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M.Sc. THESIS

Overview of the National System and Management of Protected Areas in Namibia: A Case Study of the Four Selected National Parks

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DIPLOMA THESIS ASSIGNMENT

Kulumelo Ernest Munyungi

Thesis title

Overview of the National System and Management of Protected Areas in Namibia: A Case Study of the Four Selected National Parks

Objectives of thesis

The aim of this paper is to assess the effectiveness and efficiency of conservation strategies of selected protected areas in Namibia, to analyze their implementation and to assess the management practices of the protected areas in order to increase management effectiveness of national protected areas network for biodiversity conservation.

Methodology

1. Evaluation of conservation strategies in different protected areas in Namibia.
2. Analyse of the management implementation in the protected areas and its effectiveness.
3. Analyse how to improve the conservation strategies and how to increase the management effectiveness

Information sources:

1. Literature review, review of project related documents, articles etc.. Review internet sources and online documentations.
2. Correspondence interview with the policy markers and the management systems in the selected protected areas, electronic interview with stakeholders and relevant institutions.

Schedule for processing

Controled steps :

List of papers and other information - to the September 30th

Characteristic of studied protected areas - to the October 31st

A literature review - to the November 30th

An analyse of the conservation strategies - to the December 31st

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The proposed extent of the thesis

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Keywords

Conservation, Protected area, Namibia, National park, savanna ecosystems in south Africa

Recommended information sources

Chapeyama, O & Schalken W. 2009: Strengthening the Protected Area Network. Mid-Term. Final Report. Unpublished.

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DECLARATION

I hereby declare that I Ernest Munyungi Kulumelo solely authored this master thesis as one of the prerequisite requirements for the M.Sc. degree at the Faculty of Environmental Sciences, Czech University of Life Sciences Prague. I have carried out different studies connected to my thesis on my own; therefore I declare that I only used those sources that are referenced in the work.

Prague, 30th April 2012 Ernest Munyungi Kulumelo

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I would also take this privilege time to express my heartfelt thanks to my family particularly my mother for her motherly love, her words of encouragement kept me going. I know I could stand on my own twos but without you mom I wouldn't be where I am today.

ABSTRACT

The system of protected areas in Namibia has a long history dating way back from colonial era, whereby more than a hundred years have now passed since the establishment of the first National Park (NP) in 1907. Under literature review, some studies have indicated that not all of Namibia's Protected Areas are in a good state; most of them are in a bad state. Therefore, this study's background has pondered in investigation of the overview of Namibia's PA system which constitutes less than 20 % of the country's land surface. Among the aims of this thesis, the main one was to initiate a discussion on the national system of the Management of Protected Areas which could help find amicable solutions for its improvement. Moreover, its effectiveness could create a platform in lobbying for an increased government budget allocation for the management of protected areas. The methodology and result of this study presents the manner in which the aims were reached following the analysis of characteristics and the comparative analysis of the four selected National Parks (Bwabwata, Mahango, Mamili and Mudumu). However, in some sections the analysis showed the similarities between the four and in some cases it showed significant differences between NPs especially when compared to the best parks in the country such as Etosha and Waterberg. Still in the results, the SWOT analysis conducted showed that threats are the setbacks hampering progress in these parks. Meanwhile, in the discussion it was analyzed that the current limited budgetary allocations to Namibia's PAs is the key factor which fails not only to achieve its conservation objectives, but also to realize the true economic values of the parks. In enclosure, the study concludes that a lot must be done in order to match the IUCN categories' objectives since most of the parks are below IUCN standard. In addition, if more is done, these PAs are not only going to be socio-economically worthy but a cornerstone for biodiversity as well. Lastly, if all is taken into consideration the result of this study could add to the contribution of greater studies done in the same field to improve management system of Namibia's national parks. Some of the recommendations made by this study includes: the maintenance of roads and other infrastructures within the parks, regular assessment of parks' activities, proper

training of the staff management and good policy must be put in place in order to deal with threats caused by anthropogenic activities.

Key words: Protected areas, National Parks, Namibia, Biodiversity, Management system

Contents

1. Introduction

Protected areas are meant to be a cornerstone of conservation policies as they provide multiple benefits for man and nature (Balmford et al., 2003). However, they are not worthy anything until when managed to a higher standard only then they could tend to be important. They are of vital importance since they provide significant process such as ecosystem services which is a driving force in water purification retention, reduction of both man-mad and natural disturbances and together with erosion control. Moreover, they buffer human communities against environmental negative impacts and support food and health security by maintaining crop diversity and species of economic value. On the other hand, the conservation of protected areas is equivalent to conservation of biodiversity.

Biodiversity which is the diversity of life within species and their habitats (Burke, 2006) is also important to human beings as we interact and deal with life on daily basis. Human beings are so dependent on a variety of living resources for their survival (Mukul, et al., 2008). Furthermore, in developing countries, rural communities rely on protected areas for substance and livelihoods; where as researchers in this field reported that protected areas contribute directly to global sustainable development and poverty reduction. (Thompson, 2002) documented that there is a need to conserve protected areas since they are essential for biodiversity which offer the following:

- Medicine, food and fuel
- Provide flood and pest control
- Raw materials for buildings, furniture, paper and many other resources
- Source of recreation and enjoyment such as hiking, hunting together with fishing

Namibia as a developing country, most of its people live in poverty as the unemployment figure stands at 51 %. Namibia is one of the driest countries in the world making it harder for the local people depend on substance farming as it is a trend in most Sub Saharan African countries. Inevitably leaving poor people with no option but rely on protected areas, especially in the case of Bwabwata National Park stated in the result of this study. Unlike in the past, the new approaches of conservation in Namibia recognize the need to involve local communities in conservation which can benefit them in terms of poverty alleviation.

The aims of the thesis

The main objective of this paper is to initiate a discussion on the national system of the Management of Protected Areas which could help find amicable solutions for its improvement. Therefore, its effectiveness could create a platform in lobbying for an increased government budget allocation for the management of protected areas. Within this frame, particular aims are:

1) To present the current status and background of the management of Protected Areas in Namibia

2) To evaluate conservation strategies in different protected areas in Namibia

3) To analyze the management implementation in the PAs and their effectiveness

4) To address number of existing barriers that hinders the effective management of the national protected areas of Namibia

5) To discuss and comment on the government budget through which protected area systems could be strengthened to achieve its conservation objectives and fully capitalize on its economic value and improvement of biodiversity

6) To relevant management activities of PAs in the context of development of ecotourism, national education, and scientific based biodiversity conservation effort in Namibia

2. Literature review

2.1. Importance General Background of protected areas

A protected area is an area of a land, and a sea which is dedicated to the protection and maintenance of biodiversity and natural and associated cultural resources and managed through legal or other means. They vary by level of protection depending on the effectiveness of laws by each country together with the involvement of regulation of the international organization (IUCN, 2004a). About 60, 000 parks around the globe estimated best satisfy IUCN world conservation union definition for protected area (Phillips, 2003a). The International Union for Conservation of Nature (IUCN) has provided guideline and revised the definition of protected areas (PA) which has been widely and internationally accepted. It states that a PA is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystems services and cultural values (IUCN, 2008).

This definition and meaning is applicable in current research although findings might give cause to reconsidering the definition. The table below shows IUCN six recognized different management categories for PA, representing grades from strict protection as indicated in categories Ia, Ib and II, to management for human access and sustainable use in category VI (Table 2.1).

Table 2.1: ICUN categories of PA (IUCN, 2004b)

Category	**Description**
Ia	Strict Natural reserve: PA managed mainly for science
Ib	Wilderness area: PA managed for mainly wilderness protection
II	National Park: PA managed mainly for ecosystem protection and recreation
III	Natural Monuments: PA managed mainly for conservation of specific natural features
IV	Habitat/Species Management Area: PA managed mainly for conservation through management intervention

V	Protected landscape/Seascape conservation and recreation
VI	Managed Resources Protected Area: PA managed mainly for the sustainable use of natural ecosystems

Yellowstone national park is one of the oldest national parks which were established in 1872 which evolved model called "Yellowstone model" which has found wide application throughout the world. Africa in particular, this model became effective since 1968 (Phillips, 2003b). To date, there are now more than 100, 000 estimated protected areas around the glob which are accounted to cover about 12 % of the earth's land surface. These areas are designed to regulate and manage to achieve specific conservation objectives (Germany's FMENCNS, 2008).

2.1.1. Background of protected areas in Namibia

During colonial era, about hundred years ago when Namibia was still under Germany colony, protected areas existed and first National park was established in 1907, since then, conservation has grown to the upper heights. Today Namibia is one of the proudest countries with its records in biodiversity. After the country gained its independence 1990, the government has become signatory to the Conversion of Biological Diversity (CBD) and now PA network has extended to cover about 17 percent of the country's land surface area (MET, 2010).

Barnard et al (1998) estimated that about 14 percent of the country is formally protected within a network of 21 national parks, game reserves and recreational areas; although, the ability to conserve set of Namibian biodiversity has been described to be serious inadequate (Barnard et al., 1998). However, Namibia is the only country in the continent that has its entire coastline protected as a national park, the "Namib-Skeleton Coast National Park" (NSCNP) as shown on figure 3. This area stretches along the entire coastline of the country with a distance of 1,570 km, and it is said to be the 8th largest PA in the world and 6th in Africa (Brown, 2009).

Protected areas in Namibia provide an important value such as ecologically and economically related and together with biological legacy (Ashley et al., 1994). The government through Ministry of Environment and Tourism (MET) runs all the protected areas

across the country. Article 95 (1) provides the foundation for the formulation of policies and legislation on nature conservation aimed at safeguarding the biodiversity and ecosystems for feature generation.

2.1.2. The history of legal framework for conservation of protected areas

The economy of Namibia is so dependent on mining, agriculture, fisheries, tourisms and other natural resources including wildlife. Since the inception of the country as a state, Namibia has been blessed with multiple numbers of natural resources, although it's not most Namibians who had ownership rights over any resources (Jones, 1999). This has led to negligence and ignorance in people's minds as most of them felt little need to protect natural resources which could not benefit them. In most cases rural poverty has led to environmental degradation due to uncontrollable extraction of resources both in nature and their environmental surrounding (Ndoro & Pwiti, 2009).

Another example is from wildlife point of view where people's attitudes towards wildlife were largely shaped by discriminatory legislation and heavy law enforcement activities against poaching (Eloff, 2006).

In the past, most communities had well-established natural resources and wildlife management through traditional and religious belief which helped in reducing poaching activities and illegal hunting. On wildlife management, conservationists separated local people from wildlife by establishing game parks and reserves (Baker, 1996).

The historical overview of conservation of protected areas has it that the earliest conservation measures were taken in 1892, where's in 1907, three game reserves were proclaimed which were referred to as Game reserves, Namib park and Etosha national park respectively, and these protected areas still exist up to today. The legal framework legislation was based on German laws since German was the first country which colonized Namibia (Carpenter, 2005).

After German left, in 1955, Namibia under South African authority established a permanent section to manage the country's game reserves. In 1960 , game parks and recreations including DaanViljoen game park, West Caprivi Game Reserves, Fish River Canyon, Namib Desert Park, Nautkluf Mountain Zebra Park and the Cape Cross Seal Reserve were declared, and by the year 1967, legislation was passed allowing commercial farmers ownership of certain game species on their farms.

It further went on provision to huntable and non huntable species of birds and animals. In 1990 when the country gained its own independence, new government was formed which showed commitment to the environment by creating the Ministry of Wildlife, Conservation and Tourism which is now called "Ministry of Environment and Tourism (MET, 2010).

2.1.2.1. Environmental laws before independence (1915-1989)

When German left the country after 1st World War, United Nation through a League of Nations gave mandate to South Africa to govern Namibia, and environmental laws were still applicable. During this period, conservationists separated local people from wildlife through the establishment of game parks and reserves, and thus they were forcibly removed out of these places (MET Namibia, 2010). Wherefore, the earliest conservation measures were introduced in order to regulate uncontrolled hunting.

