BINDURA UNIVESITY OF SCIENCE EDUCATION

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EFFECT OF COVID-19 PANDEMIC ON WILDLIFE CONSERVATION IN MATOPO NATIONAL PARK ZIMBABWE.

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DEDICATION

This research project is dedicated to the Nyamanjerere family who suffered for my success, and I know you are very proud of me.

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ABSTRACT

The global pandemic of Covid-19 had detrimental repercussions on the conservation of wildlife, Nature Based Tourism (NBT) and local community livelihoods particularly for those adjacent to Protected Areas. Focusing in Matopo National Park Zimbabwe this project was focused on assessing the implications of the Covid-19 pandemic on wildlife conservation; status of NBT and gain understanding on the main sources of livelihoods before Covid-19 and other means of sustaining their livelihoods during Covid-19. The research was divided into three phases of 2020 (zero-lockdown, total-lockdown and partial-lockdown). The findings of the research are that poaching incidences increased during the 2020-2021 period of Covid-19 pandemic as compared to the period before the pandemic (2015-2019), tourist flow declined during the pandemic and local communities embarked on several socio-economic activities during Covid-19 and the Pandemic negatively impacted the livelihoods of people living adjacent to the park.

List of Acronyms and Abbreviations

BUSE	Bindura University of Science Education
CBO	Community Based Organization
GDP	Gross Domestics Product
IPZ	Intensive Protection Zone
KII	Key Informant Interview
MNP	Matopo National Park
NBT	Nature Based Tourism
PAs	Protected Areas
RMNP	Rhodes Matopos National Park
SADC	Southern African Development Countries
SDGs	Sustainable Development Goals
WHO	World Health Organization
WMA	Wildlife Management Area
ZPWMA	Zimbabwe Parks and Wildlife Management Authority

Table of Contents

List of figures

CHAPTER ONE

1.1 INTRODUCTION

SARS-CoV-2 is an infectious agent that causes coronavirus disease also known as Covid-19. Specialists concur that Covid-19 originated in Wuhan‘s ‘wet market’ which offers living and dead wild and domestic animals for sale as meat. Some researchers state that this virus may be present in pangolins, while others think it may be in bats (Kickbusch et al., 2020).

Most of developing countries have been positively affected by Covid-19 imposed lockdown regulations for instance restricted movements of people in Protected Areas (PAs) lowered stress on wild flora and fauna and its habitat, reduced air and traffic pollution due to minimized human activities in PA (Chebby et al., 2021). However Covid-19 pandemic made wildlife conservation more difficult in various ways for example poaching incidents due to inadequate human resources, resorting to bush-meat hunting for survival, high spread of veld fires due to lack of enough man-power on the ground (Chebby et al., 2021). Since parks did not receive visitors, ecotourism dwindled and this reduced financial support for wildlife conservation. More so human perspective regarding wildlife as hosts of this disease led to merciless killing of animals in retaliation for instance indiscriminate killing of endangered Chinese pangolin and the rare Indian pangolin (Stone et al., 2021).

1.2 BACKGROUND

Wildlife conservation has been affected by reduced financing which also led to retrenchment and firing of important key players in wildlife protection. In many African countries illegal hunting is generally acceptable, however staff rotation and providing rangers with patrol requirements have been affected by Covid-19 imposed restrictions, wearing down and reducing rangers’ morale. Community wildlife conservation frequently depends on meetings, parks and community liaisons mostly with no access to technological communication (Ndlovu et al., 2021).

The pandemic put more pressure on wildlife and its habitat and communities that depend on them. A decline in revenue generated from tourism and severe social economic constraints brought by Covid-19 worsened lives of rural population, budget limitations and Covid-19 related constraints also hindered wildlife conservation efforts at the same time. As a result poaching, tree cutting, small scale mining, people and livestock encroachment and agricultural conversion

impacted wildlife conservation. In this crisis decrease in animal population, extinction of some species locally, amplified ecological disturbances since some ecosystem and wildlife population are already on a verge of extinction (Mhlanga and Ndhlovu, 2020). Communities living on peripheries of PAs are usually affected with food insecurity, government indifference and they heavily rely on natural resources for their survival (Mudzengi et al., 2022). However they make use and have the potential to care of natural resources. Local communities carry the conservation cost frequently without getting the rewards for instance (human-wildlife conflict (HWC), and not being considered in natural resources management). Community-based conservationist model of community engagement to control natural resources was also affected pandemic. Implications on local conservation efforts and tourism sector have significant negative economic effects on communities. Conservation's opportunity cost and the danger of conversion of land also increase with dwindling tourism and trophy hunting revenue. Governments, private landowners and local communities trust wildlife conservation as a reliable land use strategy choice could be damaged by the abrupt loss of wildlife-based revenue. Engagement between conservation organizations and communities is hampered by movement restrictions and social distancing regulations jeopardizing hard-won conservation gains trust with the communities (Musakwa et al., 2020).

