

Community-Led Conservation: Mitigating Wildlife Conflict Through Collaboration

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Abstract

This study examines the relationship between Human-Wildlife Conflict (HWC) management and Community-Based Conservation (CBC), highlighting the part that local communities contribute in promoting sustainable wildlife management practices. The study underlines the importance of cooperative approaches based on community agency and stewardship are to the management of HWC and biodiversity conservation. The study employs a mixed method approach, and the researchers used focus groups and expert interviews to gather the needed data in the Save Conservative area (Chivi, Mwenezi & Chiredzi Districts). A sample size of 300 for quantitative method and 20 for qualitative method were used. The findings of this research were (1) collaborative governance, local knowledge and social-ecological resilience in Human-Wildlife Conflict is important and, (2) human wildlife conflict is a major challenge for conservation efforts. In light of these results, it was determined that community involvement in decision-making is essential because it fosters community ownership and engagement, which results in better conservation outcomes. Furthermore, there is need for collaborative management as it promotes community engagement and ownership.

Key words: Community-Based Conservation, Human-Wildlife Conflict, Conflict Management, Collaborative Governance and Social-Ecological Resilience.

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1.0 Introduction

Human-wildlife conflict (HWC) is a prevalent challenge, especially in African countries, with the potential to wipe away all the global biodiversity conservation and sustainable development gains achieved so far (Long *et al.*, 2020, Egriet *et al.* 2022) as cited by Zvidzai *et al.*, (2023). Because human activities are intruding into wildlife areas, HWC is becoming a more urgent global. Human–wildlife conflicts (HWCs) are a worldwide problem, especially around protected areas where human and wildlife need overlap (Chakuya *et al.*, 2023; Pisa and Katsande, 2021 and WWF, 2021). With climate change projections for Southern Africa pointing to drier conditions (Feng & Fu, 2013; Ragab & Prudhomme, 2002), the intensity of human–wildlife conflict is likely to increase (Matema *et al.*, 2022). In their research, Chakuya *et al.* (2023) highlighted that climate change plays a further role in aggravating HWC. Alterations in food and water availability due to severe droughts, temperature changes and flooding force wildlife to migrate in search of more suitable habitats. HWC is often triggered when people and wildlife compete for limited resources in the form of space, food, and water, (Zvidzai *et al.*, 2023).

The roots of HWC are deeply intertwined with human encroachment into wildlife habitats, which has been accelerated by urbanization, agricultural expansion, and infrastructure development (Chakuya *et al.*, 2023). Jeke (2014) highlights that the conflicts are exacerbated as humans encroach on wildlife corridors and, potentially, as wildlife repopulate human-dominated landscapes. The core root of the problem is being caused by conflicts which are brought on by increases in both human and wildlife populations where the wildlife territories are expanding into the regions where people live and on the other hand, human settlements are encroaching into protected areas. One of the key aspects of the 2000 land reform programme was an emphasis on the direct redistribution, equity and land for crops, with little attention on wildlife management (Dhliwayo *et al.*, 2022 and Wolmer *et al.*, 2004). This intentionally or unintentionally resulted in the 2000 land reforms transforming all the affected areas such as the Save Valley Conservancy (SVC) significantly and in certain circumstances converted wildlife areas into agricultural land (Dhliwayo *et al.*, 2022 and Scoones *et al.*; 2012).

Accordingly, HWC tend to manifest when, wildlife physiological requirements are deemed to prove direct or indirect negative consequences on the aims and aspirations of humans, (Zvidzai et al., 2023). These interactions often lead to adverse impacts on human life, property, or livelihoods (Redpath et al., 2017). As human populations continue to grow and settle in proximity to natural ecosystems, the frequency and intensity of these conflicts are expected to rise (Owen-Smith et al., 2022). The communities and wildlife in the Save Valley Conservancy (SVC) in southeast Zimbabwe have been significantly impacted by this conflict. It has resulted in a decreased space for game, declining wildlife populations and the contentious sharing of limited space between humans and wildlife (Stoldt et al., 2020). HWC has an enormous financial effect, especially on rural areas that depend mostly on agriculture and livestock. These consequences are particularly noticeable in areas where people and wildlife live side by side, making interactions common. Livestock predation by large carnivores, such as lions, wolves, and hyenas, can lead to significant financial losses for farmers, which can directly dissuade them from engaging in conservation efforts aimed at protecting these species (Mishra et al., 2021).

In India, for example, a study conducted in the Indian states of Madhya Pradesh and Uttarakhand found that the annual economic loss due to livestock predation can reach upwards of \$1,500 to \$2,000 per household, a staggering amount for communities that often live on a few thousand dollars a year (Mishra et al., 2021). As people try to maintain their agricultural productivity while replacing animals that perish or making investments in preventative measures, this economic strain may end up in cycles of poverty.