And since then game protection legislation was based on German laws mostly on the related issues such as regulations concerning the import and export of species, protection of endangered species such as pythons and tortoises together with Welwitschia plants (Herry, 1997). This law was also expanded by South Africa in 20s (Government notice No. 151, 1996). Furthermore, during 60s in apartheid time, South African government ill treated black Namibians by discriminating them from having rights to natural resources of the country.

On the contrary, the government granted white commercial farmers the rights to utilize the wildlife on their properties, which then later formalized these rights in the conservation Ordinance of Nature (No. 4 of 1975) which is up to date (Boudreaux, 2008).

2.1.2.2. Laws on when the country gained its independence

Namibia has managed borrowed laws and policies of other bodies and in particular, legislation on environment and nature conservation from South Africa which is its latest ex-colony. The evolution of these policies and regulations in Namibia has played a significant role in creating status quo. However the Ministry of Environment and Tourism is busy addressing its own bill for conservation and protection of immovable cultural heritage, though at current continue using the borrowed laws (Gwasira, 2005).

In most cases, Namibian legislations on nature conservation and protected areas are connected to South African ones. Meanwhile, the current legislations and practices were introduced in 1969, one of the periods in Namibian history when South African's odendaal

commission dealing with separate development such as the creation of Bantustands or black people's homelands for development purposes (Totemeyer, 1999). On the other hand, many laws have had to be repealed and amended since the country attained its independence in 1990. Contrary to that, the government can't change all laws at once.

Some of them such as the National Monuments Act number 29 of 1969 have been retained to protect immovable cultural heritage though others are been addressed. An astonishing fact is that since South Africa has already changed its own legislation on National Monument Act 29 of 1996 which is been still used in Namibia, this could be an indication of failure on the other part.

The major policy appropriated by the national monument council is that of the MET on wildlife management and tourism in communal areas as well as that of establishment of conservancies, and this policy has got three aims as expressed in circular 19 of 1995, which are as follow (Sullivan, 1999):

(1) To remove discriminating provision of Nature Conservation Ordinance (Ordinance 4 of 1975) by giving conditional and limited rights over wildlife to communal area farmers that were previously enjoyed by commercial farmers

(2) To link with rural development by enabling communal area farmers to derive direct income from the sustainable use of wildlife and tourism.

(3) To provide an incentive to rural people to conserve wildlife and other natural resources through shared decision making and financial benefit.

2.1.2.3. Laws on environmental protection for management of PAs

The management of protected areas in Namibia is governed by the Nature Conservation Ordinance (Ordinance 4 of 1975). This law has been adopted long since the country was under South African colony, which has been since then regarded as old, and therefore the government through the ministry of Environment and Tourism has been working on a new bill on protected areas and wildlife management to replace the outdated legislation (NPW, 2010).

The new laws aim to provide an improved classification system for PAs and safeguard to prevent impacts from mineral prospecting and mining. In addition, the bill ought to address a framework for cooperative and harmonization of the relationship between the environment and local people, especial those dwelling in protected areas.

Couple of years ago, the cabinet has developed PA management policies on tourisms and wildlife concessions on state land, which was approved in 2007. And this bill sets out a framework for developing, awarding and managing tourisms and hunting together with other concessions that doesn't disturb conservation objectives. Nonetheless, the national policy on human wildlife conflict management was also approved by cabinet in the year 2009; it provides official framework and guidelines. Another policy on protected areas has been approved; this policy recognizes the plight and rights of the people living inside PAs.

2.2. Overview of the national system in the management of protected areas

Many studies and researches together with projects on the management of protected areas in Namibia have addressed a number of common obstacles. These have been the major obstacles hindering the effectiveness of management in the national protected areas systems country-wide. Under evaluation of the ecological and economical values of Protected Areas, and the subsequent under-investment in PA management is one of them. In addition to that, insufficient financial resources limit PAs' management effectiveness by threatening the ecosystem services and biodiversity that PA needs to protect (UNDP, 2010).

About 7 years ago, the annual budget of MET for PA management was approx USD 7 million which was considered to be very less to adequately manage the PA system of Namibia which accounts for at least 17 % of land surface area. However, to date, many projects and research done in this sphere has got a significant role that has made tremendous progress in securing sustainable financing for the PAs' though not to the utmost level. Some economist analysis points out that PA systems contributes to the GDP by 6 % through park based tourisms, therefore, MET, for the past 4 years has made an effort by increasing the annual budget for park management and development.

Meanwhile, donors have also pledged financially assisting the sinking ship by helping it to stay afloat. This includes USD 67 million from the US Government's millennium Challenge Account (MCA) with USD 40.5 million direct investment in Etosha National Park management infrastructure – the MCA's first biodiversity –based tourism project and investment in parks by its poverty alleviation. The federal government of German through KFW Banengruppe has done the same by donating total sum of 2 million Euros for the Bwabwata, Mudumu and Mamili parks (UNDP, 2010). Moreover, UNDP (2009) emphasizes

on the greater awareness of the PA systems which marks the need for ensuring that the essential elements of biodiversity and ecological processes are safeguarded from economic interests.

2.2.1. Namibia's list of protected areas

Conservation biologists believes that national protected areas is a cornerstone of the nation's effort to conserve biodiversity, and it also has the potential to become an engine for regional and national economic development. So, without the national protected area system, economic activities connected with the tourisms industry would never exist (Chris at el, 2005).

Namibia lies at the heart of the species' richness, the Namib-karoo-Kaokoveld Desert, one of the WWF's Global 200 Ecoregions. And this country's PAs' system comprises of 20 national protected areas covering about 17 percent of the country's 823,680 square kilometers of terrestrial area. However, there are some hindrances to successful improvement of PA management effectiveness, and these includes a fragmented policy framework, weak institutional capacities, weak human capacities for PA functionality, incomplete biogeographic coverage and the absence tested mechanisms for public-private community partnership (SPAN, 2005).

Global environmental facility (GEF) investing in our planet, through Namibia established a project, strengthening the Protected Area Network (SPAN) aiming to address three broad intervention areas.

1) Strengthening systematic capacity, creating enabling legal/policy environment and financial mechanism for PA management
2) Strengthening institutional capacity
3) Demonstrating new ways of PA management. There are four field demonstration sites: Bwabwata-Mudumu-Mamili Complex (Etosha), Skeleton Coast Link, Ai-Ais and Sperrgeibiet (www.span.org.na).

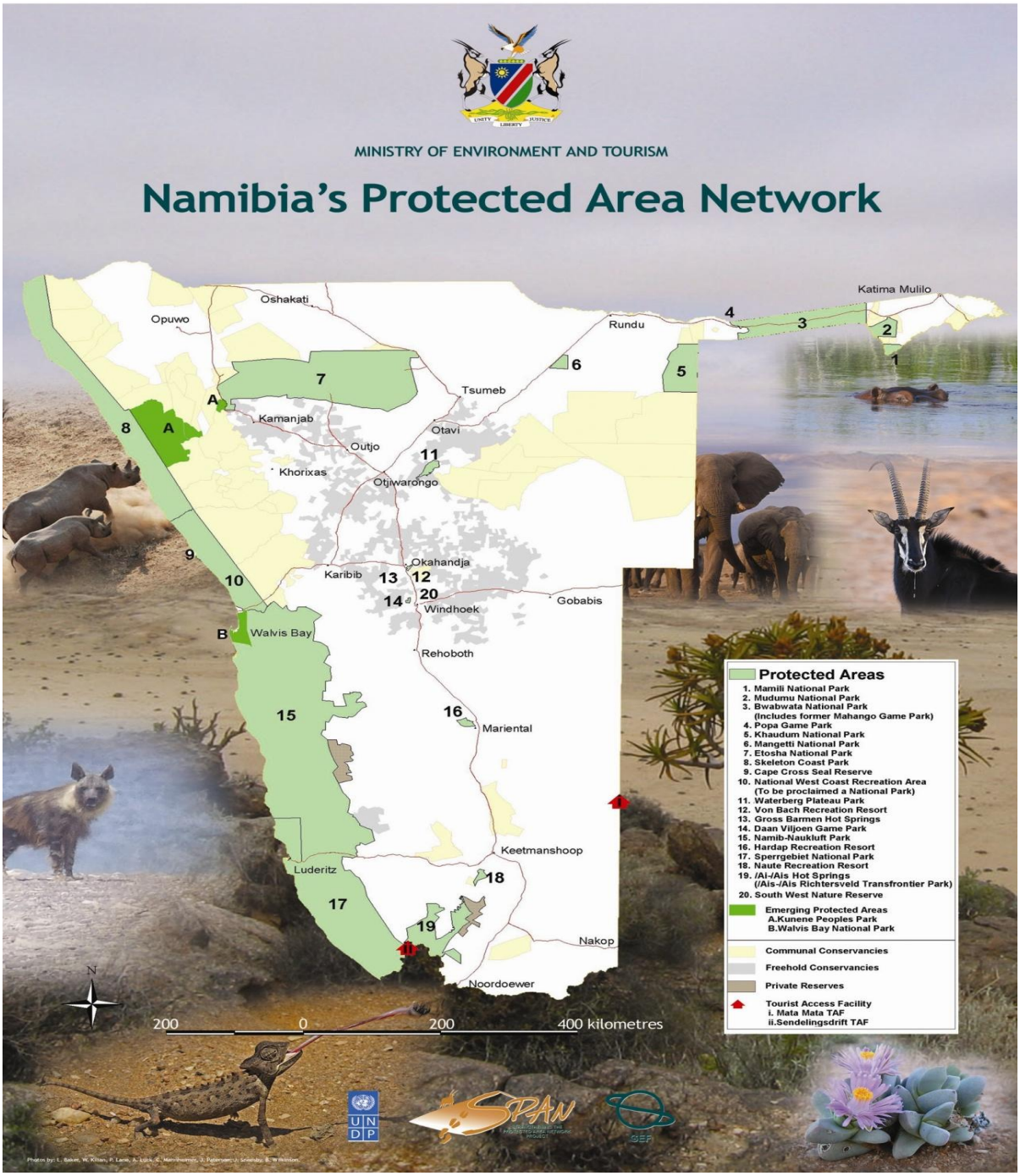
Table 2.2: National parks & nature reserves of Namibia (Source: WICE, 2010 Nature World on Namibia)

Protected Area	Management type	Size in hectares	Marine area	IUCN Category	Latitude	Longitude
Ai-Ais Hot Springs	Game Park	346,117		III	37.391	-118.3056
Bwabwata National Park	Game Park	0			40.7636	-108.9907
Cape Cross Seal Reserve	Game Park	6,000		III	31.475	-109.0528
DaanViljoen	Game Park	3,953		IV	45.522466	-111.618385
Doro!nawas Area1	Conservancy	0		IV	42.0837	-118.7067
Doro!nawas Area2	Conservancy	0			35.1145	-115.2949
Doro!nawas/UibasenTwyfelfontien JMA	Conservancy	0		IV	42.0727	-116.7764
Ehirivopuka	Conservancy	0			32.6749	-116.1416
Etosha National Park	National Park	2,227,000		IV	38.371215	-115.13212
Gross Barmen Hot Springs	Game Park	100		IV	45.506725	-111.598401
Hardap Recreation Resort	Game Park	25,177		III	45.491354	-111.603327
Hvab	Conservancy	0			32.6749	-116.1416
Kalk Plateau	Conservancy	0		III	36.0784	-115.5039
Khaudom	Game Park	384,162		IV	40.342242	-115.41789
KhoadiHôas	Other area	0		VI	39.67	-118.5
Mamili National Park	Nature Reserve	31,992		III	38.453299	-115.787884
Marienfluss	Conservancy	0		IV	36.0784	-115.5039
Mashi	Conservancy	0		IV	36.0784	-115.5039
Mayuni	Conservancy	0			38.2169	-105.8051
Mudumu National Park	Nature Reserve	100,959		IV	38.264163	-113.843008
Namib Naukluft	Game Park	4,976,800		IV	40.753259	-112.633325
National Diamond Coast Recreation Area	Recreation Area	2,900			45.626638	-85.548083
National West Coast Recreational Area	Recreation Area	780,000		IV	45.727888	-85.671207
Naute Recreation Resort	Game Park	22,452		III	38.568307	-115.656233
NyaeNyae	Conservancy	0		III	37.3524	-111.9294
Omatendeka	Conservancy	0		IV	31.52	-109.066
Orupembe	Conservancy	0		III	31.4461	-109.0197
Oskop	Conservancy	0			42.2983	-117.1652
Purros	Conservancy	0		III	40.5604	-119.9902
Salambala	Conservancy	0			40.4193	-119.9417
Sanitatas	Conservancy	0			44.3595	-118.7429
Sesfontein	Conservancy	0		III	37.4828	-109.0521
Skeleton Coast Park	Game Park	1,639,000		V	38.571597	-115.56162
SorrisSorris	Conservancy	0		III	43.6118	-117.7937
Torra	Conservancy	0		IV	43.438	-117.2898
Tsaobis-Leopard NR	Private Reserve	35,000			42.1229	-118.2302
Tsiseb	Conservancy	0			37.391	-118.3056
UibasenTwyfelfontein	Conservancy	0			41.9675	-118.2398

