



# Complexities of Conflict: Climate Change, Elephants and Local Livelihoods in Lupane, Zimbabwe



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## ABSTRACT

The conflict between humans and wildlife can result in negative impacts on both parties and hinder conservation efforts. By predicting how conflict risks may change with a growing agricultural sector and human population under a changing climate, policymakers can effectively allocate resources for mitigating and conserving conflict-prone species and regions. This study investigated the drivers of human-elephant conflict in Lupane, Zimbabwe, emphasizing the role of climate change and variability. Using an ethnographic approach informed by the sustainable livelihoods framework and political ecology, it examined how changing climatic conditions, such as water shortages, rising temperatures, and diminishing grazing, exacerbate conflicts between humans and elephants. These challenges have led to increased human intrusion into elephant territories, driven by collapsing rain-fed agriculture and a need for diversification into forestry-based livelihoods. The consequences of this conflict have been severe, resulting in injuries, deaths, damage to crops and infrastructure, economic losses, and food insecurity for affected households. As human populations grow and the impacts of climate change become more pronounced, the risk and geographical spread of human-elephant conflict are expected to escalate. The study highlights the importance of understanding these dynamics to inform policymakers in resource allocation for conflict mitigation and conservation efforts. It also critiques existing institutional support systems for addressing human-elephant conflict, assessing their climate sensitivity. To enhance sustainability, the research advocates for integrating empirical data on human-wildlife coexistence into international conservation policies and developing comprehensive, long-term strategies at a transboundary level, particularly in the context of climate change.

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## INTRODUCTION

Across the globe, wild elephants inhabit 50 countries. They can be found in 13 Asian and 37 African countries. Currently, the population of wild Asian elephants ranges from 35,000 to 50,000, while approximately 16,000 are held in captivity. The prevailing trend in nearly all Asian and African nations has been a significant decrease in the number of wild elephants, primarily attributed to human-induced factors such as population growth, deforestation, habitat degradation, and the fragmentation of breeding populations. Blanc et al. cited by Ngcobo et al. argue that Southern Africa is home to the largest proportion (55%) of the elephant population on the continent, with Eastern Africa housing 28%, Central Africa

containing 16%, and the remaining 2% located in Western Africa.<sup>1</sup> Human-elephant conflicts are being documented across various regions in Africa, with reported incidents peaking according to Thennakoon and the University of Peradeniya.<sup>2</sup> Over the years, the issue of human-elephant conflict has garnered significant attention and emerged as a major conservation concern, as noted by Gubbi, Warner, and Sitati et al.<sup>3</sup> Graham et al. emphasize that human-elephant conflict poses a threat to biodiversity conservation and development efforts.<sup>4</sup> This challenge is particularly complex for conservationists, as elephants have been classified as a vulnerable species by the International Union for Conservation of Nature (IUCN) since 2004, yet are often perceived as pests by human communities and rural settlements.<sup>5</sup> Dublin and Hoare posit that elephants are seen as playing a dual role in society, serving as a significant species in conservation efforts while also being involved in conflicts with humans.<sup>6</sup> The issue of human-elephant conflict is a matter of both conservation and socio-economic importance due to its effects on both elephants and humans. This phenomenon has been observed since the 19th century in both Asia and Africa. Studies have shown that 70% of the population in Zimbabwe depends on agriculture and non-timber forest products as a source of their livelihood.<sup>7</sup> The intricate interplay between livelihoods, climate change, and human-wildlife conflict is a significant area of concern. Dickman, notes that human-wildlife conflict is widespread and difficult for conservationists to solve today.<sup>8</sup> The conflict is a critical threat to both humans and wildlife. Alterations in climatic conditions notably influence human-wildlife conflict. While numerous studies have concentrated on human-wildlife conflict, fewer have effectively linked climate change, wildlife, and livelihoods.

According to the Zimbabwe Elephant Management Plan of 2021-2025, Zimbabwe is one of the major elephant range states and it is estimated that it is home to 82,000 individual elephants. This makes it the second-largest elephant range state in Africa after Botswana, which is estimated to have over 130,000 elephants. Zimbabwe has four elephant ranges namely, the Sebungwe, Mid-Zambezi Valley, South-East Lowveld and North-West Matabeleland ranges. In these ranges, elephants are distributed in national parks, conservancies, forestry and communal areas. Lupane and Hwange National Parks fall under North-West Matabeleland. The 2014 elephant survey conducted by the Zimbabwe Parks and Wildlife Management Authority estimated that approximately 2,201 elephants are dispersed in the communal areas within the elephant range. However, elephants migrate from one elephant range to another or even to a neighbouring country.

The increasing human population density in communal areas has affected the elephant-ranging areas as the households clear cropping fields and cut down timber products from the forestry areas. Lupane is categorized under the agro-natural region IV which is characterized by poor climatic conditions such as low rainfall and high temperatures.<sup>9</sup> According to the IPCC synthesis report of 2007, the impacts of climate change on flora and fauna are unequivocal.<sup>10</sup> Extensive crop and livestock production is practised by households in these areas, mainly under erratic rainfall conditions. Crop failure due to climate change-

<sup>1</sup> Julian J Blanc and Richard F W Barnes, *African Elephant Status Report 2007: An Update from the African Elephant Database* (Iucn, 2007); Jabulani Nkululeko Ngcobo et al., "The Future Survival of African Elephants: Implications for Conservation," *International Journal of Avian and Wildlife Biology* 3, no. 5 (2018): 379–84.

<sup>2</sup> Sunethra Thennakoon, "Cultivation Damages Caused by Wild Animals" (University of Sri Jayewardenepura, 1996); Faculty of Agriculture, *Alternative Solutions to Human-Elephant Conflict* (University of Peradeniya, 2005).

<sup>3</sup> Sanjay Gubbi, "Patterns and Correlates of Human–Elephant Conflict around a South Indian Reserve," *Biological Conservation* 148, no. 1 (2012): 88–95; M Zoë Warner, "Examining Human-Elephant Conflict in Southern Africa: Causes and Options for Coexistence," *Master of Studies Capstone Projects, Department of Earth and Environment Science*, 2008; Noah W Sitati et al., "Predicting Spatial Aspects of Human–Elephant Conflict," *Journal of Applied Ecology* 40, no. 4 (2003): 667–77.

