

Assessing Local Community's Attitudes towards Wildlife Conservation: A Case Study of Makao Wildlife Management Area in Tanzania

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Abstract

Understanding communities' attitudes towards wildlife conservation is essential because human behaviour greatly influences wildlife sustainability. This study assesses local communities' attitudes towards wildlife conservation in Makao wildlife management area. Four villages, Makao, Jinamo, Sapa and Mwabagimu, were randomly selected for this study. Data were collected using questionnaire survey, focus group discussions, and key informants' interview from 363 heads of households, selected using purposive sampling and simple random sampling technique. Results indicate that, L local communities were aware of human-wildlife conflicts existence $90\% \pm 2$. Power disparity among wildlife stakeholders ($\beta = -0.137$), Crop damage ($\beta = -1.245$), Wildlife animal attack ($\beta = -1.014$), family size ($\beta = .137$) negatively influences local attitudes towards wildlife. On the contrary, educational level ($\beta = 1.415$), age ($\beta = 1.388$), and economic activities ($\beta = .743$) positively influenced local attitudes toward wildlife conservation. Therefore, the appreciation of local attitudes is a key for the successful implementation of any conservation project. The study recommends engagement and education to enhance conservation awareness and foster a positive attitude towards wildlife conservation among local communities.

Keywords: *Attitude, Makao, Wildlife conservation, Wildlife management area, local communities*

1.0 INTRODUCTION

Wildlife conservation has attracted increased attention in recent years because of mounting problems such as habitat loss, poaching, and climate change (Advani, 2023; Børresen et al., 2023; Obradović et al., 2023). While conservation efforts have traditionally focused on protected areas and wildlife reserves, there is growing recognition that the involvement and support of local communities are critical for the success of conservation initiatives (Kideghesho, 2016; Keane et al., 2019). Worldwide, local communities coexist with wildlife and rely on natural

resources for their livelihoods (Lwankomezi et al., 2021b; Felix et al., 2022; Doley and Barman, 2023; Zhou, 2023). Yet, conflicts arise when wildlife destroys crops, attack and kill livestock and sometimes threats to human life (Lyamuya et al., 2014). At a global scale, community attitudes towards wildlife get shaped on the interactions among benefits and costs. Positive experiences, such as income from tourism or recognition of cultural values, can foster stewardship. On the other hand, unfavorable experiences such as crop raiding, livestock predation, human injury, or resource restrictions tend to generate hostility and bitterness (Jew & Bonnington, 2011).

In sub-Saharan Africa, where most of the rural communities derive their subsistence and livelihoods from natural resources, such a delicate balance between conservation and human welfare is very detestable (Hariohay et al., 2018; Felix et al., 2022). Studies from Tanzania, Kenya, and Namibia revealed that, communities suffering repeated crop losses to elephants, livestock depredation by large carnivores, or exclusion from grazing land often perceive wildlife primarily as a source of hardship, which undermines their willingness to cooperate with conservation efforts (Rust & Marker, 2013; Lyamuya et al., 2014). Conversely, communities tend to have a positive perception when they have benefited from job creation, share tourism revenues, or receive social services from conservation projects (Børresen et al., 2023). Yet, these outcomes are not uniform; for instance, while Kideghesho (2010) draws attention to enduring resentment from land-use conflicts in the western Serengeti corridor. Keane et al. (2019) reported instances in which WMAs have slightly enhanced household income, indicating that governance processes and equity in participation govern the perceptions of the people.

Tanzania has abundant biodiversity and has allocated over 40% of its land as protected areas. However, majorities of the protected areas have been declared through the forcible eviction of local communities, some of whom had lawful land tenure (Bluwstein, 2017). Having been forcibly uprooted from ancestral land, the local community refused to surrender or endorse the government's plans of conserving their areas for wildlife conservation (Mbise & Sosiya, 2023). The conflict arises due to lack of compensation for the land lost, and the government never consulted the affected community prior to conservation plans being drawn (Dickman, 2010; Lwankomezi et al., 2023). Attitudes, thoughts, and feelings influence how the people behave towards wildlife and may be decisive for

the future of wildlife management and conservation (Keane et al., 2019; Carter et al., 2014; Børresen et al., 2023).

Existing studies across Tanzania provide valuable but incomplete insights into the role of community attitudes. Research in Rungwa and Loliondo reveals that perceptions are shaped by immediate livelihood costs such as crop damage and predation (Hariohay et al., 2018; Lyamuya et al., 2014), whereas research in Tarangire illustrates how retaliatory killings of lion's seed from very concrete frustrations with conservation governance (Felix et al., 2022). However, these studies tend to overlook the lingering historical grievances of eviction and power disparities salient in Makao and therefore tend not to systematically investigate whether socio-demographic factors such as education, household size, or employment condition conflict experiences in shaping attitudes. Therefore, not much is known about the attitudes of local communities residing in the Makao Wildlife Management area. The Makao Wildlife Management Area connects the Maswa Game Reserve, Ngorongoro Conservation Area, and Serengeti National Park (Lwankomezi et al., 2021b). This makes it a crucial and environmentally sensitive region within northern Tanzania's diverse Serengeti Ecosystem.

