Human-Wildlife Conflict in Gachegache, Zimbabwe: Climate Change, Water Scarcity, and Sustainable Community Conservation Strategies.

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Abstract

This study explored the relationship between climate change, water scarcity, and human-wildlife conflict (HWC) in Gache Gache, Zimbabwe, with a focus on sustainable community conservation strategies acknowledging the inseparable link between ecological systems and human livelihoods. Wildlife migration patterns have become increasingly unpredictable, leading to intensified competition for resources and heightened conflict. While community-based conservation strategies provide a foundation for coexistence, their effectiveness remains limited by inconsistent implementation, financial constraints, and a lack of local ownership. Governance structures continue to be a significant barrier, as weak institutional support and inefficient resource allocation hinder progress in conservation efforts. Greater community engagement, adaptive governance, and sustained investment in conservation initiatives are essential for fostering long-term human-wildlife coexistence. Addressing these challenges requires a shift towards more inclusive decision-making processes, where local communities are active stakeholders rather than passive recipients of externally driven conservation policies. A holistic approach that integrates ecological sustainability with social and economic empowerment will be critical in mitigating human-wildlife conflict and ensuring resilience in conservation efforts. HWC, evaluate the effectiveness of community-based conservation (CBC) strategies, and examine the role of governance, resource allocation, and community engagement in HWC mitigation. A qualitative research design was employed, utilizing semi-structured interviews and focus group discussions to gather data from key stakeholders, including community members, conservation officers, and policymakers. Thematic analysis was used to interpret the findings. The study concludes that while CBC strategies have shown potential in reducing HWC, their effectiveness is hindered by governance challenges, limited financial resources, and inadequate local participation. Climate-induced water scarcity continues to exacerbate conflicts as wildlife encroaches into human settlements in search of resources. To address these challenges, the study recommends strengthening conservation governance, increasing financial and technical support for community initiatives, enhancing local participation in conservation decision-making, and integrating HWC mitigation into broader climate adaptation policies. A holistic and adaptive approach is essential for fostering long-term coexistence between human populations and wildlife in Gache Gache.

Key Words: Human-Wildlife Conflict, Climate Change, Water Scarcity, Sustainable Community Conservation, Community-Based Conservation (CBC)

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1.1 Introduction and Background

Human-wildlife conflict (HWC) is a pervasive issue that manifests globally, often resulting from the intersection of expanding human populations and wildlife habitats. The International Union for Conservation of Nature (IUCN) highlights that such conflicts are becoming more frequent and severe due to habitat loss and fragmentation, leading to increased encounters between humans and wildlife. Climate change further exacerbates these conflicts by altering resource availability and species distributions, intensifying competition between humans and wildlife. For instance, changes in temperature and precipitation patterns can shift the habitats of various species, bringing them into closer contact with human settlements (Abrahms et al., 2023). This global trend underscores the need for comprehensive strategies that address both conservation and human livelihoods.

In the African context, HWC is particularly pronounced due to the continent's rich biodiversity and the proximity of human communities to wildlife habitats. The World Bank reports that encounter between humans and wildlife often lead to crop raiding, livestock predation, and property damage, adversely affecting livelihoods and exacerbating poverty. Climate-induced water scarcity further intensifies these conflicts, as both humans and wildlife compete for diminishing water resources. For example, prolonged droughts have been linked to increased incidents of elephants raiding crops in search of food and water (Gaynor et al., 2021). Efforts to mitigate HWC in Africa have included the development of community-based conservation programs, which aim to involve local communities in wildlife management and benefit-sharing. However, the effectiveness of these programs varies, often hindered by limited resources and inadequate governance structures.

