region

HNP- Hwange National Park

PA- Protected Areas

IUCN- International Union for Conservation of Nature

HWC- Human Wildlife Conflict

NGO- Non-Governmental Organisation

SECF- Social Economic and Cultural Framework

CCP Management- Conservation Collaboration and Programme Management

CHAPTER 1: INTRODUCTION

1.1 Background to the study.

As a keystone species and ecosystem engineer, the savanna elephant (*Loxodonta africana*) must be protected worldwide. Elephant management consequently garners international interest. In addition to producing dung compost and facilitating seed dispersal and germination, elephants also operate as agents of habitat modification, influencing the choice of microhabitats by other herbivores by altering the danger of predation and food availability (Valeix et al. 2011). Various advantages nature provides are essential to survival and well-being (Costanza et al. 2014). African elephants are a keystone species vital to establishing and maintaining healthy ecological systems (Chase et al. 2016). Elephants play an economic role; they are value generators that impact every area where they occur (Mariki et al. 2015). They are mega-herbivores and consume vast quantities of plants. Elephant management plans typically balance biodiversity conservation with human development and well-being. These plans involve various interventions such as contraception, translocation, hunting, and culling, as well as strategies to mitigate HEC and promote coexistence.

In Zimbabwe's Hwange National Park (HNP), African elephants (*L. africana*) have exceeded the management goal of 5,000 to 10,000, with current estimates of 45,000 by 2021 (Tickle et al. 2025). As poaching has become a huge problem, estimates show that by 2024, over 200 elephants have been killed. At HNP, a study was conducted to determine the age and sex of 101 lower jaws from savannah elephant deaths caused by drought. They found that there were more female elephant deaths than males overall, and they also provided evidence that the social and developmental activities of savanna elephants are congruent with and have an impact on the overall distribution of female mortality prevalence in proportion to male mortality (Ndlovu et al. 2023). Human-elephant conflict is a serious conservation concern in nations where elephants are found. A management plan was created and implemented to prevent and lessen conflict between humans and elephants. However, the majority of current preventative techniques are based on site-specific elements that only provide temporary solutions, and mitigation strategies often shift conflict risk from one location to another, which is why human-elephant conflict persists (Shaffer et al. 2019).

The EMP was put in place to maintain the increasing elephant population at a sustainable level, ensuring their long-term survival without affecting other wildlife or breaching the carrying capacity of their habitat. It was also put together to tie together interests, endorse sustainable development projects that benefit nearby communities and elephant conservation, reinforce law enforcement efforts, and oppose unlawful activities that threaten elephants to balance development and conservation sustainably. Unchecked populations significantly impact ecosystems by changing plant communities and generating deforestation. These creatures must be managed because of the disruption of other species' habitats and the threat to biodiversity (Hyvarinen et al., 2021). Life on Earth depends on the sustainable cohabitation of species, but this cannot be easy, especially when huge creatures are involved. Understanding local populations' attitudes, beliefs, and behaviours toward elephants can be facilitated by incorporating a social science component into wildlife management programs.

This study examines how the elephant management plan progresses to various stakeholders within the ZIMPARKS organisation. As no monitoring and evaluation for the Elephant Management Plan has ever been done, this was a good approach to investigate further how the implementation is progressing between the stakeholders before being handed out to the workers and local people by doing a background check. Furthermore, data collected through questionnaires revealed a slight lack of awareness and knowledge regarding the EMP among communities directly impacted by its implementation. This was exacerbated by the absence of a dedicated monitoring program to track progress and evaluate the plan's effectiveness. It was necessary to do a background check on how the EMP is progressing, firstly in North West Matebeleland. Thus, initial observations raised critical questions about the effectiveness. A comprehensive assessment was required to determine how the plan achieves its goals of maintaining healthy elephant populations, balancing conservation with development needs, protecting elephant habitat, and fostering community involvement. There is a lack of a long-term background check assess the impacts of this plan over a long period, particularly on ecosystem health and population dynamics.

1.2 Problem Statement

Since the implementation of EMP, no monitoring and evaluation has ever been done in Zimbabwe. Hence, a comprehensive assessment was essential to determine the extent to which the plan

achieves its stated goals of maintaining healthy elephant populations, balancing conservation with development needs, protecting elephant habitat, and fostering community involvement, especially in the broader management context of KAZA TFCA.

1.3 Objectives

Main Objective

- To assess the elephant conservation status after the EMP was put in place and identify areas for improvement.

Specific Objectives

1. To evaluate stakeholder perceptions of the EMP's effectiveness in addressing human-elephant conflict and biodiversity conservation.
2. To assess the effectiveness of the EMP implementation strategies by looking at the five thematic areas from 2021 to 2023.

1.4 Justification

Zimbabwe has a large and rising elephant population which presents both conservation potential and concerns. An effective EMP is essential for combining elephant conservation with the needs of local communities and reducing human-elephant conflicts. Zimbabwe's Elephant Management Plan is crucial for balancing the preservation of its unique elephant population with the requirements of local populations. However, assessing the plan's success during the 2021-2023 timeframe is critical to ensuring it meets its objectives. This assessment will disclose progress toward conservation goals and any deficiencies in execution. By identifying strengths and weaknesses, the review can help shape future updates of the EMP, ensuring that it remains a practical approach for protecting Zimbabwe's elephants for future generations.

CHAPTER 2: Literature Review

Prior research has significantly advanced the philosophy and practice of managing and involving project stakeholders. The actors in a successful stakeholder engagement process have a cultural affinity, acknowledge one another's authenticity, invest time in establishing trust, and can accept little achievements (López-Rodríguez et al. 2020).

The act and thought of including and guiding officials in projects that are viewed as intricate have benefited much from earlier research. (Williams, Ferdinand et al. 2015) looked at the work from a more nuanced perspective. Because stakeholders—including local communities, governmental and non-governmental organisations, and the commercial sector—often have valuable information and insights that can direct the development and implementation of effective conservation plans, it is critical to comprehend their perspectives. Their involvement could lead to more specialised and practical approaches. When stakeholders feel valued and acknowledged, they are more inclined to back conservation initiatives, reduce opposition, and enhance collaboration in management initiatives, all fostering cooperation and trust (Shackleton, Adriaens et al. 2019). In place of delivering local knowledge that advances scientific understanding of ecosystems and species, stakeholders can help with data collecting and monitoring initiatives. Their participation may result in more precise evaluations and flexible management (Kusters et al., 2018). This project will encompass the sole purpose of the progress of the EMP.

2.1 Stakeholder perspectives on the EMP.

Stakeholder engagement is essential to the development and execution of an elephant management plan because of its many advantages and the various roles that stakeholders can play. By offering a variety of viewpoints and areas of expertise, stakeholders, including governmental organisations, local communities, conservation NGOs, and businesses, make a substantial contribution to the effectiveness of such strategies. Their involvement aids in managing expectations, spotting and resolving possible dangers, and creating a cooperative atmosphere supporting project objectives. (Sterling et al. 2017). By embracing communities in decision-making processes, effective stakeholder engagement empowers them and can result in less conflict between humans and

elephants and greater support for conservation initiatives. (Benites-Lazaro and Mello-Théry 2019).

In Zimbabwe, stakeholder engagement has been instrumental in developing the Elephant Management Plan, which involves various stakeholders from the wildlife and tourism industries, NGOs, and government agencies (Makoni, 2023). The benefits of stakeholder engagement include enhanced understanding of project stakeholders, improved risk management, more effective expectation management, and increased stakeholder satisfaction, all of which contribute to sustainable and successful project outcomes (Browne and Goodchild, 2023). Moreover, stakeholder engagement promotes trust and goodwill among stakeholders, which is vital for overcoming challenges that may arise during project implementation.

Any modern organisation's success and survival depend on its ability to comprehend and meet stakeholder expectations. The significance of fulfilling and, preferably, surpassing stakeholder expectations for corporate social responsibility can be considered. The idea of organisational stakeholders is presented, along with the stakeholder analysis procedure that identifies the stakeholder groups inside an organisation and each group's expectations of the Organisation. Although it's crucial to fulfil all reasonable stakeholder expectations, a company should ideally be able to surpass them. Corporate social responsibility is briefly reviewed to set the scene for thinking about the importance of stakeholder engagement. It is stated how crucial it is to balance the frequently divergent expectations of different stakeholder groups. This involves coordinating a company's CSR efforts with stakeholders' expectations and conventional business objectives, such as producing the targeted profits and return on investment.

A study of stakeholder opinions and perceptions in Botswana, home to the most significant population of African elephants, was conducted, and it revealed that HEC has increased due to growing human populations, notwithstanding the conservation initiatives. The study, which used a national survey, found that most respondents respect elephants as a component of an ecosystem. Still, serious issues with ineffective management and poor stakeholder communication were found. The findings showed that those living inside elephant ranges perceive things differently from those outside regarding the destruction that elephants cause. Despite the study suggesting that culling does not lower HEC, there is still a belief in its efficacy, even though many favour non-fatal deterrent techniques. The report highlights that stakeholders must collaborate and communicate

better to strengthen management methods and handle the issues raised by HEC in Botswana (Adams et al. 2017).

The importance of corporate social responsibility from a business standpoint is examined, as is the duty of an enterprise to involve pertinent stakeholders in its CSR plans and initiatives. Examining how a business can engage with stakeholders, gain support for its CSR initiatives, and ensure that these initiatives live up to their expectations of the business concludes the chapter. The importance of communication strategies as the foundation of a successful stakeholder engagement plan is emphasised (Fleming 2020).

A wide range of stakeholders must support the conservation of recognised species since it is increasingly seen as being for the world's benefit. Divergent views on conservation objectives frequently result in divisive discussions, even while conservation and animal welfare organisations concur that helping wildlife is essential. Meanwhile, conservationists criticised animal welfare proponents for being excessively sentimental, not comprehending the realities of conservation, and caring too much for people at the price of biodiversity (Hammond 2023). Looking at data from the UK, zoos showed that the knowledge of seasoned stakeholders is invaluable when evaluating the welfare of caged animals. To assess the welfare of elephants, it stressed the value of consulting zoo employees and other specialists, noting that their viewpoints on conventional husbandry have not been sufficiently acknowledged in the body of current literature. Elephants' physical and social habitats were valuable resources. The findings, however, made clear the necessity of expert stakeholder engagement in improving animal well-being to influence future changes to the management guidelines for captive elephants and the technique for evaluating their welfare (Chadwick et al. 2017).

In South Africa, as of December 2015, surveys showed that there were 28,168 elephants. Seventy-eight percent of them live in Kruger National Park and reserves that are open to and adjacent to the park (Pretorius et al. 2019). They succumbed to challenges such as, overpopulation of elephants leading to habitat degradation and biodiversity loss. The park thus engaged in discussions about culling versus translocation of elephants. In order to increase conservation efficiencies going forward, adaptive management depends on the evaluation of previous activities. Elephant management has historically concentrated on artificially boosting the population by fencing, water supplements, and culling. The emphasis has recently shifted to supporting ecological mechanisms

that could control elephant populations, particularly in the Kruger National Park (Robson and van Aarde 2018).