This article examines local communities' attitudes towards wildlife conservation in Makao WMA. The following objective were addressed in this paper (i) to assess human-wildlife conflict awareness among local in the study area, (ii) evaluate determinants for local people's attitude toward wildlife conservation in the study area. In evaluating determinants for local people's attitude, the following hypothesis are addressed (i) power disparity, crop damage, and wild animal attacks negatively influence people's attitudes toward wildlife conservation, and (ii) education level, family size, age, and economic activities positively influence local people's attitudes toward wildlife conservation. The article will foster a positive attitude towards wildlife conservation among local communities.

2.0 THEORETICAL FRAMEWORK

The paper is based on the Social Exchange Theory that dynamics of stability and social change resulting from the interaction transactions between different groups (Homans 1961). The theory states that people enter into relationships basing on their subjective views on the costs and benefits and the various alternatives available to them (Homans 1961). Social interaction is framed by the social exchange theory as an exchange activity where individuals weigh the rewards and costs of each potential

opportunity (Overskeid 2018). Out of all the alternatives with equal costs, people prefer those with higher rewards, whereas when the reward level is the same, the alternative with the least cost is preferred (Clark and Taplin, 2012). Thus, the theory holds that people respond to policies and interventions based on their own expectations for particular outcomes (Brest 2010). This holds that attitudes toward conservation are dependent upon perception.

According to the theory, people's attitudes are accountable given that its assumptions are embedded in human nature and rational dynamics, where people want good outcomes out of situations and avoid negative experiences from the same. Local communities are also rational decision-makers, weighing benefits and costs (Homans 1961; Overskeid 2018). This theory is relevant because community evaluation varies along time and from individual to individual, reflecting a person's preferences and contextual factors (McCleery 2009). Hariohay et al. (2018) point out that relationships existing around protected areas are of mutual dependence, in which actions from one party influence the other. This theory implies that attitudes influence, in various forms, people's collective actions, which themselves influence wildlife conservation (Ostrom 2000). The perception of fairness in conservation comes in when policies, laws, and park management are legally and practically performing equal distribution of benefits. Therefore, according to Hariohay et al. (2018), attitudes are influenced by a variety of factors such as group size, age, household expertise, and perception of parks, wildlife, and rules guiding them. Highlighting conservation dynamics, the communities bordering conservation areas bear the costs of conservation-right from crop raiding to displacement and restricted access to resources (Ngo et al., 2019; Lwankomezi et al., 2021a; Raycraft, 2023). These suggests that social exchange in and around protected areas is not always balanced and that local communities perceive the relationships with wildlife depending on whether there is a balance between their contributions and gains from conservation (Cropanzano and Mitchell, 2005). To capture that local attitude aspect, this study concentrates on local experiences and practices in Makao Wildlife Management Area.

3.0 MATERIALS AND METHODS

3.1 Study Area

Makao WMA located in Meatu District and serves as a link between the Maswa Game Reserve and the Serengeti National Park between 3°21'30.8"S 34°51'11.3"E (Figure 1). It extends over an area of 780 km² and covers seven villages (Sapa, Mbushi, Iramba Ndogo, Mangudo,

Jinamo, Mwabagimu, and Makao) in the northern Serengeti ecosystem. Makao WMA is bounded by the Serengeti National Park to the north, Ngorongoro Conservation Area to the east, Maswa Game Reserve to the northwest, and Kakesio escarpment on the west. The area of Makao WMA is largely inhabited by the Sukuma, Datoga, and Nyaturu tribes. Agriculture and pastoralism are the cornerstones of the economy of Makao WMA-member villages. Makao WMA experiences a climate dictated by bimodal rainfall, with rain falling between 700 mm in the southern region and 900 mm in the north. The rainy seasons mostly begin in November and end in December. The rivers in Makao WMA are seasonal, with water levels dropping gradually from north to south. Rocky hills and flat plains characterize this landscape with typical black cotton and sandy loam soils (URT, 2012).