Von Bach Recreation Resort	Game Park	4,285		38.540098	-115.740213
Waterberg Plateau Park	Game Park	40,549	IV	38.930372	-119.36689
Wuparo	Conservancy	0		37.391	-118.3056

Figure 2.1 below shows the diversified Namibia's protected area network system, ranging from the northeastern part of the country, region one (Caprivi) to the southern part of the country, the thirteenth region (Karasberg). Unlike other countries, the PA network system of Namibia is managed and controlled by the government through Ministry of Environment and Tourism (MET). On the map below, the patches marked green representing PA are scattered across the country making it so difficult to manage financially.

Fig 2.1: Namibia's protected area-network (Source: MET, 2010)



2.2.2. The current state of Namibia's PAs

Currently the government runs protected areas which cover about 17 % of the country's land surface. These areas conserve biodiversity by protecting habitat and species of national and global significance. According to IUCN on Namibia's state of PAs, it recognizes

the role played in this sphere which includes and increased number of management plans approved and implemented, and increased number of parks being managed and improved infrastructure (SPAN, 2010). More recently, Namibia's PAs has been declared and recognized as a cornerstone for biodiversity of different types of species. And moreover, PAs supports national economic development and poverty reduction through job creation, financial benefits to the state. These areas have become a source for wildlife translocation to other places within the country's conservation areas.

The country's Community Based Natural Resources Management (CBNRM) program has been successful through conservation and thus contributing to the economy and rural development. Moreover, the program has included successes such as (MET Webportal, 2011):

- Extending the protected areas including massive 19% of the country's land surface over 130, 000 square kilometers
- 59 registered conservancies with over 230, 000 members
- 30 new conservancies in development
- Economic benefits to communities has increased from less that N$600, 000 in 1998 to N$41.9 million in 2008
- 29 formal joint venture lodges and campsites partnership within the communal tourism sector and further 15 in development
- Joint venture conservancies represent 856 beds, 789 fulltime jobs and over 250 seasonal positions
- The private sectors have invested more than N$145 million (US$ 19 million) in tourism and communal conservancies.

2.2.2.1. Parks as a cornerstone for biodiversity conservation and ecosystem services

After World War Two, couple of decades ago, the loss of biodiversity together with its threat has become a global concern which is mainly fueled by climate change. To make the matter worse, the world's biodiversity is found in the poorest countries of the world (Koziell, 2001). Nonetheless, developed countries have done a lot to restoring biodiversity worldwide which has yielded. Dating way back 1977, the European Unions has provided over 150 million Euros to support (Africa-Caribbean-Pacific states) in their effort to achieve the

protection and enhancement of the environment and natural resources. In addition, the IUCN has also provided guidance for support to protected areas (IUCN, 1999).

2.2.2.2. Biodiversity hotspot

Norman Myers (1999) defines biodiversity hotspot as a biogeographic region with a significant reservoir that is under threat by humans (Myers, 1990). For a region to qualify as a hotspot, it must meet two strict criteria, such as: 1) must contain at least 0.5% or 1,500 species of vascular plants as endemics. And number 2) it has to have lost at least 70% of its primary vegetation. Currently there are more than 25 areas classified as hotspots worldwide.

Namibia's Succulent Karoo which is further extended to South Africa is one of the richest Succulent flora on earth as well as remarkable in endemism in plants which counts for 69%. It's the only one of the two arid ecosystems which is rich in biodiversity (Jones, 2007).

This region covers 102,691 km^2 collectively and about 26 000km^2 for Namibia alone (!Hoaes, 2012). Meanwhile, anthropogenic activities like agriculture, grazing and mining especially diamond threaten this fragile region. The Succulent Karoo has staggering level of biodiversity with over 6300 plant species, 250 species of birds, 78 species of mammals, 132 species of reptiles and amphibians (Anderson, 2008).

2.2.2.3. Conservation of biodiversity and PA

Biodiversity which is a variety of life is an important way human beings interact and deal with life. The air, water, and food are all fundamental to our existence. Human beings are so dependent on a variety of living resources for their survival (Mukul, et al., 2008). Therefore, there is a need to conserve biodiversity particularly in protected areas where there is abundance of biological diversity. Because they (Thompson, 2002):

- They give us food, fuel, and medicines
- They help clean our air, purify our water, break down wastes and provide flood and pest control
- They are used as a raw materials for buildings, clothing, furniture, paper and other products
- They are a constant source of recreation and enjoyment, ranging from hiking, hunting, and fishing.

2.3. Namibian biomes

Namibia has got four major distinct biomes and each has its own biodiversity. They are distinguished by climate, fauna and flora communities (Wardell, 2000). The four main biomes comprises of the Desert, Namakaroo succulent shrub dominated biome, Savannah which is tree and grass dominated and occupies about 84% of land and the Wetland biomes. Apart from these major four, there are some sub biomes such as lakes and salt plans as well as Succulent Karoo.

2.3.1. Namib Desert

One of the driest biome in Namibia is the Namib Desert. The word Namib means "bare or vast place". It is under harsh environment conditions which are more extreme. This biome receives very little rainfall which is ranging from 10mm to 70mm annually. It extends from the Northern-west border of Namibia and Angola at the mouth of Kunene River to the Southern part of the country, laying on top of Orange River (Andrew, 2010).

Since global warming is increasing, the biodiversity of these biomes are at risk because incidence of draught is also increasing and consequently drying up water holes which acts as source of life for many organisms. The Namib Naukluft Park is also found in the Namib Desert as well as Sossusvlei, the stunning orange sand dunes blowing into razor sharp ridges and peaks by the wind (Game-reserve, 2002-2011).

Apart from infrequent rains, both animals and plants in this biome depends on mist that roles up to 100km in land, whereas all living organisms relies on this moisture, and interestingly all has adapted to this harsh conditions. The most common fauna species that thrives in this environment are reptiles, but some certain types of mammals and birds dwells in it as well. Oryx which are regarded as the master of the vast shadeless wilderness leads the list of mammal species in the Namib. However, springboks, jackals, lions, flamingos and other species of animals also make a community of this amazing biome (Stander, 2011).

2.3.2. Savanna

This biome is divided into two parts, namely, the Woodland and Grassland Savanna. The Woodland Savanna is located in the northeastern part of the country which receives higher amount of rainfall and as a result is characterized by the presence of medium to large

trees, whereas most of animals live there are browsers and with grazers as well (CCF, 2002). On the other hand, the Grassland Savanna tends to be the largest biome in the country which stretches over the entire central region, ranging from north to central east and southern part of the country respectively as shown on Fig 2.2 & 2.3. Meanwhile, ecologists in the region believe that this biome supports a wide variety of organisms. Due its rich habitat, many organisms particularly animals migrates to this biomes.

The Namib Savanna Woodland covers the great escapement that demarcates the entire Southern Africa, comprising of Angola, Botswana and South Africa respectively. And, it is further divided into ecoregions such as Erongo, Naukluft, Spitzkoppe, Gamsberg and rocky central plateau (WWF, 2008). The other part, particularly northern areas are poorly protected and consequently fall under threat from poaching, off road driving and together with farming which consequently result in habitat fragmentation. This is one of the drivers to species extinction in most ecosystems (Barnard, 1998). Savanna vegetation is accounted to be covering about 40% of land in Africa, whereby in southern Africa it covers 65% (Scholes, 1997).

Different studies on biomes in Namibia contemplate on geographical distribution of the savanna types not only on the amount of annual precipitation as previously perceived in previous studies. However, there are certain factors geographical distribution lies such as the ability of the soil to retain moisture and the ecological nature of mopane which is independent of physiographical region controls the distribution of the evergreen notophyll (Okitsu, 2005).

Fig 2.2: Namibian PAs in relations to major biomes NACSO 2007

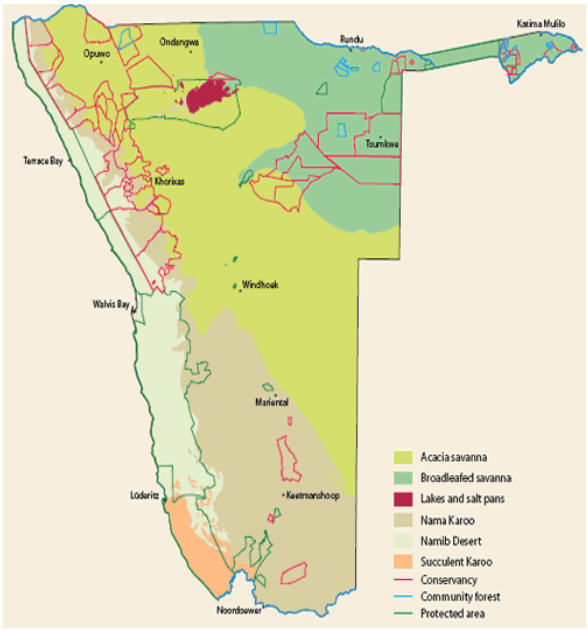


Fig 2.3: proportion of different biomes conserved

BIOME	Communal Conservancies	Concession areas	Freehold Conservancies	National parks & game reserves	Community Forests	(overlap with Conservancies)	Total
Total Area of Namibia (%)	14	1	6	17	1	0	38
Lakes and Salt Pans	1	0	0	97	0	0	98
Nama Karoo	13	1	1	5	0	0	20
Namib Desert	14	3	1	75	0	0	92
Succulent Karoo	0	0	0	90	0	0	90
Acacia Savanna	12	0	13	5	0	0	30
Broad-leafed Savanna	25	0	2	8	2	1	37

2.3.3. Wetlands

In Namibia, Wetlands are areas where there is permanent or temporary surface water. These areas include ephemeral, perennial rivers, swamps, springs, flood plains, lakes, dams, marshes, seeps, oshanas, estuaries, islands and shallows seas (Simmons et al, 1998). Wetlands, worldwide are the most important biomes which are among world's biologically productive ecosystems that enhance biodiversity (NNF, 2002). However, in Namibia, these areas are in jeopardy due to the poor management strategies (Kolberg, 1996).

Namibia is believed to be Africa's driest country; therefore its wetlands are in long term threat. Only less than 5 % of the country's 824 000 km^2 is accounted for its wetland areas which are mostly found outside protected areas (Hines & Kolberg, 1996). Meanwhile, (Bethne et al, 1998) lists the major pressures on Namibia's fragile wetlands which includes: water pollution by livestock and people, costal and marine industrial development, oil exploration, water abstraction from their sources such as rivers and other wetlands, river flow regulation, wetland and aquifer pollution through substances used in industries agriculture and

disease control and local overharvesting and unselective harvesting of wetland resources. Since tropical regions are so poor in soil fertility, many species of plants and animals together with human beings rely on wetland areas. Where there is water, there is life.