Due to economic collapse rural populations witnessed financial challenges caused by Covid-19 pandemic and government regulations in addition to tourism revenue loss. Market for livestock, curios and farm products were closed hence cutting down vital communities' sources of livelihoods. Job losses in urban areas due to Covid-19 imposed lockdown made people to move back to rural areas, this is clearly shown with transnational laborers who moved to communities closed to PAs close to international borders (Musakwa et al., 2020). Threats to wildlife conservation mainly increase due to increased poverty and food insecurity. In the face of economic meltdown many African rural population lacking access to food are drawn to PAs boundaries when there are no capital reserves for the money in order to utilize the region's natural resources (Mudzengi et al., 2022) Some of these consequences include a rise in poaching, cutting down of trees for charcoal and timber, small-scale mining, people and livestock encroachment in PAs and destruction of wild spaces (Mudzengi et al., 2022).

1.3 PROBLEM STATEMENT

Economic constraints brought about by Covid-19 lockdown intensified illegal fishing, massive cutting down of trees and poaching in protected ecosystems, with many ecotourism related jobs at risk across the nation. In the period of the pandemic the country's agenda was protecting human life in this devastating period the banning of social gathering (Cherkaoui et al., 2020). However in most of PAs social and economic effects of the pandemic are observed especially in regions where local communities heavily depend on nature based tourism for their livelihoods. For instance in Moroccan conservancies grass roots organizations depending on ecotourism to finance endangered species projects were forced to closed due to closure of regional and international borders leading to huge losses income(Cherkaoui et al., 2020). While owing it to reduced law enforcement effort due to Covid-19 impacts poaching increased as there was less manpower to monitor activities in the park.

There are few facts concerning the extent to which the impacts of Covid-19 change the patterns and livelihoods of communities particularly those that heavily depend on PAs, despite the fact that information on how the Covid-19 pandemic affects protected and conserved areas, as well as recommendations on what should be done to mitigate its effects is readily available (Kideghesho et al., 2021, Shoo et al., 2021) additionally there is few data on alternate forms of income used by locals living close to PAs to support themselves during the Covid-19 pandemic and its effects on biological diversity preservations. Therefore, in order to ensure the wellbeing of both the local residents and protected regions, additional in-depth researches are required to examine the aforementioned challenges.

1.4 JUSTIFICATION

This study is important in that it will provide information on how the Covid 19 pandemic affected wildlife conservation in Matopo National Park. It will also provide information on the livelihood strategies that were used by communities adjacent to the Park during the Covid-19 pandemic.

1.5 AIM

To assess effect of Covid-19 Pandemic on wildlife conservation in Matopo National Park, and livelihood strategies of communities living adjacent to the Park.

1.6 Specific Objectives

1. To compare local communities' sources of livelihood amidst the Covid-19 pandemic era between 2020/21 and the period 2015 to 2019.
2. To compare poaching incidences between the initial Covid-19 span of 2020/21 and the period of 2015 to 2019.
3. To asses tourist arrival patterns at Matopo National Park in the different periods of Covid-19.

1.7 Research Questions

1. What were the sources of livelihood of the local communities during the initial Covid-19 pandemic period of 2020/21 and 2015/19?
2. What incidences of poaching activities occurred between 2020/21 Covid-19 era and the period 2015/19?
3. What period of Covid-19 pandemic did Matopo National Park experience a rise in tourist arrival patterns?

CHAPTER TWO

LITERATURE REVIEW

2.1 Background of Covid-19 Pandemic

According to (Neupane, 2020) the globe experienced one of the global greatest shocks which is the COVID-19 pandemic. For instance, in Wuhan first cases of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Cov-2) were observed in December 2020. Mortality and other health problems rose due to the spread of the virus on a global scale(Bennett et al., 2020, Wang et al., 2020). On the 11 of March 2020, according to (Neupane, 2020) the World Health Organization (WHO) declared Covid-19 a global pandemic. Various industries including wildlife conservation, tourism, the health sector, and other daily activities experienced the impact of Covid-19 (Pinner et al., 2020, Saadat et al., 2020). Livelihoods of the majority of developing countries are not stable but the COVID-19 pandemic worsened the situation, according to (Chebby et al., 2021) African countries lost about 220 billion US dollars due to the COVID-19 impact on food security, employment, and other social economic sectors. According to (Bennett et al., 2020, Neupane, 2020) some research highlighted the positive impacts of the COVID-19 on biological diversity conservation for example limiting number of tourists and the associated pollution inside and outside protected areas thus creating a conducive environment for wildlife expansion.

The Zimbabwean government imposed regulations at the national level in response to the spread of COVID-19, for example, Statutory Instrument 77 of 2020 Public Health (COVID-19) Prevention, Containment, and Treatment regulations (Ndlovu et al., 2021). An abrupt stop to international travel prohibiting regional and international tourists from visiting the country brought an abrupt halt to tourism hence affecting tourism generated revenue in the first quarter of COVID-19 period 2020.

2.2 Local Communities' Livelihoods under COVID-19 Pandemic

Findings from other studies showed how susceptible people in Africa without adequate resources are to Covid-19 (Nhamo et al., 2020). In Zimbabwe such an impact has an important effect on societal and economic welfare (Nyabunze and Siavhundu, 2020). The Covid-19 has had a severe negative influence on the finances and management efficiency of PAs, as well as on the livelihoods of the communities residing in and near these areas (Spenceley et al., 2021). Threats

to biodiversity including poaching, wildlife trafficking and forest logging have escalated during and after Covid-19 era due to economic crisis generated (Cherkaoui et al., 2020).