Moreover, the destruction of crops by herbivores such as elephants, deer, and wild boars can lead to food insecurity, particularly in regions heavily dependent on subsistence agriculture (Hazzah et al., 2019). These animals' crop raiding may destroy crops, resulting in both immediate financial losses and long-term effects on communities' access to food. Occasionally a family's ability to sustain itself for a whole season is dependent upon the loss of a single crop. This exacerbates the cycle of economic vulnerability, fostering resentment toward wildlife, which can often result in retaliatory killings a phenomenon that frequently negates conservation efforts (Treves et al., 2021; Maxwell et al., 2016; Nyumba et al., 2020; Mayberry et al., 2017; Sampson et al., 2021;). The opportunity costs associated with HWC are another critical aspect

in understanding its economic impacts. For instance, when farmers lose livestock or crops due to wildlife interactions, they may turn to less sustainable agricultural practices such as overgrazing or increased use of pesticides to protect their crops (Owen-Smith et al., 2022). These actions undermine the natural resources that these populations eventually rely on by endangering local ecosystems and causing long-term decreases in biodiversity.

Given these difficulties, tackling the financial effects of HWC is essential to creating conservation plans that work and are accepted by the community. This calls for specialized interventions that can improve community resilience, like programs to make up for losses caused by wildlife and encouraging non-agricultural and non-livestock livelihood options. Communities may be more inclined to embrace conservation techniques that safeguard their means of subsistence as well as the species they interact with if financial incentives are established. The Government of Zimbabwe's conservation philosophy is underpinned by a holistic human–wildlife conflict mitigation approach, exemplified by the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE), implemented since the late 1980s (Matema et al 2022). The guiding philosophy of CAMPFIRE is sustainable rural development that enables rural communities to manage and benefit directly from indigenous resources (Child 1996). Although extensively supported by most indigenous Zimbabweans, CAMPFIRE's approaches and implementation remain embedded in colonial ideology (Dzingai 1995). The programme is largely directed by external organisations and the private safari operating industry and business and operational agreements are mainly between Rural District Councils and the private safari industry (Murombedzi 1991). Human-animal conflict is still a major problem that has not been effectively resolved in Zimbabwe (Mhlanga 2001).

In addition to economic consequences, human-wildlife conflict often causes significant psychological distress for affected people. People's daily routines, social interactions, and farming practices can all be altered by a persistent fear of wildlife attacks. The emotional toll of living under the threat of wildlife, especially among vulnerable populations such as women and children can contribute to increased anxiety and stress levels (Davis et al., 2021 and Jeke 2014). Positive attitudes toward wildlife can be cultivated through community involvement and education, which highlight the ecological roles and benefits of wildlife conservation. Implementing effective education

programs that promote coexistence, the ecological importance of wildlife, and alternative strategies for managing conflict can help mitigate fear and enable communities to appreciate wildlife as valuable ecological partners (Davis et al., 2021). through Problem Animal Control, wildlife managers and rangers have been instrumental in intervening in HWC conflicts (PAC; Gandiwa et al., 2012 and Dube & Kavhu 2022).

Therefore, a comprehensive understanding of HWC needs to take these psychosocial aspects into account. More successful instructional and engagement methods might be framed by acknowledging that unfavourable attitudes of wildlife are frequently rooted in first-hand experiences of conflict. In the end, lowering the psychological and social aspects of conflict between people and wildlife necessitates all-encompassing strategies that incorporate financial assistance, community education, and active participation in conservation decision-making. A more peaceful cohabitation between people and wildlife can be achieved by addressing these many variables, opening the door for sustained coexistence. Therefore; this paper is going to address the research's main question which is how can community-led conservation initiatives, through collaborative approaches, effectively mitigate human wildlife conflict and promote coexistence between humans and wildlife?

The following hypothesis were tested the:

H₁: There is no difference on human-wildlife community incidents between community-led community and non-community-led areas.

H₂: there is no relationship between community engagement and livelihood engagement.

1.1 Theoretical Frameworks on Community Participation

A strong theoretical basis is necessary to comprehend conflicts between humans and wildlife as well as the efficacy of conservation measures. A number of frameworks provide light on the interactions between wildlife and human populations, highlighting the significance of local participation in conservation initiatives.

1.1.1 Traditional Ecological Knowledge (TEK)

Traditional Ecological Knowledge (TEK) is defined as “a cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment” (Berkes, 1993, p. 3). This definition concurs with the observations of most scholars namely, that such a knowledge system is dynamic, cumulative, evolving, place-based and geographically specific (Johnson, 1998; Charnley et al., 2007). TEK is rooted in social institutions (governing through customary rules, prohibitions and sanctions) (Osemeobo, 2001; Adom et al., 2016; Sinthumule and Mashau, 2020). It also encompasses worldviews or cosmology (beliefs, spirituality, sacred objects) of local people (Melaku Getahun, 2016; Kosoe et al., 2020) that shape environmental perceptions, factual observations and experiences, as well as resource management systems and practices (Joa et al., 2018). Such knowledge has been aided in the development of scientific management plans and is becoming more widely recognized as a source of data for natural resource conservation, management, and sustainable usage (Fritz et al., 2019).