The wetland systems of Namibia is divided into five categories (Shigwedha, 2007), namely: 1) beaches and costal lagoons which falls under marine systems, a category of shallow ocean and costal waters includes mud flats together with lagoons and rock shores. They are found at the Kunene and Orange River. 2) river-line wetland systems which carters flowing rivers, flood plains, some river mouths and flesh water lagoons. And these areas include perennial and ephemeral rivers such as Zambezi, Okavango, the Kwando-Linyanti-Chobe system and their flood plains. 3) Standing and open bodies of water with no or little vegetation which includes lakes such as Otjikoto and Guinas, pans (Etoshaand Nyae-Nyae) and dams (Hardap, Von Bach and Olushandja) respectively makes part of this category. 4) Caves which include Aigamas and Dragon's Breath cave. And the finally 5) Palustrine system which is well vegetated standing water pools such as swamps, marshes, mulapos, springs and seeps (Staff reporter, 2007).

2.3.4. Namakaroo

The Namakaroo, sometimes written Nama Karoo, is a vast, open and arid region which is not extreme rich in species. However, one extraordinary thing about this biome is its remarkable flora and fauna that are adapted to its climatic condition (McGinly, 2008). It covers most of southern central Namibia, and further down south to Orange River which borders Namibia and South Africa. See appendix 1 & 2. The Fish river canyon, which is the second largest canyon in the world, is found in this biome.

The Nama Karoo biome is characterized by dwarf shrubs and scattered grassland whereas Quiver trees acts as distinctive icons for the South. It is dominated by animal species such as springbok, Oryx, kudu, mountain zebras and ostrich (Burke, 2001). As this biome shared by two countries, namely South Africa and Namibia, each side has a different ecosystem. The Namibian side has a huge vegetation zone which holds some interesting bird species such as Rufous-eared Warblers and Karoo Eromomelas (Safariwise, 2009). On the other hand, the Succulent Karoo biome in Namibia has exceptional high biodiversity which is accounted for the predicted number of 776 plant species and 234 of these are endemic to the biome. Moreover, 284 of these plants are Red listed and are said to be vulnerable or

endangered and even nearing extinction. Subsequently, it is also home to 9 lichen species which are dependent on fog from the Atlantic Ocean (Tour brief, 2005-2012).

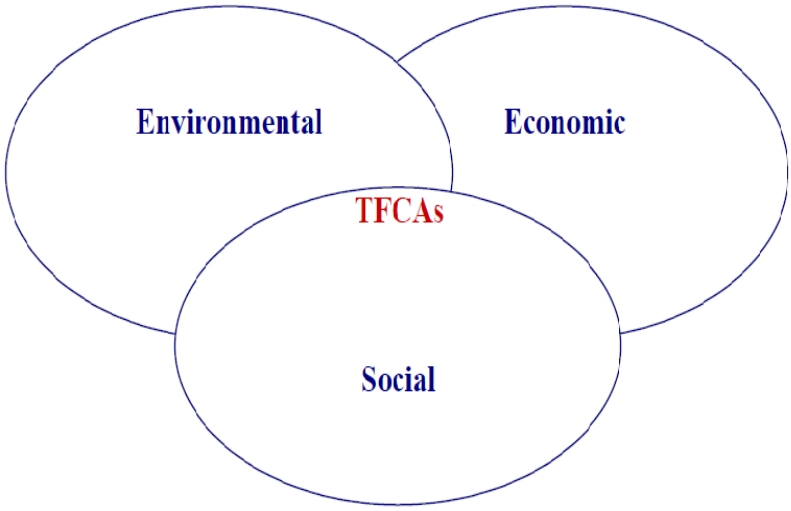
2.4. Conservation of protected area in Southern Africa-transfrontier (corridor)

A Transfrontier conservation area (TFCA) is an area that strides across two or more international borders where the natural resources are collaboratively managed by the governments of those countries (SADC –FMD Project, 2008). SADC member states are entirely committed to promoting the TFCAs and with its resources by ratifying the protocol on wildlife conservation law enforcement in 2003 as shown on Table 2.3 and Appendix 3. The TFCAs' mission is to contribute to (Sandwith, 2005):

- Regional biodiversity conservation
- Regional, national and local level economic development
- Social and cultural cross border contacts and cooperation
- International peace and stability
- Maintenance of peace and security
- Information and experience sharing
- Poverty alleviation
- Building of culture of peace and cooperation between neighbouring countries and communities.

Through TFCAs, wildlife conservation benefits local communities socially and economically in a sense that their establishment has the potential to contribute towards the betterment of their livelihoods. In most SADC region, this project has provided jobs and revenue generating opportunities for many (SAGDEAT, 2003). TFCAs is a multi-scope with spin off effects which affect environmental, economic and social concerns, it therefore appears compelling to analyze them through the three dimension of sustainable development. These includes environmental, economic and social dimension, Fig. 2.4 (Ramos, 2003).

Fig 2.4: TFCAs and the 3 Dimension of Sustainable Development (Ramos, 2003)



TFCAs have the possibility to contributing more towards sustainable development for each of these three dimensions mentioned above. For instance, under Environmental dimension it is biodiversity conservation, whereas economic opportunities falls under Economic dimension and transboundary falling under Social dimension see Appendix 3. As for biodiversity conservation is indisputably an integral part of sustainable, where plants, animals and together with micro-organisms interacts with one another within their physical environment and ecosystem (WRI, 2003).

Table 2.3: SADC's current and proposed TFCAs

Name of TFCA	**Countries involved**	**Status**
Ai-Ais/Richtersveld Transfrontier Park	Namibia & South Africa	MoU signed 17 August 2001 Treaty signed 1 August 2003
Kgalagadi Transfrontier Park	Botswana & South Africa	Treaty signed May 200
Limpopo-Shashe TFCA	Botswana, South Africa & Zimbabwe	MoU signed 13 June 2006
Great Limpopo Transfrontier Park	Mozambique, South Africa & Zimbabwe	MoU signed 10 November 2000 Treaty signed 9 December 2002

Lubombo Transfrontier Conservation and Resource Area	Mozambique, South Africa & Swaziland	Trilateral Protocol signed 22 June 2000
Maloti-Drakensberg Transfrontier Conservation and Development Area	Lesotho & South Africa	MoU signed 11 June 2001
Iona-Skeleton Coast TFCA	Angola & Namibia	Mou signed 1 August 2003
Liuwa Plain-Kameia TFCA	Angola & Zambia	Conceptual phase
Kavango-Zambezi TFCA	Angola, Botswana, Namibia, Zambia & Zimbabwe	MoU signed 2006
Lower Zambezi-Mana Pools TFCA	Zambia & Zimbabwe	Conceptual phase
Malawi-Zambia TFCA (combination of Nyika and Kasungu/Lukusuzi TFCAs)	Malawi & Zambia	MoU signed 13 August 2004
Niassa-Selous TFCA	Mozambique & Tanzania	Conceptual phase
Mnazi Bay-Quirimbas Transfrontier Marine Conservation Area	Mozambique & Tanzania	Conceptual phase
Chimanimani TFCA	Mozambique & Zimbabwe	MoU signed
Maiombe Forest TFCA	Angola, Congo & DRC	Conceptual phase
Kagera TFCA	Rwanda & Tanzania	Conceptual phase
Zimoza TFCA	Mozambique, Zambia & Zimbabwe	Conceptual phase

2.4.1. Angola

Angola, like its ally Namibia, inherited a great deal of environmental legislation which is made of (acts & decrees), decision and orders from colonial era whereas its environmental legislation remained outdated until the mid 90s when the new legislation was introduced and eventually adopted and enforced (Jones, 2008). It is a common knowledge that the TFCAs are of a significance importance given evidence of species richness in most biodiversity hotspots.

Therefore, the justification to conserve biodiversity need not be repeated (Swanson, 1992). However, that's not the case today. Angola, following the civil war, has been affected negatively, as the area of the KAZA Angolan component was a battle field whereas today the consequences of the war are still visible in the area.

The Angolan government has been in a number of projects, latest 2011, involved in removing landmines and other caches of mass destructions from the KAZA areas which has yielded a good result. After the operation, about 62 km of road had been cleared of landmine from an area of 5, 2 million square kilometers. Additionally, about 1 201 anti-personal landmines were deactivated, while 18 army machine guns and 3 504 explosive products did not detonate (!Hoaes, 2012b).

2.4.2. Botswana

Due to the amazing Okavango Swamps which gives life to wildlife, Botswana's TFCAs has been described as the Eden of Africa. There are three shared TFCAs in Botswana which includes, KAZA, Kgalaghadi and Limpopo-Shashe TFCA. Although Kgalaghadi is one of the driest regions, but yet it is the most significant among them because of it's vast large landscape. It straddles the border between South Africa and Botswana which at the same time adjoining two national parks: Kalahari Gemsbok National Park (South Africa) and Gemsbok National Park (Botswana).

In the Year 2000, the then two head of state (former President Thabo Mbeki of South Africa, and his counterpart Festus Mogae of Botswana) officially opened the Kghalaghadi Transfrontier Park (KTP) whose aim was to unify the system of control and management with tourist being able to move freely across the international boundaries between the two countries (Hanks, 2003). Beside biodiversity, the Kalahari, both Botswana and South Africa is home to Southern Africa's earliest indigenous hunters, the san-bushmen (Chennells, 2001).

2.4.3. Namibia

2.4.3.1. Namibia's TFCAs

Namibia has realized that conservation to be in fully operations it needs to address the need for closer transboundary cooperation with other sister nations such as neighboring countries. With this motive, Namibia and other Southern African countries have signed

formal agreements to establish TFCAs (MET, 2012a), as indicated on Table 2.3. Wherefore, Namibia is involved in 3 TFCAs which comprises of 1) A/-//Ais Richtersveld Transfrontier Park, 2) Kavango Zambezi Transfrontier Conservation Area (KAZA) and 3) Iona Skeleton Coast Park (MET, 2012b).

2.4.3.2. /Ai-/Ais-Richterveld Transfrontier Park

/Ai-/Ais-Richterveld Transfrontier Park are located in the southern part of the country which borders Namibia and South Africa. It jointly conserves larger part of Succulent Karro Biome an international acclaimed biodiversity hotspot (SANParks, 2009). Within conservation context, it was established by two governments, namely, Namibia and South Africa to jointly manage /Ai-/Ais Transfrontier Park (Namibia) and Richterveld Transfrontier Park (South Africa). Therefore, today this corridor protects a vast area that crosses the South African border to encompass one of the richest botanical hot spots in the world, the Succulent Karoo (Handly, 2008). See appendix 4 & 5. The park was proclaimed in 1936 under apartheid administration and subsequently other farms were added as well. Eventually, in 2003, the park was amalgamated with South Africa's Richtersveld Park forming /Ai-/Ais-Richterveld Transfrontier Park, table 3.

Fish river canyon, the second largest canyon in the world is also found in this area together with Orange River. Since it makes part of Succulent, this area is uniquely blessed with the abundance of plant life such as the Quiver tree (Aloe dichotoma), maiden's Quiver tree (Aloe ramosissima), the rare giant Quiver tree (Aloe pillansii) and the halfmens (Pachypodium namaquanam), and many other species of animals as well (Van der Lende, 2011).

2.4.3.3. Kavango Zambezi Transfrontier Conservation Area (KAZA)

KAZA brings five (5) countries together in transfrontier conservation. These countries include Angola, Botswana, Namibia, Zambia and Zimbabwe respectively as shown on Fig. 2.5 bellow. The memorandum of understanding between these countries was signed in the year 2006, agreeing to create a transboundary area of 400, 000km2. As for Namibia, the zone includes the Caprivi Strip which is also region one and a center for that matter. KAZA carries 70+ protected areas (Atkinson, 2011).

Fig 2.5: Map of Southern Africa showing KAZA corridor (Source: KAZA TFCA).