2.2 Effectiveness of Elephant Management Plans.

Elephant management plans typically balance biodiversity conservation with human development and well-being. These plans involve various interventions such as contraception, translocation, hunting, and culling, as well as strategies to mitigate HEC and promote coexistence. Going further, South Africa conducted a study where 12 elephants found that while most interventions improved environmental well-being, they negatively impacted animal and human well-being. They integrated a one well-being approach. Several factors, broadly divided into environmental, social, economic, and governance dimensions, affect elephant management plans' effectiveness. Environmental factors include habitat management and ecological balance, which ensures that elephant populations do not exceed the carrying capacity of their habitats; social factors are essential, especially when it comes to managing human-elephant conflict and involving local communities in conservation efforts to increase support for elephant management; economic factors include the need for adequate financial resources to implement these plans, and providing economic benefits to local communities can increase their effectiveness; governance is essential, with cooperation and coordination among local communities, non-governmental organisations and government agencies being crucial for successful implementation, and strong policy frameworks and frequent monitoring and evaluation are also critical.

In Kenya, wildlife is a vital source of income for the government and a national resource (Otianga-Owiti et al., 2021). Protected areas are effectively managed to achieve significant conservation results. They deduced the administration efficacy of game reserves in Kenya based on the distribution and range of several parameters related to terrestrial animal diversity and their correlation with governance and designation types. In contrast to less strictly managed PAs, they believed that different forms of governance cause differential managerial efficacies. This suggests that strictly managed PAs have better habitats that attract more wildlife, in higher species diversity. This fosters efficient management, especially for focal species groupings (big herbivores, large carnivores, and endangered species) (Onditi et al., 2021).

Community-based natural resource management has emerged as a key resource governance approach in most southern Africa. In many countries, it was first seen as a panacea for sustainable development, but its acceptance has steadily decreased (Heffernan 2022a). It is guided by the idea that interacting with, benefiting, and developing institutions representing local communities is necessary for long-term conservation success. However, sustainable resource management's effectiveness and impact may differ based on national natural resource regulations and the consequences accompanying the agreements (Mbizo et al., 2021).

Botswana's proactive conservation measures and community involvement have played a significant role in the country's remarkable success with its elephant management strategy. Botswana is home to one of Africa's most considerable elephant populations, with an estimated 130,000 elephants. It has implemented tactics including habitat preservation, community-based management, and sustainable hunting quotas. After lifting a five-year hunting ban in 2019, it resumed trophy hunting tourism, sparking a range of domestic and international responses (Mbaiwa and Hambira, 2023).

These efforts contributed to the elephant numbers' stability and aimed at mitigating HWC, particularly in places where elephants roam on agricultural lands. Involving local communities in managing decisions ensures that they benefit from conservation, fosters a sense of ownership, and equips them with responsibility towards wildlife. In other words, the plans help emphasise sustainable biodiversity and preserve it while supporting local economies through ecotourism (Mbaiwa 2017). Botswana has a comprehensive approach to elephant management, which serves as a model for balancing conservation needs with the realities of rural communities (Adams et al. 2017).

With vast elephant habitat remaining, Myanmar is another ideal location to save Asian elephants (*E. maximus*). However, the rising HEC could jeopardise current elephant conservation initiatives. Therefore, to help guide long-term management methods for elephant conservation, 303 interviews were performed in rural communities that are close to elephants. Stakeholders aimed to comprehend the primary obstacles people encountered in enhancing their standard of living, the kinds and degrees of HEC they came across, and their perspectives on elephant conservation. According to the participants, the biggest challenge was poverty rather than conflict with elephants. However, 38% of farmers reported losing much of their produce to elephants the year

before, making HEC a moderate to severe problem. The findings demonstrated that despite living close to and frequently being injured by elephants, communities favoured the conservation of elephants and were eager to help with conservation initiatives. This outcome gave optimism in the fight to preserve elephant numbers in Myanmar. Additionally, they concluded that conservation measures that include managing societal issues like poverty could be more successful in preserving elephants than those that only target HEC (Sampson et al. 2019).

Stakeholder perspectives on elephant management faced similar management challenges, for instance, when views or levels of engagement changed in tandem with changes in laws, community involvement, or ecological requirements. Elephant-human conflicts are complicated affairs that present both parties with imagined and actual difficulties. Elephants visit the Lake Jipe area, which is located on the western edge of Kenya's Tsavo West National Park, virtually every day (Kinyanjui et al., 2020). Considering this nation, a change to a community-based program was necessary since elephants posed a serious threat to stakeholders by destroying property, agriculture, and fishing, which is the primary source of income. It has significantly decreased, and the local population is now more conscious of elephants' existence.

Programs were developed where locals could benefit from wildlife tourism, promoting coexistence. As communities saw tangible benefits from conservation, their attitudes shifted from viewing elephants as pests to valuable assets, leading to reduced conflict and increased support for conservation efforts. The 'conflict to coexistence continuum framework' was used to assess the community's perceptions and attitudes regarding elephants and ascertain the current state of affairs on the subject. According to the study, people's perceptions of risk and their chances of witnessing elephants are significantly influenced by worsening socioeconomic issues such as erratic income sources, food insecurity, and interpersonal conflicts. This study was supposed to rely on stakeholder relations, risks, and incentives to determine whether community interactions with elephants would develop into cohabitation or conflict in villages.

Botswana focuses on elephant management and community rights by actively looking at conflicts between elephants and livestock farming, especially in rural areas. The government introduced community-based resource management policies that allowed communities to manage wildlife, including elephants. Local communities were empowered to develop tourism initiatives that benefited directly from elephant conservation. This approach enhanced community support for

elephants, reducing human-wildlife conflict and fostering a sense of stewardship among local populations. Human activity and environmental changes have made wildlife and natural resources vulnerable and rapidly declining (Branco et al. 2019).

Illegal activities, including fishing, hunting, and logging, severely deplete natural resources in and near protected areas in several African nations. Over the past ten years, poaching of African elephants has resulted in significant population decreases. Cooperation between local communities and elephants can significantly improve anti-poaching tactics. Tanzania focused on anti-poaching efforts in Selous Game Reserve, which examined how high poaching rates affected elephant populations. Through the shift in policymakers' attitudes, there was an increase in funding and focus on anti-poaching measures, including community patrols. Local communities were engaged in conservation efforts, thus receiving benefits from protecting wildlife. As poaching decreased, community attitudes improved, recognising the value of elephants for both ecological and economic benefits. This led to stronger support for conservation efforts.

However, 95% of the local community reported that their resentment of elephants grew as they faced expenses, and 82% of respondents said they had no regret when an elephant died after damaging their harvest. Findings implied that, in low-income areas, garnering local support for elephant conservation is more viable because, on average, the advantages of elephants should exceed the costs (Ngorima et al. 2020). In the partially protected areas surrounding Ugalla, they once investigated behaviors that pose challenges for conservation. The methods adopted to safeguard Ugalla caused residents to feel alone, harassed, and intimidated. They were incensed that game rangers were using excessive force and beatings to keep them out of the Reserve, and that Ugalla was being preserved as a trophy hunting location for outsiders. Local populations believed that providing land for agricultural purposes (16%), enhancing local livelihoods (17%), and encouraging participatory conservation (16%) would all help to curb illicit activities. According to findings, conservation measures were necessary to provide transparent and equitable benefits to the local community surrounding Ugalla. Outreach initiatives increased public understanding of conservation and fostered favorable attitudes toward it (Wilfred et al. 2019).

Known for its innovative CBNRM, Namibia seeks to empower local people to manage and benefit from the nation's natural resources, particularly its wildlife. Its constitution was the first in Africa to mention environmental preservation (Cruise and Sasada 2021). The strategy involves granting

communities rights to oversee wildlife, and providing them with support and training to develop management plans. They encourage conservation efforts; for instance, hunting quotas and tourism concessions generate financial benefits that promote the protection of unique species like the black rhino and desert-adapted elephants. According to current projections, the African savanna elephant was classified as Endangered in 2021 after being moved from Vulnerable on the IUCN's Red List of Threatened Species (Cazalis et al. 2022). The database indicates Namibia has Africa's fifth-largest estimated national elephant population (Cazalis et al., 2022). Based on the anticipated 415,000 African savanna elephants, this categorisation adjustment was made in the Kunene and Zambezi regions (Wenborn et al. 2024).

The three primary objectives or pillars of CBNRM are community empowerment, environmental preservation, and economic development (Heffernan 2022b). As more people become aware that human development and animal conservation must coexist, community-based conservation is growing in popularity in developing countries. This type of conservation has been carried out in Namibia by locally managed organisations known as "communal conservancies," which provide Namibians living in rural areas with conditional rights over resource management and tourism (Beal 2019). Now, looking at this country, it faced a challenge of having to balance conservation needs with local livelihoods in regions with significant elephant populations, thus the implementation of CBNRM, which allowed communities to utilise wildlife resources sustainably. Communities received training and support to manage wildlife tourism. With financial incentives tied to conservation, local attitudes shifted positively, increasing elephant protection and community-led conservation initiatives. Namibia's CBNRM model is not impeccable, but its forward-thinking strategy offers a strong foundation for several development and conservation advantages (Beal 2019).

With isolated, dispersed populations spread across 13 range countries, Asian elephants (*Elephas maximus*) are extremely threatened. More than 60% of the world's remaining wild elephant population lives in India, where there are between 25,000 and 30,000 elephants dispersed throughout a varied terrain. To create elephant corridors that would lessen habitat fragmentation and HEC, it chose to implement its own EMP. Enhancing conservation efforts by improving the interaction of elephants and local communities was the aim. As a flagship species, the Asian elephant (*E. maximus*) is essential to India's attempts to conserve biodiversity, especially in its

tropical forest environments. By assessing 209 locals' opinions about elephants and the HEC management authority, which consists of forest officials, they investigated 25 instances of these elephants being electrocuted in North Bengal, India (Dash et al., 2025).

Human-elephant confrontations in India have claimed an average of 450 lives annually between 2009 and 2020. Ex gratia payments for property losses from the federal and state governments averaged US\$4.79 million per year during that time. India took several actions to address this urgent conservation issue after realising how serious these disputes were. Overall, a strong institutional policy and legal structure devoted to conservation enable India to maintain the greatest remaining population of wild elephants in the world amidst its human-dominated environments. Strong political will and a long-standing cultural connection to elephants and the natural world, which promotes greater tolerance and support for conservation initiatives, further solidify this commitment (Pandey et al. 2024).

CHAPTER 3: Materials And Methods

3.1 Location and description of the study area

Classified as the fifth agro-ecological region of Zimbabwe, North West Matabeleland Province experiences a semi-arid climate characterised by distinct wet and dry seasons. Mean annual temperatures range from 18°C to 22°C, with the hottest months occurring from September to October before the arrival of the rainy season. Rainfall patterns exhibit a marked seasonality, with most precipitation (averaging between 400mm and 600mm annually) concentrated between November and March. This influx of moisture sustains a mosaic of vegetation types, with dominant plant communities including Kalahari woodlands, dominated by drought-resistant trees like Acacia species, and patches of montane grassland persisting on higher elevations. The underlying geology of the region significantly influences soil composition. Sandy soils with low organic matter content, classified as Arenosols, are prevalent throughout the province. These soils, while well-drained, present challenges for sustainable agriculture due to their limited water retention capacity.