In Morocco, Marrakech 30% of hotels and other tourism activities summing up to 42% the March 2020 lockdown led to closure of these jobs putting a heavy toll on livelihoods that depended on tourism for survival (Cherkaoui et al., 2020).

According to (Sumner et al., 2020) the achievement of sustainable development goals (SDG) particularly SDG1 of poverty alleviation was compromised. (Spenceley et al., 2021) African tour operators experienced a decline in the bookings of more than 75% this threat robbed a million livelihoods of their jobs. In support of this (Barrow and Fabricius, 2002) argues that globally people living close to the parks and protected areas are poor and depend on natural resources for their survival. People and livestock encroachment into PAs, increased subsistent poaching and reduced funding are all expected impacts of the above actions on wildlife conservation (Guerbois and Fritz, 2017).

Additionally most of villages in Tanzania including Mwanda, Kakoi and Maweni during the Covid-19 induced lockdown shifted to other sources of livelihoods such as farming, livestock husbandry, fishing and Boda-Boda (Motorcycle taxis). Others were left with no means of livelihoods resulting in people breaking Covid-19 imposed lockdown rules and regulations to sustain their livelihoods (Chebby et al., 2021).

2.3 Relationship of the Covid-19 Pandemic and Wildlife Conservation

COVID-19 can cause a decline in tourism, trophy hunting generated revenue, food insecurity and poverty which pose a huge threat in wildlife stewardship and conservation (Lindsey et al., 2020, Mease et al., 2018). However according to (Arora et al., 2020) despite closure of tourism the environment also benefited from COVID-19 restrictions, for example wild flora and fauna gained enough room to occupy spaces typically occupied by humans.

In China greenhouse gas emission was reduced for instance carbon dioxide was reduced to 25%, nitrogen dioxide to 30% and a 6% global decrease of these greenhouse gases (Tohjima et al., 2020). Additionally due to lockdown regulations (Neupane, 2020) highlighted that human movement in PAs was reduced hence lessening stress and pressure on wildlife.

On the other hand a number of literature indicates that the crisis of COVID-19 brought some negative impacts for instance limited monetary support for wildlife conservation the reason being no tourism occurred as a result of parks being closed, increase of wildfires in PAs because of limited manpower, unlawful wildlife harvesting becoming a source of survival for communities living near PAs and governmental and non-governmental organization putting their main focus on COVID-19 prevention and treatment neglecting wildlife protection.

More so wildlife survival and their natural habitat mainly within and outside PAs was at a great risk because of alternative activities practiced by the local people for example intensive agricultural production and livestock keeping (Chebby et al., 2021). To add on intense wildlife killing due to false assumptions of wildlife as a vector of this pandemic was experienced in Africa, Asia and South America (Neupane, 2020, Spenceley, 2020)

2.4 Wildlife-based Tourism and COVID-19 Relationship

Sustainable NBT is a growing economic engine for many countries (Cherkaoui et al., 2020). Income related to tourism is an important means of financing efforts of conservation in less developed countries. In Zimbabwe trophy hunting in 16 safari areas (38% of the areas covered by PAs) and photographic tourism in 11 national parks and 16 recreational parks (54% of the total areas covered by PAs) account for 80% that is US$ 25 million of the Zimbabwe Parks and Wildlife Management Authority (ZPWMA) annual revenue budget (Lindsey et al., 2020). Donor aid is another source of finance for conservation, contributing up to 32% of the money for PAs in Africa and it is up to 70-90%min some other countries (Lindsey et al., 2020).

To add on to funds for wildlife protection, NBT is one of the one major contributor of SDGs and an important means of foreign income exchange. The Covid-19 ha had an abrupt stop of international travel at the end of the first quarter of 2020, which had an impact on the amount of money several countries got them from tourism. Arrivals of tourists during the first quarter prior to the Covid-19 pandemic followed the anticipated pattern. Domestic travelers made up the majority of visitors, followed by those from Europe, Asia, America, United Kingdom (UK), the SADC area, other African nations and Australia-New Zealand. Tourist arrivals for the local and global market ceased during the period of total lockdown. There was no considerable distinction between the time before and during a partial shutdown.

However, a substantiated significant difference between mean domestic tourist arrivals before and after total lockdown as well as between total and partial lockdowns was observed. According to (Stone et al., 2021) Botswana experienced a closure of businesses not providing essential goods and services in the first 28 days the shutdown. In first 28 days of lockdown service providing jobs allowed to operate and others were closed.

Botswana tourism experienced huge loses on the closure of borders when trade and travel regulations were imposed. The outcome is that the sector is still aiming to build community resilience through promotion of tourism to heritage sites with reduced prices for local people (Stone et al., 2021). Moreover Botswana tourism experienced a standstill due to trade and travel regulations that were put in place to minimize spread of novel virus.

