

Perceptions Towards Sustainable Conservation and Wildlife Resources in Protected Areas: The Tuli Circle, Zimbabwe

Robert Muzvondiwa^a

^aZimbabwe Parks and Wildlife Management Authority, Zimbabwe.

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ABSTRACT

Tuli Safari Area or Tuli Circle have a spatial extension of 416km² set aside for sustainable wildlife conservation. The area surrounded by Shashe, Dibilishaba, Machuchuta, Masera and Maramani communal areas. There is evidence of illegal harvesting of wildlife resources by the local community from visual data collected by Zimparks officers on patrol in the field, hence the need to appraise the nature and cause. The research employed both quantitative and qualitative data collection methods. Triangulation of data collection tools was employed to ensure reliability and validity of the results. Data collection tools, which encompass field observation, questionnaires, interviews and focus group discussions were used to solicit data from informants. Judgmental and a non-probability sampling technique were used to come up with the subjects of the study which includes Village Heads, Senior Village Heads, Headmen and Councilors. A sample of 50 subjects were chosen on the basis of the researcher's knowledge and judgment of the subjects as office bearers and the positions they hold in the community. Prevalence of domesticated animal encroachment, arson, human wildlife conflicts and illegal harvesting of wildlife and wildlife products by adjacent local communities is common in and around TC. High demand for grazing pastures and water resources for domesticated animals and people is the main cause of conflicts between wildlife, wildlife custodians and the adjacent communities. Law enforcement coupled with environmental awareness assists in the minimization of conflicts between human and wildlife, poaching and domestic animal encroachment.

KEYWORDS:

Wildlife Conservation, Community Actions, Sustainable Conservation, Illegal Harvesting, Community Perceptions.

1. Introduction

Tuli Circle (TC) or Tuli Safari Area (TSA) is found on the south western part of Zimbabwe. TC is part of 13.1% land designated to Zimbabwe Parks and Wildlife Management Authority by the Government of Zimbabwe set aside for wildlife conservation. Sustainable conservation of biological diversity is a popular subject worldwide and has become an issue of lively debate among conservationists (Frank *et al* 2019). In the face of human population growth and near overstretch of livelihood capacities of different population groups, 'original' land owners are now agitating to reclaim their lands which were previously acquired by government for conservation purpose (Brechin, Wilshusen, Fortwangler & West, 2003).

Large tracts of land have been set aside across Africa where complete protection of species and their habitats is the primary focus (König *et al.*, 2020). Thinking in conservation circles following the publication of the World Conservation Strategy (WCS) in 1980 has shifted towards integrating and reconciling human needs and conservation practices (Gandiwa *et al.*, 2014). In formulating policies to support collaborative natural resources management, it is important to realise that different interest groups hold different perceptions towards wildlife (Pooley, Bhatia & Vasava 2020).

Some local communities regard wildlife as a 'God-given gift' to exploit without stringent state controls. Others consider wildlife to be a national heritage that equally belongs to all citizens and that should be exploited under the auspices of and for the benefit of the nation (Hazzah, Chandra & Dolrenry, 2019). The argument is that, unless local communities are able to directly benefit financially from neighbouring wildlife resources, illegal harvesting of wildlife resources will always persist, maintains, (Kansky, Kidd & Fischer, 2021).

Understanding community actions and perceptions is pivotal in achieving sustainable wildlife management in conservation areas. (Bennett, 2016). To attain developmental goals whilst conserving wildlife there is need to understand peoples' actions and attitudes towards wildlife conservation and illegal use of wildlife resources and be able to manage them (Haruna & Mwalyosi, 2020). Peoples' actions and perceptions about wildlife protection, and illegal use are not taken cognisant of and into consideration (Frank, Glikman & Marchini, 2019). People feel that exclusive preference is given to wildlife since large tract of land are put aside by the government as wildlife conservation areas.

Mhlanga (2000:16), defines sustainable conservation as “to protect, manage and uplift earth’s natural resources for current and future generations.” Conservation includes judicious or wise usage of resources by humans available in nature.

Tuli Circle is not spared from a myriad number of problems bedevilling many conservation areas adjacent to human settlements. The area is surrounded by Shashe, Dibilishaba, Machuchuta, Masera and Maramani communal areas.