North West Matabeleland

It is an area characterised by significant human-elephant interaction and ongoing conservation challenges. This region was selected as the study area due to its status as a critical elephant habitat within the broader KAZA TFCA, its history of human-elephant conflict, and the active implementation of elephant management strategies under the national EMP framework.

The geographical scope encompasses multiple administrative districts within NW Matabeleland, including areas under traditional authority, government administration, and various conservation management regimes. This geographical diversity represented different governance structures and management approaches within the elephant conservation landscape.

It was selected to symbolise various biological zones, the density of elephant populations, or degrees of conflict between humans and elephants. Through the analysis, the researcher could evaluate how well the elephant management plan worked in each of these situations. This region

was selected because it represents one of the 4 main places where the EMP is being implemented and also because it comprises a sizable share of Zimbabwe's elephant population.

Analysing the region gave the researcher a more complete view of the plan's overall effects. The area is roughly 25,000 km², and it contains safari areas, forest areas, commercial farms, communal land, and national parks, the majority of which is covered with Kalahari sands. The 68,028 elephants are part of a larger regional population of approximately 227,900 in the Kavango-Zambezi Trans frontier Conservation Area (KAZA), which encompasses Sebungwe and sections of south-eastern Angola, Namibia, south-western Zambia, and Botswana. Hwange National Park is where the majority of the population comprises approximately 83,000 elephants. As the rains start, elephants migrate between Zimbabwe and Botswana, resulting in a shared population between the two countries.

3.2 Study area map.

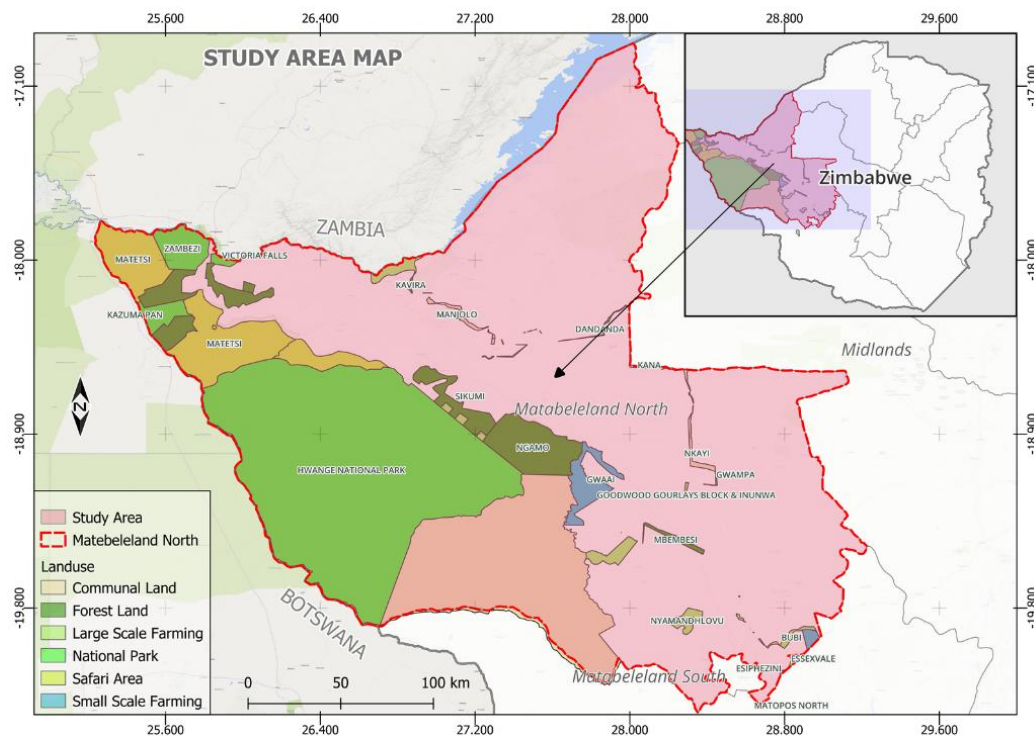


Figure 3 1 the North West Matabeleland Region

3.2.1 Other Elephant Management Regions

Covering an area of 15,000 km² south of Lake Kariba, in northern Zimbabwe, the Sebungwe region is situated between the Zambezi River to the north and the Gwayi River to the south. The area covers parts of Matabeleland North and Mashonaland West provinces in Zimbabwe. The Parks and Wildlife Estate in Sebungwe includes 6,234 km², two safari areas, and two national parks.

The South East Lowveld is a distinct geographical and ecological region in Zimbabwe's south-east corner. It has been defined by low-lying, hot, and semi-arid savanna terrain. This region is between the Limpopo River to the south and the Save River to the north. The South East Lowveld elephant population is concentrated in Gonarezhou National Park. The population is located within the Great Limpopo Trans frontier Conservation Area (TFCA), and elephants patrol between Gonarezhou and Kruger National Park and over the park's boundary into Mozambique. Separate elephant populations exist in the Bulyebe Valley, Malilangwe, and Save Valley conservancies. There is also a small population in the Tuli Safari Area, which South Africa and Botswana share as part of the Mapungubwe TFCA.

With over 2,574 kilometers from its source in Zambia to its mouth at the Indian Ocean, the fourth-longest river in Africa is the Zambezi. This 11,000-square-kilometer region contains six safari zones, Mana Pools National Park, and minor, neighboring communal lands. The elephant population in the mid-Zambezi Valley is shared with Mozambique and Zambia's Lower Zambezi National Park. It is home to a variety of ecosystems, such as marshes and floodplains, which are vital habitats for elephants' feeding and mating habits.

3.3 Research Design

A cross-sectional survey design was used in this research to evaluate stakeholder perceptions of the Elephant Management Plan (EMP) effectiveness in NW Matabeleland, Zimbabwe. A mixed-methods strategy was used in the study, integrating quantitative survey data collection with comprehensive statistical analysis to address the two primary research objectives: evaluating stakeholder perceptions of EMP effectiveness in addressing human-elephant conflict and

biodiversity conservation, and assessing the effectiveness of EMP implementation strategies across five thematic areas. The research design was specifically chosen to capture diverse stakeholder perspectives across multiple organisational types and geographical areas within the study region. This approach enabled a comprehensive evaluation of EMP implementation effectiveness while providing statistically robust evidence for policy recommendations and strategic planning decisions.

3.4 Target Population and Sampling Methods

3.4.1 Target Population

The target population comprised all stakeholders directly or indirectly involved in elephant management and conservation activities within NW Matabeleland. This included government officials, non-governmental organisation representatives, academic researchers, tourism operators, traditional authorities, hunting safari operators, and ZIMPARKS personnel.

3.4.2 Sampling Framework

Purposive sampling was used to ensure comprehensive representation across all major stakeholder categories. The sampling framework was designed to capture diverse perspectives while maintaining adequate sample sizes for statistical analysis across different organisational types and geographic areas.

Sampling Criteria:

- Direct involvement in elephant management activities
- Representation from all major stakeholder categories
- Geographic distribution across NW Matabeleland
- Minimum one-year experience with EMP-related activities
- Willingness to participate in survey research

Sample Size Determination: The final sample size of 86 respondents was determined based on statistical power calculations for detecting medium effect sizes (Cohen's $d \geq 0.5$) with 80% power at $\alpha = 0.05$ significance level. Given resource constraints and stakeholder availability, this sample size provided adequate statistical power for planned analyses while ensuring practical feasibility.

3.4.3 Stakeholder Categories

The sampling framework encompassed seven primary stakeholder categories:

- Government Organisations (n=39, 45.3%): Including ministry officials, district administrators, and local government representatives
- NGOs (n=13, 15.1%): Both international and local non-governmental organisations
- ZIMPARKS (included in government category): Parks and wildlife management personnel
- Academia/Students (included in another category): Researchers and academic institutions
- Tourism Safaris (included in other categories): Tourism operators and related businesses
- Hunting Safaris (included in other category): Hunting operators and associated organisations
- Other Stakeholders (n=34, 39.5%): Including traditional authorities

3.5 Data Collection Methods

Systematic survey was created based on a thorough literature assessment on the evaluation of elephant management efficacy and the five theme areas of the EMP framework. 13 variables representing respondent demographics, organisational affiliations, and answers to EMP effectiveness questions made up the final dataset. Each responder was given a unique identification number to maintain anonymity and facilitate data monitoring and validation processes.

The survey responses were converted into Microsoft Excel format. Double-checking processes, range validation for Likert scale replies, and completeness verification for all required fields were all part of the data-entering process.

Tourism Safaris, Hunting Safaris, NGO, Government, ZIMPARKS, Academia/Student, and Other categories were represented by the number codes 1–7 for the various organisational kinds. The original 1–5 coding of all Likert scale responses was retained, with six denoting "Not Applicable" replies that were not included in some statistical analyses.

EMP familiarity, implementation efficacy, stakeholder engagement, support for EMP, and conservation capacity were the five main factors chosen for primary analysis. These factors provide thorough coverage of all aspects of EMP effectiveness and are directly correlated with the study's goals.

Additional variables were created to facilitate comprehensive analysis, including binary positive response indicators, organisational type labels, and composite satisfaction scores. Positive responses were defined as ratings of 1 (Strongly Agree) or 2 (Agree), while ratings of 3-5 represented neutral to negative perceptions.

3.6 Statistical Analysis Framework

3.6.1 Analytical Software and Environment

Python 3.x, a programming language with Pandas, sys., json, NumPy for data processing, statistical testing, and visualisation, was used for all statistical studies. Pandas for data manipulation, NumPy for numerical computation, SciPy for statistical testing, matplotlib and seaborn for visualisation, and other libraries for more complex statistical operations were all part of the analytical environment.

The comprehensive analysis script was developed to ensure reproducibility, transparency, and statistical rigor across all analytical procedures. All analytical steps were documented and validated to ensure accurate implementation of statistical methods and interpretation of results.

3.6.2 Statistical Analysis

The data analysis followed a systematic six-phase approach designed to comprehensively address both research objectives while maintaining statistical rigor and practical relevance. Using a multi-phase analytical method, the study started by profiling stakeholder responses using descriptive statistics (mean, frequency, and distribution). Chi-square tests looked at categorical correlations, while non-parametric tests (Kruskal-Wallis, Mann-Whitney U) were employed to compare views across organizational kinds. Important connections between EMP efficacy parameters were found using correlation analysis (Pearson/Spearman). Practical significance was measured by effect sizes (Cohen's d^* and Cramér's V), and power analysis confirmed that medium/large effects were robustly detected. Publication-quality charts were used to display the results, and listwise deletion was used to handle missing data. Despite distributional limitations, the use of non-parametric techniques ensured acceptable inferences by accounting for Likert-scale ordinality and non-normality.

CHAPTER 4: Results

4.1 Demographics of respondents

A total of 86 stakeholders were interviewed. Among them, 3.5 % (n=3) were from Tourism Safaris, 5.8% (n=5) from Hunting Safaris, 15.1% (n=13) NGOs, 45.3 % (n=39) from the government, 3, 5% (n=3) students, and 26.7% (n=23) unidentified officials. The pie chart below shows the organisation type distribution of the various stakeholders interviewed (Figure 4.1).