Zimbabwe, located in Southern Africa, faces significant challenges related to HWC, particularly in regions adjacent to protected areas. The Gache Gache area, situated near Lake Kariba, has experienced increased incidents of human-wildlife interactions, especially involving elephants and other large herbivores. These interactions often result in crop destruction and pose threats to human safety. The Zimbabwe Parks and Wildlife Management Authority (ZimParks) has implemented measures such as community education programs and the establishment of wildlife corridors to mitigate

these conflicts. However, the effectiveness of these interventions is often limited by resource constraints and varying levels of community engagement. In 2024, the Zimbabwean government announced plans to cull 200 elephants to address food insecurity among vulnerable populations, a decision that sparked considerable controversy. Critics argue that such actions may undermine conservation efforts and fail to provide long-term solutions to the underlying causes of HWC (Le Monde, 2024). This situation underscores the need for sustainable and community-centred approaches to HWC management.

At the local level, communities in Gache Gache are directly affected by the consequences of HWC. Crop losses due to wildlife incursions threaten food security and livelihoods, leading to negative perceptions of wildlife conservation among local residents. Efforts to mitigate these conflicts have included the use of deterrent methods such as chili fences and the promotion of alternative livelihoods to reduce dependence on agriculture. However, challenges persist, including limited access to resources, inadequate support for implementing mitigation measures, and insufficient involvement of local communities in decision-making processes. Research indicates that successful HWC mitigation requires a holistic approach that integrates ecological, social, and economic considerations (Mekonen, 2020). This underscores the importance of developing strategies that not only address the immediate impacts of HWC but also promote long-term coexistence between humans and wildlife.

This research aims to examine the interplay between climate change, water scarcity, and HWC in Gache Gache, Zimbabwe. Through assessing current community-based conservation strategies and their effectiveness, the study seeks to identify sustainable solutions that align ecological conservation with the socio-economic needs of local communities. Through this analysis, the research will contribute to the development of informed policies and practices that promote harmonious coexistence between humans and wildlife in the context of environmental change.

1.2 Statement of the Problem

Despite ongoing conservation efforts, human-wildlife conflict (HWC) in Gache Gache, Zimbabwe, remains a significant challenge due to climate-induced water scarcity, which forces wildlife into human settlements in search of resources. Mekonen (2020)

argues that competition for diminishing water sources intensifies conflicts, leading to crop destruction, livestock predation, and threats to human safety. Existing mitigation measures, such as wildlife corridors and deterrents, have shown limited effectiveness due to inadequate community involvement and resource constraints. Without sustainable, community-driven conservation strategies, HWC will continue to threaten both biodiversity and local livelihoods. This study examines the effectiveness of current interventions and explores alternative approaches to foster long-term coexistence.

1.3 Research Objectives

1. To assess the impact of climate-induced water scarcity on human-wildlife conflict (HWC) in Gache Gache, focusing on wildlife movement and resource competition.
2. To evaluate the effectiveness of current community-based conservation strategies in mitigating human-wildlife conflict (HWC) and promoting sustainable coexistence in Gache Gache.
3. To examine the role of governance, resource allocation, and community engagement in shaping the success of human-wildlife conflict (HWC) mitigation efforts in Gache Gache.

1.4 Research Questions

1. How does climate-induced water scarcity influence human-wildlife conflict (HWC) in Gache Gache by increasing competition for essential natural resources?
2. How effective are existing community-based conservation strategies in reducing human-wildlife conflict (HWC) and fostering sustainable coexistence in Gache Gache?
3. What is the impact of governance, policy implementation, and resource distribution on the success of human-wildlife conflict (HWC) mitigation strategies in Gache Gache?

2.0 Theoretical Framework

This research employed two interrelated theoretical frameworks: Adaptive Co-Management (ACM) and Social-Ecological Systems (SES) theory. These frameworks provide a comprehensive lens to understand the dynamic interactions between human communities and wildlife, particularly under the pressures of climate-induced water scarcity. Adaptive Co-Management (ACM) is a collaborative approach that combines the iterative learning processes of adaptive management with the collaborative governance structures of co-management. According to Armitage et al. (2009) ACM is a process that emphasizes shared decision-making, flexibility, and learning among stakeholders to manage natural resources effectively. Key elements of ACM include stakeholder collaboration, iterative learning, and adaptability to changing environmental conditions. In the context of this research, ACM is pertinent as it encourages the involvement of local communities in conservation efforts, promoting shared responsibility and knowledge exchange to mitigate HWC. This aligns with the research objective of evaluating the effectiveness of community-based conservation strategies in reducing HWC and fostering sustainable coexistence.