CHAPTER THREE

3.1 Study Area

The research took place in Matopo National Park, among other oldest national parks Matopo National Park (MNP) was set to be a protected area in 1926. It was upgraded to incorporate more land in 1930. By so doing local indigenous people living within the park and on park boundary were voluntarily or involuntarily relocated further from the park (Maisiri, 2017). Matopo National Park covers 453km2 of which 100km2 in Whovi area is specifically set as an Intensive Protection Zone (IPZ) for the conservation of black rhinos and white rhinos (*Diceros bicornis* and *Ceratotherium simum)* respectively. RMNP is divided into four substations namely Hazelside, Maleme, Whitewaters and Togwana this division on the park into substation was done to decentralize duties. MNP is surrounded by a total of six (6) wards which are ward 15, 16, 17, 18, 24 and 25. On the eastern part the park is bordered by Tuli River.(Burrett et al., 2016) These surrounding wards rely on the park for various services such as thatch grass and timber harvest. In natural farming regions the park falls in region IV in Matebeleland South Province. According to (Mupangwa et al., 2011) in meteorological aspect MNP is characterized by hot semi-arid climate and high seasonal rainfall, long-term average annual precipitation of 580mm. The daily temperature is often moderately high whereas the average temperature can go low as 8.6 Degrees Celsius making vegetation type, afro-mountain woodlands, flat woodlands and grass woodlands. There are three distinct seasons that are observed these are: hot and wet (November to April), cool and dry (May to August) and hot and dry (September to October). In July the maximum daily temperature is 26 °C, while January it is 36°C.In June the monthly low temperature averages 9 °C while January its 24 °C.

Dominant woody species found in the park include *Afzelia, Commiphora, Kirkia*, *Colophospemum* and *Pterocapus* (Scharsich et al., 2017). According to (Sagonda and Pegg, 2015) great numbers of herbivores in MNP include, Sable antelope (*Hippotragus niger*), Hippopotamus (*Hippopotamus amphibius*), Eland (*Taurotragus oryx*), Blue wildebeest (*Connochaetes taurinus*), Impala (*Aepyceros melampus*), Giraffe (*Giraffa camelopardalis*), Plains zebra (*Equus quagga*), Waterbuck (*Kobus ellipsiprymnus*) and Kudu (*Tragelaphus strepsiceros*). Large carnivores are also found in the park these include: Spotted hyena (*Crocuta crocuta*) and Leopard *(Panthera pardus).*

Figure 3.1: Study area map for Matopo National and adjacent wards

3.2 RESEARCH DESIGN

In this study descriptive analysis was used to collect data from local communities. Descriptive survey is a research method which seeks to focus on the prevailing situations in terms of trends, processes belief practices and attitudes (Mugenda and Mugenda, 2003). It concerns itself with characteristics of sample population under study not individual characteristics thereby providing most appropriate answers to a current problem. Semi-structured questionnaires were used for data collection because it is regarded as most suitable in collecting information on how communities survived before and after the Covid-19 pandemic period and also how they helped in wildlife conservation. Key Informant interviews were administered within Matopo national park selected staff which will effectively help to identify and gather information wildlife protection, incidence of illegal activities and tourism performance during the period of Covid-19 pandemic 2020/21 and the period before Covid-19 pandemic 2015/19.

3.3 SAMPLING PROCEDURE

Random sampling was used to collect data for this study because it gives an opportunity for every member of the population to be selected and a known chance to be included in the sample population (Ghauri et al., 2020). In as far as Matopo National Parks is concerned it is surrounded by six (6) wards namely ward 15(Gulati), 16(Silozwe), 17(Dewe), 18(Bhazha), 24(Research) and 25(Mthwakazi) For the purpose of this research a total of five hundred (500) households from Silozwe (ward 16) and Research (ward 24) was used as total population size from which a 10% sample population will be derived thus fifty (50) households twenty-five (25) households from each ward. These two wards are deemed suitable for the study because there is no buffer zone separating the communities and the park estate they share the same fence boundary with the park. Therefore 500 households from the selected communities adjacent to the park and the staff members of Matopo National Park make up the population under study. In addition, because of the geographical setting of the communities surrounding the park the population under study was grouped into clusters in this case wards and these wards are ward 16(Silozwe), 24(Research). The study will utilize cluster sampling technique to gather data from the communities. Cluster sampling is a two stage process where the population under study is divided into groups such as wards and villages, clusters are chosen at random and every individual in a cluster is considered in a sample (Baridalyne, 2012).

3.4 KEY INFORMANTS

Key Informant Interviews (KII) were directed to the staff members of Matopo National Park who are involved in wildlife conservation, tourism and hospitality which are for example five (4) Wildlife officers or two (2) Station ecologists and ten (5) lodge attendants or seven (4) Accounts clerks respectively. The purpose of this interviewing these Key Informants is to come up with information on the conservation of wild flora and fauna, incidence of poaching activities status of NBT during the Covid-19 pandemic of 2020/21 and the period before Covid-19 pandemic 2015/19. In a total number of four substations namely Hazelside, Maleme, Whitewaters and Togwana non-probability convenience sampling will be employed to collect data from the Key Informants. Convenience sampling is a method often used for qualitative research focusing on available participants during the course of the interview, since it depends on participants' interests and motives it is important to note that the error of non-participant will be included in the research.