Tuli Circle has a relatively large assemblage of wildlife which occasionally move out of protected areas in search of browse and forage, (Lischka et al., 2019). As they pass through residences, they sometimes destroy property, domesticated animals and crops (Morehouse & Boyce, 2017). Poaching incursions, domestic animal encroachment, human wildlife conflicts are common in and around Tuli Circle. Due to expansion of rural communities adjacent to TC and increased demand for land, residential and commercial properties have exacerbated human wildlife conflicts. Hence, the research seeks to appraise perceptions towards sustainable conservation and wildlife resources in and around Tuli Circle and suggests measures which can be adopted to assist conservationists to address such problems.

2. Methodology

Blackstone (2018) defines methodology as the philosophy and logic of the research process. The study is analytical and descriptive in nature and gave a detailed insight into the nature and causes of human actions and perceptions towards sustainable conservation and illegal harvesting of wildlife. Judgmental or purposive sampling, a non-probability sampling method involving selective sampling was deliberately used to select Village Heads, Senior Village Heads, Headmen and Councillors from community members.

A questionnaire is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent, postulate, (Crossman, 2020). For the purpose of this research, the researcher sought direct consent from the participants to appreciate the subjects under study and acknowledging their constitutional rights. The consent was on voluntary basis, meaning that an individual had the ability to choose whether to participate in the research or not.

It was also imperative that the researcher avoids bias, which is an unethical practice by ensuring objective gathering and reporting of the data. Appropriate research methodology and correct reporting was also ensured as part of ethical considerations. The researcher circulated questionnaires to chosen respondents in the sample frame. The questionnaires were hand delivered to relevant respondents to make sure that those who were selected by the researcher received them. Questionnaires contains list of questions the investigator intended to enquire from the subjects and had both open and closed ended questions.

Data was collected by rangers on daily, strategic and extended patrols was used to support and augment the findings from questionnaires, interviews and FGDs. Above all, data collected on problem animal controls and awareness campaigns was used to reliably validate the findings of the research. Data recording, processing, analysis and storage was done at Tuli Circle main station.

Tools used for data collection include questionnaires, key informant interviews, focus group discussion (FGD), as propounded by, (Ashley, 2019). Participatory research tools have been employed so that information collected captured local people's actions, perceptions and attitudes. Purposive sampling method assisted in making the most out of a small population of interest and arrive to valuable research outcome, buttresses, (Crossman, 2020). Key informants were the Village Heads, Senior Village Heads, Chiefs and Ward Councillors who participated in the study in their capacity as the office bearers and community representatives.

A sample of 50 units was selected comprising of five councillors, five headmen and 40 Senior / Village Head from five communal areas which surrounds TC. The researcher determines the sample size by deciding the number of people to be involved in the research to ensure validity and reliability of the results obtained. Sample size determination 50% of whole population of the target group (Senior / Village Head, Headman and Councillors) under study was chosen to represent the population. Field observation is a qualitative data collection method, which is used to observe naturally occurring behavior of people or animals in their natural settings.

Field observations in Tuli Circle including poachers' encounters, visual incursions, recovery of snares, animal carcasses and cattle encroachment for the past three years by Rangers were undertaken. An interview is conversation between the interviewer and the interviewee with a specified purpose Blackstone

2018). Interviews were used to solicit information from Parks Officers, Senior/Village heads, Headmen, Councillors. An interview allowed the researcher to gather subjective opinions as well as factual information.

Data obtained from field observations on patrols, interviews, questionnaires as well as focus group discussions was coded, categorised and analysed by themes. The data collected from the community leaders and Rangers was analysed using the Statistical Package for Social Sciences® (SPSS) version 16.0.