The Social-Ecological Systems (SES) theory, posits that humans and ecological systems are intricately linked, forming complex and adaptive systems (Berkes and Folke (1998). It empasises the interdependence between social and ecological components, highlighting the need for integrated management approaches. SES theory's main assumptions include the concepts of resilience, adaptability, and the recognition of feedback loops between human and ecological systems. In this research, the SES theory enables an in-depth examination of how climate-induced water scarcity impacts both human and wildlife behaviours, thereby influencing HWC dynamics. This perspective supports the research objective of analysing the influence of environmental factors on HWC in Gache Gache.

Integrated the ACM and SES theories provides a holistic framework for this study. ACM offers a practical approach to resource management through stakeholder collaboration and adaptive strategies, while SES theory provides a conceptual understanding of the interconnectedness between human and ecological systems. Together, these frameworks facilitate a comprehensive analysis of HWC by considering both governance structures and ecological dynamics. This integrated

approach is essential for addressing the research objective related to the role of governance, policy implementation, and resource distribution in HWC mitigation. Critiques of ACM highlight challenges such as power imbalances among stakeholders and the potential for conflicts arising from differing interests (Plummer and Armitage, 2007). Similarly, SES theory has been critiqued for its complexity and the difficulty in operationalizing its concepts in empirical research (Binder et al., 2013). Despite these limitations, the application of these theories is justified in this research due to their comprehensive perspectives on human-environment interactions. Through acknowledging and addressing these critiques, the research aims to apply these frameworks thoughtfully, ensuring a balanced analysis that considers both theoretical insights and practical constraints.

Drawing from the above, in this research, ACM will inform the evaluation of current community-based conservation strategies, assessing the extent of stakeholder collaboration and adaptability in management practices. SES theory will be utilized to analyse the interactions between social and ecological variables, such as how water scarcity influences wildlife behaviour and, consequently, HWC incidents. This dual-theoretical approach will enable a comprehensive understanding of the multifaceted nature of HWC in Gache Gache, leading to more effective and sustainable mitigation strategies.

3.0 Research Methodology

The research methodology for this study was y structured to provide a comprehensive and systematic approach. The chosen methodology aligned with the study's objectives through ensuring a rigorous and context-sensitive exploration of the issue while maintaining ethical integrity and scientific validity. An interpretivist research philosophy, which emphasize understanding social phenomena from the perspectives of those involved was utilised. According to Creswell (2020), the interpretivist paradigm was particularly suited to qualitative research as it allowed for an in-depth exploration of human experiences, behaviours, and interactions. Given that this study sought to understand how communities in Gache Gache perceived and responded to HWC under conditions of water scarcity, the interpretivist approach was appropriate. It enabled the researcher to capture the lived experiences of affected individuals and

explore the socio-ecological dynamics shaping conservation practices. Unlike positivist approaches, which prioritized objective measurements, the interpretivist paradigm valued context, meaning, and subjective interpretations, making it well-suited for analysing complex human-environment interactions.

In line with this philosophical orientation, the study employed a qualitative research design, which was ideal for exploring social and ecological phenomena in depth. Flick (2022) argued that qualitative designs facilitated a holistic understanding of issues that could not be adequately quantified, such as attitudes, beliefs, and behavioural patterns. Since HWC is influenced by a range of socio-economic and environmental factors, a qualitative design allowed for flexibility in data collection and analysis, ensuring that emerging themes and contextual insights were adequately captured. Unlike quantitative approaches that relied on numerical data, qualitative research provided rich, descriptive accounts that were essential for understanding community-based conservation efforts. To operationalize this qualitative design, the study utilized a case study approach, the specific case study being Gache Gache. Yin (2021) contended that case study research was particularly effective in examining contemporary real-life phenomena within their natural settings. Given that HWC is shaped by localized environmental and socio-political conditions, a case study approach allowed for a detailed exploration of the interplay between climate change, water scarcity, and conservation strategies. This method enabled the study to generate context-specific insights that could inform broader conservation policies in Zimbabwe and beyond.