<sup>4</sup> M. D. Graham et al., "The Movement of African Elephants in a Human-dominated Land-use Mosaic," *Animal Conservation* 12, no. 5 (October 23, 2009): 445–55, <https://doi.org/10.1111/j.1469-1795.2009.00272.x>.

<sup>5</sup> Sitati et al., "Predicting Spatial Aspects of Human–Elephant Conflict."

<sup>6</sup> Holly T. Dublin and Richard E. Hoare, "Searching for Solutions: The Evolution of an Integrated Approach to Understanding and Mitigating Human–Elephant Conflict in Africa," *Human Dimensions of Wildlife* 9, no. 4 (December 2004): 271–78, <https://doi.org/10.1080/10871200490505701>.

<sup>7</sup> FAO, *Climate Change and Food Security: Risks and Responses* (Rome: FAO, 2016).

<sup>8</sup> Amy J Dickman, "Complexities of Conflict: The Importance of Considering Social Factors for Effectively Resolving Human–Wildlife Conflict," *Animal Conservation* 13, no. 5 (2010): 458–66.

<sup>9</sup> V. Thebe, "Siziphile Land Occupations, Wilderness Farming, Threat of the Wild and Livelihood Vulnerability in Western Lupane District.," in *Forum for Development Studies*, 1st ed., vol. 48 (Routledge, 2020), 111–28.

<sup>10</sup> Lenny Bernstein et al., *Climate Change 2007: Synthesis Report: An Assessment of the Intergovernmental Panel on Climate Change* (IPCC, 2008).

induced drought leads to an extension of livelihood options into elephant-ranging areas. Wildlife has the potential to harm crops, harm or kill domestic animals, and pose threats to or cause harm to humans. The conflict between wild animals and humans has detrimental effects on both parties and is a highly intricate and pressing issue for wildlife management and conservationists.<sup>11</sup> It is crucial to comprehend how elephants and humans will be influenced by climate changes to pinpoint regions where human-elephant conflict may escalate and to formulate conflict mitigation tactics that anticipate the changing dynamics of conflict triggers and challenges. This paper assesses the intersectionality of climate change, human-elephant conflict and rural livelihoods. The paper is structured as follows: It starts by exploring the two theoretical frameworks underpinning the study. This is followed by a detailed description of the study setting, ethnography and methodological issues. The subsequent section of the paper delves into the study findings and discussion, which is then succeeded by the conclusions and recommendations.

## THEORETICAL FRAMEWORKS

This study is guided by the sustainable livelihoods framework and political ecology perspective. The Sustainable Livelihoods Framework (SLF) suggests that households possess different levels of resources and capabilities and are subject to varying degrees of exposure to the institutions and policies influencing their environment. Their livelihood choices and resulting welfare outcomes are shaped by the interplay of these factors. Consequently, individual and household endowment of resources is viewed as a critical issue in the application of the SLF.<sup>12</sup> There are five categories of resources from which people may choose livelihood options, especially in the face of trends, shocks, seasonality of their livelihoods as well as the institutional structures and processes.<sup>13</sup> These resources encompass natural, social, human, physical, and financial capital. Based on the abundance of these resource categories, individuals develop and select potential livelihood strategies that are expected to yield favourable welfare results, such as higher income and well-being. These identified livelihood strategies help mitigate their susceptibility to natural disasters and economic uncertainties. Sustainability is achieved when these strategies can withstand and rebound from pressures and disruptions while preserving or enhancing their resources, assets, and activities both presently and in the future without depleting the natural resource foundation. The study employed the sustainable livelihoods approach as it promotes innovative thinking. More specifically, this approach liberates development practitioners from traditional methods that typically focus on pinpointing issues and devising remedies. Instead, it encourages them to consider contexts and interconnections, enabling development initiatives to adopt a more process-driven approach. Consequently, it advocates for a fresh approach to policy evaluation that shifts away from one-size-fits-all recommendations towards context-specific strategies that enable diverse, local viewpoints to emerge within the policy framework.

Numerous academics attribute the origins of environmental anthropology and political ecology to the research conducted by Julian Steward.<sup>14</sup> Between the 1920s and 1950s, Steward was active in the fields of cultural anthropology and archaeology, where he formulated a research framework known as 'cultural ecology'. This framework aimed to elucidate how human social structures were shaped as adaptive responses to local environments and necessary subsistence practices. Political ecology, on the other hand, delves into the power dynamics existing between society and nature, examining social interests, knowledge, perceptions, and institutions.<sup>15</sup> The theory looks at the interaction between politics, economics, social well-being and the biological environment. Political ecology is an analytical framework that delves into the political, economic, and social influences that influence human-environment interactions, encompassing aspects related to conservation efforts. It also explores the diverse discursive and practical methods employed in establishing protected areas.<sup>16</sup> This perspective underpins this study

<sup>11</sup> Beatrice Frank and Brandon P. Anthony, "Towards More Resilient Conservation Practices: Bridging the Past and Present of Human-Wildlife Interactions," *Sustainability* 13, no. 21 (November 3, 2021): 12131, <https://doi.org/10.3390/su132112131>.

<sup>12</sup> Emmanuel Joseph Mensah, "The Sustainable Livelihood Framework: A Reconstruction," 2011.

<sup>13</sup> Mensah, "The Sustainable Livelihood Framework: A Reconstruction."

<sup>14</sup> L.L. Gezon and S. Paulson, "Place, Power, Difference: Multiscale Research at the Dawn of the Twenty-First Century," in *Political Ecology Across Spaces, Scales, and Social Groups*, ed. S. Paulson and L. L. Gezon (New Brunswick, N.J.: Rutgers University Press, 2005), 1–16; Jerry K Jacka, *Alchemy in the Rain Forest: Politics, Ecology, and Resilience in a New Guinea Mining Area* (Duke University Press, 2015); P. Robbins, *Political Ecology: A Critical Introduction*, 3rd ed. (Hoboken, N.J.: Wiley Blackwell, 2019).