3. Results and discussion

It was noted that 94% of the community leaders from Shashe, Dibilishaba, Machuchuta, Masera and Maramani communal areas concurred that their subjects illegally introduce domesticated animals in TC intentionally in the dry season for grazing and water. The main land use practiced in communal areas adjacent to Tuli Circle conservation area is livestock ranching and some private game conservation areas a distant along Shashe-Limpopo River. Above all, both Beitbridge and Gwanda have CAMPFIRE areas close to TC administered under the auspices of respective rural district councils. According to (Kansky, Kidd & Fischer, 2021), conflicts exist between various resource user groups and uses such as livestock ranching, farmers and wildlife conservation. Conflicts between people, Parks Officers, wildlife and domestic animals are always common due to boundary porosity which is Shashe River the only source of natural water for domestic animals and people during the dry season. Besides that, 86% of the respondents confirmed that communities living around Tuli Circle conservation area illegally harvest wild animals for both subsistence and commercial purposes. The surrounding irrigation schemes which were introduced by the Government of Zimbabwe to argument food security in Matabeleland South which is hot and semi-arid region illegally provide wires for snaring of wild animals. Above all, some poachers steal copper wires in Zimbabwe, South Africa and Botswana for trapping wildlife in the conservation area.

Essence of contemporary environmental awareness campaigns

Illegal harvesting of wildlife resources manifest lack of genuine participation and involvement of the local people in sustainable wildlife conservation programmes at grassroots level, submits, (Treves & Santiago-Ávila, 2020). From the results, 90% of the community leaders responded that they actively

participated in CAMPFIRE initiatives either under Gwanda or Beitbridge Rural District councils. Through CAMPFIRE, communities are taught on how to sustainably use wildlife resources so that they can derive direct benefits from sustainable wildlife conservation and management. Equipping people with knowledge through awareness campaigns assist to change the people’s actions, behavior and attitude towards wildlife. Local people conserve what they know, fully understand and derive a direct benefit from, postulated, (Hazzah, Chandra & Dolrenry 2019).

Above all, 66% acknowledged that ZimParks under Community Liaison and Extension Services regularly carry out educational environmental awareness campaigns in their local areas periodically. Awareness coupled with positive attitude change results in behavior change, avers, (Pooley, Bhatia & Vasava, 2020). Law enforcement and environmental policies are mostly reactive to problems whilst awareness is proactive. Above all, the creation of protected areas and law enforcement has failed to totally curb unsustainable exploitation of wildlife resources such poaching. Hence, environmental awareness might be the panacea to environmental problems, proclaims, (Knox, Ruppert, Frank, Sponarski & Glikman, 2021).

Table 1: Human Wildlife Conflicts (HWC) reports and Awareness Campaigns (AC) held. Source: Field Data TC, 2018-2021

| Year | 2018 | 2019 | 2020 | 2021 |
|--------------------------|------|------|------|------|
| Awareness Campaigns held | 12 | 14 | 18 | 13 |
| HWC Reports | 4 | 4 | 17 | 13 |

Pearson Correlation Coefficient test on relationship between Awareness Campaigns (AC) held and Human Wildlife Conflicts (HWC) reports received.

Table 2: Pearson Correlation Coefficient test on relationship between Awareness Campaigns (AC) held and Human Wildlife Conflicts (HWC) reports received. Source: Field Data, Tuli Circle 2018 -2021.

| X | Y | XY | X ² | Y ² |
|----|----|-----|----------------|----------------|
| 12 | 4 | 48 | 144 | 16 |
| 14 | 4 | 56 | 196 | 16 |
| 18 | 17 | 306 | 324 | 289 |
| 13 | 13 | 169 | 169 | 169 |
| 57 | 38 | 579 | 833 | 490 |

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Pearson Correlation Coefficient Formula. Pearson's Correlation Coefficient formula is as follows, Where, r = Pearson Coefficient. n= number of observations. $\sum xy$ = sum of products of the paired observations (scores). $\sum x$ = sum of the x scores. $\sum y$ = sum of the y scores. $\sum x^2$ = sum of the squared x scores. $\sum y^2$ = sum of the squared y scores.

$$\begin{aligned} r &= \frac{4 [579 - (57)(38)]}{\sqrt{[4(833) - (57)^2][4(490) - (38)^2]}} \\ &= \frac{2316 - 2166}{\sqrt{(3332 - 3249)(1960 - 1444)}} \\ &= \frac{150}{\sqrt{(83)(516)}} \\ &= \frac{150}{\sqrt{42828}} \\ &= \frac{150}{206.95} \\ &= \underline{0.7248778196} \\ &= \underline{0.725}. \end{aligned}$$

Therefore, there is a positive correlation coefficient between Awareness Campaigns (AC) held in Tuli Safari Area and Human Wildlife Conflicts (HWC) experienced in the Area. The Zimbabwean experience suggests that if wildlife is permitted to contribute meaningfully to the welfare of the people, they will not afford to lose it in their battle for survival, propounds, (Gandiwa, et al., 2014). It is the role of proactive awareness campaigns to create environmentally enlightened societies in far as sustainable use is concerned.