Objectively, KAZA's vision is to establish world class transfrontier conservation area and tourism destination in the Okavango and Zambezi river basins within the context of sustainable development (Atkinson et al. 2012). Some studies in the region, indicates that southern Africa's natural based tourisms it is now contributing to the gross domestic product through KAZA and other transboundry conservation areas.

In an economics sphere, it's believed that wildlife based tourism has positively stimulated economic development and despite that, the likelihood of wildlife and domestic is coming more into intimate contact. However, this might also need an extra mile for scientific knowledge to understand the relationship between the two which might result in either good or bad (WCS-Animal and Human Health for the Evironment and Development, 2012).

2.4.3.4. Iona Skeleton Coast Transfrontier Conservation Area

There are four (4) protected areas under Iona-Skeleton Coast Transfrontir Area, two in Angola (Iona National Park & Namibie Partial Reserve) and two in Namibia (Skeleton National Park & North West People's Conservation Area) all falling under Namib Desert. This area features quiet variety number of wildlife including salt pans, seal colonies and others. Furthermore, inlands and river beds are home to lions, black rhinoceros, giraffes, baboons, Springbok and others (Kock, et al., 2011).

2.4.4. South Africa

As it is understood that protected areas are widely recognized as a key determinant in conservation as well as protecting biodiversity (IUCN, 1994), South Africa which is seen to be economically powerhouse not only in the region but in the whole continent, is committed to conservation as any other countries in the region. Advantageously, the management of protected areas is not financially affected as it is in other sub Saharan Africa.

South Africa's national parks are maintained by South African National Parks (Biodiversity & ecosystems, 2009), whereas, the Transfrontier within the country borders are: AiAis Richtersveld, Kgalaghadi, Great Mapungubwe, Maloti-Drakensberg, Great Limpopo and Lubombo. Since the country is one of the newest on the continent which gained its independence recently, South Africa has been using old environmental policy which were said to be outdated. Therefore, Transfrontier conservation areas on its borders reversed bad decisions made by colonial powers (Marais, 2000). However, TFCAs is facing challenges although at the same time progressing. Nevertheless, in most studies, within the sphere concludes that political difference might be a hindrance towards TFCAs objectives. Given an illustration on the analysis of differences in species diversity between protected and neighboring non-protected areas, how much more species can be conserved in protected areas compared to non protected area (Wasiolka, 2011).

2.4.5. Zambia

As in other countries in the region, Zambia is no different towards TFCA. Wildlife has led the way in Community –Based Natural Resources (CBNRM) with special focus in response to poaching of the most endangered species such as rhino and elephant (KAZA TFCA pre-feasibility study annexes, 2006).

In most recently, four private sectors have been working with traditional leaders and communities to identify possibilities for business projects aimed at creating employment for the youth. On the other hand, attention is being given to support the community conservation zone and wildlife transfrontier corridors. Meanwhile, Zambia's current and proposed TFCAs are: Liuwa Plain-Kameila TFCA, KAZA, Lower Zambezi – Mana Pools TFCA, Malawi-Zambia TFCA (combination of Nyika and Kasungu/Lukusuzi TFCA) and Zimosa TFCAs as indicated on table 3 above. The Nyika TFCA is the current priority because of its capacity

boosting biodiversity; moreover, the area is estimated to carrying over 100 mammal species, about 500 bird species and 287 species of butterfly (Peace Parks Foundation, 2011).

2.4.6. Zimbabwe

More focus is within six (6) countries for TFCAs, although they are more countries involved in transfrontier conservation areas as stated on table 3 which are not mentioned in this part. The most significant countries to Namibia in this regard are Angola, Botswana, South Africa, Zambia and Zimbabwe, which all shares border with Namibia, although Zimbabwe is geographically exceptional. Zimbabwe is a home to one extraordinary TFCA, the great Limpopo Transfrontier Conservation Areas which is also shared by South Africa and Mozambique as the group's highest priority (Final Technical Report, 2006). In addition to that, Zimbabwe's other TFCAs includes: Limpopo-Shashe TFCA, Kavango-Zambezi TFCA (KAZA), Lower Zambezi-Mana Pools TFCA, Chimanimani TFCA and Zimoza TFCA.

Some of the state and private owned land falls under these areas which may have major positive economic potential and thus boost ecotourism enterprises. However, the political situation within the country has been one of the set backs in terms of social economic development and in other spheres (Cumming, 2003). Moreover, as Africa's conservation areas comes under increasing pressure from expanding human population as well as human resources needs, TFCs has been considered a relief and breathe of fresh air from biodiversity point of view (Bengis, 2003).

2.5. Namibia's economic values of protected areas

Generally, beside PAs being regarded as important tools for the conservation of biodiversity, they are also considered to be generating significant economic resources, as indicated in the Millennium Development Goals of the United Nations. They can provide and create investment opportunities and employment. In addition, they can also help guard against environmental disturbance and the impact of climate change, although unfortunately, their importance remains poorly understood and greatly undervalued (Secretariat of the Convention on Biological Diversity, 2008). Many studies contemplate on the economic impetus provided to conservation which has to transform the way that conventional protected areas are managed. In sub Saharan Africa, a good example is that of Madikwe in South Africa to its

growing number for policy reforms that are transforming protected areas into self funding and semi-autonomous agency (World Bank, 2002). As it is now well documented in academic literatures, biodiversity should be conserved both for its value as a local live-hoods resources and as well as national and international public good. On the other hand, the significance of poverty reduction, particularly in developing countries through conservation of PAs is growing rapidly since these areas are integrating with a broad sustainable development (Scherl, et al. 2004).

As it is in other country's PAs, Namibia's case is no difference. Wildlife and its utilization has determined the economic and financial values as it is vividly seen through conservancies which are found to be economically efficient and able to contribute positively to the GDP of the country. They further act as a channel for the capture of donor grants as an income generating, although flexibility and adaptability in design are key factors in ensuring effective rural development and conservation in PAs (Jonathan et al., 2001). See appendix 6. It's a common knowledge that Namibia's economy is primarily based on the natural resources such as mining, fisheries and agriculture as stated earlier in this paper. However, statistically, in 2008, primary industries contributed N$17.75 million, about 24.4 % of the total GDP of N$72.9 billion (National Account, 2008).

Namibia's PA's system has significant economic value from the direct and indirect income it generates, mostly through tourism and wildlife, but interestingly heavily dependent on a very limited budgetary appropriation which is insufficient in carrying out all the operations. In an economical world, the economical value of PAs doesn't draw any attention due to the fact that they are not traded on commercial markets and therefore have no market values. The values of non-market goods and services need to be measured and expressed in monetary terms, so that they could be weighed on the same scale as commercially traded components (IUCN, 1998). Otherwise, PAs and their functionality in an economy shaped by market could be among the natural resources most often described as worthless (CNPPA, 1995).

2.5.1. The Tourism value of the Protected Area System

Although tourism has been not a recognized sector traditionally, but recently it has been shown to be one of Namibia's most important industries, whereas majority of the people is dependent on wildlife and natural resources. The industry has undergone rapid growth since 80s, with an average increase in international arrivals of 16 % (Turpie et al., 2004a). The main direct use values associated with PAs system are derived from tourism activities which include: generating expenditure through entry and accommodation fees, and moreover, tourist lodges support other sectors by buying food and equipment (Turpie, 2004b).

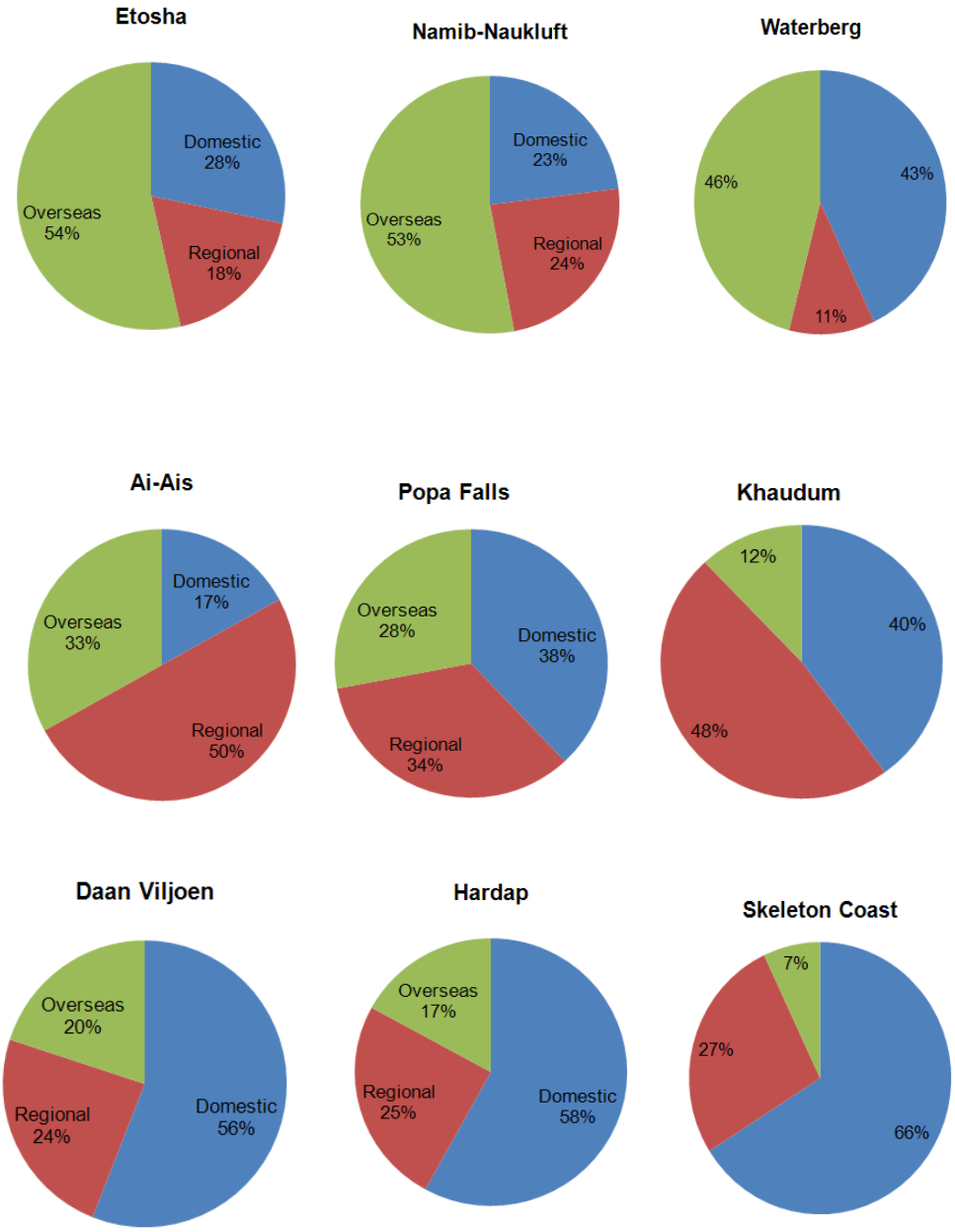
In contrast to this, tourists especially from abroad dominate the parks upon visiting, although the actual numbers of visitors differs from park to park. However, statistic has got it that six National Parks attracts many visitors and Etosha National Park being among them, followed by Waterberg Plateau, Namib-Naukluf and Ai-Ais, Popa Falls and Khaudum as well as Gross Barmen (Turpie, 2004c). Yet, despite this, trophy hunting and sales of live animals also make an incredible contribution to the overall value (Richardson, 1998); and another value is that of wildlife viewing (Barnes et al. 1997).