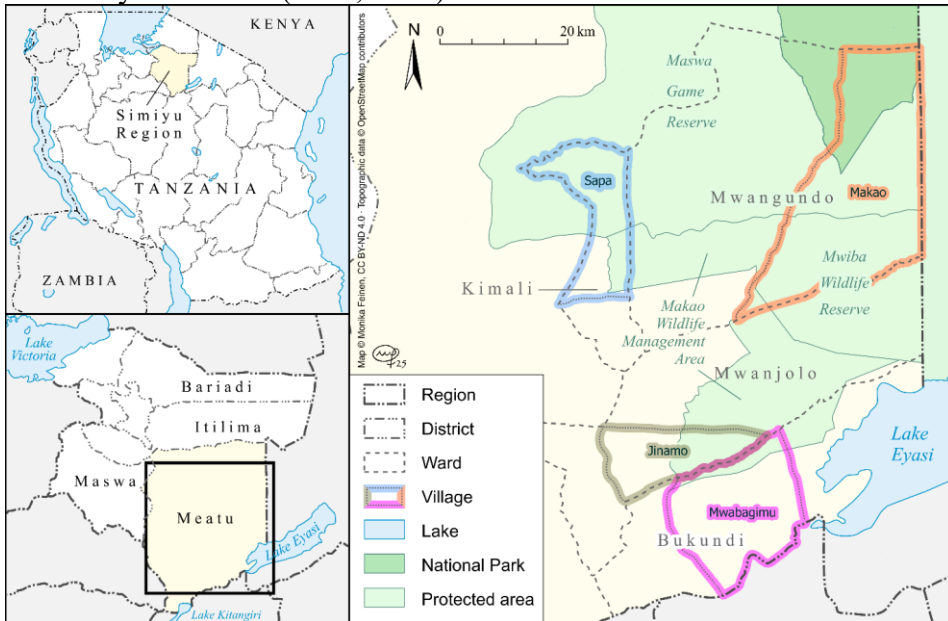


Figure 1. The study villages in Makao WMA

3.2 Data collection

Four villages (Makao, Mwabagimu, Jinamo, and Sapa) were selected from Makao WMA through a random selection process. The reason behind employing a random sampling technique in selecting these four villages was to ensure an equitable opportunity for each village to be included in the study. A total of 363 respondents were interviewed using a semi-structured questionnaire. The respondents included the heads of households selected randomly from each village; the number of respondents from each village was as follows: Makao (95), Mwabagimu (95), Jinamo (91), and Sapa (82). The names were gathered from the

village chairs' household register, and in each study village, a random number generator (<http://stattrek.com/Tables/Random.aspx>) was used to create random numbers of households to be surveyed.

The questionnaire assessed the local community's attitudes toward wildlife. The attitude was evaluated by four measurements forming the 'attitude determinant' (a) local access to resources, (b) local coexistence with wild animals, (c) local capabilities, and (d) benefit-sharing. Descriptive statistics were used to obtain the mean, median, and percentage. To verify the uniformity of the data entry, a frequency run was conducted for all variables to identify any incorrect values that may have been entered. Chi-square tests were used to determine the relationship of the variable under study, and statistical significance was set at p values < 0.05. Later, the linear logistic regression method was employed to determine the most effective predictors of attitude using the Statistical Package for the Social Sciences (SPSS) version 21. The linear logistic regression equation is indicated in equation 1.

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon \dots \dots \dots \text{Equation 1}$$

Where:

- X_1, X_2, \dots, X_k = predictor variables
- $\beta_1, \beta_2, \dots, \beta_k$ = regression coefficients

This study obtained ethical clearance from the Open University of Tanzania, the Tanzania Wildlife Authority (TAWA), the Meatu District Council, and the Makao WMA. Written consent was provided to all respondents before the collection of data. Data collection proceeded after all respondents had signed the consent forms. Voluntary participation was ensured, and confidentiality of processes, including the names of all respondents, was guaranteed. Proper acknowledgment of sources was provided

4.0 RESULTS

4.1 Household Characterization

Results showed that some important demographic information about study participants was revealed. The sample was skewed by the numbers, with 65.5% respondents being males while females represented only 34.5% (Table 1). Despite a gender disparity in the study area, no evidence was found to suggest that males and females have different attitudes toward wildlife conservation. A number of respondents (21%) had no formal education. Most had only primary education (69.4%), so conservation approaches should be developed in such ways that are easily

comprehensible and accessible to people having low education levels. A minority were educated at college (2.1%) and secondary (7.5%) levels.