3.5 SECONDARY DATA COLLECTION

Gathering secondary data from MNP on the law enforcement and conservation efforts seeks information regarding the results of Covid-19 in ecotourism status, floral and faunal conservation and incidence of poaching activities within the Protected Area (PA). (Bowen, 2009) four steps (finding, selecting, appraising and synthesizing data contained in documents) of systematic qualitative document analysis was used on the literature available to asses the implications of the pandemic on NBT in Matopo national park Zimbabwe. These documents were MNP station reports. The major advantage of employing (Bowen, 2009) four steps is that it breeds evidence that is credible and the collaboration of gathered information reduces potential bias from a single secondary source (Eisner, 2017).

3.6 DATA ANALYSIS

Qualitative analysis was used to analyze data gathered during the study. Data collected in questionnaires was recorded utilizing Microsoft Access and analyzed using Statistical Package for Social Sciences (SPSS 16.0). Key Informant Interviews (KII) data was merged and crucial points were selected. Poaching incidents were collected from the Matopo National Park (MNP) reports. Qualitative results obtained from the study were represented in form of text and bar graphs.

CHAPTER FOUR

RESULTS

4.1 Gender

There were twenty (20) males constituting 40% and thirty (30) females who constituted the remaining 60%.

4.2 Age Group

Age groups that dominated the population under study were 21-30 years and 31-40 years each age group had 26% followed by the age of 41-50 with 24% and 51-60 years had a least percentage of 10%.

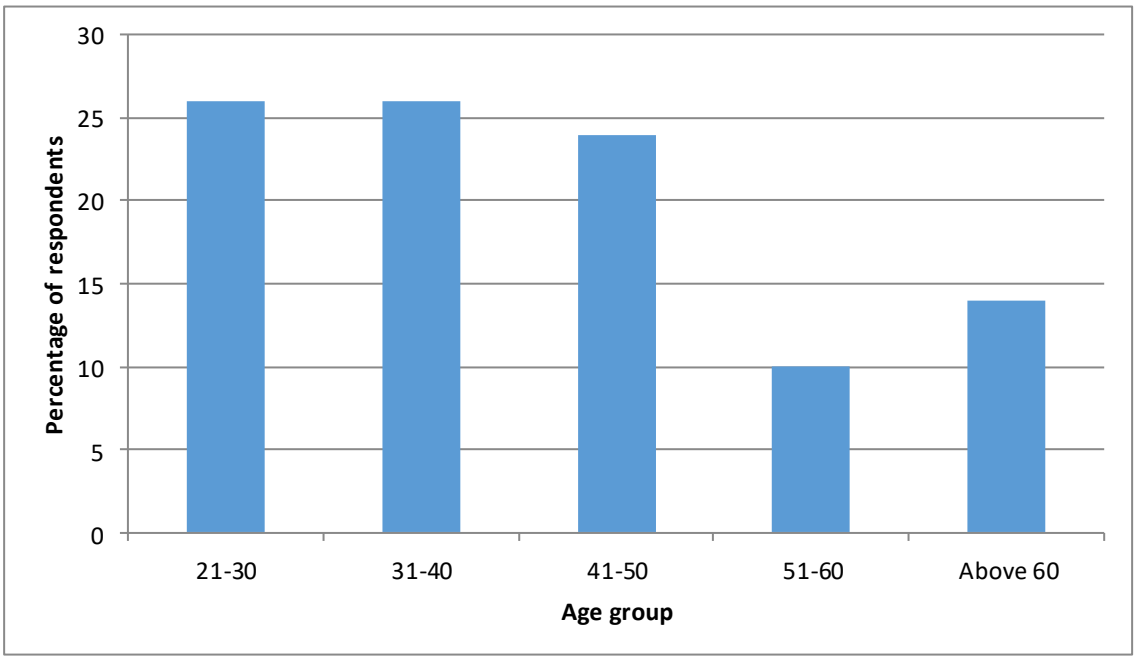

Figure 2.2: Age group of respondents

4.3 Resident Wards

Dewe village of ward 17 had 52% of respondents participating and Silozwe village ward 16 had 48% of respondents participating.

4.4 Main Jobs

Participants in the study were involved in a number of social and economic activities including farming, fish harvesting, vending, pensioners and those with no any kind of a main job

contributed 2%. The remainder of the jobs including agriculture extension, apiculture, sculptures, brick molding, building, craft work, domestic casual workers, plumber, ranger, ecologist, grave digger, miner, nurse, parks casual worker, taxi driving, teaching, shop keeping, thatching, grass cutting contributed (72%).

4.5 Other Income

Out of two wards under study 52% of the population confirmed to have other income generating activities which cushioned them during the Covid-19 pandemic and 48% had no other income.