The target population for this research comprised local community members, conservation officers, policymakers, and non-governmental organizations (NGOs) involved in wildlife conservation in Gache Gache. According to Patton (2020), a diverse target population enhances the validity of qualitative research by ensuring multiple perspectives are represented. In this research, community members provided first-hand accounts of HWC experiences, conservation officers offered insights into management strategies, and policymakers contributed perspectives on governance and policy frameworks which ensured a well-rounded analysis of the issue. For the selection of participants, the study employed purposive sampling, a non-probability sampling technique that allowed for the deliberate selection of individuals with relevant

knowledge and experience. According to Bryman (2019), purposive sampling is particularly useful in qualitative research and in this research, it ensured that participants who possessed the necessary expertise to provide meaningful contributions were selected. Given the focus on community-based conservation, key informants included village leaders, farmers, and conservation practitioners with direct involvement in HWC mitigation efforts. This approach ensured that the data collected was rich, relevant, and directly aligned with the research objectives. The sample size for this study was 20 participants.

The sample size for this study was determined based on the principles of qualitative research, which prioritize depth and richness of data over numerical representativeness. Unlike quantitative research, where large sample sizes are required for statistical generalization, qualitative research seeks to provide deep insights into specific phenomena through detailed accounts and thematic exploration (Creswell, 2020). The decision to use a sample size of 20 participants was guided by the concept of data saturation, which occurs when additional participants no longer provide new insights (Guest et al., 2020). Qualitative research emphasizes the importance of selecting participants who are most knowledgeable about the phenomenon under study. Patton (2020) asserts that purposive sampling allows researchers to target individuals with relevant experience and expertise, ensuring that the data collected is meaningful and directly applicable to the research objectives. The selection of 12 participants for structured interviews and eight for focus group discussions (FGDs) was deliberate, allowing for both individual perspectives and collective community insights. Mason (2019) argue that qualitative research sample sizes typically range from 15 to 30 participants, depending on the complexity of the study and the diversity of perspectives needed. In smaller case studies, a sample size of 10–20 participants are often sufficient to capture key themes while maintaining feasibility in terms of data collection and analysis (Boddy, 2016).

The decision to have 20 participants in this study aligns with these recommendations, ensuring a balance between comprehensive data collection and manageability. Additionally, Guest et al. (2020) found that data saturation in qualitative studies is often reached within the first 12 interviews, with diminishing returns thereafter. Thus, the

sample size for this study was appropriate for capturing the necessary depth of information without unnecessary redundancy.

Data collection was conducted through semi-structured interviews and focus group discussions (FGDs), which allowed for an in-depth exploration of participants' experiences and perspectives. Kvale and Brinkmann (2020) argued that semi-structured interviews provided a balance between flexibility and structure, enabling researchers to probe deeper into emerging themes while maintaining consistency across interviews. FGDs, on the other hand, facilitated collective discussions that revealed shared experiences, community dynamics, and divergent opinions on conservation strategies. The combination of these methods ensured a comprehensive understanding of HWC in the research area. Thematic analysis was used to analyse the data. Thematic analysis allows the identification of patterns and recurring themes within the responses. According to Braun and Clarke (2021), thematic analysis was a robust method for systematically organizing and interpreting qualitative data. In this regard, thematic analysis enabled the researcher to categorize findings into key themes and through iterative study, allowed for continuous refinement of themes as new insights emerged.

The research religiously adhered to research ethics to ensure the protection and dignity of all participants. Informed consent which according to Resnik (2020), is a fundamental research principle that ensure participants are fully aware of the research’s purpose, risks, and benefits was obtained from all participants before data collection. Additionally, confidentiality and anonymity were maintained to protect the identities of participants, particularly those discussing sensitive conservation or policy-related issues. Ethical safeguards, including voluntary participation and the right to withdraw at any stage, were upheld to ensure compliance with ethical research standards.