Table 1: Demographic Characteristics of Respondents (N = 363)

Variable	Category	Frequencies (n)	Percentages (%)	Interpretation
Gender	Male	238	65.5	The sample was dominated by males; however, there was no significant difference in attitudes toward wildlife conservation between males and females.
	Female	125	34.5	
Education Level	No formal education	76	21.0	A notable portion lacked formal education, emphasizing the need for simplified conservation awareness programs.
	Primary education	252	69.4	Most respondents had only a basic education.
	Secondary education	27	7.5	Few had completed secondary education.
	College and above	8	2.1	Very few attained tertiary education.
Household Size	1–4 members	98	27.0	Smaller households were less common.
	5 or more members	265	73.0	The majority had large households, which may increase their dependence on natural resources.
Age Group (Years)	18–28	83	22.8	Younger participants were fewer in number compared to the older groups.
	29–48	121	33.4	Represented a substantial middle-aged category.
	49 and above	159	43.8	Older respondents formed the largest age group.
Primary Livelihood Activity	Livestock keeping	165	45.5	Livestock keeping was the dominant livelihood, reflecting reliance on natural resources.
	Crop cultivation	158	43.4	Crop farming was also a major source of livelihood.
	Wage labour	23	6.4	Few were engaged in wage employment.
	Others (small trade, craft, etc.)	17	4.7	Minor livelihood activities supplement incomes.

Source: Field data, 2022

Moreover, the results indicated that two-thirds of the households have a family size of more than five members, while only 27% of all respondents stated that their households have members ranging from 1 to 4. This has implications for wildlife conservation strategies, since larger households

may require more resources, and consequently their environmental impacts may be higher. Furthermore, 43.8% of all respondents were 49 years and older, while 33.4% were in the age category of between 29 and 48, an aspect to consider in engaging different age groups in the development of conservation strategies since different age categories may have diverse attitudes and perspectives towards wildlife conservation. Livestock keeping took the lion's share of livelihood activities, with 45.5% of respondents practicing it. Around 43.4% of respondents were involved in crop cultivation as a main livelihood activity, and only 6.4% of respondents practiced wage-labour as the main livelihood activity across all study villages. Thus, the utmost majority of the local populations in the WMA were smallholder farmers and livestock keepers heavily dependent on natural resources for livelihood.

4.2 Human-wildlife conflict awareness

Human-Wildlife Conflicts (HWC) were very well known to local communities in all the study villages, with an average of 90% \pm 2 people knowing that HWC existed in their villages (Table 2). In this study, higher awareness was observed among the people of Mwabagimu and Makao, with 92.6% and 90.5% recorded, respectively, signifying that community members were more considerate of wildlife, maybe due to their closeness to wildlife corridors and conservation programs. The slightly lower awareness levels in Sapa (87.8%) and Jinamo (89.0%) may be due to the lack of contact with conservation education programs or fewer encounters with wildlife. Nearly 10% of the respondents in the different villages stated that they did not know or were unsure about HWC, indicating that the majority of residents have a good understanding of the conflict, its causes, and the species involved. Large community awareness of human-wildlife conflict provides a solid basis for participatory conflict containment and coexistence methods. There is a need to convert awareness into practical measures, such as improved reporting, community hunting, and education on the least harmful measures.

Table 2: Local awareness of Human–Wildlife Conflict by village

Awareness of Human–Wildlife Conflict	Makao (n = 95)	Mwabagimu (n = 95)	Jinamo (n = 91)	Sapa (n = 82)	Mean (%)	SD
Aware of HWC in their area	86 (90.5%)	88 (92.6%)	81 (89.0%)	72 (87.8%)	90.0	2.0
Not aware / Uncertain	9 (9.5%)	7 (7.4%)	10 (11.0%)	10 (12.2%)	10.0	2.0

Source: Field data, 2022

4.3 Determinants for local people's attitude toward wildlife conservation in the study area

Local community attitude determinants were used as dependent variables along with explanatory variables (Table 3). Power disparity among wildlife stakeholders had a negative influence on attitudes toward wildlife ($\beta = -0.137$). This suggests that significant imbalances in power or influence among different groups of people involved in wildlife management lead to negative attitudes toward wildlife. A wild animal attack negatively influences attitudes toward wildlife ($\beta = -1.014$), suggesting that when people are attacked or harmed by wild animals, it can lead to negative attitudes toward wildlife. This occurs when local communities feel that they have suffered significant physical or emotional harm due to the attack. Crop damage negatively influences wildlife attitudes ($\beta = -1.245$), implying that when wild animals destroy crops or other agricultural resources, they cultivate negative feelings toward wildlife, particularly when local communities acknowledge that their livelihoods or economic well-being are jeopardized by wildlife. These negative attitudes undermine conservation efforts and further thwart support for conservation initiatives.

On the other hand, communities with secondary and college education hold more positive views toward wildlife, thus suggesting that education may create the pattern of their attitudes toward wildlife ($P=0.000$). People aged 18-28 had a positive attitude towards wildlife ($\beta = 1.388$). In contrast, people aged 29 and above were less positive toward wildlife ($P = .817$), suggesting that individuals above 29 may have had more negative experiences, which could lead to a more negative attitude. People practicing crop farming and livestock keeping had less positive opinions toward wildlife, suggesting that peoples' sentiments varied based on the type of livelihood they engaged in. Furthermore, employed individuals were more positive towards wildlife, while an increasing family size had a negative influence on their attitude towards wildlife (Table 1).