<sup>15</sup> Enrique Leff, "Political Ecology: A Latin American Perspective," *Desenvolvimento e Meio Ambiente* 35, no. 35 (2015): 29–64.

<sup>16</sup> Peter D. Neumann, *Pentecostal Experience: An Ecumenical Encounter*, vol. 187 (Eugene Oregon: Wipf and Stock Publishers, 2012).

because of its capacity to assess the complex relationship between livelihoods, wildlife and changing climatic conditions.

## METHODOLOGY

This study focused on wards 26 and 25 of Lupane District, situated within the Shangani Reserves in the Matabeleland North Province of Zimbabwe. These reserves, along with the Gwayi Reserves, were created as the first native reserves in the isolated northwestern part of the country. They served as quarantine areas for the defeated Ndebele people, as mandated by the Matabeleland Order-In-Council on July 18, 1894. The available land was allocated to the Ndebele for settlement, enabling agricultural and pastoral activities.<sup>17</sup> According to ZimVac, the region is suitable for integrated crop and livestock farming.<sup>18</sup> The community primarily relies on maize and cotton cultivation, along with animal husbandry for sustenance and income. During periods of food scarcity, households also seek local job opportunities to earn necessary cash. However, the Lupane district, located in Matabeleland North, is marked by inconsistent and low rainfall, making rain-fed agriculture highly unpredictable. Classified within Natural Region IV agro-climatically, Lupane experiences semi-arid conditions and receives only 450-800mm of rainfall annually, significantly less than central and eastern districts of Zimbabwe that enjoy greater precipitation. In four out of five years, Lupane tends to have below-average rainfall, resulting in crop failures, especially for moisture-sensitive crops like maize due to extended dry spells. To cope with these challenges, households often extend their agricultural efforts by pursuing alternative income sources such as wages and forestry work.<sup>19</sup> The region is plagued by insufficient rainfall, faces sporadic dry spells, and is vulnerable to drought.<sup>20</sup> Furthermore, the district borders Hwange National Park, known to house approximately 45,846 elephants, while the forestry areas in North-West Matabeleland are estimated to have around 1,101 elephants.<sup>21</sup>



Fig 1: Shows the map of Lupane District within Matabeleland North Province.  
Source: ZimVac (2010).

The research utilized a qualitative exploratory design to examine the intersection of climate change and human-elephant conflict. Participants took part voluntarily and provided informed consent. This methodology facilitates an in-depth and nuanced understanding of the participants' experiences, viewpoints, and stories related to the topic being studied.<sup>22</sup> In qualitative research, the emphasis is placed

<sup>17</sup> Thebe, "Siziphile Land Occupations, Wilderness Farming..."

<sup>18</sup> Zimbabwe Vulnerability Assessment Committee, "Zimbabwe Vulnerability Assessment Committee (ZimVac) Rural Livelihoods Assessment," in *Presentation to the RVAC Dissemination Meeting, July*, vol. 15, 2010.

<sup>19</sup> Thebe, "Siziphile Land Occupations, Wilderness Farming..."

<sup>20</sup> Thebe, "Siziphile Land Occupations, Wilderness Farming..."

<sup>21</sup> USAID Zimbabwe Resilience Anchors Activity, *The State of Human-Wildlife Conflict in Zimbabwe: Moving from Conflict to Coexistence* (USAID, 2022), <https://www.land-links.org/wp-content/uploads/2024/06/USAID-Zimbabwe-Final-Study-Report.pdf>.

<sup>22</sup> Norman K Denzin, *Interpretive Interactionism*, vol. 16 (Sage, 2001); Richard Swedberg, "On the Use of Definitions in Sociology," *European Journal of Social Theory* 23, no. 3 (August 3, 2020): 431–45, <https://doi.org/10.1177/1368431019831855>.

on comprehending local social dynamics rather than generalizing the results.<sup>23</sup> Questioning plays a crucial role in qualitative studies to comprehend different viewpoints. Therefore, employing a qualitative methodology allowed the researchers to uncover the origins of a phenomenon, utilize codes to capture individual experiences, and validate theoretical or conceptual frameworks linked to the phenomenon. Coding served as an analytical tool to manage extensive data and explore different interpretations of phenomena. The study was initiated by conducting an initial visit to the study site to gain an understanding of the socio-economic and agroecological characteristics of the designated regions.<sup>24</sup> The interview guide served as the primary tool for data collection, developed through the compilation of the textual dataset known as the fundamental text mining process. Subsequently, the data transformation phase involved systematically filtering the text in a structured manner. This process entailed analyzing the frequency and occurrence of words within the text dataset. The final phase involved the data conversion procedure, during which the subjects and materials relevant to information extraction were identified. Data collection took place from December 7th to February 15th, 2024. Through a purposive sampling method, the researchers carried out fifteen (15) key informant interviews and five (5) focus group discussions (comprising 8-10 participants in each group). Employing various data collection methods aimed to corroborate information obtained through alternative techniques.

## PRESENTATION OF FINDINGS AND DISCUSSION

### Characteristics of livelihoods of the study areas

The study involved asking participants about their livelihoods to develop profiles for the research. This livelihood-focused approach generates data and analyses that provide a deeper understanding of the changes and vulnerabilities faced by households. It also helps in grasping the local livelihood strategies and their associated risks. Discussions with the participants revealed that agriculture is the primary livelihood source in the area under study. Further inquiries showed that households engage in mixed farming, which includes both crop production and animal husbandry. The interactions highlighted that farming is deeply embedded in their culture and is regarded as a source of pride and prosperity. One female participant (54 years) alluded that:

*Farming is part of our lives in this community. Our forefathers were farmers and we have to continue doing it. We may be facing several challenges as smallholders but there is no way we can make it outside farming. Women play an important role in sustaining smallholder farming.*

It came out of the deliberations in one focus group discussion that small-scale farmers encounter numerous obstacles due to their limited size and frequently isolated rural locations, impeding their capacity to develop successful enterprises and ensure food security for their households. A significant number lack access to credit, formal markets, and essential resources such as quality seeds, agricultural tools, or veterinary medicine to maintain the health of their livestock. Agro-ecological characteristics of the study areas such as elephants, poor Kalahari soils and erratic rainfall were also mentioned as part of the hurdles to smallholder growth. While smallholder agriculture is commonly acknowledged as a crucial sector for development, it has seldom received the required policy and institutional backing to enable smallholders and rural economies to prosper.<sup>25</sup>

Casual labour was also mentioned as an important livelihood option pursued by some households in the area. It emanated from the engagements that casual labour was mainly used by the poorest households with limited access to productive assets. It was also noted from the study that the money earned from casual labour was insufficient to meet the household's needs, and this finding is corroborated by

<sup>23</sup> Egon G Guba and Yvonna S Lincoln, "Paradigmatic Controversies, Contradictions, and Emerging Confluences.," in *The Sage Handbook of Qualitative Research*, 3rd Ed. (Thousand Oaks, CA: Sage Publications Ltd, 2005), 191–215.