3.1 Response Rate

The study targeted two key groups; structured interview participants and focus group discussion (FGD) participants. Among the 12 participants selected for structured interviews, 10 took part in the study, while two were unavailable or declined to

participate. Additionally, all eight participants invited for the FGD actively participated, ensuring a complete dataset from this group. The response rate for the study is presented in the table below:

Table One: Response Rate

Category	Targeted Participants	Actual Participants	Response Rate (%)
Structured Interviews	12	10	83.3%
Focus Group Discussion	8	8	100%
Total	20	18	90%

A response rate of 90% is considered highly satisfactory for qualitative research, as it ensures the inclusion of diverse perspectives while minimizing gaps in the data. According to Creswell (2020), achieving a high response rate strengthens the credibility of qualitative studies by ensuring that the findings accurately reflect the lived experiences of the target population. Given the relatively small sample size of this study, the participation of 18 respondents provided sufficient data saturation, reducing the likelihood of missing critical insights related to HWC. The high response rate, particularly the full participation in the FGD, contributed significantly to the richness of the data. Bryman (2019) asserts that focus group discussions enhance qualitative research by capturing collective views and stimulating deeper discussions that may not emerge in individual interviews. The structured interviews also yielded valuable in-depth narratives, providing a comprehensive understanding of the challenges faced by the local community. However, the absence of two interview participants, while minimal, may have slightly limited the diversity of individual perspectives. Nevertheless, the broad representation across the two data collection methods ensured that the study's objectives were met.

4.0 Presentation, Analysis and Discussion of Findings

4.1 Impact of Climate-Induced Water Scarcity on Human-Wildlife Conflict (HWC) in Gache Gache

The findings from interviews, focus group discussions (FGDs), and document analysis revealed that climate-induced water scarcity significantly exacerbates HWC in Gache Gache through increasing competition for essential natural resources. Interview participants frequently highlighted the depletion of water sources as a primary factor forcing wildlife into human settlements. One participant lamented:

> *With the rivers drying up earlier each year, elephants have no choice but to come into our villages looking for water and food*

In the same vein, another participant echoed,

> *Wild animals no longer respect the park boundaries because their usual water points dried up, and they come straight to our homes.*

Another participant emphasized:

> *We used to have water in our boreholes all year round, but now they dry up faster, and we have to share with animals*

Similarly, one participant observed this:

> *Water scarcity is making the situation worse; even predators like lions now roam near villages more frequently*

A conservation officer had this to add:

> *The increasing dryness of the landscape has caused unexpected animal movements, leading to more conflicts between communities and wildlife*

Focus group discussions confirmed this observation, with community members agreeing that prolonged droughts have intensified conflicts. One FGD participant highlighted the following:

> *Before, we only saw wild animals near our farms occasionally, but now they are here almost every week*

Another participant added this:

> *Even the hippos, which used to stay in the lake, are now coming further inland searching for water, making fishing more dangerous*

Another participant made the following lamentations:

There are more cases of cattle being attacked near drying waterholes because wild animals now come there too

In similar vein, another participant stressed this:

This situation is not normal; it has worsened over the past five years

These findings align with studies by Gaynor et al. (2021), who argue that climate change-induced water scarcity disrupts wildlife movement patterns, thereby increasing interactions with humans.

In addition, document analysis further reinforced these findings. An analysis of the ZIMPARKS Annual Report 2021 reveals a direct correlation between water scarcity and rising human-wildlife conflict incidences in such areas as Gache Gache. The report highlighted that "*severe droughts in the Zambezi Valley and surrounding areas have led to a 35% increase in reported human-elephant encounters between 2019 and 2021*" (ZIMPARKS, 2021, p. 18). It further emphasizes that declining water levels in Lake Kariba have disrupted traditional wildlife migratory routes, pushing animals into human-occupied areas. The report concludes that "*inadequate water provisioning within protected areas has led to increased foraging in agricultural lands and settlements*" (p. 22), clearly pointing to water scarcity as a conflict driver. Similarly, the National Climate Policy of Zimbabwe (Ministry of Environment, Water and Climate, 2017) underscores the environmental risks posed by climate variability and reduced water availability. It identifies Gache Gache as one of the critical ecological zones vulnerable to climate-induced stress. The policy warns that climate change is projected to increase the frequency and intensity of droughts in low-rainfall zones, a characteristic of Gache Gache exacerbating resource-based conflicts between humans and wildlife (p. 34). This document supports the SES theory by acknowledging that ecological stressors disrupt both natural and human systems.