Table 3: *Determinants for local people's attitude toward wildlife conservation*

Independent variables	β	SE	Statistical tests	
			Wald Chi-square	p-value
Intercept	4.861	.49	52.456	.002
[Gender=1] Male	1.823	.395	.327	.632
[Gender=2] Female	0 ^b	.	.	.
[Age=1] 18-28	1.388	.604	5.285	.000
[Age=2] 29-38	.733	.594	0.521	.817
[Age=3] 39-48	1.21	1.031	0.301	.701
[Age=4] Above 48	0 ^b	.	.	.
[Education=1] Informal	-2.776	.944	.642	.992
[Education=2] Primary	1.216	2.152	1.065	.001
[Education=3] Secondary	1.415	2.023	4.651	.000
[Education=4] College	0 ^b	.	.	.
[Income=1] Livestock Keeping	.593	.805	1.995	.875
[Income=2] Crop cultivation	.655	.670	2.828	.743
[Income=3] Employment	.303	.560	.043	.003
[Income=4] Petty Trade	0 ^b	.	.	.
[Family Size=1] 1-4	-.137	.319	.184	.668
[Family Size=2] Above 4	0 ^b	.	.	.
[Power disparity=1] Yes	-2.147	.244	9.365	.002
[Power disparity=2] No	0 ^b	.	.	.
[Crop damage=1] Yes	-1.245	.288	.723	.004
[Crop damage=2] No	0 ^b	.	.	.
[Wild animal attack=1] Yes	-1.014	.292	.002	.001
[Wild animal attack=2] No	0 ^b	.	.	.

- The reference category is Good.
- This parameter is set to zero because it is redundant.
- A positive value of beta indicates the positive influence of the attitude, while a negative value indicates the negative influence of the attitude.

Source: Field data (2022)

5.0 DISCUSSION

5.1 Human-wildlife conflict awareness

Local communities show complete understanding of human-wildlife conflict (HWC) which proves that conflict exists as a real-life problem throughout the Makao WMA landscape. People now widely understand wildlife conflicts because they regularly encounter wildlife and experience multiple wildlife conflicts which matches the characteristics of

areas that have wildlife migration routes and common resource areas. The residents of Mwabagimu and Makao show elevated awareness because their locations near wildlife migration paths and their involvement with conservation programs lead to more wildlife interactions and better access to conservation information. The slightly lower awareness levels in Sapa and Jinamo can be attributed to decreased wildlife encounters and decreased participation in conservation education programs which demonstrate how awareness initiatives do not affect all areas equally. Only a few participants remained unclear about HWC. High awareness levels by themselves do not guarantee that people will manage conflicts successfully or take actions that benefit conservation (Advani, 2023). The conversion of awareness into action requires functional systems which include easy-to-use reporting channels, community-based crime prevention programs and training programs that teach people to handle situations without using force. The research results indicate that conservation programs need to shift from basic information sharing to active community involvement which teaches people practical skills to protect HWC while making their knowledge useful for damage reduction and safety improvement and conservation goal support.

5.2 Determinants for local people's attitude toward wildlife conservation

The present study suggests that power disparity, crop damage, and wild animal attacks have a negative impact on people's attitudes toward wildlife conservation, thereby confirming the first hypothesis. Local communities that had borne the costs of conservation often viewed wildlife conservation negatively. Those who faced greater price increases were more likely to oppose wildlife conservation than those who were less affected. For example, two families in Jinamo village lost about 30 hectares of maize farms due to an elephant raid. The loss of livelihood-sustaining resources eroded their support for wildlife conservation. The result supports the findings by Hariohay & Røskaft (2015), who argued that most constraints faced by livestock and crop farmers were associated with wildlife and were deemed conservation-induced expenses.

Power disparity among wildlife stakeholders negatively affects the attitude toward wildlife, implying that in cases wherein power dynamics are unequal, those potential or actual stakeholders in the unsatisfactory side may well develop negative attitudes toward wildlife since they feel that their views and interests are hardly represented or considered. Kajembe et al. (2016) noted that unequal power distribution and influence can result in the erosion of trust and cooperation among stakeholders,

which, in turn, negatively affects wildlife conservation activities. When people feel that the imbalance of power is severely disturbing, their positive attitudes toward wildlife conservation in Makao WMA are substantially hindered, as revealed by the study. According to Social Exchange Theory (Homans, 1961; Cropanzano & Mitchell, 2005), the disparity exists because conservation costs are borne by local households while governance activities are represented by few. Indeed, prior studies have shown that the community loses its legitimacy and cooperation when local communities are excluded in decision-making processes and when benefits are distributed asymmetrically in Tanzania (Kideghesho, 2016; Kajembe et al., 2016; Bluwstein, 2017). Dickman (2010) contends that concerns with social justice often in fact take precedence over ecological concerns in the organization of conservation conflicts. Our findings support those from Keane et al. (2019), who found that WMAs function well when governance systems provided opportunities for active community participation.