Organization Type Distribution

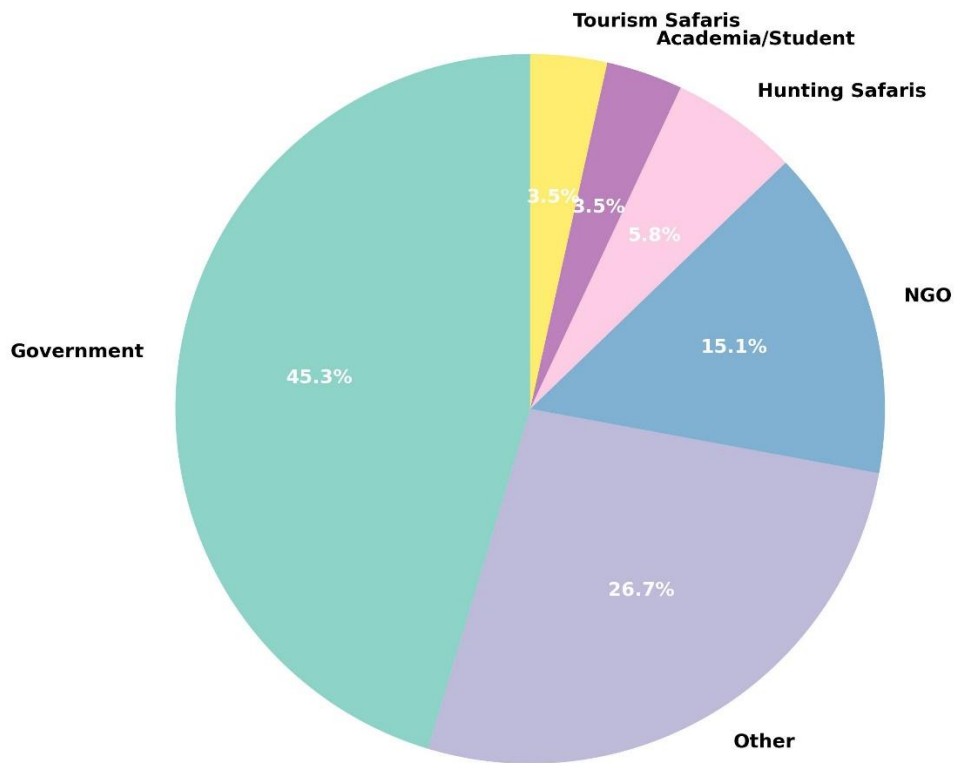


Figure 4. 1 Organisation type questionnaire distribution.

4.2 Percentage in positive responses given by various stakeholders with a positive affirmation towards the implementation of the EMP.

There was a significant difference in the perceptions of different organisational affiliation in terms stakeholder engagement ($p=0.005$), active membership in national management policy ($p=0.034$), and in reporting mortalities ($p=0.026$) Kruskal Wallis test (Table 4.1). However, when it comes EMP Familiarity ($p=0.938$), effective implementation of the EMP ($p=0.114$), support towards elephant management ($p=0.976$), distribution through Social, Economic and Cultural Framework ($p=0.971$), Adequate Conservation Capacity, Coordination, Collaboration and Programme Management ($p=0.224$), improving the EMP better ($p=0.666$) and Addressing key issues in the implementation ($p=0.242$), it showed that there was no difference in the perception of different organisational affiliation in terms of stakeholder engagement (Figure 4.2).

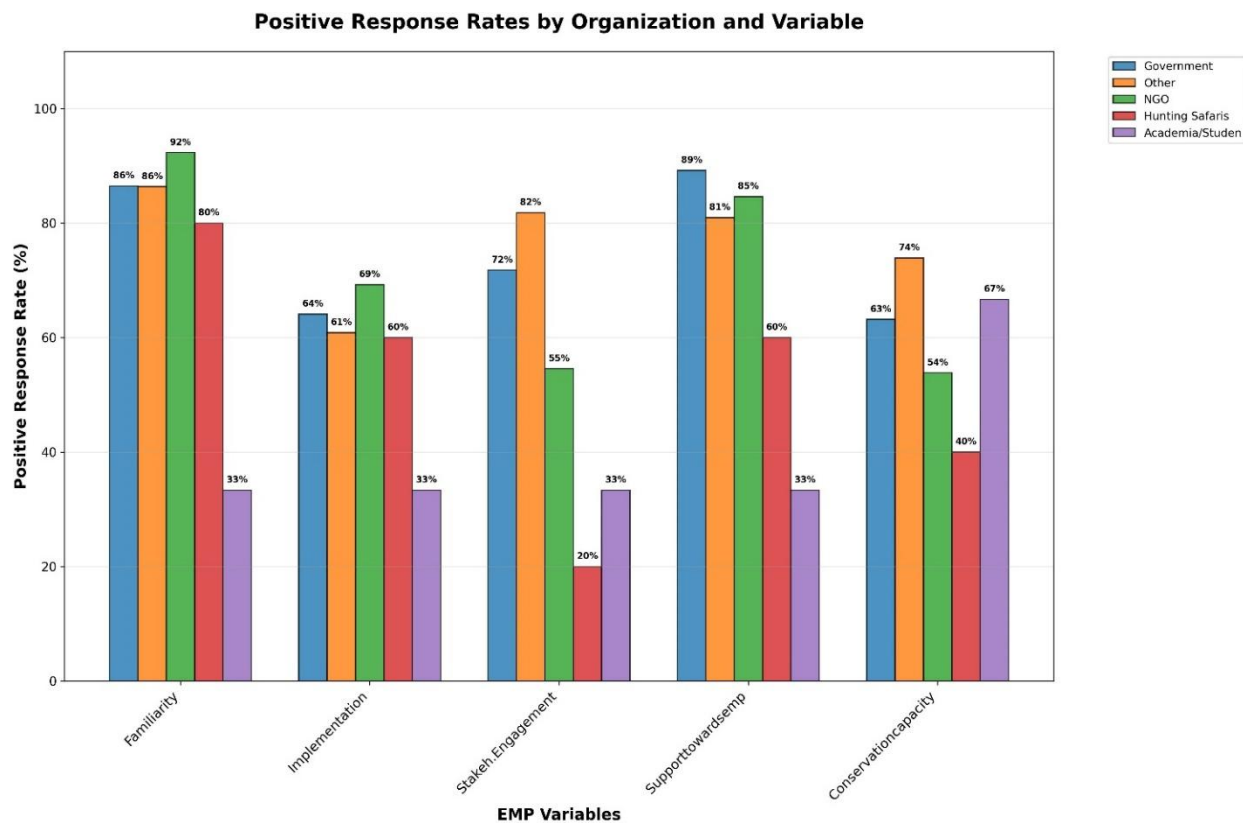


Figure 4. 2 Positive responses in the 5 thematic areas.

EMP FACTOR	KRUSKAL-WALLIS P VALUE
EMP Familiarity	0.938
EMP Implementation	0.114*
Stakeholder Engagement	0.005 *
Active Membership Distribution	0.034 *
Support Towards EMP	0.076*
Reporting Mortalities	0.926
Distribution Through S.E.C.F	0.971
Conservation Capacity	0.211*
C.C.P Management	0.224
EMP Can Be Done Better	0.666
Key Issues In The Implementation	0.242

Table 1 EMP factors vs. Kruskal-Wallis P Value

4.3 Response rate in the five thematic areas.

Tourism Safaris strongly agreed that there was the full engagement in elephant management across all stakeholders, while hunting safaris, NGOs, government, and other stakeholders disagreed. However, Zimparks remained neutral regarding stakeholder engagements (Figure 4.3(a)). Tourism safaris agreed that stakeholders are active members of the Elephant Management Committee while hunting safaris, NGOs, and Zimparks remained neutral, and the government and other stakeholders disagreed (Figure 4.3(b)). All stakeholders disagreed that they were aware of the level of implementation of the EMP (Figure 4.3(c)). Regarding support towards the EMP, Tourism Safaris were neutral about their decision, while Hunting Safaris, NGOs, the Government, Zimparks, and other stakeholders disagreed that they supported the elephant management financially or technically (Figure 4.3(d)). All the other stakeholders disagreed on conservation capacity. However, the Tourism Safaris were neutral in that there is adequate conservation capacity for elephant conservation and the implementation of the management plan (Figure 4.3(e)).

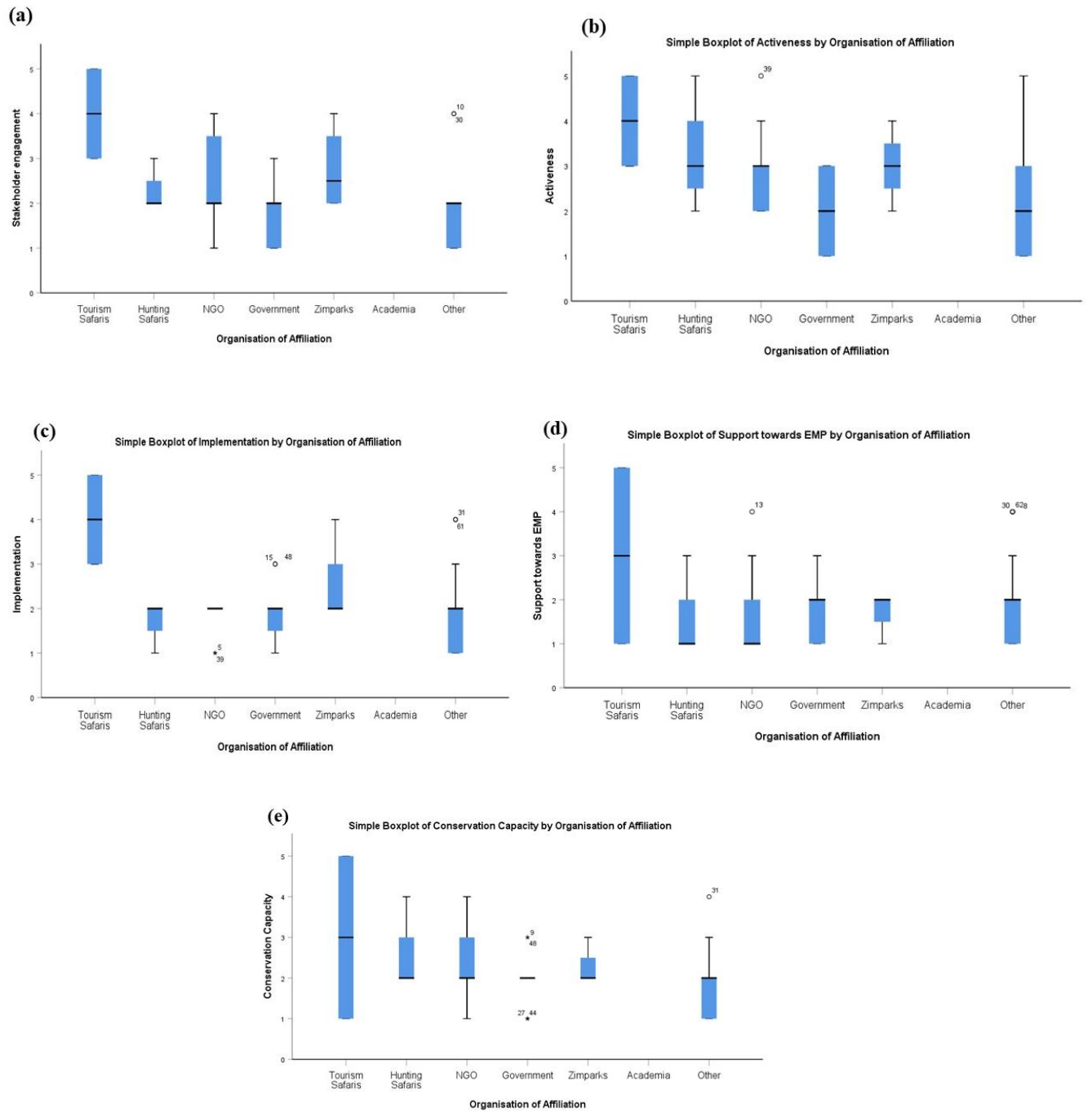


Figure 4. 3 Response rate of stakeholders in the thematic areas.