Moreover, a report by the Centre for Natural Resource Governance (CNRG, 2020) titled "*Climate Change and Resource Conflict in Zimbabwe's Rural Districts*" provides a focused case study on Mashonaland West Province. It states that seasonal drying of boreholes and rivers in Nyaminyami District has resulted in elephants accessing communal water points (CNRG, 2020, p. 15). This pattern is described as an "*emerging human-security crisis linked to poor adaptation strategies at the community*

and institutional levels" (p. 17). The report recommended urgent investment in climate-resilient water infrastructure to mitigate these rising tensions.

4.2 Effectiveness of Community-Based Conservation (CBC) Strategies in Mitigating HWC

The study found that community-based conservation (CBC) strategies have had mixed success in mitigating HWC. Interview participants acknowledged that certain measures, such as chili fences and beehive barriers, have been effective to some extent. One interviewee made this statement:

> *Chili fences work for small animals, but elephants are intelligent; they sometimes just knock them over and continue eating our crops*

Another interview participant highlighted the following:

> *Beehives help in some places, but maintaining them is expensive, and not everyone can afford to replace broken hives.*

Furthermore, another interviewee made these remarks:

> *We have tried using noise deterrents at night, but the animals are no longer scared like they used to be*

A participant who was an environmentalist made this comment:

> *Some people are reluctant to adopt conservation measures because they do not see immediate benefits*

To this effect, a conservation officer stated the following:

> *More funding is needed to expand CBC efforts, especially in areas where conflict is escalating.*

Findings from FGDs also yielded divergent perspectives. Some participants supported the use of deterrents, with one stating:

> *We have seen fewer baboons in areas where beehive fences were placed*

However, others were sceptical, with one participant making the following arguiment:

> *These methods are temporary; the real solution is to create better water access points within the park so that animals do not need to come here*

Another participant adding this:

> *Not everyone benefits equally from these conservation strategies, and this causes tensions among us*

Furthermore, another participant said this:

> *Unless the government supports these efforts more seriously, we will continue losing crops and livestock.*

From document analysis, reports analysed indicated that while CBC strategies have shown promise, inconsistent implementation and limited funding have hindered their success. The WWF Zimbabwe Report (2021) titled *"Community-Led Conservation Practices in Northern Zimbabwe"* highlights both the successes and challenges of CBC strategies. It documented the deployment of over 150 beehive fences in selected villages, reporting that "*the number of elephant crop raids dropped by 40% in areas with well-maintained deterrent systems*" (WWF, 2021, p. 11). However, the report also emphasized issues of sustainability, noting that without regular financial support and capacity-building, most of these conservation efforts degrade within 12 to 18 months (p. 14). It attributed this to the lack of technical support and unequal access to conservation benefits among community members. An evaluation by the Zimbabwe Environmental Law Association (ZELA, 2022) titled *"Assessment of Wildlife-Based Land Use Models"* discusses the weaknesses in the implementation of CBC under the CAMPFIRE program. The report points out that areas such as Gache Gache, elite capture and limited benefit-sharing have led to a decline in community trust towards conservation initiatives (ZELA, 2022, p. 19). Additionally, it provides that "*The mismatch between policy intentions and practical implementation continues to widen as donor fatigue and political interference undermine local empowerment*" (p. 23). These findings reveal structural barriers to effective CBC deployment.