In the Makao WMA, the People felt they were never heard or involved in few decisions. The Authorized Association (AA), acting on the interest of government authorities, violated the local communities' right to full participation in the governance of Makao WMA. The outside players were such as investors, the Wildlife Division, and District game officers- they wielded too much power- because they denied the local community the basic right to participate. Hence, all decisions regarding the operations of the WMA were in the hands of external actors. As a result, this led to a bunch of problems, with diminished participation in wildlife management and this study found power imbalances and power struggles in three areas: conflict over revenues from investments; conflict over management of operations; conflict over access and utilization of resources by less privileged community members. Kiwango (2017) supports this by stating how power centralization has led to the shifting of decision-making processes to a broader arena of stakeholders with different interests, thereby affecting local attitudes toward wildlife conservation.

It shows that if crop damage occurs, there emerge negative wildlife attitudes in the study area; in the area, buffaloes and elephants were the major crop-damaging animals. Maize fields sustained the most damage. Results show that growing crops near WMAs has led to a significant increase in crop damage on village land, which has them in negative attitudes. This was demonstrated by respondents near Makao WMA being victimized by elephants raiding their crops. The findings concur with Advani (2023) and Hariohay et al. (2018), where distance from protected

areas is among the factors that influence wildlife attitudes of local communities. Cultivation occurring near the boundaries of protected areas increases the likelihood of elephants raiding crops. The present study indicates that destruction of crops by wild animals constituted the single most important cause of conflict across whole villages and, consequently, breeding an eroding negative attitude towards wildlife. The present study shows that the annual cost of crop damage by wildlife exceeds Tsh 1,150,000 per household. It shows that an average of Tsh 13,168.27 is gained as benefits per person per household per year for local communities residing in Makao member villages. This means local communities incur roughly 90 times as much cost for crop damages as they realize in benefits, thereby intensifying local poverty and projecting negative sentiments on wildlife conservation. According to Raycraft (2023), crop damage by African elephants (*Loxodonta africana*) disrupts local acceptance of elephants and conservation efforts, thereby calling for immediate solutions.

Further results indicated that households whose crop damaged crops endorse less conservation. This is in line with what Social Exchange Theory predicted, that whenever tangible costs were perceived to outweigh benefits, there was less support (Ostrom, 2000). A myriad of SSA studies mirror our findings: while crop raiding lessens tolerance to elephants and other wildlife in Tanzania and Kenya (Lyamuya et al., 2014; Hariohay et al., 2018; Raycraft, 2023). Rust and Marker (2013) signal that economic losses lower tolerance levels for coexistence with carnivores in Namibia. Jew and Bonnington (2011) suggest, however, that tolerance may vary across socio-demographic groups. While reinforcing the centrality of livelihood security in shaping conservation attitudes, our work advances the literature by providing effect sizes, shedding light on the magnitude of impact in relation to governance and other variables.

Wild animal attack has a negative influence on attitudes toward wildlife. Incidents of human-wildlife conflict involving predator animals were evident in the study area. There were reported cattle attacks by predators in Jinamo and Mwabagimu villages, which provoked local communities' retaliatory killing of problem animals, leading to conflicts with conservation authorities. For example, a local community with a lot of livestock may have more instances of negative interaction with PAs through trespass of their livestock into the conserved areas. The present study indicated that livestock keepers stayed with fines and arrests when they were found with their livestock grazing illegally in PAs. The results tend to say that the household that had the loss occasioned by depredation

of wild animals had a more negative attitude toward wildlife conservation than their counterpart. Negative experiences with wildlife lead to fear, anger, or resentment towards those involved, be it animals or wildlife; these sentiments are what create negative attitudes towards the wildlife themselves. The results correspond with those of Rust et al. (2011), who found that owners of cattle lost to predatory wild animals opposed wildlife conservation in the Selous Game Reserve.

Local community was hurt and given lifelong disabilities after being attacked by hyenas at night. For example, 45 cases of injury by wild animals were reported in the study villages, resulting in five deaths. This caused the retaliatory killing of wild animals. The current study indicates that elephants, leopards, and lions frequently injure local communities, although these incidents are not reported to officials. Additionally, local communities are commonly attacked by poisonous snakes, which they consider a normal occurrence. This is in line with Felix et al. (2022) that human attacks can render wildlife vulnerable to poaching, retaliatory killings, and habitat fragmentation. Muriuki et al. (2017) indicate that in Tanzania and Kenya, retaliatory killing has threatened the persistence of wildlife populations, where the number of wildlife killed by humans exceeds the number of livestock killed by wildlife.