In Africa, various scholars have reported the use of different (categories) but interrelated forms of TEK in the current research (Sinthumule (2023). These include taboos and totems, customs and rituals, rules and regulations, metaphors and proverbs, traditional protected areas, local knowledge of plants, animals and landscapes, and resource management systems (Sinthumule, 2023). These categories of analysis in traditional knowledge and management systems are based on a knowledge-practice-belief framework introduced by Berkes (1999). The communities who have taboos in their culture do not necessarily perceive them as instruments of resource conservation; however, they play an important role in conservation of natural resource (Sinthumule and Mashau, 2020).

Natural resources are critical to the lives and livelihoods of local communities, particularly in developing nations (Sinthumule (2023). To avoid ecological destruction and degradation, natural resources are protected through customary laws and regulations that help to facilitate common agreement on the use or non-use of a particular ecosystem service (Boafo et al., 2016; Asmamaw et al., 2020). These rules and regulations do not function independently; they usually complement other aspects of TEK such as taboos, sacred sites and resource management systems (Nadasdy

1999). Traditional rules and regulations on natural resources are achieved through strict sanctions and fines that are charged to offenders who are found to have violated such rules and regulations (Jimoh et al., 2012; Bofo et al., 2016; Mavhura and Mushure, 2019; Asmamaw et al., 2020). In Zimbabwe, penalties can be in the form of livestock or buckets of grain to the traditional leaders (Mavhura and Mushure, 2019). As a result, TEK offers crucial ecological insights as well as a network of knowledge that incorporates principles that might aid in ecosystem restoration (Haq et al., 2023). By integrating TEK into conservation policies and practice, organizations can promote a sense of ownership among local stakeholders. Such integration not only enriches biodiversity conservation efforts but also affirms the rights of indigenous peoples, ultimately fostering a more inclusive approach to environmental management (Berkes, 2012).

1.1.2 Social-Ecological Systems Theory

Social-Ecological Systems (SES) Theory provides a conceptual framework for understanding the interconnectedness of human and natural systems (Berkes & Folke, 1998). With the increase of a series of uncontrollable extreme climate events (such as drought, flood, snow disaster, etc.), the vulnerability of human society and ecosystem to climate change is gradually exposed, that is, the vulnerable nature of social-ecological system to climate change disturbance and pressure, which shows that the system is developing in a direction that is not conducive to its own stability and human interests (He, Zhou & Ahmed, 2021). The concept of social–ecological systems has been shown to analyse development issues arising from complex interactions between people and the environment on a regional scale (Folke et al., 2016; and Steffen et al., 2011), and is based on the perspective of *“the division between society and natural system is artificial and arbitrary”* (Berkes & Folke 1998). Social–ecological systems, also known as a *“composite human–earth system”* or *“composite human–nature system”* (Wang et al., 2018; Fischer et al., 2015), refers to the coupling system with complexity, nonlinear, uncertainty, and multilayer nesting characteristics formed by the interaction between human beings and the environment (Wang et al., 2020; Gain et al., 2020). In this regard, Flint, Kunze, Muhar, Yoshida, and Penker, (2013), indicate that the theme, traits, purpose, and character of human study can all be used to classify the interaction between the social system and the natural ecosystem.

1.2 Methodology

1.2.1 Study Area

Three regions surrounding the Save Conservancy, thus Chivi, Chiredzi, and Mwenezi, were examined in the research study. It is situated in the Masvingo Province in the southeast of Zimbabwe. Respondents were selected from the Sengwe, Tshovani, Chitsa, and Marimba communities. The ownership and operational structure of the SVC are now markedly diverse (Dhliwayo et al. 2022). In its northern part, which was not affected by the land reform, most properties are supported by Bilateral Investment Promotion and Protection Agreements (Kreuter et al. 2010). Lahiff, and Scoones, (2003) posits that in the southern region of the SVC, land reform brought significant changes. Large settlements in the western and eastern areas have led to wildlife areas being transformed into crop and livestock spaces (Scoones et al., 2012; Wels, 2000). The other remaining wildlife pockets in the SVC are now under the custodianship of the Zimbabwe Parks and Wildlife Management Authority (Dhliwayo et al 2022).