4.4 The correlation heat map in the five thematic areas.

The map shows strong relations between stakeholder engagement and conservation capacity (0.63), and moderate correlations between implementation and other factors (0.47- 0.48). Stakeholder engagement is closely linked to conservation capacity, suggesting that collaborative approaches strengthen conservation efforts. Implementation success depends on multiple interconnected factors (Figure 4.4).

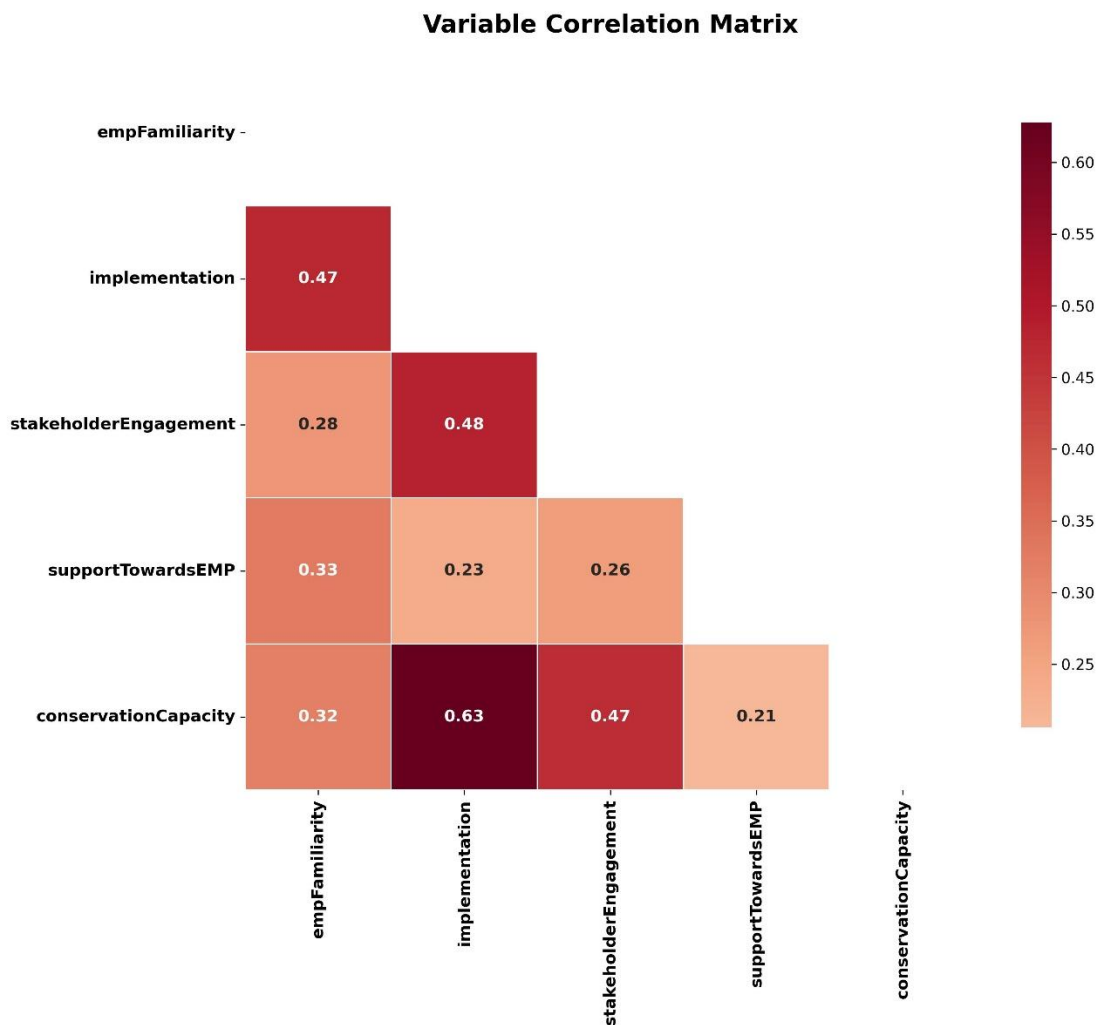


Figure 4. 4 The correlation heat map.

4.5 Effectiveness of the EMP to the stakeholders.

Tourism Safaris rate implementation is highest (median around 4-5), while government, NGOs, and Hunting Safaris show lower ratings (median around 2-3). (Figure 4.5).

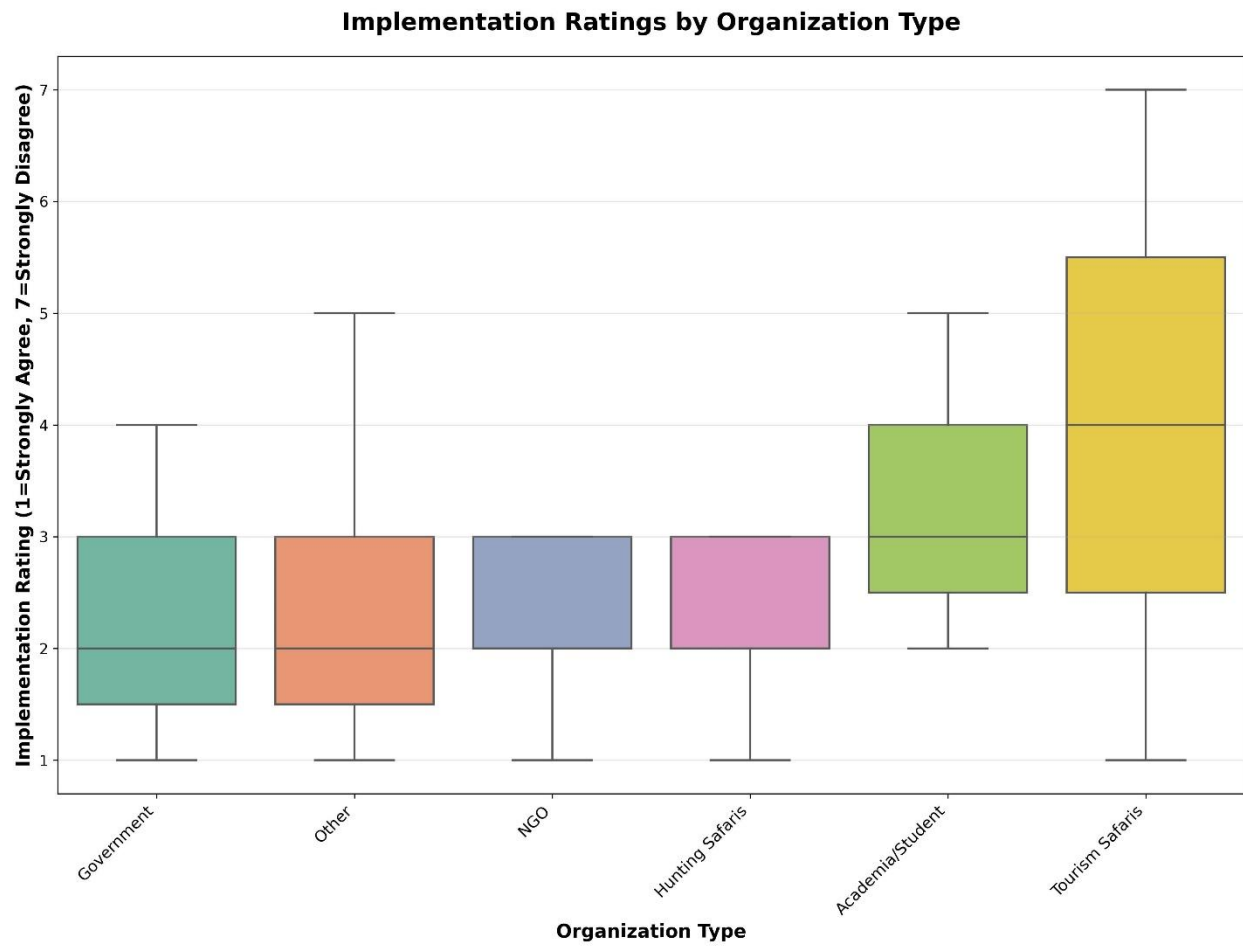


Figure 4. 5 Implementation for the stakeholders.

4.6 Comparison of the GVT vs. NGO perception analysis.

As notable differences emerge, NGOs rate stakeholder engagement (3.0 vs. 2.1) and conservation capacity (2.8 vs. 2.2) much higher than Gvt. Implementation and support show smaller gaps, while familiarity is nearly equal (Figure 4.6).

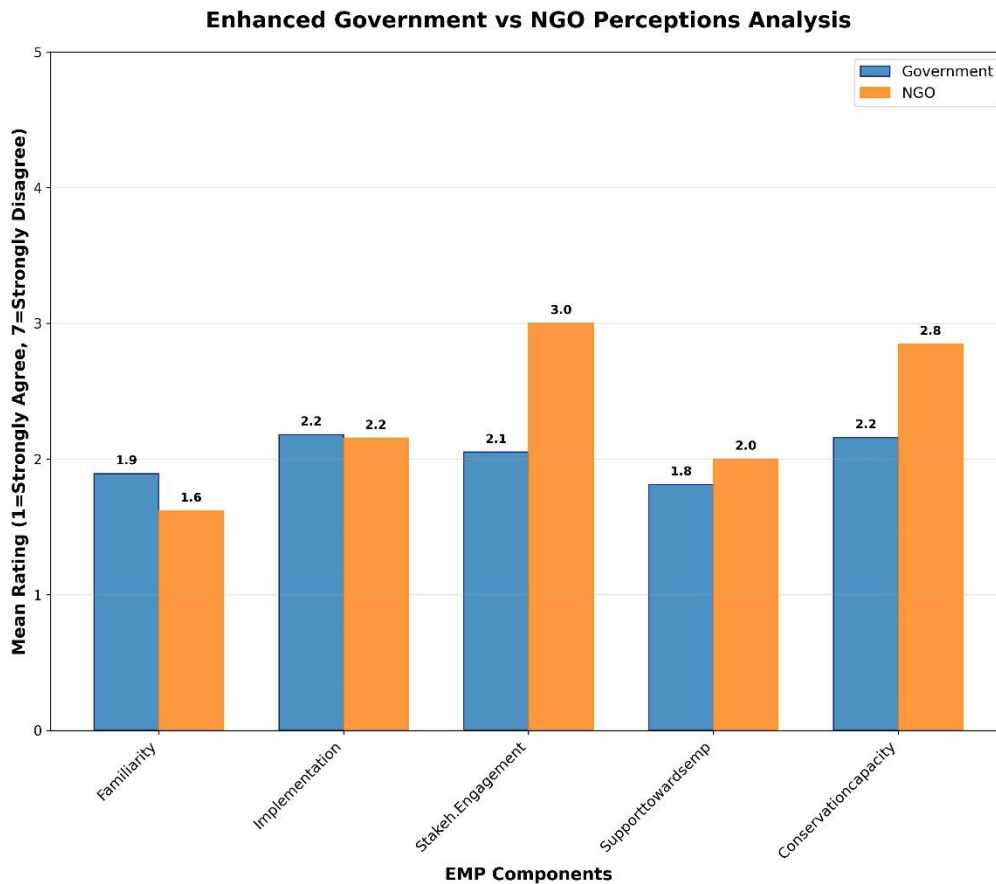


Figure 4. 6 Gvt vs NGO mean rating comparison.