4.6 Other Sources of Income

Respondents adapted to alternative sources of revenue during Covid-19 pandemic include agriculture 14%, parks casual laborers 8%, chicken production 2%, eggs hatching 2%, fishing 12%, home gardening 6%, mechanics 2%, taxi driving 4%, thatch grass selling 2%, thatching 2%, vending 2% and forty-four (44) percent of individuals did not have alternative sources of revenue during the crisis.

4.7 Remittance

Evidence from the administered questionnaires shows that a large percentage of fifty-six (56) (n=28) did not receive any remittance to sustain them during Covid-19 period and 44% (n=22) received remittance which cushioned them during the pandemic.

4.8 Source of Remittances

Of those who received remittances, 4% received them from brothers, 10% from children, 4% from husbands, 4% from mothers, 8% from sisters, 4% from sons, 2% from wives and 2% from uncles.

4.9 Location of Remittances Sender

Most of the remittance received by respondents was sent from South Africa which constituted 34%, followed by 6% from within the country (Harare and Kwekwe) and 4% was sent from the United Kingdom.

4.10 Lockdown Effects

More effects of covid-19 lockdown were experienced during the full lockdown stage and less lockdown effects were experienced during partial lockdown.

4.11 Livelihoods Affected

Eighty-eight percent of respondents in the two wards agreed to have experienced the effect of Covid-19 on their day to day socio-economic activities sustaining their livelihoods while only twelve (12) percent the pandemic did not affected their day to day living.

4.12 Impacts of Covid-19 on Livelihoods

Regulations of the Covid-19 pandemic had a heavy toll on locals' livelihoods these effects include, reduced income for craftsmen due to reduced tourist flow, artisanal miners not allowed to work in order to minimize the spread of corona virus in crowed areas, parks casual workers were retrenched, children not going to school because schools were closed, mass gathering for example church gatherings and awareness campaigns were not allowed, farmers and vendors were not allowed to sell their products in central business centers, income reduction for restaurants cooks due to closure of restaurants, low income for domestics casual workers, closure of small scale shops, taxi drivers were not allowed to operate and only 10% claimed not to have experienced the effects of Covid-19 on their livelihoods.

4.13 Jobs Affected

The number of jobs affected ranged from artisanal mining (12%), curio selling (10%), tour guiding (14%), small-scale enterprises (vending, 14%), nature based tourism (12%). Other jobs including cross-borders, taxi driving and thatch grass harvesting constituted (38%) of the jobs that were affected.

4.14 New Livelihoods

A percentage of fifty (50) claimed that they embarked on new livelihood activities that generated a source of income during the Covid-19 period and another fifty (50) percent had no other new activities that they did to generate an income.

4.15 New Livelihood Type

Respondents that participated during the survey had new socio-economic livelihood activities which include chicken production (10%), fishing (10%) home-gardening (10%), and informal-

mining (12%) restaurant cook (2%) and two (2) percent of routine duties as a ranger and fifty-four (54) percent was of those with no other new livelihood activities.

4.16 Tourism Performance

Before Covid-19 tourism at MNP was operating as expected. In the complete lockdown period no regional and international tourism was experienced in the park. Under the partial lockdown regional tourism was operating however with a great difference from no-lockdown phase and this affected the total revenue received by the park during 2020.

4.17 Poached Wildlife

Considerable amount of faunal species were lost to poaching in 2021 which recorded two hundred and sixty-four (264) poaching incidences of game meat poaching and in 2020 one hundred and one (101) poaching incidents were reported. Comparing these results with those from five (5) years before Covid-19 period wildlife poaching incidents were quite low this is from 2015-2019 with reported cases of 70, 54, 60, 44 and 88 respectively. No season had poaching incidents higher than ninety (90).

4.18 Key Informants' Response

Information gathered from Key Informants states that the number of rangers conducting wildlife conservation was reduced, because most manpower was operating from home, some operations such as dam dense surveys were ceased. The number of workers in the establishment was reduced, casual workers doing game fence, roads and fireguards management, and rhino monitoring were retrenched. Some staff members contracted Covid-19, some rangers were quarantined and this reduced number of rangers reporting to work and some rangers died of Covid-19. No recruitment for casual workers was done, some rangers resigned (some went to pursue their education carrier, some to be in the pastoral ministry, and some left to look for other jobs in South Africa however they were seen in the city of Bulawayo). Movement from vacation leave was restricted especially during the first 21days of lockdown rangers on time off were not able to report back to work due to strict travel restrictions.

Results from the KII showed that wildlife poaching increased during lockdown period reason being local people began to illegally access natural resources in the park as it was their main alternative source of livelihood during the lockdown period. Local communities were left jobless especially casual laborers in the parks hence they began to illegally utilize protected natural

resources to earn an income this is evidenced by wildlife court cases in 2021, also wire snares recovered on water holes where wildlife congregates especially dry seasons, arrests made inside the park and poaching gear impounded (fishing nets, spears, bicycles and axes). Communities resorted to subsistence poaching to minimize the protein demand among pregnant and lactating women. Poaching increased due to a lack of employment particularly among park casual workers and those from urban areas who came to settle in their villages during the Covid-19 lockdown. Poaching also increased due to shortages of rangers in the field conducting law enforcement. Low tourist arrival lead to reduced tourism revenue which supports park operations hence inadequate fuel resources lead to an increase in subsistence poaching because there was a shortfall in tourism arrival which is the main source of park revenue generation. Job losses for local people and other urban populations residing close to the park lead to increased subsistence poaching for meat provisions. Some businesses for local communities were closed especially curio markets and restaurants hence local people began to poach to sustain their livelihoods.