Community activities in Tuli Circle conservation area

With the respondents acknowledging 90% participation and involvement in CAMPFIRE initiatives, 86% poaching, 94% cattle encroachment this manifest community actions both positive and negative in TC. Natural resources conservation and management is difficult to achieve without local community participation and involvement, propounded, (Glowka et al., 1984). Murphree (1991:22) avers that “illegal harvesting of wildlife and human wildlife conflicts are always common in Africa especially to communities living adjacent to protected areas and are documented.”

Poaching incursions, domestic animals’ encroachment and human wildlife conflicts are more concerted from the Zimbabwean side of the conservation area and cascade into Botswana due to the porosity of the conservation area and the boundary as well. The main modes of poaching adopted by poachers are the use of wire snares, dogs, spears and torches during the night. Modifications of habitats through man’s use of land have altered the distribution and abundance of many large mammals, postulates, (Livingstone, 1857). The omnipresence of wires makes it easier for poachers to conduct their business through use of wire snares to illegally trap wildlife. Table below shows community activities in Tuli Circle conservation Area.

Table 3: Community activities in Tuli Circle conservation Area. Source: Field Data, Tuli Circle 2018 -2021.

| Community Activity | 2018 | | 2019 | | 2020 | | 2021 | | Total |
|--------------------------------|------|-------|------|-------|------|-------|------|-------|-----------|
| | O | E | O | E | O | E | O | E | |
| Poaching Incursion | 15 | 11.46 | 08 | 8.31 | 19 | 18.05 | 07 | 11.18 | 49 |
| Intr. of domestic animal cases | 21 | 19.65 | 17 | 14.25 | 27 | 30.95 | 19 | 19.16 | 84 |
| Human Wildlife Conflicts | 04 | 8.89 | 04 | 6.44 | 17 | 14 | 13 | 8.67 | 38 |
| Total | 40 | | 29 | | 63 | | 39 | | 171 |

Chi-square test for the association between community activities and sustainable wildlife conservation initiatives in Tuli Circle conservation area. Community activities were noted and recorded by wildlife rangers in the field include poaching incursions, introduction of domestic animals and human wildlife conflicts in areas around Tuli Circle. The data used was recorded from 2018 to 2021.

Table 4: Chi square on community activity in Tuli Circle. Source: Field Data, Tuli Circle 2018 -2021.

| Community Activities | 2018 | | 2019 | | 2020 | | 2021 | | Total χ^2 |
|---------------------------|-------|-----------------------|-------|-----------------------|-------|-----------------------|-------|-----------------------|----------------|
| | O-E | (O-E) ² /E | |
| Poaching incursion | 3.54 | 1.09 | 0.31 | 0.01 | 0.95 | 0.05 | -4.18 | 1.56 | 2.71 |
| Intr. of domestic animals | 1.35 | 0.09 | 2.75 | 0.53 | -3.95 | 0.5 | 0.16 | 0.001 | 1.12 |
| Human wildlife conflicts | -4.89 | 2.69 | -2.44 | 0.92 | 3 | 0.64 | 4.33 | 2.16 | 6.41 |
| Total | | 3.87 | | 1.46 | | 1.19 | | 3.72 | 10.24 |

Null Hypothesis, (H_0): There is no association between community activities and sustainable conservation initiatives.

Alternative Hypothesis, (H_1): There is an association between community activities and sustainable conservation initiatives.

$df = (r-1)(K-1)$: where r is the number of rows and k is the number of columns

$$df = (3-1)(4-1),$$

$$(4)(5) = 6$$

$$6 = 12.6$$

X^2 cal (10.24) < df (12.6), hence, acceptance of the null hypothesis, (H_0), therefore, there is no association between community activities and sustainable conservation initiatives.