4.7 Support vs. Conservation Capacity Relationship

It shows a weak correlation ($r^2 = 0.042$) between support and conservation capacity with scattered data points. Support for the EMP doesn't automatically translate to adequate conservation

capacity, suggesting that enthusiasm alone is insufficient- actual responses and capabilities are needed. (Figure 4.7)

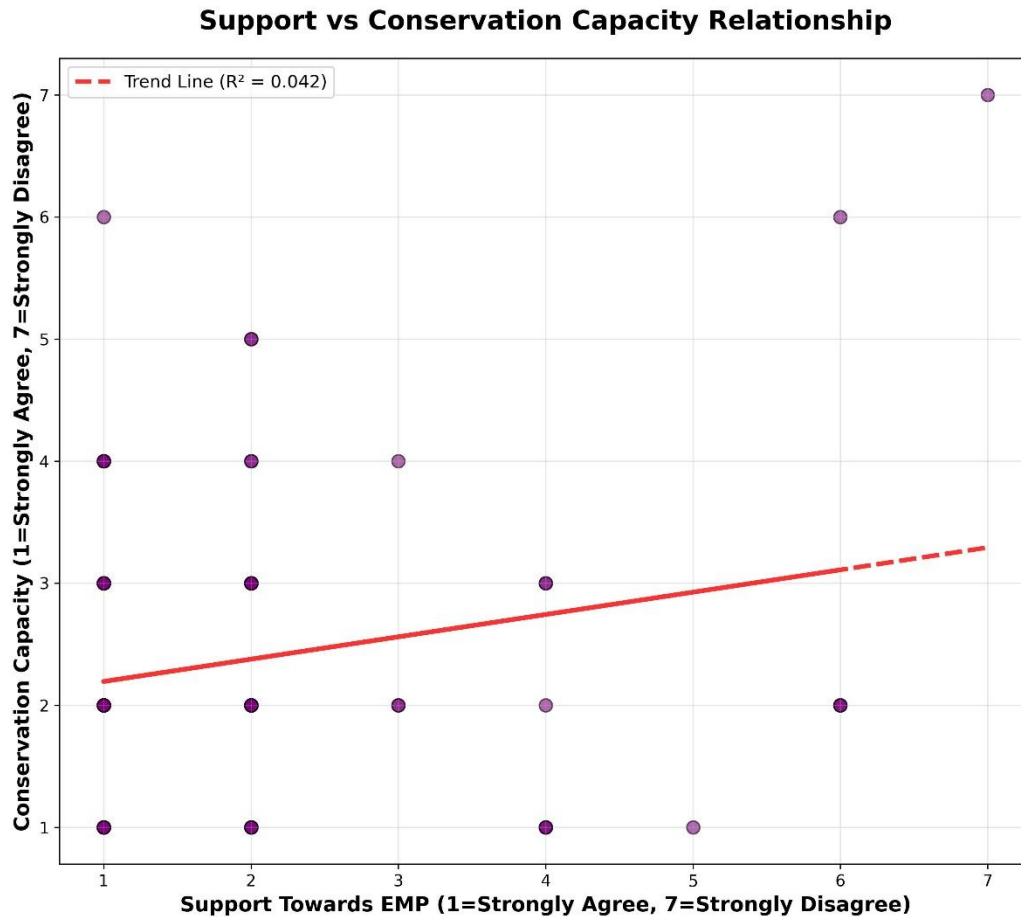


Figure 4. 7 Support vs Conservation Capacity Relationship.

4.8 Satisfaction Score Distribution

Most responses cluster around 2-3 on the satisfaction scale (mean 2.37 median 2.20), indicating moderate to good satisfaction levels. (Figure 4.8).

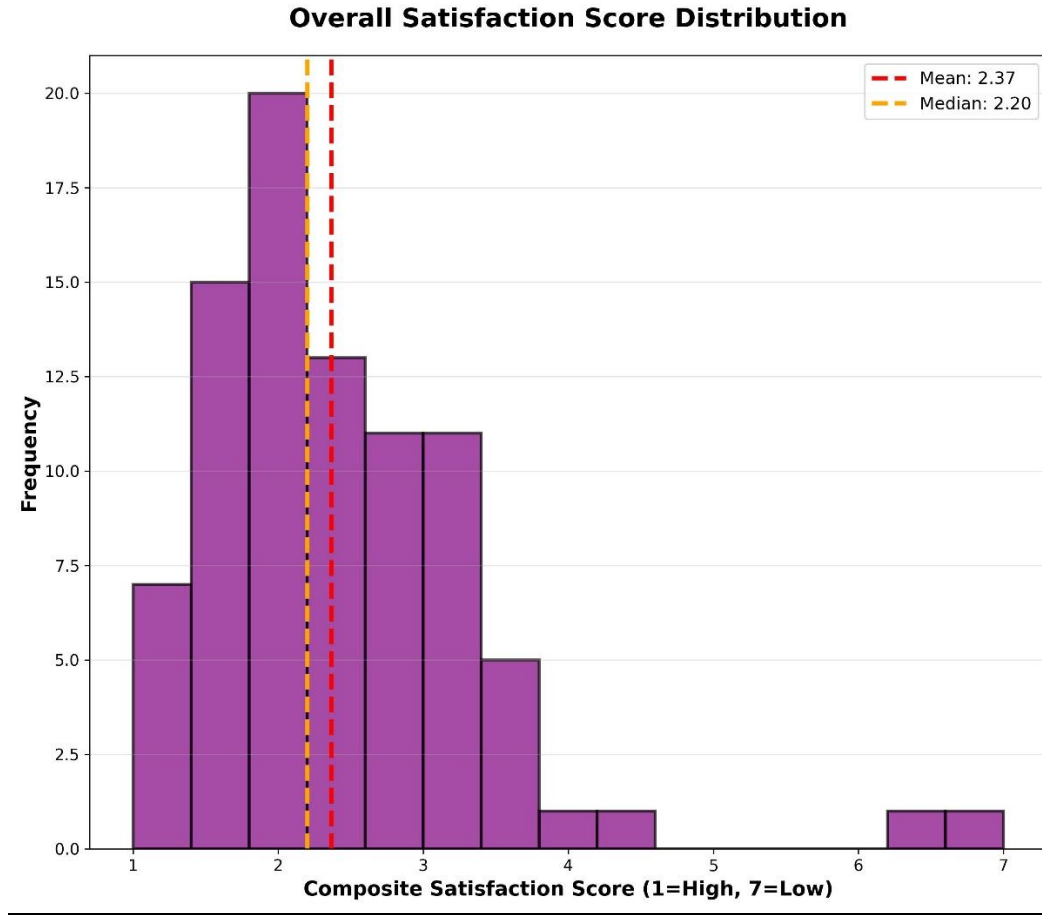


Figure 4. 8 Satisfaction Score Distribution.

4.9 Response Rates by Organisations

This highlights how NGOs consistently rate the most variables as the highest (80-92%), followed by government and “other” organisations. Academia rates most variables only at 33%, while Hunting Safaris shows variable performance across different metrics (Figure 4.9).

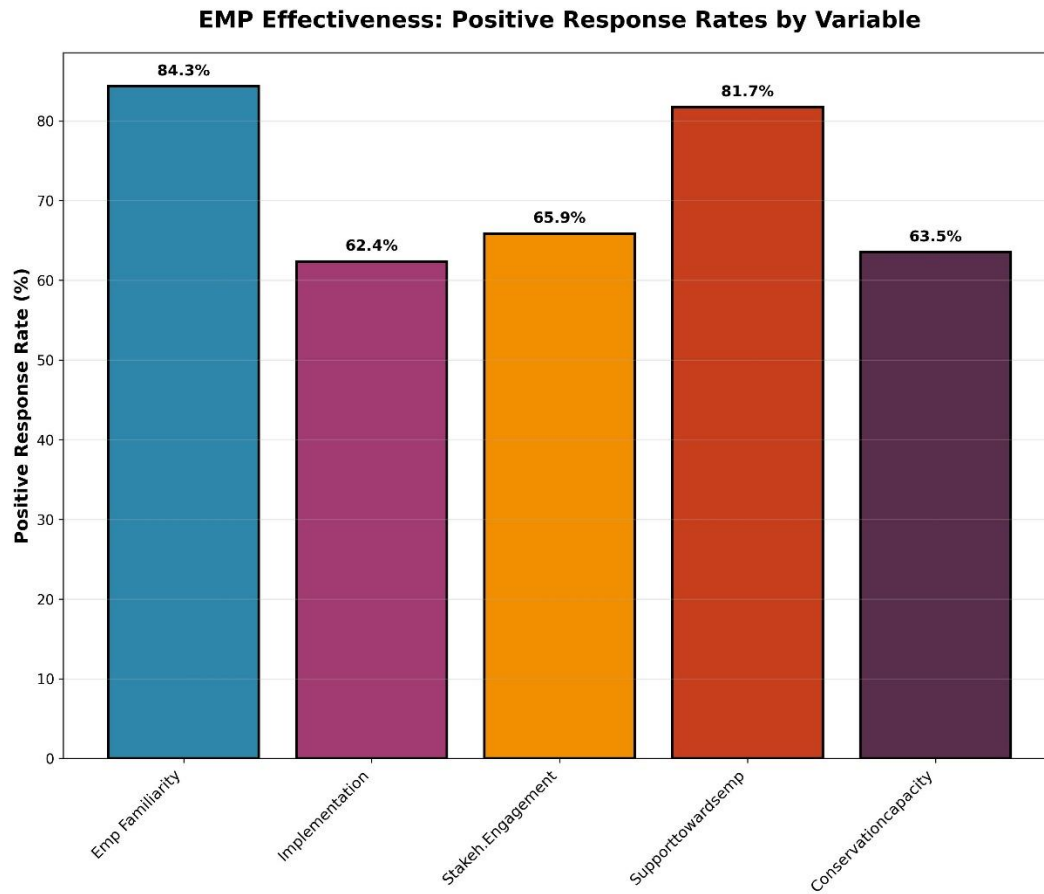


Figure 4. 9 EMP effectiveness: Positive response rates.