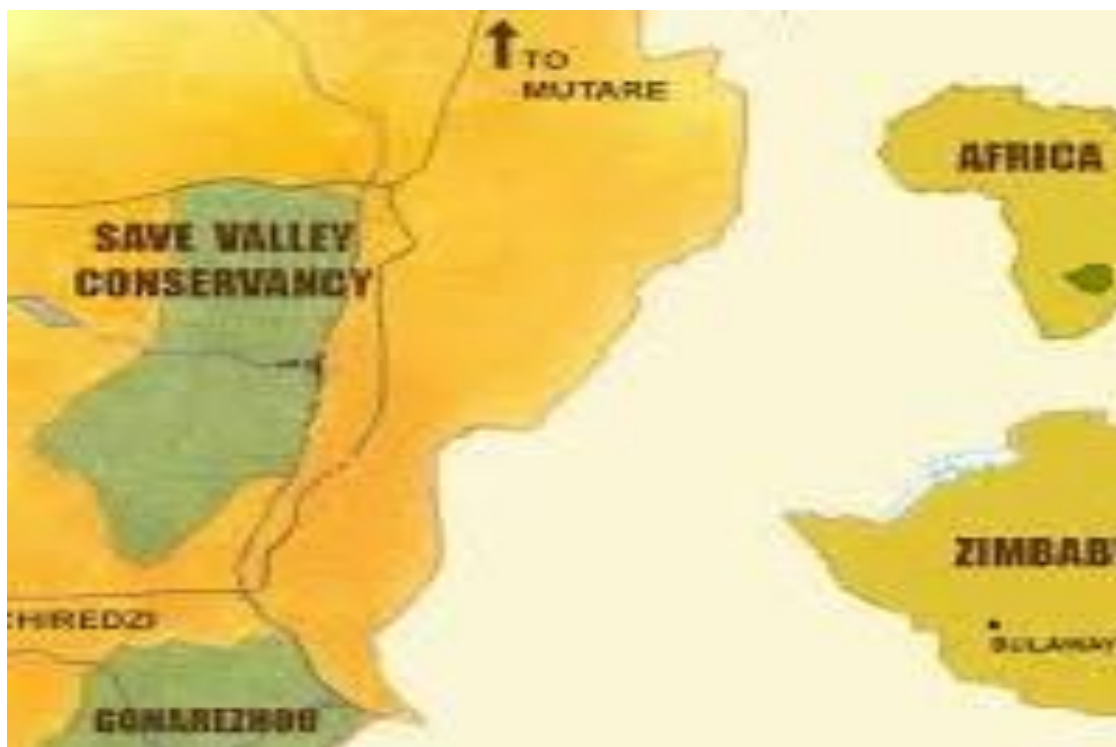


Fig 1: Save Valley Conservancy, Zimbabwe

1.2.2 Study methodology

The study used a mixed method approach where 300 questionnaires were distributed to respondents. Interviews were done to 20 respondents using purposive sampling method as well as focus group discussions were held with key informants from the communities and conservation stakeholders. Participants were also assured that their contributions would be strictly used for academic purposes and would remain confidential, with the guarantee that no information would be divulged to anyone outside the research context (Ferreira & Serpa, 2018). Data analysis used both descriptive statistics to and thematic analysis from interviews and focus group discussion data.

The regression analysis is used to understand the relationship between a dependent variable and independent variable. In this case the dependent variable is livelihoods improvements while the independent variable is the community engagement. This is a linear regression analysis, given by the following formula.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \epsilon$$

Where Y = dependent variable

X = independent variable

β = Beta coefficient

ϵ = Epsilon (error term)

1.3 Results

1.3.1 Demographic data

1.3.1.1 Response rate

The response rate for the questionnaire was 100 percentage, which is considered excellent depending on context.

1.3.1.2 Age Distribution & Engagement

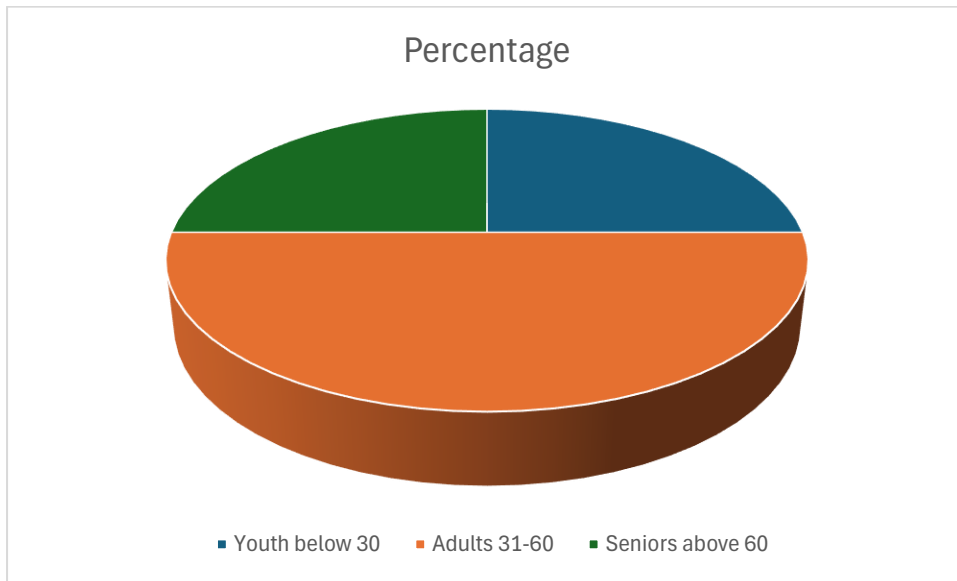


Fig 1.2: Age distribution of respondents

Source: Field data

Fig 1.2 shows the age distribution of the respondents, the youth accounted for 25%, the adults and seniors accounted for the 75%.

1.3.1.3 Gender Dynamics and Roles

Table 1.1 Involvement in Conservation:

Gender	Total	Percentage
Female	120	40
Male	180	60

Source: Field Data

From Table 1.1, 40% of females participate in community meetings while 60% males participate in decision-making.