Furthermore, the Southern Africa Trust (2020) also produced a regional conservation policy brief titled *"Community Engagement and Wildlife Conflicts in the Zambezi Basin"*. It concludes that although CBC methods are incorporated into national policies, actual implementation in Zimbabwe suffers from fragmented institutional support. The decentralisation model is underfunded, and (areas such as Gauche Gache) lack the technical know-how and logistical support to sustain conservation practices (Southern Africa Trust, 2020, p. 8). The brief advocates for an integrated approach that includes both ecological investment such as construction of water points in parks and social investment like training and inclusive decision-making.

4.3 Governance, Resource Allocation, and Community Engagement in HWC Mitigation

The study revealed that governance structures and resource allocation play a crucial role in shaping the success or failure of HWC mitigation efforts. Interview participants expressed frustration over inadequate support from local authorities. One respondent made the following assertion:

> *We report our losses, but the compensation process is slow, and sometimes we receive nothing at all*

Another interviewee quizzed the issue of financing conservation arguing the following:

> *The government talks about conservation, but where the money for proper fences or better security patrols is?*

Another participant made this lamentation statement:

> *Community voices are rarely considered when making conservation decisions, and this makes people less willing to cooperate*

Another participant made this observation:

> *There is too much bureaucracy; even when solutions are proposed, they take years to be implemented.*

Furthermore, a conservation officer added this:

> *We do our best with limited resources, but more government support is needed."*

FGDs echoed these frustrations, with participants citing weak policy enforcement and lack of community involvement in decision-making. One participant made this argument:

> *Policies are made in offices, but we, who live with the animals, are not consulted on what works best*

Another participant added this:

> *If the government really cared, they would help us build stronger defences instead of just telling us to live with the animals*

In addition, another participant made this statement:

> *We need financial assistance to invest in stronger protective measures like reinforced granaries and secured livestock enclosures.*

Furthermore, a participant also made these remarks:

Without proper laws and enforcement, all these conservation efforts will not last

Coming to document analysis findings, the findings reinforced interview findings. The Zimbabwe National Development Strategy 1 (NDS1) 2021–2025 acknowledges the importance of environmental governance and community involvement in sustainable development. However, under the Environment and Natural Resources Management pillar, the report heighted that although frameworks exist for community engagement, actual implementation is patchy due to bureaucratic inertia and underfunding. Furthermore, the document made this conclusion; "*delays in compensation for wildlife-induced losses demotivate affected communities from actively participating in conservation programs*" (p. 68). These institutional weaknesses echo concerns raised by local respondents in the primary data. Another important source, the African Wildlife Foundation (AWF) Report (2020) titled *"Enabling Policy Environments for Human-Wildlife Coexistence in Southern Africa"*, critiques Zimbabwe's centralized approach to wildlife governance. The report makes this argumentation; "*Too often, community inputs are only symbolic, and real decisions are made at provincial or national levels*" (AWF, 2020, p. 10). In the research area, this top-down approach leads to policy resistance and informal conservation practices that lack legal recognition. In this regard, the AWF recommends building transparent feedback loops between local communities and government departments to enhance trust and compliance.

Furthermore, the UNDP Zimbabwe (2021) project evaluation titled *"Mainstreaming Biodiversity into Rural Livelihoods"* which assessed donor-funded conservation programs in Mashonaland West provided that; while donor-funded projects initially improve community capacity, sustainability falters once external support is withdrawn (UNDP, 2021). The report also observes that communities are more engaged and responsive when they see tangible benefits and have institutional representation in conservation planning. The evaluation warns that weak inter-agency coordination between ZIMPARKS, Rural District Councils, and civil society actors continues to delay adaptive interventions. These governance gaps resonate with critiques from Plummer and Armitage (2007) regarding institutional power imbalances in adaptive co-management systems.