<sup>24</sup> Robert Chambers, "Participatory Rural Appraisal (PRA): Challenges, Potentials and Paradigm," *World Development* 22, no. 10 (October 1994): 1437–54, [https://doi.org/10.1016/0305-750X\(94\)90030-2](https://doi.org/10.1016/0305-750X(94)90030-2).

<sup>25</sup> Marcel Mazoyer, "Protecting Small Farmers and the Rural Poor in the Context of Globalization," in *Paper Presented at the World Food Summit 2001* (Rome: FAO, 2001); S. Gillman, *Small Farms Produce More Food than Statistics Show* (Horizon: The EU Research & Innovation Magazine, 2019); Shenggen Fan and Christopher Rue, "The Role of Smallholder Farms in a Changing World," *The Role of Smallholder Farms in Food and Nutrition Security*, 2020, 13–28. .

Mohammed-Shuker and Sadik who reiterated that casual labour income was not sufficient.<sup>26</sup> Casual labour amongst the households was only a stop-gap measure to reduce the likelihood of livestock sales. The study participants highlighted the significance of migration and remittances in supporting the livelihoods of a substantial number of households. Insights from focus group discussions and in-depth interviews suggested that remittances primarily originated from South Africa, Botswana, and the United Kingdom. One participant indicated that;

*Almost all households you have seen in this community have a relative outside the country. Few households are doing well out of the remittances while a commendable number do not benefit much. Remember most of our kids in South Africa and Botswana do not have permits to work there. So, they don't remit much compared to those from well-to-do households.*

The anecdotes above demonstrate varying benefits of remittances among different households. It was observed that impoverished households received sporadic remittances that had minimal impact on diversifying livelihoods, as the majority of funds were allocated towards immediate household necessities. Additionally, the study revealed that certain households were engaged in small-scale mining activities either directly or indirectly. Further investigation indicated that small-scale mining is a readily accessible venture with rapid returns. One participant indicated that:

*Some young people from our community have migrated as far as Nkayi, Bubi and Matobo districts which are gold-endowed. Some have managed to build beautiful houses out of the money they get from their mining activities. But we are told that these small-scale miners are damaging the environment in areas where they are mining.*

The study also revealed that certain young individuals relied on poaching firewood for their livelihood. The need for firewood in Bulawayo has increased due to the high cost of electricity and frequent power outages. Some women in one group discussion alluded that craftwork was becoming a popular livelihood strategy in the area. Craftwork was improving the income status of those involved. One female (56 years) posited that:

*I lost my husband 20 years ago and had to join Lupane Women Development Trust, an organization that aims at empowering women through craft and skills development. I can tell you that through craft I managed to send my kids to school without hurdles. I still do farm but during the dry spell, I focus on craftwork.*

Shackleton et al. argue that although women value the modest earnings derived from trading their crafts, highlighting the importance of accessing a larger market to increase their craft's profitability.<sup>27</sup> Generating more income from their crafts provides women with a level of financial independence, reducing their reliance on their partners. Additionally, the study revealed that certain households engaged in small-scale trading activities, which encompassed the sale and purchase of goods and services, ranging from locally produced agricultural items to imported second-hand consumer goods. One observable change in the pattern of women's work was the decline of participation in farming and an increase in petty trading. This is confirmed by Fapohunda who argues that rural women are facing growing expectations to financially support their households, particularly those whose husbands have been laid off from formal sector jobs due to rationalization and privatization.<sup>28</sup>

### **The drivers of human-elephant conflict in Lupane**

Participants were asked about the drivers of human-elephant conflict in the Lupane district. In the study, participants were asked about the factors influencing human-elephant conflict in their specific regions. Findings revealed that the primary driver of such conflicts was the proximity to the protected area.

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<sup>26</sup> Fuad Mohammed Shuker and Hakim Hashim Sadik, "A Critical Review on Rural Youth Unemployment in Ethiopia," *International Journal of Adolescence and Youth* 29, no. 1 (December 31, 2024), <https://doi.org/10.1080/02673843.2024.2322564>.

<sup>27</sup> Ross T Shackleton et al., "Explaining People's Perceptions of Invasive Alien Species: A Conceptual Framework," *Journal of Environmental Management* 229 (2019): 10–26.

<sup>28</sup> Tinuke M Fapohunda, "Employment Casualization and Degradation of Work in Nigeria," *International Journal of Business and Social Science* 3, no. 9 (2012): 257–67.