1.3.1.3 Ethnic & Cultural Composition

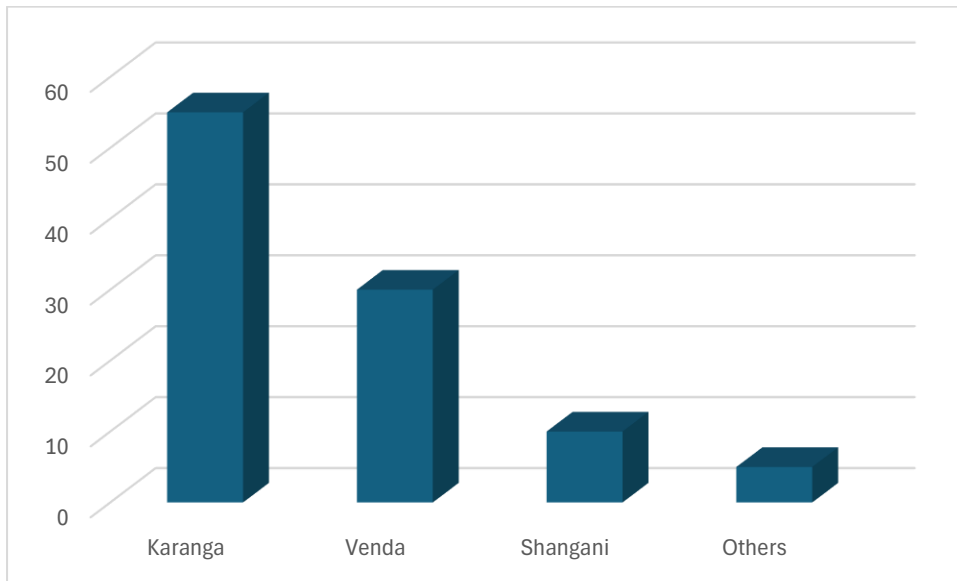


Fig 1.3 Ethnic and Cultural Composition

Source: Field Data

Fig 1.3 shows that the Karanga Ethnic group dominates the respondents.

1.3.1.4 Education & Literacy Levels

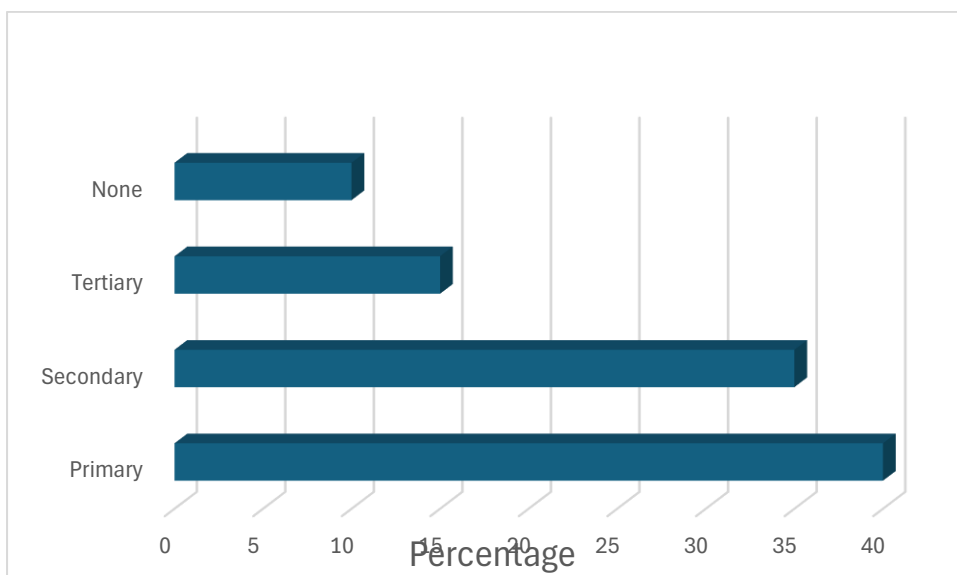


Fig 1.4 Education and Literacy Level

Source: Field data

From Fig 1.4 above, 10% of the respondents are not educated.