Community activities in Tuli Circle symbolises their attitudes and perceptions towards illegal harvesting and sustainable conservation of wildlife resources. If wildlife does not contribute significantly to their well-being, people will not be able to afford to preserve it, except as tourist curiosity in a few protected areas cited, (Holdgate, 1992). Sustainable conservation initiatives have been established for the people surrounding Tuli Circle to benefit through CAMPFIRE initiatives where 90% are involved and participate which is administered through Gwanda and Beitbridge Rural District Councils.

In order to aid sustainable utilization of wildlife the concept of CBNRM has been introduced in many sub-Saharan African States, cites, (DSE Seminar 1999). However, it seems the communities are not taking cognisance of CAMPFIRE initiatives and advocates to illegal and unsustainable harvesting of wildlife and wildlife derivatives in and outside Tuli Circle.

In this regard, the community do not have the aesthetic and economic value of wildlife dwelling adjacent to them bestowed in their minds. Transfer Appropriate Authority (AA) from Zimparks to RDCs were just as good as transferring authority from one government arm to another with sincere participation and involvement of the local community. Many projects which call for community participation and involvement in wildlife conservation and management have been launched throughout Africa over the past ten years states, (LIIED, 1984). Above all, in formulating policies to support collaborative natural resources management, it is imperative to realize that different interest groups hold different perceptions about wildlife.

The role of law enforcement and anti-poaching (LEAP) initiatives.

It has been noted that 86% of the respondents acknowledged that poaching is one of the negative activities done by their communities living adjacent to TC. Law enforcement and anti-poaching operations in Tuli Circle is determined by the mood of the mighty river Shashe. However, existing legislation governing the utilisation of wildlife and wildlife products does not consider local people's perceptions about protection and illegal use of wildlife as an issue in wildlife management and conservation arena, (Parks and Wildlife Act Chapter 2014 of 1996).

Prior to colonisation African communities were dependent on wild animals and plant resources, communities exercised collective access to the resources through complex sharing and rotational schemes, says, (Mhlanga, 2000). It is only recently that African countries have begun to question the conservation practices they have inherited from their colonial masters.

Table 5: Law Enforcement and Anti-Poaching (LEAP) initiatives in Tuli Circle. Field Data, Tuli Circle 2018 -2021.

| Year | 2018 | 2019 | 2020 | 2021 |
|---------------------|------|------|------|------|
| Local patrol | 672 | 756 | 1092 | 1134 |
| Extended Patrol | 532 | 560 | 1064 | 1200 |
| Awareness Campaigns | 12 | 14 | 18 | 13 |

Despite huge financial resources spent on law enforcement and awareness campaigns by the state and private agencies, there seem to be stumpy comprehension on the importance of wildlife resources in Zimbabwe, propounds, (Gandiwa et al., 2013). This can be manifested by the omnipresence of domestic animal encroachment in the conservation area, human wildlife conflicts, poaching and illegal use of wildlife resources in and around protected areas, buttressed (Slagle & Bruskotter, 2019). This is mainly because of lack of genuine participation and involvement of the local communities in the management and conservation programmes of wildlife and natural resources, suggests, (Knox, Ruppert, Frank, Sponarski, & Glikman 2021).

Legislation coupled with environmental policies cannot guarantee continued existence of natural resources without the support of the local communities who use and exploit the resources proposes, (Glikman, Frank & Marchini, 2019). In spite of law enforcement and awareness campaigns, local communities continue to illegally harvest wildlife and prevalence of human wildlife conflicts, posing a threat to their survival, cites, (Slagle & Bruskotter, 2019).

Wildlife managers have been unable to cope up with the problem and, as a result, pressure on the dwindling wildlife populations is increasing claims, (IUCN 2020). Several cases of human disturbances have been recorded in Tuli Circle for the past five decades, the surrounding communities have been caught many times involved in poaching, arson and illegal introducing of domesticated animals in the conservation area.