Discussions revealed that the creation of Gwayi and Shangane reserves by the colonial administration created the current human-elephant conflict challenge. One participant (79 Years) posited that:

*You won't understand the current human-elephant conflict without looking at the history of this country. Our people were pushed out of fertile areas such as Nyamandlovu and Inyathi to pave the way for white commercial farming activities. It was done during the period when the same administration created the Hwange National Park. We were displaced from our original land and relocated to this area by the colonial government. The local communities were not allowed to come close to these protected areas except for employment purposes only.*

The study's results are supported by Palmer and Thebe, who contend that during this period, the colonial state allocated land to Ndebele natives that was adequate for their settlement, whether as entire tribes or specific tribal segments, and suitable for their agricultural and pastoral needs.<sup>29</sup> This land allocation also included a fair and equitable share of springs or permanent water sources. One of the aims behind establishing native reserves was to form a pool of labour for settler farms, mines, and industries.<sup>30</sup> For Garland, the interactions between elephants and people are framed by colonial and post-colonial policies for the management of wildlife.<sup>31</sup> The finding is also corroborated by Shaffer et al, argues, that who argue that as humans alter the environment, leading to the coexistence of human and elephant populations in closer proximity, the probability of conflict rises, often resulting in fatal outcomes.<sup>32</sup> By being surrounded by a national park, the smallholders not only have to deal with the constraints of adapting farming to techniques that respond to environmental variability and not compatibility with the challenges posed by socio-economic stressors but also have to manage the pressure of elephants which add more complexity to their farming systems.<sup>33</sup>

It emanated from the engagement that the expansion of the human population was also increasing the likelihood of human-elephant conflict. In one in-depth interview, the participant indicated that the ever-increasing population of people and the subsequent expansion of human activities such as mining and farming into areas previously occupied by elephants is creating a challenge. He insinuated that:

*I think our population is to blame for this problem. When we got here in the 1940s, elephants were not a big problem. We could stay for years without seeing them. I also think that the colonial administration had an effective way of controlling these elephants compared to what the National Parks is currently doing. What has complicated the situation is the expansion of human settlements closer to the National Park, the creation of dams and irrigations, and developments that attract these elephants. The expansion of the Chinese coal mining activities close to the national park is further disturbing the elephants which forces them to change their migration patterns and roam all over.*

Conversations revealed that the increase in population, along with economic activities like farming expansion and urban growth, were causing habitat depletion, driving elephants into regions dominated by humans. The Chinese expansion of coal mining into Hwange National Park is creating habitual changes for these elephants. Noise from mine machines and geological explorations were reportedly frustrating the elephants in their traditional habitual zones.

Deeper discussions highlighted that climate change was exacerbating the conflict between humans and elephants in the region. Study participants contended that the fluctuating climate conditions were undermining the national park's ability to support the grazing requirements of elephants. In particular, it became evident from the stories shared that climate change was causing water scarcity issues for elephants, compelling them to venture further inland in pursuit of this vital resource. Competition for water resources,

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<sup>29</sup> Thebe, "Siziphile Land Occupations, Wilderness Farming, Threat of the Wild and Livelihood Vulnerability in Western Lupane District"; Robin Palmer, *Land and Racial Domination in Rhodesia.*, 1978.

<sup>30</sup> Thebe, "Siziphile Land Occupations, Wilderness Farming, Threat of the Wild and Livelihood Vulnerability in Western Lupane District."

<sup>31</sup> Elizabeth Garland, "The Elephant in the Room: Confronting the Colonial Character of Wildlife Conservation in Africa," *African Studies Review* 51, no. 3 (2008): 51–74.

<sup>32</sup> L Jen Shaffer et al., "Human-Elephant Conflict: A Review of Current Management Strategies and Future Directions," *Frontiers in Ecology and Evolution* 6 (2019): 235.

<sup>33</sup> N Givá and N Sriskandarajah, "Farming Systems within Protected Areas and Dealing with Drought and Elephant Invasion: Climate Change Challenges in Limpopo National Park, Mozambique.," 2012.

especially during dry spells out was causing conflicts. During a specific focus group conversation, it was revealed that climate change impacts both humans and elephants in a way that intensifies the conflict between them. This sentiment was vividly expressed by a key participant who expressed their concern by stating:

*Climate change and associated variability create a problem in that as households fail to harvest, what we have seen is that they resort to forestry resources. Specifically, we have seen communities resorting to poaching or encroaching on elephant habitats for survival purposes. On the other hand, as elephants starve and go for days without water, such a situation pushes them to roam around for survival purposes.*

In a related response, one participant alluded that:

*I think this challenge of elephants will continue to be complicated by climate change. We are told that elephants are starving at the Hwange National Park and that is why they are now straying all over in search of food and water. I also think that the other reason behind the increase in the human-elephant conflict is emanating from the cyanide poisoning that left more than 100 elephants dead at the Hwange National Park. If it is true that an elephant is an intelligent animal, then these animals were traumatized and haven't recovered from that trauma. They will continue to roam and destroy our livelihood systems.*

Multiple scholars align with the research results, highlighting that factors such as climate change, habitat loss and fragmentation, ivory poaching, and human encroachment into elephant territories significantly contribute to the human-elephant conflict.<sup>34</sup> According to Nyirenda et al., wildlife conservation conflicts emerge when individuals are impacted by the implementation or lack of implementation of conservation measures like policies, regulations, and laws.<sup>35</sup> These conflicts reflect fundamental differences among individuals, necessitating resolution to safeguard both human welfare and biodiversity.<sup>36</sup> Conflicting land utilization demands from different stakeholders, such as farmers and wildlife agencies, add another layer of complexity to the issue.

Study participants also pointed out that the conflict between humans and elephants signifies the inadequacy of the Zimbabwe Parks and Wildlife Management Authority in managing the elephant population. A key informant hinted that:

*Our biggest challenge is that Zimparks seems incapacitated to control the elephants and other problem animals in the area. I am not so sure if it's a result of an astronomical leap in the elephant population the department is under-resourced or both. We hear that the park has more than 80,000 elephants which is a problem on its own. Even if I am not an ecologist, I do not think that Hwange National Park can accommodate such a number.*

It emerged in one focus group discussion that some participants thought that the human-elephants conflict needs to be looked at from a global political economy perspective. Participants suggested that the elephant issue highlighted the diminished sovereign rights of countries in the Global South concerning their ability to regulate elephant populations. This was also supported by one National Parks official who posited that:

*We need to understand that the problem of elephants is a globally driven one. You won't believe that given the population of elephants at this National park, the European Union and its*

<sup>34</sup> J. Poole and P. Granli, "Mind and Movement: Meeting the Interests of Elephants.," in *An Elephant in the Room: Science and Well Being of Elephants in Captivity*, ed. L.D., Forthman, L.F. Kane, and P. Waldau (North Grafton, MA: Center for Animals and Public Policy, 2008); Michael J Chase et al., "Continent-Wide Survey Reveals Massive Decline in African Savannah Elephants," *PeerJ* 4 (2016): e2354; Scott Schlossberg, Michael J Chase, and Curtice R Griffin, "Poaching and Human Encroachment Reverse Recovery of African Savannah Elephants in South-East Angola despite 14 Years of Peace," *PLoS One* 13, no. 3 (2018): e0193469; Severin Hauenstein et al., "African Elephant Poaching Rates Correlate with Local Poverty, National Corruption and Global Ivory Price," *Nature Communications* 10, no. 1 (2019): 2242.