On the other hand closure of smuggling channels such as borders and ports reduced commercial poaching since there were no routes to traffic animal products within the region or outside country borders. Movement restrictions of people in the park led to reduced human activity in the park hence low big-game poaching was experienced.

CHAPTER FIVE

DISCUSSION

5.1 Social-Demographic Profile of Participants

Results from the study shows that the dominant age group was 21-30 and 31-40 which constituted young and energetic population. According to (Moyo et al., 2016) this group is considered productive and full of energy because they can work under little supervision and are able to fend for their families. For efficient wildlife conservation and local livelihood development the young age can be taught the importance of sustainable wildlife conservation (Morar and Peterlicean, 2012).

5.2 Respondents' Economic and Social Characteristics

The majority of the respondents were into several socio-economic activities, however agriculture, fish harvesting, vending and livestock production were most practiced activities. As a case of Tanzania villages near Burunge Wildlife Management Area (WMA) practiced farming, fishing, cattle keeping as a means of generating income (Chebby et al., 2021). Evidence presented by (Kaswamila, 2009) in the Migombani, Barabarani and Esilalei communities highlights that first job preferences for people living near PAs are farming, cattle production and Nature Based Tourism (NBT) activities. Moreover according to (Komba et al., 2021, Labrière et al., 2016, Moshi, 2016) argue that communities living adjacent to Parks estates greatly depend on animal husbandry and agriculture.

5.3 Social and Economic Activities amidst the Covid-19 Period

Locals faced many challenges during the Covid-19 era the main challenges were low tourism in-flow (low customers to buy craftsmen's products) and inflation which resulted in a fall in their income. A percentage of individuals lost their jobs for example park casual workers and those in curios selling the reason being they depended on parks and tourism activities. Similar results from Malawi states that local communities were greatly affected by Covid-19 outbreak due to reduced tourism flow. (Attah, 2021).

5.4 Communities' Alternative Sources of Income during the Pandemic

For locals to survive during the pandemic Silozwe and Dewe villages adopted an array of new activities these included fishing, home gardening, informal mining, taxi driving and restaurants

workers, others respondents had no alternative sources of income. This is similar to as study to that of Malawi which highlights that communities of Kakoi, Maweni and Mwada had new alternative sources of survival these activities included farming, cattle production, fishing, taxis while others ventured into tourism (Chebby et al., 2021). Effects of these activities were similar both MNP and Burunge WMA, un-monitored livestock husbandry (cattle, goats and donkeys) and intensive farming on park boundary which threatened the survival of wildlife species in their natural habitats and people from urban areas settling in villages resulted in intensified pressure on natural resources us.

5.5 Wildlife Protection and Conservation

During the pandemic the deployment of rangers on the ground was affected by low fuel resources to transport law enforcement team to their ground bases. It was also affected by reduced number of rangers reporting to work (some succumbed to Covid-19, some were quarantined, others were unable to travel back from their time-off vacations and some resigned due to various reasons including pursuing their educational carrier, fulfilling their calling to pastoral ministry and some resigned in search of other professions in South Africa. This exposed the PAs to various incidences including illegal wildlife hunting, informal mining and non-forest timber harvesting, fuel human resources to sustain fire management activities and game water supply particularly in dry season. In times of hardship local people around PAs adapt to the situation by embarking to other sources of income such as harvesting wildlife and fishing(Beyers et al., 2011, Brashares et al., 2011, De Merode et al., 2007, Draulans and Van Krunkelsven, 2002, Fusari and Carpaneto, 2006). Conservation efforts in protecting wildlife and its habitat require efficient deployment of rangers on the field to curb wildlife incursions.

However poaching of big game animals decreased during the period 2020-2021 this is due o closure of smuggling channels such as ports and borders, low demand of commercially important animals (rhinoceros). On the other hand illegal subsistence hunting spiked especially in the dry season, a general assumption is that children were not going to school; some community members were left jobless due to retrenchment and a great need to survive during this period. This is evidenced by an increase in wildlife court cases in 2021, wire snares recovered on water holes where wildlife congregates especially dry seasons, arrests made inside the park, poaching gear impounded (fishing nets, spears, bicycles and axes).

Comparing the Covid-19 period of 2020-2021 and the period prior to Covid-19 (2015-2019) poaching was substantially low the reason being local communities had other ways of surviving and illegal wildlife harvesting was not their best option and also those from urban areas had their livelihoods sustained because most of them were employed. More so there were plenty of fuel resources and this entails that wildlife conservation was carried out efficiently with enough time to respond to wildlife incursion, regular rangers' deployment in time and fire management.

CHAPTER SIX

CONCLUSION

The outbreak of Covid-19 had effects on wildlife conservation in PAs and its effects were felt by some adjacent communities.