4. Conclusions and Recommendations

Local residents appreciate the fact that wildlife in Tuli Circle is there to stay and the development of the area depends on it. The reason for supporting the preservation of conservation area by local communities is that it generates revenue and foreign currency through hunting and tourism. Above all, people around Tuli Circle sometimes seem to be less tolerant to the damage inflicted on them and their property by wild animals.

It is evident that people are positively inclined towards sustainable wildlife conservation and management. However, this attitude can be eroded unless they are protected from wild animals and their needs are addressed. At the moment in areas like Shashe, Dibilishaba, Machuchuta, Masera and Maramani which are adjacent to the conservation area, people are failing to co-exist with wildlife.

It is recommended that policy makers take cognisance of different community aspirations and views on the ground since they are the owners and custodians of the wildlife resources living adjacent to them. Furthermore, policy makers should revisit and revise their policies to suit the needs of the local people who live adjacent to wildlife for them to co-exist sustainably.

Benefits from wildlife should be extended to the local community for them to develop a friendly and good attitude towards sustainable wildlife and wildlife conservation authorities. There is a clear testimony that Gwanda and Beitbridge Rural district Councils who have been given Appropriate Authority by the Government of Zimbabwe are failing to walk the talk since there is no genuine participation of the local people at household level. Despite that, Appropriate Authority (AA) was conferred to RDCs, the authority should be given to the local people at household level for the residents to exercise a meaningful stewardship and ownership over wildlife resources for them to achieve sound sustainable wildlife conservation. This will enable the community at grassroots level to walk the talk and realize the aesthetic and economic value of wildlife through benefit-sharing directly gained from sustainable utilisation of wildlife resources in their local area.

In order to avoid domesticated animal encroachment in the conservation areas designated for wildlife conservation, Rural Development Councils and development authorities have a significant role to play.

Introduction of programmes which provide water and rangelands restoration in areas adjacent to the conservation area is pivotal. Shashe river is the only perennial source of water supply in the area hence conflicts arise between domesticated animals, people and wildlife. If development continues to encroach along Shashe river, blocking and occupying wildlife corridors, habitats and niches there will be persistence of human-wildlife problems.

Planners need to be aware of the presence and importance of wildlife before they embark on any developmental projects. Integrated environmental impact assessments and liaise with Zimbabwe Parks and Wildlife Management assess if the proposed developmental project does not interfere with wildlife habitats. Sustainability of conservation areas worldwide depends on the attitudes and perceptions of the local residents.

Moreover, there is need to intensify regular awareness campaigns in the nearby communal areas to foster attitude change to the community through transmission and dissemination of sustainable wildlife conservation information. This will enhance installation of sustainable wildlife conservation software in their minds since they are the hardware of sustainability. Above all, this will assist to solve the prevalence of human wildlife conflicts currently experienced in all communal areas around Tuli Circle.

Awareness campaigns are a proactive measure of sustainable wildlife management rather than law enforcement and anti-poaching initiatives which are sometimes reactive after the damage has already been done on wildlife resource. In spite of that awareness campaigns assist in the creation of well illuminated, enlightened and environmental conscious residents.

Intensification and equipping of law enforcement and anti-poaching initiatives assist to lessen illegal harvesting of wildlife and their derivatives in Tuli Circle. Introduction of stiffer penalties for poachers, which are deterrent and exemplary to the community, assist in the reduction of illegal exploitation of wildlife resources. Integration and amalgamation of regulations assist in the strengthening of judgements by courts for wildlife crimes. For example, a poacher found in possession of copper wire snares can be charged with Parks and wildlife Act, (Chapter 20:14) in conjunction with Copper Control Act, (Chapter 14:06). A fishmonger illegally fishing using mosquito nets can be charged with Parks and wildlife Act, (Chapter 20:14) in conjunction with Health Act, (Chapter 15:09).

Regional integration to manage shared wildlife resources is unavoidable since Tuli Circle share spatial conservation area with Botswana and South Africa closely. The proposal of Greater Mapungugwe Trans-Frontier Conservation Area (GMTFCA) by three countries, Zimbabwe, Botswana and South Africa is an idea welcome to regional integration on law enforcement and anti-poaching initiatives in order to achieve sustainable conservation of wildlife resources.

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