4.4 Discussion of Findings

The findings of this study confirm that climate-induced water scarcity profoundly impacts human-wildlife conflict. This aligns with the social-ecological systems (SES) theory, which emphasizes the interdependence of human and ecological systems (Berkes & Folke, 1998). Depleted water resources force wildlife into closer contact with human settlements, thereby increasing the frequency of conflict. These results corroborate existing literature identifying climate change as a primary driver of human-wildlife interactions (Gaynor et al., 2021). As water sources become scarcer, both humans and animals are forced to compete over dwindling resources, leading to increased cases of crop destruction, livestock predation, and direct confrontations with wildlife (Nyhus, 2016). These interactions create significant socio-economic challenges for communities, which further complicates conservation efforts (Lindsey et al., 2021).

Moreover, the study highlights the mixed effectiveness of community-based conservation (CBC) strategies, reinforcing the Adaptive Co-Management (ACM) framework's assertion that conservation must be flexible and responsive to community needs (Armitage et al., 2009). While strategies such as beehive fences and chili deterrents have shown promise, their success is often hindered by financial constraints and inconsistent implementation. The study revealed that some community members view these strategies as short-term fixes rather than sustainable solutions. This is a challenge also noted by Plummer and Armitage (2007), who argue that co-management approaches require robust institutional support and continuous adaptation to emerging challenges. Without adequate funding and capacity building, community conservation efforts may become ineffective in the long term (Lindsey et al., 2021).

Additionally, governance and resource allocation emerged as critical factors influencing the success or failure of conservation initiatives. Weak institutional frameworks, slow response times, and bureaucratic inefficiencies have led to community distrust in conservation authorities. Many participants expressed frustration with delayed or inadequate compensation schemes, which discourage active participation in conservation programs. This finding aligns with wider critiques

of conservation governance, which emphasise that effective resource management necessitates policy frameworks, practical enforcement and local engagement (Redpath et al., 2017). According to Taylor et al. (2022), strengthening governance structures and ensuring community representation in decision-making processes are essential for improving conservation outcomes.

Another key theme emerging from the findings is the need for increased community engagement in conservation efforts. The study found that many local residents feel excluded from decision-making processes, which reduces their willingness to cooperate with conservation authorities. This issue is particularly significant in light of the SES theory, which emphasizes the need for integrated social and ecological management (Berkes et al., 2003). Without active involvement from local communities, conservation efforts are less likely to be successful, and these communities are more likely to take retaliatory action against problematic species (Dickman, 2010). Enhancing local participation, fostering partnerships between communities and conservation organisations, and ensuring equitable distribution of the benefits of conservation initiatives can improve cooperation and long-term sustainability (Lindsey et al., 2021).

5.0 Conclusion

Climate-induced water scarcity has exacerbated the conflict between humans and wildlife in Gache Gache, disrupting livelihoods and biodiversity. Although community-based conservation efforts have been implemented, they remain limited in effectiveness due to governance challenges, resource constraints and insufficient local participation. Without a more adaptive and inclusive approach that integrates local knowledge, equitable resource distribution and stronger institutional support, this conflict will persist and threaten long-term conservation and community well-being. To achieve sustainable coexistence, there must be a paradigm shift towards policies that prioritise ecological resilience while addressing socio-economic needs. This will ensure that conservation efforts are effective, equitable, and sustainable for future generations.

6.0 Recommendations

- ✓ **The Parks and Wildlife Authority should** strengthen conservation governance by increasing patrols, enforcing wildlife protection policies, and ensuring that compensation schemes for affected communities are timely and transparent.
- ✓ **Development partners should** provide financial and technical support for community-based conservation programs, ensuring the long-term sustainability of initiatives such as beehive fencing and alternative livelihood projects.
- ✓ **The Gache Gache community should** actively participate in conservation efforts by forming local conservation committees, adopting sustainable farming practices, and working collaboratively with authorities to mitigate human-wildlife conflict.
- ✓ **The Government of Zimbabwe should** integrate human-wildlife conflict mitigation into national climate adaptation policies, prioritizing water resource management and infrastructure development to reduce competition between wildlife and human populations.
- ✓ **NGOs should** facilitate capacity-building programs that equip local communities with the knowledge and skills to implement effective conflict mitigation strategies and advocate for their conservation rights.

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