Owing to lack of sufficient resources and the unpreparedness of locals to react efficiently to minimize repercussions of Covid-19, it worsened their social and economic activities. In order to survive some ventured in new alternative sources of survival and some had no alternatives, those with alternatives some of them were involved in illegal wildlife hunting and harvesting threatening sustainable conservation in MNP. This study highlighted that activities such as livestock production, fish harvesting, small scale mining and tree logging for fuel wood and other purpose made it difficult to effectively carry out wildlife conservation.

There was increased poaching during the Pandemic. This was due to several reasons including reduced numbers of rangers reporting to work and those on the work establishment as a result of deaths, sickness caused by Covid-19 and retirement of other rangers among other factors. Comparing these results with those from five (5) years before Covid-19 period wildlife poaching incidents were quite low this is from 2015-2019 this was due to factors such as adequate fuel resources for ranger deployment and reaction to wildlife incursions and enough man power to report to work.

Complete shutdown of tourism in 2020 negatively affected MNP given its dependency on NBT. It is crucial for the park estate to have a variety of tourism package to cater for the demands of local and visitors from within our region so that it will not heavily depend on NBT alone. More importantly having the budget of MNP affected by Covid-19, the wildlife conservation efforts and law enforcement task force was impaired.

RECOMMENDATIONS

The MNP authorities can encourage and support indigenous people with diverse income to lessen their dependence on NBT and natural resources such as curio selling and beekeeping to adopt environmentally and socially friendly techniques on farming and fishing with less impact

on natural habitat in order to reduce the effects of Covid-19 Pandemic on local communities and biodiversity.

To keep the rangers present on the field at MNP, more funding and human resources must be allocated to the staff. Park estate planning and management is essential in aiding to set aside measures for the changing climate and future pandemics, in a broader sense ZPWMA should continue institutionalizing its revenue generating strategies in order to wean itself off reliance in foreign tourism to finance conservation of park's estates.

To reduce the repercussions of Covid-19 on local communities and biodiversity assistance from the government, non-governmental organizations and other stakeholders will be of great help in protecting them from the pandemic's effect on their way of life and preventing them from turning to wildlife crimes like poaching in order to survive.

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APPENDICES

APENDIX1: QUESTIONNAIRE
Questionnaire Number …….

A. DEMOGRAPHIC INFORMATION

1. Gender [1] Male ☐ [2] Female ☐

2. Age Groups [1] Below 20 ☐ [2] 21-30 ☐ [3] 31-40 ☐
[4] 41-50 ☐ [5] 51-60 ☐ [6] Above 60 ☐

3. Where do you live? [1] Ward 15 ☐ [2] Ward 16 ☐ [3] Ward 17 ☐

[4] Ward 18 ☐ [5] Ward 25 ☐

4. What is your main employment?

……

5. Do you have any other jobs you do to earn an income? Yes/No

If yes; (a) what other jobs do you do to earn an income?

……

6. Do you receive any money from other people (remittances)? Yes/No

If yes; (a) who sends you the money?.....

(b) Where do they live?.....

B. KNOWLEDGE OF COVID-19

7. In which stage of lockdown did you first experience the effects of Covid-19 in Nature Based Tourism?

[1] No lockdown ☐ [2] Full lockdown ☐ [3] Partial lockdown ☐

8. Did the Covid-19 pandemic and Lockdowns affect your livelihoods (income-generating activities)? Yes/No

If yes, (a) how did Covid-19 and the Lockdowns affect your Livelihoods?

……

……

9. What jobs were affected by Covid-19 imposed lockdown?

……

……

C. PRACTICES DONE TO ADAPT TO COVID-19 PANDEMIC

10. Did you embark on any new livelihood activities during the Covid-19 period? Yes/No

If yes, (a) what new activities did you embark on?

……

APPENDIX 2: KEY INFORMANT INTERVIEW GUIDE

This Key Informant Interview will be directed to the Matopo National Park employees who are involved in wildlife conservation, tourism and hospitality and the scientific department services ie Wildlife officers, Accounts clerks and station ecologist respectively. The purpose of these interviews is to come up with data on wildlife protection, incidence of illegal activities and tourism performance during the Covid-19 pandemic period of 2020/21 and the period before Covid-19 pandemic 2015/19.

1. What position do you occupy in the organization?

[1] Ranger ☐ [2] Wildlife officer ☐ [3] Station ecologist ☐

[4] Accounts clerk ☐ [5] Lodge attendant ☐

2. Did the number of rangers conducting law enforcement duties change before or during the period of Covid-19?

[1] Yes ☐ [2] No ☐

(a) If Yes give reason

……
……
……
……

3. Were there any changes in poaching patterns during the lockdown periods? Yes/No

If yes, (a) did the poaching Increase or decrease (during the lockdown periods)

……
……
……
……

4. Were there any changes in arrival patterns of tourists during the Lockdown period? Yes/No

If Yes, (a) when did you first experience these changes?

……
……

5. Did the Lockdown period affect any other Park activities? Yes/No

If Yes, (a) what other Park activities were affected by the Lockdown?

……
……
……