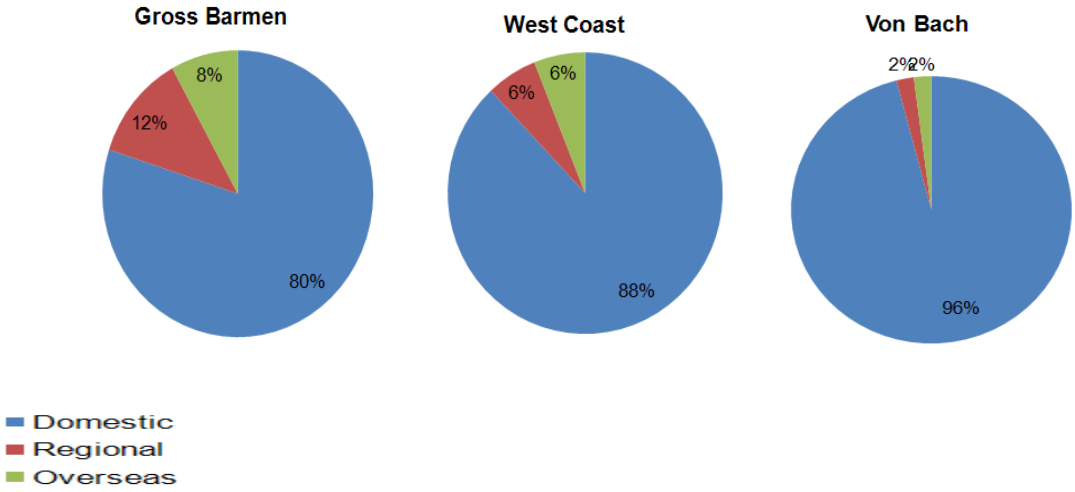
2.5.1.1. Visitors within Namibia's PAs systems

A number of literatures reveal different various studies which have estimated the origins and number of visitors to Namibia's protected areas including National Parks. In most cases overseas visitors are considered to be very important because they spend more and have higher consumer surpluses than local and regional visitors (Stoltz et al., 2001). The Namibian Wildlife Resorts (NWR) spearheads tourism as a parastatal institution whose mandate is to do business as far as tourism is concerned.

Given the data on visitors visiting parks by the NWR in (Turpie et al., 2004), three parks (Etosha, Namib-Naukluft and Waterberg) are mostly dominated by overseas visitors, whereas Ai-Ais, Popa Falls and Khaudum are dominated by foreign, regional visitors. And other remaining parks are dominated by Namibian visitors as indicated on Fig. 2.6.

Fig. 2.6: Comparison of visitors in different PAs (based on NEW data) (Turpie et al. 2004) in (MET, 2004).





2.5.1.2. The impact of Tourism on GDP

According to the World Tourism Organization (WTO), over two decades ago, Africa has experienced a rise in tourist arrival from 8.4 million to 10.6 million and receipt growth from $2.3 billion to $3.7 billion (UNWTO, 2006). Some empirical studies that investigate tourism's contribution to economic growth, statistically verifies that tourism industry significantly contribute both to the current level of GDP and economic growth of African countries (Fayissa, 2007).

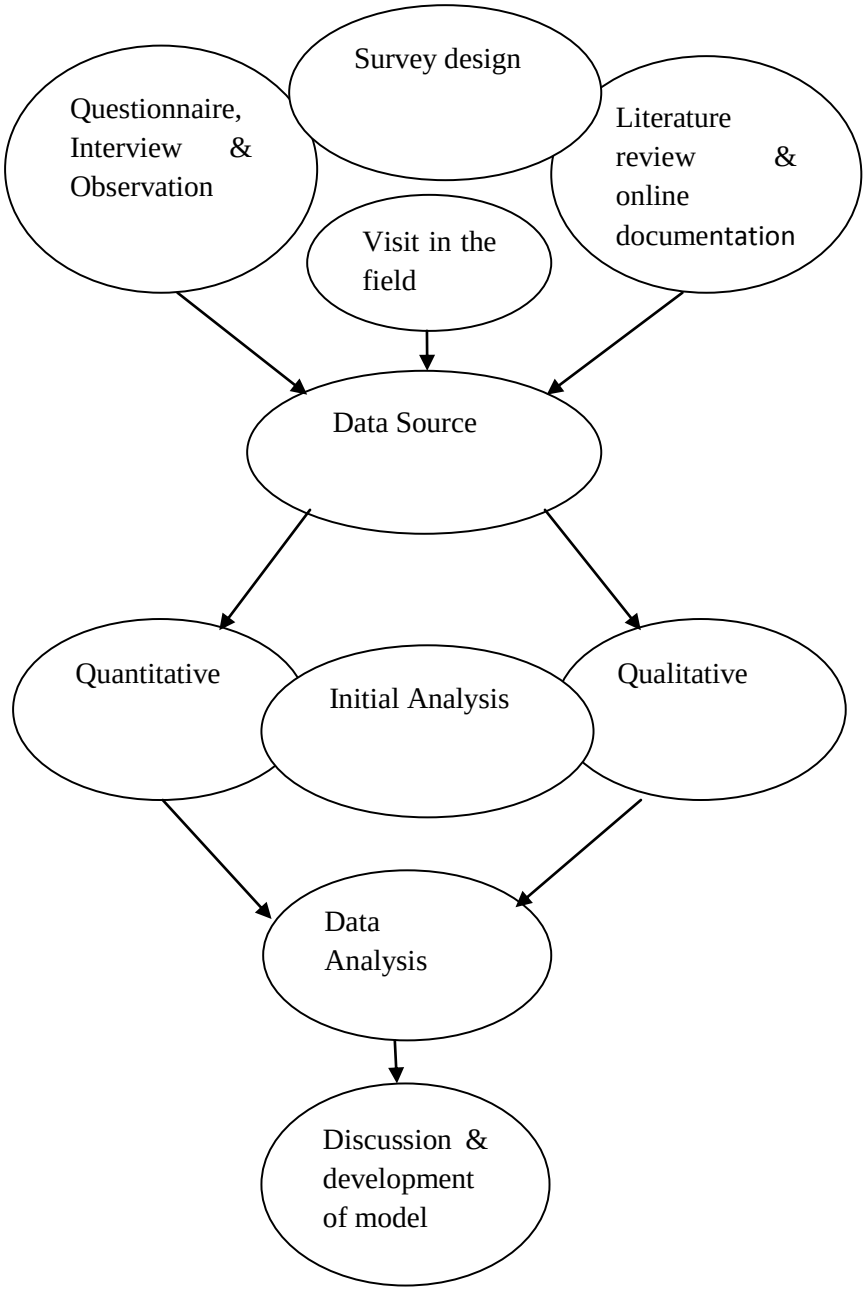
In the case of Namibia based on selected literatures on tourism, the impact can be estimated by measuring the income generated by tourism activities both direct and indirectly. Distinguishing the difference between the two, direct income result from the total expenditure generated through the purchase of tourism services and whereas indirect income comes from the demand generated in the rest of the economy by the tourism industry (Turpie et al., 2005). See appendix 7.

3. METHODOLOGY

3.1. Research design

The use of different types of data collection such as questionnaires and semi-structured interviews used in this study helped in gathering more information from varied categories of PAs.

Figure 3.1: Summarizes a research design prepared according to (Bickerman, 2008).



3.2. Geographical location of the study area

The study area of this research is the four selected terrestrial National Parks (NP) located in Caprivi region, Northern-eastern part of the country under directorate of Parks and Wildlife Management of the Ministry of Environment & Tourism. Three of them namely, Bwabwata, Mamili and Mudumu are found deep in the region, whereas Mahango, formally known as Caprivi Game Reserve, a protected area between Okavango and Kwando Rivers is shared between two regions Kavango and Caprivi (appendix 8) and Fig. 3.3.

However, this study follows methodological techniques used in other related studies, and on the other hand, the qualitative questionnaire (appendix 9) was employed both in the field and with people involved in PA management as adopted from (Mulonga, 2010) and people working in conservancies, as well as Management Effectiveness Tracking Tool (METT) implied by (MET, 2009) which was taken in 18 parks country wide as indicated on the map of Namibia's PAs below.

Figure 3.2: Map of Namibia's PAs showing the study area (MET, 2009).

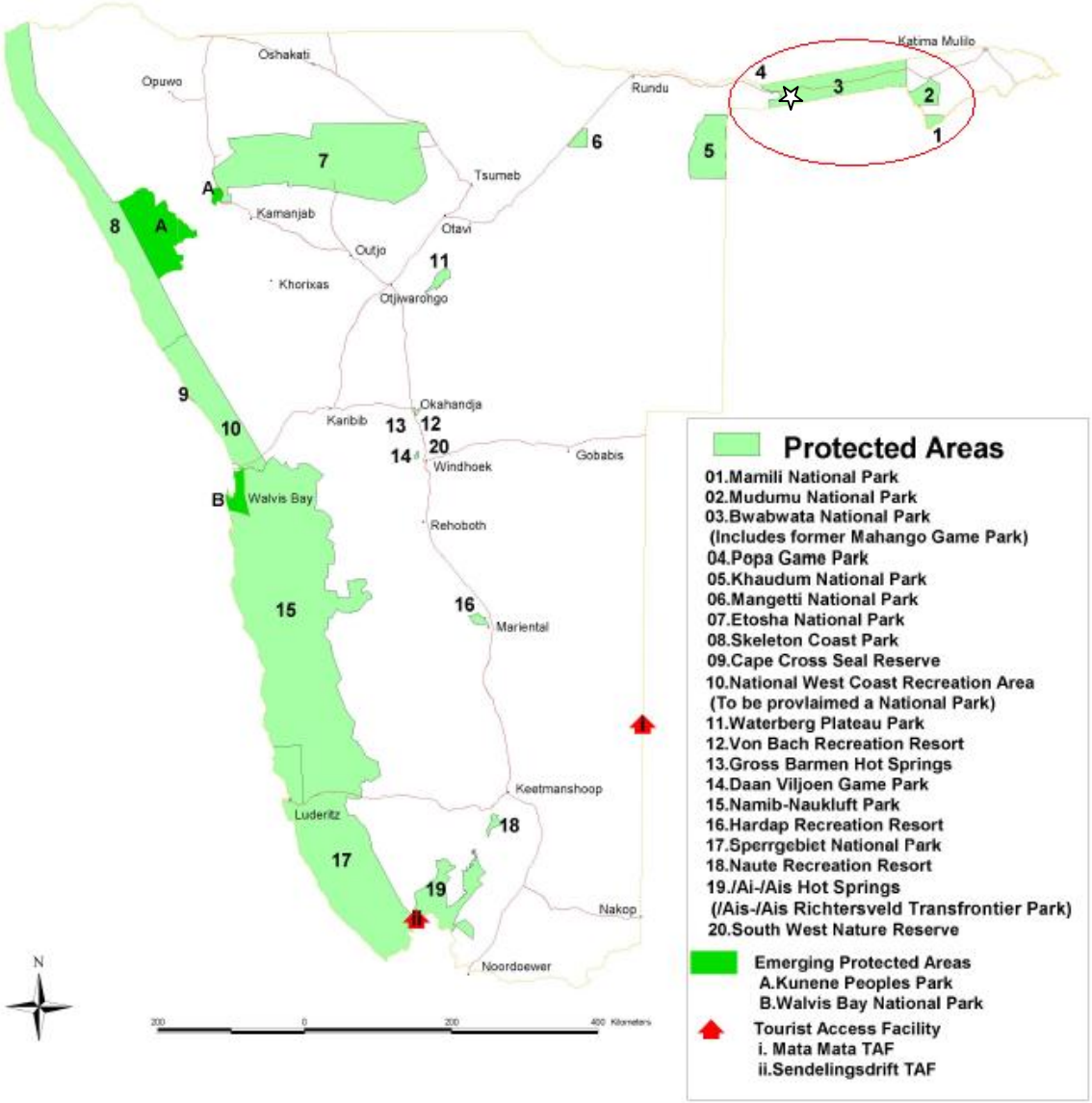


Fig. 3.2 above shows all Namibia's protected areas including the four main study sites, (Bwabwata, Mamili, Mudumu and Mahango National Park denoted with a star). Both of these NPs fall under Savannah woodland biome where they share similar habitat and species distribution which is determined by climate condition. This region receives higher amount of rainfall which swells up the lagoons and swamps enriching the biodiversity. Moreover, Kwando and Okavango River makes part of this landscape.