1.3.1.5 Livelihood & Dependency on Natural Resources

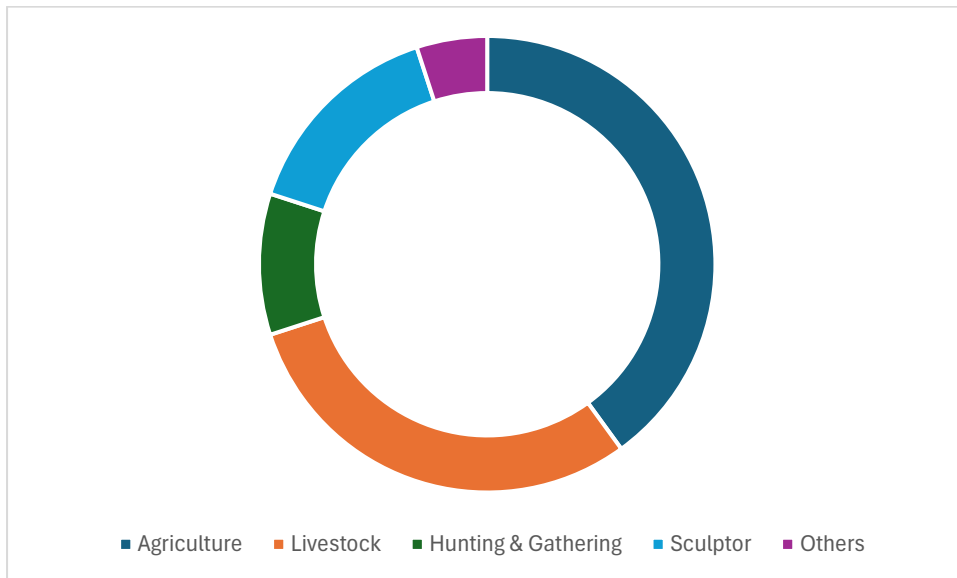


Fig 1.5 Livelihood & Dependency on Natural Resources

Fig 1.5 shows wildlife conflict drivers of livestock and agriculture account for a combined 70%.

1.3.2 Quantitative Results

1.3.2.1 Descriptive statistics

Table1.2 Reduced HWC

Category	Frequency	Percentage
Crop damage	120	40%
Livestock depredation	90	30%
Property damage	60	20%
Human injury	30	10%
TOTAL	300	100%

Source: Field data

The results show that crop damage is the most common type of human wildlife conflict incident, accounting for 40% of all incidents, followed by livestock depredation accounting for 30% of the respondents.

Table 1.3 Increased community engagement

Level of engagement	Frequency	Percentage
High	180	60%
Medium	90	30%
Low	30	10%
Total	300	100%

Source: Field data

The survey results indicate a high level of community engagement in CLC activities, with 90% of the respondents participating in conservation efforts.

Table 1.4 Improved livelihoods

Level of improvement	Frequency	Percentage
Significant	150	50%
Moderate	90	30%
Minimal	60	20%
Total	300	100%

Source: Field data

The results show that 50% of respondents reported a significant improvement in their livelihoods, while 30% reported a moderate improvement and 20% reported a minimal improvement.

1.3.3.1 Inferential Statistics

Table 1.5 Comparison of HWC incidents between CLC and non CLC areas

Area	Mean	Standard Deviation	t-value	p-value
CLC	2.5	1.2	-3.5	0.001
Non CLC	4.2	1.5	-	-

Source: Field data

The results show that the mean number of human wildlife conflict incidents is significantly lower in the Community led Conservation area compared to non CLC area.

1.3.3.2 Correlation coefficient

Table 1.6 Correlation between community engagement and livelihood improvements

Variable	Coefficient	Standard error	t-value	p-value
Community engagement	0.65	0.12	5.4	0.001
Livelihood improvement				

Source: Field data

The results show that there is a significant positive correlation between community engagement and livelihood improvement.

1.3.3.3 Regression Analysis

Table 1.7 Predictors of human wildlife Conflict Incidents

Variable	Coefficient	Standard error	t-value	p-value
Community engagement	-0.35	0.15	-2.3	0.05
Livelihood improvement	-0.28	0.12	-2.1	0.05
Constant	3.5	0.8	4.3	0.001

Source: Field data

The results show that community engagement and livelihood improvement are significant predictors of Human wildlife conflict incidents.

1.3.4 Qualitative Results

1.3.4.1 Theme 1: Community Engagement and Participation

1.3.4.1.1: Community led conservation initiatives

Community leader, “We started a community led conservation initiative to protect our forest and wildlife. We work together to monitor the forest and prevent poaching.”

Farmer, “The community led conservation initiative has helped us to take ownership of our natural resources and protect them for future generations.”

Conservation committee member, “We have seen a significant reduction in poaching and habitat destruction since we started the community led conservation initiative.”

1.3.4.1.2: Community participation in decision-making process

Community leader, “We make sure that everyone in the community is involved in the decision-making process. We hold meetings and discussions to ensure that everyone’s voice is heard.”

Conservation organisation representative, “Community participation in decision making process is crucial. It ensures that everyone is on board with the conservation efforts and that we are working towards a common goal.”

Government agency official, “We have seen that when the community is involved in decision making processes, they are more likely to support and participate in conservation efforts.”

1.3.4.1.3: Community ownership and responsibility

Community leader, “We take ownership of our natural resources and are responsible for protecting them. We work together as a community to ensure that our resources are conserved for future generations.”

Conservation organisation official, “Community ownership and responsibility are key to successful conservation efforts. When the community is invested in the conservation of their natural resources, they are more likely to protect them.”

Government agency official, “We have seen that when the community takes ownership of their natural resources, they are more likely to adopt sustainable practices and protect their resources.”

1.3.5.2 Theme 2: Human Wildlife Conflict and Livelihood Impacts

1.3.5.2.1: Crop damage and livestock depredation

Farmer, “Crop damage and livestock depredation are major problems for us. We lose a significant amount of our crops and livestock to wildlife every year.”

Community leader, “Human wildlife conflict is a major challenge for us. We have to deal with crop damage and livestock depredation on a regular basis.”

Conservation committee member, “We have tried various methods to prevent crop damage and livestock depredation, but it is an ongoing challenge.”