<sup>35</sup> Vincent R Nyirenda et al., "Elephant Crop Damage: Subsistence Farmers' Social Vulnerability, Livelihood Sustainability and Elephant Conservation," *Sustainability* 10, no. 10 (2018): 3572.

<sup>36</sup> M Nils Peterson et al., "Why Transforming Biodiversity Conservation Conflict Is Essential and How to Begin.," *Pacific Conservation Biology* 19, no. 2 (2013): 94-103; Nyirenda et al., "Elephant Crop Damage: Subsistence Farmers' Social Vulnerability, Livelihood Sustainability and Elephant Conservation."



*American allies are pushing for a ban on the sale of elephant ivory. We can't cull these elephants even if we have a carrying capacity problem. If our governments fail to re-engage those pushing for the ban on the sale of elephant tusks, then we should brace up for increased human-elephant conflict: a challenge further complicated by climate change and variability.*

Study findings revealed that societal attitudes emanating from losses incurred after elephant invasions were also contributing to the conflict. This sentiment was strongly expressed by one participant who lamented:

*We are tired of elephants. Honestly, I now understand why some people poisoned them last time. We can't achieve anything because of these animals.*

When elephants destroy people's crops, they develop negative attitudes that can vary from one place to the other. Some may feel frustrated and resentful towards elephants, viewing them as pests. Others may understand the challenges faced by elephants and try to find peaceful coexistence solutions, such as using deterrents or creating barriers to protect crops.

### **Elephants and implications on local livelihood systems**

Participants were asked questions that aimed at exploring the impact of elephants on local livelihoods. The conversation took place within the framework of climate change. It emerged from the conversations with participants that climate change is negatively impacting elephants in several ways including increased temperatures, dry spells, water shortages and diminishing grazing. The majority of the participants agreed that climate change was worsening the human-elephant conflict. Interactions with participants indicated that the reduction in crucial resources within traditional elephant habitats is prompting changes in their home range, leading to the development of new behaviours and, subsequently, the emergence of conflict focal points.

It emerged from the anecdotes that elephants are threatening the sustainability of agrarian livelihoods in the study areas. Participants indicated that elephant crop raids were damaging agricultural prospects in their communities. It seemed that elephants consistently entered the nearby village fields and destroyed crops throughout the entire year. What was observed is that reliance on farming as the central livelihood option increased household vulnerability to food insecurity and poverty. Dependence on crop production was being undermined by climate variability as well as elephant raids. One participant highlighted this by noting:

*I have seen my crops destroyed by the elephants, year in and year out, leaving behind nothing but bare ground. Our food security is always compromised by these animals. This challenge extends beyond our fields, to livestock, with leopards, jackals and other wild cats preying on our cattle, donkeys and goats. We report every day copiously to Zimparks and Council on these animals but it seems we are not winning.*

Discussions with participants indicated that most households depended on food handouts from relatives and other non-state actors. Further probes insinuated that some households were going to the extent of reducing cultivated land as a way of reducing crop losses from elephants. This is in line with Bryceson's deagrarianisation hypothesis. According to Rigg and Bryceson, rural Southern livelihoods and existence are gradually moving away from agriculture and land ownership.<sup>37</sup> This shift has implications for the persistence and propagation of poverty in rural regions, which are gradually becoming disconnected from agricultural activities.<sup>38</sup> One participant indicated that:

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<sup>37</sup> Jonathan Rigg, "Land, Farming, Livelihoods, and Poverty: Rethinking the Links in the Rural South," *World Development* 34, no. 1 (2006): 180–202; Deborah Fahy Bryceson, "Deagrarianisation and Depeasantisation in Africa," in *Handbook of African Development* (Routledge, 2018), 368–77.

<sup>38</sup> Stella May Cabeliza et al., "Bringing Education to the Communities: Its Conceptualization, Implementation & Evaluation," *Language, Literature and Society* 2019, 2019, 39; Douglas Nyathi and Joram Ndlovu, "Livelihood Diversification and Household Food Security in Selected Agrarian Settings of Western Zimbabwe," in *Sustainable Agriculture and Food Security* (Springer, 2022), 349–59; Shackleton et al., "Explaining People's Perceptions of Invasive Alien Species: A Conceptual Framework."

*Some households have abandoned farming and opted for non-farm livelihoods: some have reduced cultivated land because of the elephant problems. Farming has become futile and a waste of time and resources due to the ongoing crop damage caused by elephants.*

It emanated from the deliberations that elephants were also destroying critical infrastructure and property in the study areas. In one in-depth interview, the participant indicated that elephants destroyed his water tank and smallholder irrigation system: shattering his dream of producing horticulture products. He opined that:

*The day I will never forget is when elephants destroyed the small irrigation system I had established with the assistance of my children who are in the diaspora. The water tank was destroyed, irrigation pipes destroyed and the borehole as well. My solar system and fences were also uprooted and thrown away by the angry elephants. I am hesitant to resuscitate the infrastructure for fear that it will be a waste of resources.*

Another female participant alluded that elephants were putting a strain on community water resources. She noted that:

*Elephants strain water resources in this ward. We currently have a challenge with the few water bodies we have. With the coming in of elephants, most of them will be dry by the end of July.*

Ngcobo et al. and Dunkin et al. posit that the well-being of elephants is closely tied to water availability.<sup>39</sup> Elephants are observed to gather in regions offering ample water sources for drinking, bathing, and recreational activities, notably in lowland areas and river valleys, as they have high daily water requirements.<sup>40</sup> Participants of the study also indicated that they were losing some income as a result of the elephants. Discussions revealed that apart from property damages and crop raids, there were other indirect costs of the elephants to the locals. It emerged from the engagements that time and energy spent on deterring the elephants could be spent on other productive livelihood initiatives. One crucial source pointed out that the hidden expense of human-elephant conflict lies in the foregone opportunities to redirect efforts towards more profitable ventures, rather than constantly working to prevent crop destruction by elephants. The participant argued:

*Communities spend a lot of energy trying to deter the elephants from damaging their properties and crops. How do we expect communities to contribute to their local economic development given such a situation? So, these are some of the reasons why most of the households you have seen in this area are poor.*

Furthermore, financial losses from crop damages were also raised by the participants. Unfortunately, most of the farmers could not quantify their losses. Supported by Naughton-Treves and Nyhus, the contention is that protection area managers often receive complaints from communities experiencing recurrent crop damage by wildlife.<sup>41</sup> Despite this, detailed evaluations of crop losses are infrequently conducted, and predictive models are seldom formulated due to the intricate nature of the contributing factors. Scarce quantitative data exists regarding the occurrence, spatial and temporal trends, and the effects of elephant crop raiding on local populations in these regions.<sup>42</sup>

Elephants were also reportedly increasing fear and anxiety in our communities. In the last 15 years, participants argued that they lost a significant number of people because of elephants. One participant alluded that:

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<sup>39</sup> Ngcobo et al., "The Future Survival of African Elephants: Implications for Conservation"; Robin C Dunkin et al., "Climate Influences Thermal Balance and Water Use in African and Asian Elephants: Physiology Can Predict Drivers of Elephant Distribution," *Journal of Experimental Biology* 216, no. 15 (2013): 2939–52.

<sup>40</sup> Blanc and Barnes, *African Elephant Status Report 2007: An Update from the African Elephant Database*.

<sup>41</sup> Philip J Nyhus and Ronald Tilson, "Crop-Raiding Elephants and Conservation Implications at Way Kambas National Park, Sumatra, Indonesia," *Oryx* 34, no. 4 (2000): 262–74; L Naughton, "Collaborative Land Use Planning: Zoning for Conservation and Development in Protected Areas," *University of Wisconsin-Madison* 4 (2007): 1–16.

<sup>42</sup> Nyhus and Tilson, "Crop-Raiding Elephants and Conservation Implications at Way Kambas National Park, Sumatra, Indonesia."

*We fear for our lives in this community. Last year several people were killed by elephants, and some were injured.*

An attempt was also made to try and explore the possible benefits of elephants in the areas under study. Local communities derive numerous advantages from elephants, including meat, skin, medicinal resources, job opportunities, infrastructure enhancements, community-based tourism, and decorative items. Among these benefits, elephant meat was highlighted as the most prized commodity contributing to their livelihoods. This outcome aligns with the research findings of Malley and Gorenflo, who suggest that the benefits stemming from elephants could significantly shape community perceptions towards these animals.<sup>43</sup> The scholars also posit that community members perceive and evaluate both the tangible and intangible benefits of elephants in diverse ways. However, it emerged from the findings that community-based natural resources approaches need the involvement of communities affected by elephants.

### **Coping with Human-elephant Conflict**

Questions were asked that aimed at establishing how communities were responding to the human-elephant conflict. Participants revealed a spectrum of strategies employed to mitigate elephant crop raiding, spanning from individual and household initiatives to those necessitating community involvement or external assistance. Participants of the study alluded that guarding their fields was the most common strategy of coping with the elephant challenge. One engaged participant opined that:

*If you do not guard your field you are assured of not harvesting anything. During the day if schools are closed households engage children, but at night when these elephants mainly move, men play an important role in protecting the fields.*

Traditional methods used to guard fields include chasing the elephants through the use of loud noise. It emanated that elephants easily get irritated by loud noise and run away. Participants indicated that loud noises including firecrackers, yelling and hitting metal objects were assisting them in ensuring that elephants were deterred from entering their fields. Some households indicated that they used various forms of lights to scare the elephants. Probes however indicated that these traditional methods have become ineffective over time. This insight was shared by a participant who highlighted that:

*Over the past seven years, we have come to realize that we have some animals that are no longer scared by noise and light. They become violent the minute they see light or hear some loud noise. So for me, that is now our biggest challenge.*

Households were also reportedly responding to the challenge of elephants as a community. It emanated from the participants that in some villages, households created community duty rosters for guarding the elephants. This was easily coordinated through WhatsApp chat groups and local leadership structures. Some indicated that they grew short varieties that mature within a short period. Such varieties had the advantage of being harvested before elephants started their raids. The results are supported by Nyhus et al. who discovered in Indonesia that farmers commonly synchronized their crop planting with others to collectively monitor fields, thus reducing individual burdens.<sup>44</sup> Additionally, their research unveiled that farmers sometimes opted to harvest crops prematurely to avert potential extensive damage in the critical days nearing harvest.

It also emanated from the discussion that some farmers established their fields near their homes for easy guarding of elephants and other problematic animals. Some were reportedly growing less valuable crops as a way of reducing losses in case of elephant raids. It also emerged that some households opted for livelihood diversification away from crop-dependent livelihoods into non-farm and off-farm activities. Scholars contend that in the Global South, there is a growing disconnection of lives and livelihoods from farming practices and land ownership.<sup>45</sup> The traditional links between wealth and poverty are becoming

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<sup>43</sup> Grace S Malley and L J Gorenflo, "Shifts in the Conflict-Coexistence Continuum: Exploring Social-Ecological Determinants of Human-Elephant Interactions," *PloS One* 18, no. 3 (2023): e0274155.

<sup>44</sup> Nyhus and Tilson, "Crop-Raiding Elephants and Conservation Implications at Way Kambas National Park, Sumatra, Indonesia."

<sup>45</sup> Nyathi and Ndlovu, "Livelihood Diversification and Household Food Security in Selected Agrarian Settings of Western Zimbabwe"; Frank Ellis, *Rural Livelihoods and Diversity in Developing Countries* (Oxford university press, 2000); Rigg, "Land, Farming, Livelihoods,

less clear-cut due to the broadening array of non-agricultural opportunities and increased mobility, leading to livelihoods being detached from specific locations. Consequently, this shift has significant implications for poverty dynamics in rural areas, as poverty is increasingly decoupled from agricultural resources. A commendable number of youngsters were reportedly involved in small-scale mining, while some migrated to towns and neighbouring countries. Further probes hinted that the delocalisation of livelihoods was primarily due to the human-elephant conflict.