Figure 3.3: The study site (Four parks in the Caprivi region)

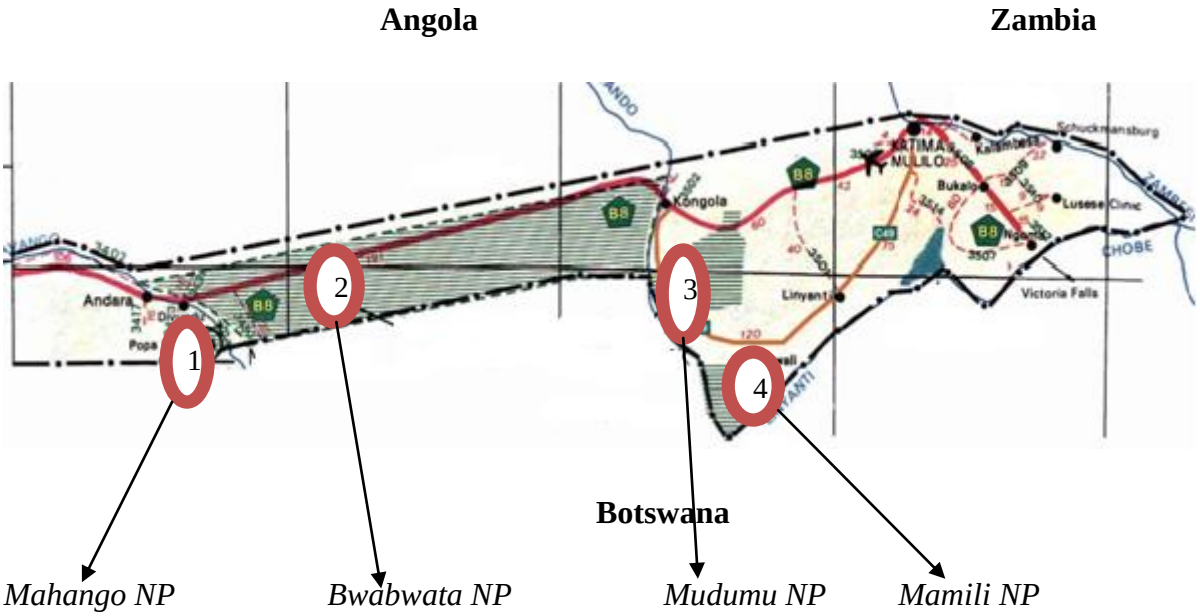
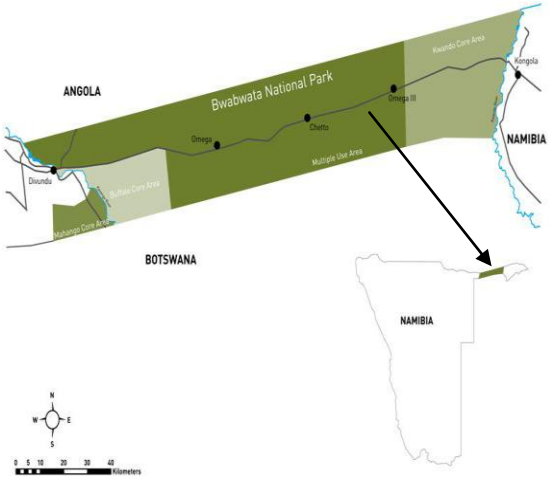
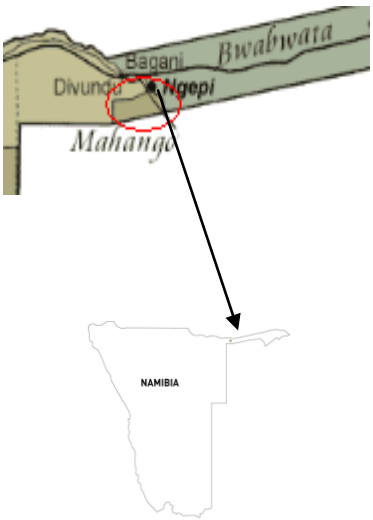


Table 3.1: The description of these four parks

Name	Size (km^2)	Proclaimed	Biome	Natural features
Bwabwata NP 	6 100	1966 formally and later proclaimed as Bwabwata NP 2007	Savannah Woodland	Vegetated sand dunes with old lines (omurambas) in between Okavango river & Kwando River
Mahango NP 	30 300 hectares	Officially proclaimed in 1990 formally Caprivi Game Reserve and later 2007 as National Park	Savannah Woodland	Omurambas, Wetlands, baobab trees, open dry woodland, Zambezi teak etc.

Mamili NP 	320	1990	Savannah Woodland	Channels of reed beds, lagoons and termitaria islands Boundary between Kwando & Linyanti River
Mudumu NP 	1 010	1990	Savannah Woodland	Kwando river floodplain & associated grasslands and riparian woodlands

3.3. Data Collection

As stated earlier in this section, methodologically this study used two forms of data collection; primary and secondary. Nevertheless, data and other necessary information were collected based on the main theme of this work (biodiversity, economic and social wellbeing protected areas offers). Moreover, after thoroughly consultation with my supervisor, the theme was extended to collecting more data on management system, conservation policy, and legal framework and so on. Some of these will make part in the results and discussion respectively.

3.3.1. Primary data collection

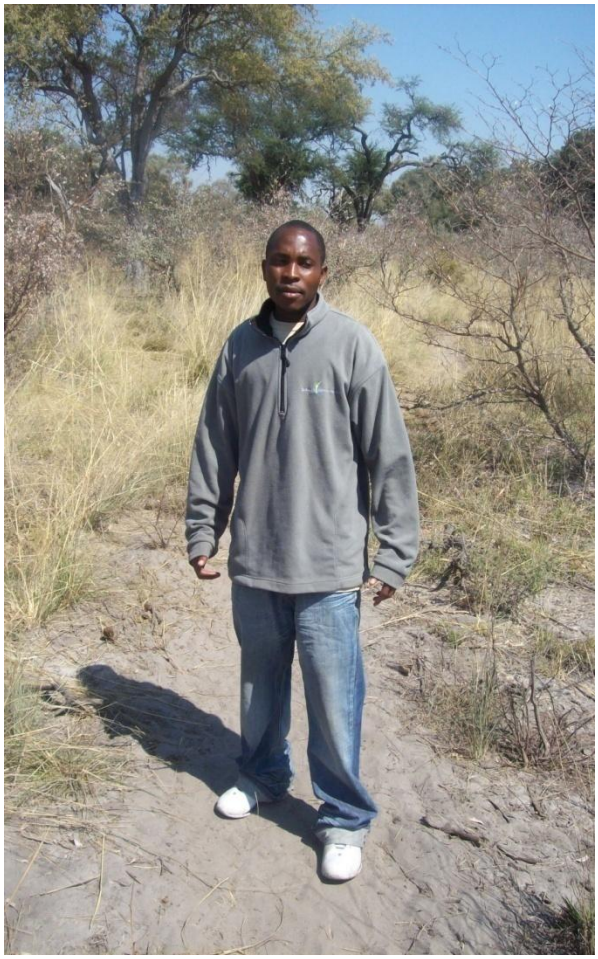
3.3.1.1. Field visit

During my internship in the year 2009, I visited couple a number of National Parks in Namibia including the four selected ones for a period of four months. More preliminary information was gathered within this period as general idea on visiting significant protected areas was initiated. The main activities were observation and interviews with people affiliated to the PAs including some officials from the Ministry of Environment and Tourism, stakeholders and members of different communities within the region. Furthermore, in order to get a view of the nature of the study area which is prior to data collection, after thoroughly consultation with expats and people who were already in the field, a reconnaissance survey was recommended to acquire some idea about the functionality of PAs and their worthiness towards biodiversity and socio-economic. Before any participation by any parties, views were exchanged with the people about the objectives of the study.

3.3.1.2. Field observation

Field observation was done in both four Parks hence they are not far from each other. As for Mudumu National Park, it was easier to redo this activity many times because I live in the area and lived there throughout my life. Most of the people in this area are involved in conservation and wildlife, since it is the only source of income for the communities. On many occasion I could go out in the field work with tour guiders and game rangers monitoring the park and tracking poachers' foot prints. Moreover, observation of management implementation in PAs and their effectiveness, activities and infrastructures and others were also recorded as shown in the photographs below.

Picture 3.1 & 2: In a field work with a tour guider in Mudumu NP (Author, 2009).



Picture 3.3: With a tour guider patrolling the Kwando River under Mudumu NP (Author, 2009)

3.3.1.3. Interview and Questionnaire

Interviews were conducted in order to carry out this work to the supervisors' satisfactory. Moreover, questionnaire including both open and closed were also done with people devoted to conservation and management of protected areas on a contact and correspondence basis respectively. Interviews with the officials from MET were done during working hour as that was the only time for them to be consulted, while, the questionnaire survey for the other staffs such as rangers, game wardens, game scouts, administrative were done in the field and upon personal inquiries. However, the process wasn't a burden to everyone as it was proposed before to be a participatory not as a mandatory. Similarly, the questionnaires were also extended to tourist guides, local people, researchers and other people visiting these areas following the objectives of the study in fulfillment and thus to collect the selected information of the study. See the sample of the questionnaire in appendix 9.

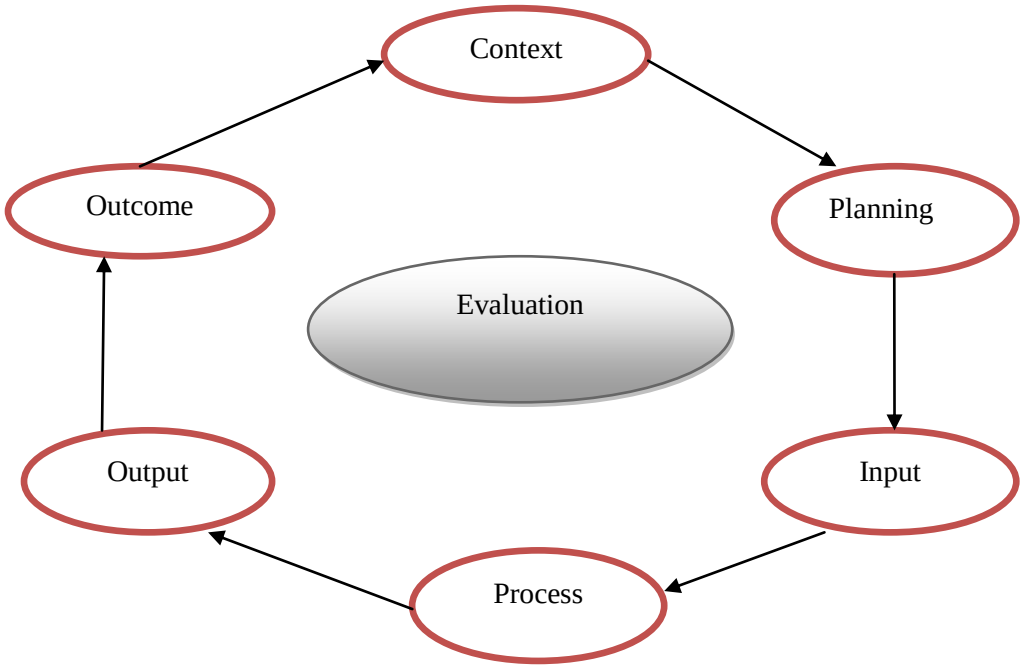
3.3.2. Secondary data collection

Relevant related literatures were thoroughly reviewed where secondary information such as reports, maps review, dissertation were collected from various government and non-government organizations such as the government of Namibia (GRN) through its Ministry of Environment & Tourism of Namibia, Namibia Nature Foundation (NFF), Namibia-Strengthening Protected Area Network (SPAN). Moreover, scientific journals were used and in other cases some sources were internet based as they are published by relevant organizations such as IUCN, CBD, the UN, the WTO and the WWF among others which have programs and task forces focusing on the areas studied and have their publication online. In addition, some information were extracted by reviewing policy documents, reports, student theses and development plans with information relevant to management and conservation of PAs. Furthermore, internet search was carried out by visiting websites managed by international organization such as GEF, PPF as well as Ramsar sites information run by wetlands.