1.3.5.2.2: Economic impacts of human wildlife conflict

Farmer, “Human wildlife conflict has a significant economic impact on us. We lose income and livelihoods due to crop damage and livestock depredation.”

Community leader, “The economic impacts of Human wildlife conflict are severe. We have to spend a lot of money to repair damaged crops and livestock.”

Conservation organisation official, “Human wildlife conflict affects our livelihoods and income. We need to find ways to mitigate these impacts.”

1.3.5.2.3: Social impacts of human wildlife conflict

Farmer, “HWC has social impacts on us. We have to deal with stress and trauma of losing our crops and livestock.”

Community leader, “The social impacts of HWC are significant. We have to deal with the emotional toll of losing our livelihoods.”

Government agency official, “HWC affects our social well-being. We need to find ways to address these impacts.”

1.3.5.3 Theme 3: Collaborative Management and Partnerships

1.3.5.3.1: Collaboration between local communities and conservation organisations

Community leader, “We work closely with the conservation organisation to protect our natural resources. They provide us with technical assistance and support.”

Conservation organisation official, “Collaboration between local communities and conservation organisations is crucial. It ensures that conservation efforts are community led and effective.”

Government agency official, “We have seen that collaboration between local communities and conservation organisations leads to better conservation outcomes.”

1.3.5.3.2: Partnerships between government agencies and local communities

Community leader, “We partner with the government agency to protect our natural resources. They provide us with funding and technical support.”

Government agency official, “Partnerships between government agencies and local communities are essential. They ensure that conservation efforts are supported and effective.”

Conservation organisation official, “We have seen that partnerships between government agencies and local communities lead to better conservation outcomes.”

1.3.5.3.3: Benefits and challenges of collaborative management

Community leader, “Collaborative management has many benefits. It ensures that conservation efforts are community led and effective.”

Conservation organisation official, “Collaborative management also has challenges. It requires a lot of time and effort to build trust and partnerships.”

Government agency official, “We have seen that collaborative management leads to better conservation outcomes, but it requires careful planning and implementation.”

The paper’s findings suggest that CLC is an effective approach to reduce HWC and promote community engagement in conservation as the study highlights the importance of trust building between community members and conservation officials.

1.3.6 Discussions

1.3.6.1 Discussions from Demographic results

A high response rate indicates strong engagement and provides confidence in the representativeness of the findings. This was supported by Cummings and Worley, (2019) and Kreuter et al., (2020) who indicated in their researches that achieving a response rate of 100% from 300 participants demonstrates strong participant involvement in the study. Conversely, a lower response rate may suggest potential response bias or the need for improved follow-up strategies in future surveys. Thus, it may be deduced that younger populations may be more receptive to conservation

education; elders may hold traditional knowledge. Gender roles also influence participation and collaboration strategies and on the other hand the implication of the cultural attitudes varies in perceptions of wildlife and conservation practices. The majority of the respondents in the study are literate enough to understand conservation and collaboration strategies. There is a high competition for land and resources in Save Conservancy which results in conflict.

1.3.6.2 Discussions from Quantitative results

From the research done, it is noted that there reduced HWC in Save Conservancy which suggest that human wildlife conflict is a significant issue in the study area. This is consistent with previous studies that have shown that human wildlife conflict is a major concern in many parts of the world, (Sibanda & Chomba, 2019; Chidziya & Moyo, 2020, Kareiva, et al, 2020 and Plummer, et al, 2017). HWCs can take a variety of forms, including attacks on humans, depredation (Matseketsa et al, 2019, Larson et al, 2016), and crop-raiding (Mhuriro, et al 2018, and Siljander, et al, 2020). Communities near protected areas (PAs) suffer from crop-raiding and livestock predation, which is often the biggest cause of conflict in Africa (Siljander, et al, 2020). People residing inside PAs are even more exposed and vulnerable to problem causing wild animal species (Akrim, et al, 2021 and Sekhar, 1998). A study carried out in Ethiopia by Tamrat et al. (2020) concluded that livestock predation is intense in and around a protected sanctuary, crop damage caused by wildlife can inflict substantial financial losses for farmers and, at the same time, create negative attitudes towards wildlife and conservation efforts. This may result in negative interactions with wildlife, culminating in increased HWCs (Grosset al., 2018).

Findings for increased community engagement is in support with Hlengwa and Maruta, (2020) who highlighted that local communities need to be involved from the planning phase of community-based tourism projects, which are meant to benefit them socio-economically, while also empowering them to participate actively in the conservation of local environmental assets. For improved livelihoods the findings suggest that livelihood improvement is a significant outcome of conservation efforts in the study area and this resonates with the study done by Mekonen, (2020) who indicated that communities in and around parks benefit immensely from proceeds obtained from sales of wildlife.