Chapter 5: Discussion

This study explores the diverse viewpoints of stakeholders regarding an Elephant Management Plan, drawing from a comprehensive poll of 86 individuals. According to the survey, there are points of agreement and disagreement among various organisational affiliations, including government agencies, non-governmental organisations (NGOs), academic institutions, and hunting and tourism safaris. This conversation provides insight into the opportunities and difficulties of successful elephant conservation and management by examining stakeholder demographics, positive response rates to EMP variables, inter-organisational perceptual differences, and the connection between support and conservation capacity.

5.1 EMP Stakeholder Perceptions.

The results of this survey, which involved 86 stakeholders, provide important new information about the complex attitudes toward the Elephant Management Plan (EMP). A fundamental insight into the leading players involved in or impacted by elephant management is provided by the respondents' distribution, which is significantly skewed towards government and "Other" authorities and NGOs. Despite their importance, the comparatively low representation from hunting safaris, tourism safaris, and academia/students indicates that their direct involvement or impact in the study setting may be less widespread than that of the larger organisational entities. Overall results may be skewed toward official viewpoints due to the survey's high government participation rate. The comparatively low number of academic and private sector (tourism/hunting) voices indicates possible deficiencies in thorough stakeholder engagement or survey outreach. The Elephant Management Plan in North West Matebeleland was the particular case in which this study used the theoretical framework of stakeholder theory study by (Fontaine et al. 2006). It grounded the idea in real-world application by offering instances of how stakeholder engagement affects conservation outcomes.

5.2 Percentage of positive responses.

Key areas show significant perceptual differences, even though there are often few notable differences in perception across organisational affiliations on general EMP elements like familiarity, practical implementation, and overall support. Of special notice are the statistically significant variations in reporting mortalities ($p=0.026$), active membership in national management policy ($p=0.034$), and stakeholder engagement ($p=0.005$) attitudes. This implies that although stakeholders may agree on the concept of an EMP, disagreements arise over the actualities of cooperation and reporting. Perceptions of EMPs differ significantly by sector. NGOs that routinely receive good ratings indicate that their conservation-focused viewpoint produces more favourable results. The continually poor academic/student scores (33%) suggest either a lack of interest in more critical analytical viewpoints or insufficient engagement with practical applications. This implies that various stakeholder groups require customised engagement tactics.

5.3 Response rate in the 5 thematic areas.

The viewpoints of tourism safaris are always different from those of other stakeholders. They were the only group to firmly support active participation in the Elephant Management Committee and complete engagement in elephant management. This optimistic perspective, in contrast to the opposition or indifference of hunting safaris, non-governmental organisations, and government agencies, indicates a possible difference in their operating realities or priorities. Their apathy toward proper conservation capacity and financial/technical support for the EMP also sticks out, suggesting that they may have a different perspective on their role or the capacity currently in place or consider these to be external obligations.

5.4 Implementation.

The fact that all stakeholders disagree on how well-informed they are about the EMP's implementation level is a startling discovery. This suggests that the EMP framework has a serious flaw in communication or transparency. Effectiveness and accountability may be hampered by a

lack of clarity regarding the plan's implementation, regardless of their engagement or affiliation with the Organisation.

5.5 Correlation.

An important finding is the strong positive connection (0.63) between conservation capacity and stakeholder participation. This implies that successful cooperation directly improves elephant conservation efforts. Likewise, the moderate correlations (0.47-0.48) between implementation and other aspects support the notion that a network of interrelated components is necessary for successful EMP execution rather than a single effort. These associations highlight how crucial it is to create cooperative settings to accomplish conservation objectives.

5.6 Challenges in Translating Support into Action.

Support for the EMP and conservation capacity has a weak connection ($R^2=0.042$), warning that a positive attitude by itself is not enough to produce observable conservation results. Although stakeholders may have conceptual support for the EMP, this support does not always convert into the actions, resources, or skills needed for successful conservation. This emphasises the necessity of bridging the gap between demonstrated support and real-world, hands-on capacity building. However, research by (Wong et al. 2021) highlights the need for effective communication and collaboration to improve stakeholder support, specifically mentioning community involvement and the challenges of translating support into practical action. It opposes this study, which identifies gaps in awareness and communication that affect translating support.

5.7 Varied Effectiveness Ratings and the NGO Perspective.

Divergent satisfaction levels with the EMP's practical application are indicated by the disparate implementation ratings, with Tourism Safaris giving it the highest grade and the government, NGOs, and hunting safaris giving it lower scores. The NGO viewpoint is especially intriguing because, although receiving lower implementation ratings than the government, they routinely reported the most excellent positive response rates (80–92%) for most variables regarding EMP

effectiveness. This contradiction may suggest that NGOs are still very involved and supportive of the EMP's fundamental objectives and intent, even though they have identified implementation challenges. Their perspective of the value of teamwork in accomplishing conservation goals is further reinforced by their superior evaluations of conservation capacity and stakeholder engagement compared to government agencies. Despite having greater access to official EMP data, the GVT is more cognizant of implementation limitations. This highlights the importance of effective stakeholder engagement in conservation strategies, which aligns with the study's findings about the need for improved stakeholder participation and communication in the EMP. It also discusses how different stakeholder groups, including NGOs, see the effectiveness of conservation programs to improve the analysis of divergent viewpoints among those involved in the EMP, a study also conducted by (Adams et al. 2017).

Despite noted difficulties and perceptual variations, the overall moderate to good satisfaction levels (mean 2.37, median 2.20 on a scale where 1=High, 7=Low) indicate a fundamental degree of pleasure with the EMP. This might result from acknowledging its importance or possibly contentment with some elements despite the need for change in others. Stakeholder satisfaction is generally relatively high, yet there is potential for improvement to address implementation effectiveness issues. Stakeholders who are informed and involved are more likely to express satisfaction, according to factors that affect stakeholder satisfaction, such as awareness of the EMP, active involvement in conservation initiatives, and opinions about the efficacy of implementation.

On the other hand, the Gonarezhou National Park article by (Musakwa et al. 2020), emphasises that community engagement programs, like the "Mpfhuka" project, which promotes a sense of ownership and attends to local needs, have a substantial impact on stakeholder satisfaction. Although both studies stress the value of awareness and participation, the Gonarezhou article emphasises how collaborative efforts can build trust and improve community relations, whereas this study emphasises the significance of communication and the perceived effectiveness of management techniques.

Chapter 6: Conclusion and Recommendations

6.1 Conclusion

Considerable information about the intricate dynamics of elephant conservation can be gained from the study on stakeholder opinions on the efficacy of the Elephant Management Plan in the North West Matebeleland region from 2021 to 2023. The 86-stakeholder poll revealed differing opinions within various organisational affiliations, especially between the tourist, NGOs, and government sectors. Although the significance of the EMP is generally acknowledged, differences in degrees of support, involvement, and awareness point to the need for improved stakeholder collaboration and communication. The results show important opportunities for improvement, particularly in transparency and stakeholder participation, notwithstanding the moderate to good satisfaction ratings observed. Fostering collaborative frameworks is essential to improving conservation outcomes, as evidenced by the substantial association between stakeholder participation and conservation capability. The link between EMP support and real conservation capacity, however, emphasises how critical it is to convert favorable sentiments into workable plans.

6.2 Recommendations

IMMEDIATE ACTIONS (0-6 months):

- ✓ Establish EMP Implementation Monitoring Committee
- ✓ Develop stakeholder feedback mechanisms
- ✓ Create resource allocation optimisation plan
- ✓ Strengthen reporting and accountability systems

SHORT-TERM IMPROVEMENTS (6-18 months):

- ✓ Implement capacity building programs for identified gaps

- ✓ Enhance inter-agency coordination protocols
- ✓ Develop performance indicators for all 5 thematic areas
- ✓ Create stakeholder engagement strategy document

LONG-TERM STRATEGIC CHANGES (18+ months):

- ✓ Establish sustainable financing mechanisms for EMP
- ✓ Develop adaptive management frameworks
- ✓ Create regional/transboundary coordination structures
- ✓ Implement a comprehensive monitoring and evaluation system

References

- Adams, T., M. Chase, A. Attard, and K. Leggett. 2017. A preliminary study of stakeholders' opinions and perceptions of elephants and elephant management in Botswana. *Pachyderm* **58**:67-76.
- Beal, M. L. 2019. Benefits Of Community-Based Conservation In Namibia: Lessons From A Dynamic Model.
- Benites-Lazaro, L. L., and N. A. Mello-Théry. 2019. Empowering communities? Local stakeholders' participation in the clean development mechanism in Latin America. *World development* **114**:254-266.
- Blackie, I., and J. Sowa. 2019. Dynamics of social ecology of elephant conservation in Botswana and implications on environmental development. *Journal of African Interdisciplinary Studies* **3**:4-25.
- Branco, P. S., J. A. Merkle, R. M. Pringle, J. Pansu, A. B. Potter, A. Reynolds, M. Stalmans, and R. A. Long. 2019. Determinants of elephant foraging behaviour in a coupled human-natural system: Is brown the new green? *Journal of Animal Ecology* **88**:780-792.
- Browne, M., and A. Goodchild. 2023. Overview on stakeholder engagement. Pages 311-326 *Handbook on City Logistics and Urban Freight*. Edward Elgar Publishing.
- Cazalis, V., M. Di Marco, S. H. Butchart, H. R. Akçakaya, M. González-Suárez, C. Meyer, V. Clausnitzer, M. Böhm, A. Zizka, and P. Cardoso. 2022. Bridging the research-implementation gap in IUCN Red List assessments. *Trends in Ecology & Evolution* **37**:359-370.
- Chadwick, C., E. Williams, L. Asher, and L. Yon. 2017. Incorporating stakeholder perspectives into the assessment and provision of captive elephant welfare. *Animal Welfare* **26**:461-472.
- Cruise, A., and I. Sasada. 2021. Investigation into the efficacy of Namibia's Wildlife Conservation Model as it relates to African Elephants (*Loxodonta africana*). *Journal of African Elephants*:3.
- Fleming, R. S. 2020. Why Stakeholder Engagement Matters. Pages 295-307 *Social Entrepreneurship and Corporate Social Responsibility*. Springer.