Attacks by wild animals on either humans or livestock were also found to be determining much less positive attitudes. These findings align with others that highlight personal risk as a significant factor in hostility toward conservation (Felix et al., 2022; Muriuki et al., 2017). According to Dickman (2010), when wildlife threatens safety, emotional responses of fear and anger combine to create stronger anti-conservation feelings than do feelings of economic loss. Somewhat similar results are documented by Lyamuya et al. (2014), whereby negative attitudes are described to occur among Maasai herders in northern Tanzania following the depredation of livestock, while Advani (2023) highlights the shaping of vulnerability assessments through direct risks. Our study accepts and expands upon these findings by integrating wild animal attacks, crop damage, and governance parameters into one fully specified predictive model to clarify their relative weight in explaining conservation attitudes.

Results reveal that education, family size, age, and economic activities positively influence local communities' attitudes towards wildlife conservation. This might be attributed to people who have completed at least a secondary and college education and may have had more opportunities to learn about wildlife, leading them to develop a more

positive view of it. Results corroborate those of other studies by Lyamuya et al. (2014) and Ngo et al. (2019). Education is one of the strongest predictors of a positive attitude, as primary, secondary, and tertiary levels of schooling all significantly increase the odds of being in favor of conservation. This substantiates the Social Exchange Theory's hypothesis regarding the influence of knowledge on reevaluating perceptions in terms of costs and benefits (Overskeid, 2018). While Børresen et al. (2023) find that education leads to increased biodiversity awareness and tolerance toward conservation policy in Tanzania, Hariohay et al. (2018) and Keane et al. (2019) see the same in other WMAs. Similarly, Mir et al. (2015) find that education tends to generate positive perceptions toward wildlife in similar settings. Obradović et al. (2023), however, warn that education could also engender opposition, as local communities may be empowered to challenge conservation injustices. Our results echo the majority of works that argue for the existence of mostly positive relationships while adding some nuances by showing graded "dose-response" effects sharply delineated across schooling levels—an extension rarely, if ever, empirically assessed within WMA contexts.

The findings suggest that local communities with employment had a more positive attitude than those without employment. The possible explanation might be that as people face unemployment, they are forced to increasingly resort to the natural resources from the PA as alternative sources of income and hence might find themselves engaging in actions that go against conservation. Alternatively, these findings were confirmed by Børresen et al. (2023) and Keane et al. (2019).

According to the findings, the relationship between livelihood creates an environment for conservation, with wage labor being pro-conservation, while farming and livestock keeping are held unimportant once the relevant governance and conflict variables are controlled for. This partly contradicts in the literature, with farming and herding having been consistently associated with negative perceptions given that there is an increased exposure to conflict (Lyamuya et al., 2014; Rust & Marker, 2013). Dickman (2010) and Kideghesho (2010) argue that subsistence livelihoods further increase vulnerability to wildlife losses, while Keane et al. (2019) argue that diversified or non-agricultural income streams affect: That is to say it works against the vulnerability. However, our results suggest a more conditional role of livelihood. In contrast to farming and livestock, which lose significance once direct conflict and governance are put into consideration, wage labor remains positively associated with conservation. This methodological consideration helps

explain why livelihood variables have produced conflicting results in past research. The present investigation confirms that higher education tends to improve society's attitude toward conservation, but sometimes it is in fact working against conservation. For instance, most resistance was generated within the study system by educated persons who had very little to lose from conservation interventions. Similarly, Obradović et al. (2023) found that highly educated people residing within protected areas tended to oppose community conservation initiatives within their domains.

The decrease in family size had a positive influence on wildlife conservation in Makao. This is because an increase in population is more likely to lead to increased pressure on natural resources. For instance, high population growth leads to high demand for cultivation, settlements, and grazing land. The results suggest that population growth in the study area has increased pressure on natural resources. Local communities require land for farm cultivation and grazing to generate income. The findings suggest that increased population pressure on wildlife is driving up the demand for bushmeat hunting in the study area. Hoffmann (2022) supports the assertion that population growth increases the demand for game meat and other animal products, leading to resource depletion. He further argues that because human population increase is inevitable around protected areas, conservationists must guide human interactions with nature in cultural landscapes of which humans are integral. The population is estimated to be 15,000 in the study villages (URT, 2022), with the local community practicing agriculture and livestock keeping as their primary livelihood strategy.