Community led conservation is effective in reducing human wildlife conflict incidents. Treves (2007) noted that it is very important that farmers be involved in the process of developing new solutions from the beginning. In addition, they understand how the situation affects them and what kinds of intervention are likely to be acceptable and feasible with in the local culture, providing there is adequate representation from the different types of stakeholders involved, (Parkhurst, 2006). It is also important to highlight the impact of community engagement in improving the livelihood of the population. This was supported by researches done by Meyer et al., (2021a); Meyer et al., (2021b) and Bandyopadhyay et al. (2009) who posited that the community led conservation initiatives positively affect income, hence, HWC may still result in trade-offs between attracting wildlife numbers and socioeconomic impacts of livelihoods. Community engagement and livelihood improvement are also critical for reducing human wildlife conflict incidents and derive benefits from the proximity to the protected zones (Dixit, Poudyal, Silwal, Joshi, Bhandari, & Hodges, 2024). This is a significant finding as human wildlife conflict is a major concern in many parts of the world and this is propounded by researches done by Dickman et al, (2019); Matseketsa et al. (2018); Pooley et al, (2017) and Moyo & Chidiya, (2018).

1.3.6.3 Discussions from Qualitative results

1.3.6.3.1 Community Engagement and Participation

It can be deduced that community led conservation initiatives are essential for effective conservation outcomes and promote community ownership and responsibility, leading to more effective conservation outcomes. As noted by Kareiva et al (2020) and Berkes (2017) community led conservation initiatives are important in human wildlife conflict management. Thus, these findings highlight that community participation in decision-making processes is a critical and promotes community engagement and ownership leading to more effective conservation outcomes. This is supported by earlier studies by Armitage et al, (2019) and Plummer et al, (2017). Emphasizing and building shared understandings of fundamental assumptions regarding wildlife conservation could enhance the participatory process, improve ecological understanding and aid conservation success (Heisel et al., 2021). Community engagement is critical during the restoration process, especially when working with communities that have a wealth of traditional knowledge related to biodiversity and natural resource management (Ogar, Pecl and Mustonen, 2020).

1.3.6.3.2 Human Wildlife Conflict and Livelihood Impacts

Human wildlife conflict is a major challenge for conservation efforts. Research by Pooley et al (2017) pointed out that crop damage and livestock depredation are significant economic and social impacts of human wildlife conflict. Dickman, et al, (2019) and Salerno et al.'s (2020, 2021) posited that human wildlife conflict is a cause for concern. They further noted that human wildlife conflict can lead to significant social impacts, including stress, trauma and conflict. In the same vein, Chidziya and Moyo, (2020) indicated that human wildlife conflict results in economic and social impacts on human lives.

1.3.6.3.3 Collaborative Management and Partnerships

There is need for collaborative management as it promotes community engagement and ownership in decision- making processes. Earlier studies have also pointed out the need for collaborative management in human wildlife conflict management, as this facilitates improved communication strategies and prompt reaction to human–wildlife conflict reports (Dube & Kavhu 2022; Armitage et al, 2019; Plummer, et al, 2017; Sibanda & Chomba, 2019, Moyo & Chidziya, 2018 and Mbereko et al. 2017). Creating an action plan for forest protection should begin by convening local communities, scientists, resource managers, and government representatives in workshops (FA, 2020). Such a strategy would be in accordance with the UN Decade of Ecosystem Restoration (2021–2030), which requires governments across the countries to integrate local communities and their indigenous knowledge with management goals (Mbah, Ajaps, and Molthan-Hill, 2021).

1.4 Conclusion

The study concluded that:

- i. Demographic factors influence community-led conservation success and also the data underscores the importance of inclusive participation in community led conservation strategies.
- ii. community led conservation is effective in reducing human wildlife conflict incidents.
- iii. community engagement and livelihood improvement are critical for reducing human wildlife conflict incidents.

- iv. community participation in decision-making processes is critical because it promotes community engagement as well as ownership, leading to more effective conservation outcomes.
- v. HWC is a major challenge for conservation efforts as it results in crop damage, livestock depredation and human injury.

This paper therefore, emphasises the benefits of collaborative management, including shared decision-making and joint problem solving as it promotes community engagement and ownership. In the same vein, the study also highlights the paramount importance of active participation by community members in wildlife conservation initiatives (Milich, Sorbello, Kolinski, Busobozi, & Kugonza, 2021). One of the major challenges in the SVC, as illustrated in this study, is HWCs, which are mainly caused by a lack of shared understanding and vision as was supported by Makumbe, *et al.*, (2022). Mogomotsi, Stone, Mogomotsi, & Dube, (2020) propounds that there is a necessity for enhanced engagement of community members regarding wildlife conservation.

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1.5 Recommendations

The paper makes the following recommendations:

- i. There is need to tailor strategies considering age, gender, ethnicity, and livelihood improve collaboration.
- ii. Collaborative management should be fostered among the communities affected by wildlife so that there is community ownership and control over conservation efforts.
- iii. There is need for collaborative management in the conservative efforts in order to reduce HWC.
- iv. There is need for trust building among the stakeholders in order to foster shared decision making and joint problem solving in reducing human HWC.
- v. Further research should be done in a different context.

Conflicts of interest

Nothing to declare.

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Author contributions

All the three authors collaborated on this paper from abstract, introduction, literature review, research design, fieldwork, primary data analysis and write up of this research.

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