Participants of the study also indicated that they reported the animals to the Zimbabwe Parks authorities and local authorities. Sometimes Parks authorities shot problematic animals and gave households game meat. One participant postulated that:

*It is so funny that the Parks guys shoot these elephants and, in the process, we get given game meat. We don't need game meat. We want to be compensated for the losses we get from these elephants. We understand elephant ivory is sold in foreign currency. Where does that money go to?*

Key informants indicated that currently, communities affected by elephants cannot be compensated because there is no law to that effect. It emerged from further engagement that the local community felt they were excluded from elephant ownership and decision-making, making it a challenge for them to benefit from these elephants. Attempts to relocate affected communities by the Government were resisted by the affected communities in the 1980s. One participant opined that:

*We cannot go anywhere because of these graves you see. We cannot abandon them here because of elephants.*

Some participants were not interested in the relocation issue arguing that it was going to create challenges for them. Some participants were insinuating that they couldn't accept the government proposal of relocation because it meant leaving the graves of their forefathers.

The findings highlight the critical need to enhance concrete advantages derived from elephants and other wildlife and to enhance property rights for local communities living alongside wildlife. Community members have voiced worries regarding the fairness of benefit distribution. Disparities in the distribution of wildlife benefits can jeopardize conservation endeavours. Furthermore, the findings indicate that for sustainable conservation involvement by local communities, the collective benefits received from wildlife must surpass the associated costs. These incentives can manifest in various ways, including increased disposable income, empowerment at the local level, guaranteed land rights, and improved access to healthcare and educational resources.

## RECOMMENDATIONS

Elephants come into conflict with humans by damaging crops and houses, and killing people, which creates antagonistic feelings towards elephant conservation among locals. It is thus important to promote compensation schemes to farmers for losses in the elephant ranges. In the areas of regular human-elephant conflict, bio-fencing may be developed to deter elephants from frequently raiding houses and crops. In addition, farmers need to be encouraged to cultivate crops not proffered by elephants to reduce recurrent human-elephant conflict. However, both of these measures again require identifying appropriate plant species and crops through further site-specific research. There is a need to promote conservation activities that enhance well-being and mitigate the negative impacts of human-elephant conflict.

There is an urgent need to strengthen the capacity and knowledge of the local people sharing their landscape with elephants to enable them to cope with human-elephant conflict. One way of doing this is to strengthen the traditional human-elephant conflict mitigation techniques to complement the centralised, and often resources-starved mechanisms. Communities and conservation organisations are already testing different human-elephant conflict mitigation techniques that confer control and responsibility to local communities, thereby offering real opportunities for collaboration in human-elephant conflict mitigation. It is also recommended that conservation and other relevant actors consider the promotion of livelihood

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and Poverty: Rethinking the Links in the Rural South"; Nyathi Douglas et al., "Diversification and Farm Household Welfare in Grasslands 'A' Farm, Kwekwe District, Zimbabwe," *J Hum Ecol* 62, no. 1-3 (2018): 58-68.

diversification as a route to improving the wellbeing of rural residents and biodiversity conservation. Studies have demonstrated that diversification reduces vulnerability and poverty, increases income and wealth, enhances security and can improve the quality and sustainability of the natural resources that constitute key assets in rural livelihoods, and hence well-being. Human-wildlife conflict can have detrimental effects on both people and wildlife and can lead to setbacks in conservation efforts. Understanding how conflict risk is likely to shift under a changing climate as agriculture and human populations expand can better allow conservationists and wildlife managers to allocate mitigation and conservation resources for conflict-prone species and regions.

## CONCLUSION

From the findings and discussions, the escalation of the human-elephant conflict is imminent with the ongoing reduction of elephant habitats due to climate change and variability. Achieving peaceful coexistence between communities and elephants remains unattainable as long as elephants cause harm by damaging crops, and infrastructure, and endangering human lives. While human-induced habitat loss and fragmentation pose critical threats to elephants, changing climate conditions and temperature variations are also disrupting elephant populations. Climate change is worsening the human-elephant conflict in areas near protected areas such as the two purposefully selected wards in Lupane District. With climate change, the likelihood of conflict escalation with elephants could change and grow, urging policymakers to preemptively address and manage such conflicts to safeguard these iconic creatures. Enhancing sustainability targets necessitates the enhanced integration of verifiable data regarding the complexities of coexisting with wildlife into holistic, cross-border conservation policies, particularly amidst climate shifts. Human-elephant discord should be viewed as a product of the interplay between individual elephant behaviours and human interactions within distinct environments, challenging the notion that it can be universally resolved through conventional solutions like fencing. Political economy analysis of the human-elephant conflict demonstrates how conservation landscapes are far from being natural and apolitical phenomena. Specifically, this challenge which appears to be a local one involving a rural household and elephants is a global issue that needs a global solution.

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Dr. Douglas Nyathi is a Post-Doctoral Fellow at the University of Johannesburg whose research critically examines the intersections of climate change, gender dynamics, and livelihood diversification within marginalized communities. His work focuses on the disproportionate effects of climate-induced displacement on women, particularly in rural Zimbabwe, a region marked by socio-economic vulnerabilities. Through extensive field studies, Dr Nyathi analyzes how women adapt their agricultural practices in response to changing climatic conditions while pursuing alternative income sources, revealing the resilience strategies underpinning their survival. By emphasizing the unique challenges faced by these communities, Dr Nyathi contributes to a deeper understanding of gendered responses to climate stressors and advocates for the integration of gender-sensitive approaches in environmental policies. His commitment to social justice aims to amplify the voices of women and marginalized populations affected by climate change. As he engages with a variety of stakeholders, his research aspires to inform policies that prioritize the needs and resilience of the most impacted communities, ultimately fostering a more equitable and empathetic response to global climate challenges.

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