Respondents aged 18-28 years had a positive disposition toward wildlife. In contrast, those 29 and older have tended to develop negative attitudes, implying that those over 29 years might have had more negative experiences that engender in them a more negative attitude. On the other hand, the study suggests that respondents older than 29 years share the properties of owning land and livestock, which may have triggered negative interactions with wildlife. The notion can, therefore, be linked to the works of Hariohay et al. (2018) and Mir et al. (2015), who argue that older communities that depend on livestock and agriculture for sustenance often clash with conservationists over pasture and farmland usage. These conflicts have instead exacerbated the anti-conservation sentiments in the local communities.

Conservation obtained a support almost four times more from younger respondents aged 18 to 28. Because younger people have fewer assets

built up and are exposed to different livelihood conditions, the incidence of damage caused by wildlife to them is lower, and thus conservation is more favored by them (Jew & Bonnington, 2011; Hariohay et al., 2018). Mir et al. (2015) draw a similar inference, noting that tolerance was higher among younger respondents from South Asia. In contrast, Keane et al. (2019) say there are generational differences among Western Muslims in Tanzania. Hoffmann (2022) associates these trends to general demographic pressures: older farmers with larger landholdings being more exposed to conflict costs and the younger respondents being more flexible. Our results corroborate the foregoing while drawing attention to an NGO-relevant split: youth seem more willing to engage in conservation partnerships, but older groups remain rather resistant, thereby calling for age-sensitive interventions.

6.0 CONCLUSION AND RECOMMENDATION

The present study has revealed a range of perspectives on local attitudes towards conservation, aligning with the findings of previous studies conducted in other protected areas. Power disparity, crop damage, and wild animal attacks negatively influence people's attitudes toward wildlife conservation. This indicates that these factors can create a sense of hostility and resentment towards conservation efforts among local communities. Accordingly, a level of participation by and equitable benefit sharing with communities from conservation activities must be introduced, thus closing the gap between communities and conservation efforts for their co-existence. Further, education level, family size, age, and economic activities possess a positive influence on the attitude of local communities toward wildlife conservation. Essentially, this infers that such factors constitute very important elements toward shaping a positive attitude to the cause of wildlife conservation. According to the present study, as experiences evolve, with bearing of the costs associated with co-existence with wildlife continuing, gradually negative attitudes begin developing within the community, and thus the community itself begins acting in ways that go against wildlife conservation. Thus, the co-existence of wildlife and humans can be promoted and accepted through understanding local attitudes-a task to be done by proper planning and education so that local communities near wildlife habitats learn to co-exist and appreciate wildlife around them.

Community attitudes towards conservation are influenced by the balance between the costs that communities must bear and the benefits they receive, with local governance having the greatest impact on community attitudes. Using the Social Exchange Theory framework for analysis, it is

clear that communities not only consider the benefits of conservation but also weigh the costs (both tangible and intangible) against the benefits they are likely to receive or those they have already received. The negative effects of crop destruction and attacks by wild animals on local communities confirm the SET theory, which states that recurrent losses in livelihood lead to a reduction in the community's willingness to support conservation. The role of power disparity as a negative predictor is indicative of the fact that conservation is not only assessed in terms of costs but also in terms of fairness, reciprocity, and legitimacy. The governance failures that either exclude or marginalize local voices undermine the perceived fairness of the 'exchange' between conservation and the community, thereby increasing resistance, even where some benefits are present. On the other hand, the positive effects of education, youth, and wage labor suggest that, through increased capabilities and opportunities, the perception of conservation as beneficial is also enhanced. The varying impact of education suggests that knowledge and awareness increase the perceived value of conservation benefits. At the same time, the younger respondents and those with wage-based livelihoods experience fewer losses and have greater adaptability in their approach towards conservation.

The study's findings have important practical implications. Firstly, the need for governance reform is paramount. Closing the power gap requires institutions that give the community the right to be heard in the decision-making process and ensure that benefits are shared transparently. Participatory budgeting, equitable representation in WMA management boards, and clear accountability structures could be some of the mechanisms that can be used to reduce the perception of unfairness. Secondly, sharing the benefits must be done in a way that is both transparent and fair. Areas most affected by wildlife conflicts should receive no less than what they generate in tourism revenues and conservation-linked projects. Thirdly, ensuring that education and youth participation are done strategically is of utmost importance for the future. Educational initiatives that enhance the community's conservation literacy, combined with targeted training programs that engage young people in conservation roles, can provide a source of ongoing support. Lastly, efforts to reduce conflict must be prioritized through measures such as providing financial assistance for crop protection technologies, forming a team that can rapidly respond to wildlife incursions, and implementing compensation schemes that are timely and easily accessible. All these measures can effectively cut down the ecological costs that currently hinder the acceptance of conservation.

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