- Fontaine, C., A. Haarman, and S. Schmid. 2006. The stakeholder theory. *Edlays education* **1**:1-33.
- Hammond, N. L. 2023. Elephant conservation conflicts: the role of emotion, morals, and perceptions.
- Heffernan, A. 2022a. Accounting for climate change in community-based natural resource management: reflections on wildlife conservation in Namibia. *Journal of Southern African Studies* **48**:489-502.
- Heffernan, A. 2022b. Development, conservation, empowerment: The trilemma of community-based natural resource management in Namibia. *Environmental management* **69**:480-491.
- Kinyanjui, M., N. Raja, E. Brennan, L. King, and L. Tiller. 2020. Local attitudes and perceived threats of human-elephant conflict: a case study at Lake Jipe, Kenya. *Pachyderm* **61**:120-130.
- Kusters, K., L. Buck, M. de Graaf, P. Minang, C. van Oosten, and R. Zagt. 2018. Participatory planning, monitoring and evaluation of multi-stakeholder platforms in integrated landscape initiatives. *Environmental management* **62**:170-181.
- López-Rodríguez, M. D., I. Ruiz-Mallén, E. Oteros-Rozas, H. March, R. Keller, V. B. Lo, M. A. Cebrián-Piqueras, and R. Andrade. 2020. Delineating participation in conservation governance: Insights from the Sierra de Guadarrama National Park (Spain). *Environmental Science & Policy* **114**:486-496.
- Makoni, K. T. 2023. Elephants must also fund their own upkeep....
- Mbaiwa, J. E. 2017. Ecotourism in Botswana: 30 years later. *Ecotourism in Sub-Saharan Africa*:110-128.
- Mbaiwa, J. E., and W. L. Hambira. 2023. Can the subaltern speak? Contradictions in trophy hunting and wildlife conservation trajectory in Botswana. *Journal of Sustainable Tourism* **31**:1107-1125.
- Mbizo, M., H. Newing, and J. P. R. Thorn. 2021. Can Nationally Prescribed Institutional Arrangements Enable Community-Based Conservation? An Analysis of Conservancies and Community Forests in the Zambezi Region of Namibia. *Sustainability*.

- Musakwa, W., T. Gumbo, G. Paradza, E. Mpofu, N. A. Nyathi, and N. B. Selamolela. 2020. Partnerships and stakeholder participation in the management of national parks: Experiences of the Gonarezhou National Park in Zimbabwe. *Land* **9**:399.
- Ndlovu, M., T. H. Madiri, D. Madhlamato, K. M. Tadyanehondo, A. Vambe, and E. Mungoni. 2023. Age-sex structure of drought-driven African elephant (*Loxodonta africana*) mortality in Hwange National Park, Zimbabwe. *Scientific African* **19**:e01459.
- Ngorima, A., A. Brown, C. Masunungure, and D. Biggs. 2020. Local community benefits from elephants: Can willingness to support anti-poaching efforts be strengthened? *Conservation Science and Practice* **2**:e303.
- Pandey, R. K., S. P. Yadav, K. M. Selvan, L. Natarajan, and P. Nigam. 2024. Elephant conservation in India: Striking a balance between coexistence and conflicts. *Integrative Conservation* **3**:1-11.
- Pretorius, Y., M. E. Garaï, and L. A. Bates. 2019. The status of African elephant *Loxodonta africana* populations in South Africa. *Oryx* **53**:757-763.
- Robson, A. S., and R. J. van Aarde. 2018. Changes in elephant conservation management promote density-dependent habitat selection in the Kruger National Park. *Animal Conservation* **21**:302-312.
- Sampson, C., P. Leimgruber, S. Rodriguez, J. McEvoy, E. Sotherden, and D. Tonkyn. 2019. Perception of human–elephant conflict and conservation attitudes of affected communities in Myanmar. *Tropical Conservation Science* **12**:1940082919831242.
- Shaffer, L. J., K. K. Khadka, J. Van Den Hoek, and K. J. Naithani. 2019. Human-elephant conflict: A review of current management strategies and future directions. *Frontiers in Ecology and Evolution* **6**:235.
- Sterling, E. J., E. Betley, A. Sigouin, A. Gomez, A. Toomey, G. Cullman, C. Malone, A. Pekor, F. Arengo, and M. Blair. 2017. Assessing the evidence for stakeholder engagement in biodiversity conservation. *Biological Conservation* **209**:159-171.
- Tickle, L., V. Jacob Tavaziva, and C. G. Thulin. 2025. Stakeholder perceptions of solutions for sustainable management of the African elephant, *Loxodonta africana*. *Wildlife Biology* **2025**:e01150.

- Valeix, M., H. Fritz, R. Sabatier, F. Murindagomo, D. Cumming, and P. Duncan. 2011. Elephant-induced structural changes in the vegetation and habitat selection by large herbivores in an African savanna. *Biological Conservation* **144**:902-912.
- Wenborn, M., R. Collinson, S. Muzuma, D. Kangombe, V. Nijman, and M. S. Svensson. 2024. 11. Communities and elephants in the northern highlands, Kunene Region, Namibia.
- Wilfred, P., E. Milner-Gulland, and H. Travers. 2019. Attitudes to illegal behaviour and conservation in western Tanzania. *Oryx* **53**:513-522.
- Wong, E. P., A. Campos-Arceiz, N. Zulaikha, P. Chackrapani, A. G. Quilter, J. A. de la Torre, A. Solana-Mena, W. H. Tan, L. Ong, and M. A. Rusli. 2021. Living with elephants: evidence-based planning to conserve wild elephants in a megadiverse South East Asian country. *Frontiers in conservation science* **2**:682590.

Appendices

Elephant Management plan Questionnaire.



1. How would you best describe your Organisation or affiliation (circle appropriate of

- a. Tourism Safaris
- b. Hunting Safaris
- c. NGO
- d. Government
- e. Zim-Parks
- f. Academia/student
- g. Other _____

	Strongly agree	Agree	Slightly Agree	Neutral	Slightly disagree	Disagree	Strongly disagree
3. I am familiar with the elephant management plan							
4. In my opinion, the elephant management plan is being implemented effectively in the region							
5. Stakeholders are fully engaged in elephant management in the region							
6. I am an active member of the National Elephant Management Committee / Regional Committee							
7. I (my Institution/ Organisation) provide technical and/or financial support towards elephant management							
8. I report any elephant-related matters- mortalities and irregularities to the Authorities							
9. Elephant management through protection and law enforcement has effectively reduced poaching in the landscape							
10. Elephant management through biological monitoring has led to the understanding of population dynamics, habitat status and space use by elephants							
11. Elephant management through the Social, Economic and Cultural Framework; has led							

to adequate awareness raising and human-elephant conflict management							
12. There is adequate conservation capacity for elephant conservation and the implementation of the management plan							
13. Coordination, Collaboration, and Programme Management has strengthened transboundary stakeholder relations in the landscape							
14. Elephant Management in Zimbabwe can be done better							

Partial Python software analysis

Phase 1: Descriptive Statistics and Data Exploration

Objective: Establish baseline understanding of sample characteristics and variable distributions.

Methods Implemented:

```
python
def basic_descriptive_stats(self):
    # Sample overview analysis
    total_responses = len(self.df)
    org_distribution = self.df['organisation_type'].value_counts()

    # Calculate percentage distributions
    for org, count in org_distribution.items():
        percentage = (count / total_responses) * 100

    # Comprehensive descriptive statistics
    summary_stats = self.df[self.key_variables].describe()

    # Positive response rate calculations
```

```

for var in self.key_variables:
    positive_count = len(self.df[self.df[var].isin([1, 2])])
    total_valid = len(self.df[self.df[var].notna() & (self.df[var] != 8)])
    positive_rate = (positive_count / total_valid * 100)

```

Statistical Measures Calculated:

- Sample size and composition analysis
- Central tendency measures (mean, median, mode)
- Variability measures (standard deviation, variance, range)
- Distribution characteristics (skewness, kurtosis)
- Response rate analysis by variable and organisation type
- Missing data patterns and handling procedures

Phase 2: Statistical Significance Testing

Objective: Test for statistically significant relationships between stakeholder characteristics and EMP perceptions.

Chi-Square Test for Independence:

```

python
# Organization Type vs EMP Familiarity independence testing
cont_table = pd.crosstab(self.df['organisation_type'], self.df['empFamiliarity'])
chi2, p_val, dof, expected = chi2_contingency(cont_table)

# Effect size calculation (Cramér's V)
n = cont_table.sum().sum()
cramers_v = np.sqrt(chi2 / (n * (min(cont_table.shape) - 1)))

```

Kruskal-Wallis Non-parametric ANOVA:

```

python
# Multi-group comparison across organisation types
groups = self.df.groupby('organisation_type')
for var in self.key_variables:
    group_data = []
    for name, group in groups:
        var_data = group[var].dropna()
        var_data = var_data[var_data != 8] # Exclude N/A responses

```

```

        if len(var_data) > 0:
            group_data.append(var_data)

    if len(group_data) >= 2:
        h_stat, p_val = kruskal(*group_data)

```

Mann-Whitney U Tests for Pairwise Comparisons:

```

python
# Government vs NGO comparative analysis
govt_data = self.df[self.df['organisation'] == 4]
ngo_data = self.df[self.df['organisation'] == 3]

for var in self.key_variables:
    govt_values = govt_data[var].dropna()
    ngo_values = ngo_data[var].dropna()

    u_stat, p_val = mannwhitneyu(govt_values, ngo_values, alternative='two-sided')

# Effect size calculation (Cohen's d)
pooled_std = np.sqrt(((len(govt_values) - 1) * govt_values.var() +
                        (len(ngo_values) - 1) * ngo_values.var()) /
                        (len(govt_values) + len(ngo_values) - 2))
cohens_d = abs(govt_values.mean() - ngo_values.mean()) / pooled_std

```

Phase 3: Correlation Analysis

Objective: Examine relationships between different aspects of EMP effectiveness and stakeholder perceptions.

Pearson and Spearman Correlation Analysis:

```

python
def correlation_analysis(self):
    # Prepare data excluding N/A values
    numeric_data = self.df[self.key_variables].replace(8, np.nan)

    # Pearson correlations for linear relationships

```

```

pearson_corr = numeric_data.corr()

# Spearman correlations for monotonic relationships
spearman_corr = numeric_data.corr(method='spearman')

# Identify strong correlations (|r| > 0.5)
for i in range(len(pearson_corr.columns)):
    for j in range(i+1, len(pearson_corr.columns)):
        corr_val = pearson_corr.iloc[i, j]
        if abs(corr_val) > 0.5:
            # Document strong correlations for interpretation

```

Phase 4: Data Visualization and Graphical Analysis

Objective: Create comprehensive visual representations of findings to support statistical results and enhance interpretability.

Visualisation Strategy:

```

python
def create_individual_charts(self):
    # High-resolution parameters for publication quality
    plt.rcParams['figure.dpi'] = 300
    plt.rcParams['savefig.dpi'] = 300

    # Individual chart creation for each major finding
    chart_types_created = [
        'Organization_Distribution',          # Pie chart
        'EMP_Familiarity_Distribution',       # Bar chart with percentages
        'Implementation_Effectiveness',      # Bar chart with significance
        'Stakeholder_Engagement',           # Distribution analysis
        'Support_Towards_EMP',               # Support level visualization
        'Conservation_Capacity',             # Capacity assessment chart
        'Implementation_by_Organization_BoxPlot', # Group comparisons
        'Correlation_Heatmap',               # Relationship matrix
        'Support_vs_Conservation_Scatter',   # Bivariate relationships
        'Positive_Response_Rates',           # Summary effectiveness

```

```
'Government_vs_NGO_Comparison',      # Key stakeholder comparison
'Overall_Satisfaction_Distribution',   # Composite measure
'Mean_Ratings_by_Organization',       # Multi-group analysis
'Response_Rates_by_Organization',     # Participation patterns
'Statistical_Summary_Overview'        # Integrated findings
]
```