3.4. Framework of evaluation

The framework of evaluation procedures which was used in this study is an extract from IUCN-WCPA's management effectiveness evaluation and together with Management Effectiveness Tracking Tool (METT) by the World Bank as indicated on Fig. 3.4. Similarly, further information on management effectiveness evaluation was also taken from the research report: Tracking and Monitoring Progress 2004-2009: *Management Effectiveness Assessment of Namibia's Protected Areas* (MET, 2009). This was modified by the Namibian GRN through its MET to Namibian Management Effectiveness Tracking Tool (NAMETT) upon the recommendation by the World Bank on PAs to best suit the Namibian PAs. This study uses METT and NAMETT tool as a rapid assessment based on scorecard questionnaire. Table 3.2 signifies the WCPA framework, and it further summarizes the elements of the WCPA framework and the criteria which were assessed. The scorecard includes 6 elements.

Figure 3.4: IUCN-WCPA's Management Effectiveness Evaluation cycle (Nakarmi, 2007).



In continuation, these elements in the result of this paper were further evaluated based on indicators such as biological importance, socio economic importance and vulnerability which affect the status and threats of PAs. Moreover, inputs were evaluated in number and capacity of staffs, budget and quality and quantity of infrastructure as illustrated on Table 3.2.

The indicators were selected based on preliminary information on biodiversity, social and economical point of view. The total number of species in each park was recorded as well as the number of Red and endemic species, therefore the information provided by these indicators revealed the extent of genetic diversity as shown in the result of this work through tables, graphs and pictures as well as line graphs showing trends over time and pie charts to effectively show the conservation status of different groups.

Table3. 2: Broad categories of indicators for PA management effectiveness evaluation: Adopted (Hocking et al., 2000)

Elements	Indicators	Level o evaluation
Context	Biological importance Socio economic importance vulnerability	Status and threats
Planning	objective Legal security Site, design and planning	Appropriateness
Input	Staffing Infrastructure Finance	Resources
Process	Management planning Management decision making Research Communication and coordination Monitoring and evaluation	Efficient and appropriateness
Output	Management plan regulations Guidelines	Efficient
Outcome	IUCN category II Recognition as WHS Bufferzone declaration Ramsar Site	Effectiveness and appropriateness

3.5. The rating criteria

There were different criteria used in rating in this study, these include the assessment form which consists of two sections1) Datasheet: details key information on the site, its characteristics and management objectives and 2) Assessment forms: which includes 3 distinctive components which were completed in result. The core of the assessment was corded under score criteria such as 0 (poor) to 3 (excellent). On the other hand (Low & High), "Ok" or simply leaving blank, indicating no data available and etc were all used.

3.6. Data analysis

The data which were obtained, some were quantified through cording, tabulation and counting and moreover, information collected were analyzed after thoroughly studying and comparing them with different data collected from other different sources. This was transformed into the results which were presented in graphs, tables, pie chats and illustration through texts. In the discussion, comparisons of PAs biodiversity and socio economic within the region and beyond the borders were also discussed. The indicators were interpreted by setting percentages.

3.7. SWOT analysis

The Strength, Weakness, Opportunities, and Threats were carried out as shown in the result. Their overall impact on the PAs was analyzed per parties' sentiments as well as data published.

4. RESULTS

The data collected through questionnaires and other sources together with information obtained during this study will be incorporated and signified in this section. Moreover, this section present results of the effectiveness evaluation of the selected national parks of Namibia, namely; Bwabwata, Mahango, Mamili and Mudumu in the Caprivi region and their objectives in protecting ecological integrity and social equity. In addition, it further presents the economic values and benefits of these NPs towards economic development.

4.1. The principle of good governance as an indicator

Good governance is the key to functionality of any state, contrary to that, the development of any kind could be in jeopardy. Wherefore, this study under this section investigated governance as an indicator in these selected PAs, and whereas 1) openness, 2) participation, 3) transparence, 4) effectiveness, 5) accountability and 6) coherence were main indicators. The figures (numbers) at the same time represent the characteristics of each indicator within the parks.

Table 4.1: Characteristics of good governance in the 4 selected National Parks

Indicators	National Parks	Characteristics
Openness	Bwabwata	2, 3
Participation	Mahango	2,3
Transparence	Mamili	1,2,3,4
Effectiveness	Mudumu	1,2,4
Accountability		
Coherence		

Table 4.1 above shows the characteristics of good governance within the selected parks. Mamili NP is categorized as a very significant park in their category topping the scoreline as indicated on the table. Government institutions and other stakeholders are very committed to rendering better services, although there are some discrepancy and setbacks faced by these institutions. Intrinsically, based on data collected, it was analyzed that Bwabwata and Mahango which are not far from each other have almost the same management activities due to cultural influence. Some of the setbacks and stumbling blocks within these PAs are due to the fact that the indigenous people such as the San living within and outside the parks feel neglected by the government. This has been considered as a major problem where as local communities criticizes the government's role as inadequate and poor. Which means there is no openness and transparency in their dealings. On the other hand, Mudumu is likely to be a second class park in the region, whereas the adiminstration structure is almost the same as that of Mamili which is a neighboring park with better governance. It was also found that injustice and unlawful enrichment of the few at the expense of the poor triggered by corruption was rife in Bwabwata and Mahango.

4.2. IUCN categories

In order to get a clear view of the protection and conservation of the these NPs, literature review on IUCN categories were conducted, and the results are displayed on table 4.2 bellow.

Table 4.2: IUCN Categories indicating the 4 parks Bwabwata-Mahango-Mamili-Mudumu (BMMM)

IUCN Categ.	**National Park**	**Legal responsibility for nature conservation & type of PA management authority - MET**
Unknown	Bwabwata NP	MET-National ParkDirectorate (Regional Authority)
II	Mahango NP	MET-National ParkDirectorate (Regional Authority)
III	Mamili NP	MET-National ParkDirectorate (Regional Authority)
IV	Mudumu NP	MET-National ParkDirectorate (Regional Authority)

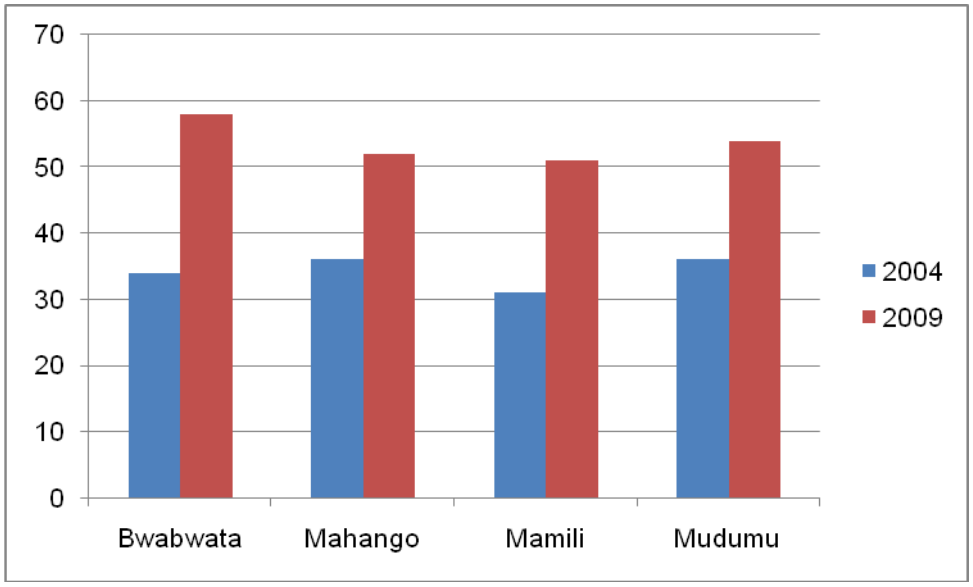
Geographically all these PAs belong to one type of topography and habitat, therefore the differences are not that much when it comes to the physical environment. However, there is a great difference between the categories per IUCN. Each park has got its own objective for protection of nature, biodiversity and ecosystem functions. The IUCN category for Bwabwata is unknown this is because the Park is knew and little is known about it, more studies is recommended to determine the objective of the park. The government manage these areas as the main form of governance countrywide.

The authority has got sole responsibility for planning the management through the Ministry of Environment and tourism, however, it has the obligation as well to inform and consult, or even involve the stakeholders such as University of Namibia and other institution to take part.

4.3. NAMETT results of the assessment for the period of 2004 & 2009

Fig 4.1: is an extract of the assessment scores for 19 parks in Namibia, but within the context of this study, 4 NPs were taken into consideration. It is of an important value to take into account that the NAMETT is designed to track changes in management effectiveness in each park as shown also on Table 4.3 (MET, 2009b).

Fig 4.1: NAMETT assement scores for 2004 & 2009



As analyzed by (MET, 2009), the result shows the change patten in the year 2009 assessment whereas in this study all parks' score increased drasitically, with Bwabwata and

Mudumu score higher by 20 or more points due to factors such as park proclamation, infrastructure development, development of management plans, donor funding through projects and etc.

Table 4.3 NAMETT results 2004 & 2009

National Park	Longtitude	Latitude	2004	2009
Bwabwata	22 ° 27 E	17 ° 58 S	34	58
Mahango	21 ° 39 E	18 ° 13 S	36	52
Mamili	23 ° 39 E	18 ° 23 S	31	51
Mudumu	23 ° 34 E	18 ° 04 S	36	54

4.4. Comparative analysis of the four NPs

Upon the field visit which was based on observation, together with data obtained from previous studies such as *DEA RESEARCH DISCUSSION PAPER of 2002* on protected areas in Namibia, a comparative analysis of the 4 national parks is drawn as indicated on Table 4.4 bellow; this is due in respect to the 4 selected areas of the study. Moreover, this section addresses wildlife abundance and the scenic beauty of Namibia's PAs. Generally, it also addresses the infrastructure within these parks, tourism been the main one. The study analyzes that the variation in visitation to the parks could be influenced by park activities, species abundance or in simpler terms, what the park has for the visitors. As the parks countrywide are divided into categories, the four falls in one category which is "*less developed wildlife parks"* featuring mostly the north eastern regions.

Table 4.4 Overview of the selected areas

Park	Game viewing	Size (km^2)	Distance from Whk	**Tourist infrastructure within Parks**			
				Maintained roads	Camping facilities	Bungalows	Shop/petrol station
Bwabwata	x	6100	>1000	x			
Mahango	x	30 300 ha	950	?			
Mamili	x	320	>1200	?			
Mudumu	x	1 010	>1200				

The table above summarizes tourist infrastructure within the parks, whereas 10 years ago tourist infrastructure was in a bad condition stresses park managers. With different information obtained from different studies there is little improvement which has been done. The roads are not properly maintained per MET standard as compared to Etosha and Waterberg Plateau Park, one of the best parks in the country. It was found that these parks offer wildlife viewing just like other parks but have a less developed tourism infrastructures. On contrary, the distance from the city Windhoek (Whk) is longer as all places are >900km farer (Table 4.4), placing them in remote areas. This could be one of the reasons why there is inadequate development in the region, as there are many limitations including poor accessibility as well. Consequently, this region has been lagging behind in terms of development in all spheres.

4.4.1. Assessment of access and transport infrastructure

The assessment is based on (Massyn, et al. 2009) of the evaluation of air strips and access roads to the Bwabwata-Mamili-Mudumu (B-M-M) for the year 2007/2008. Therefore, Table 4.5 & 4.6 presents the results. However, in the case of Mahango during the project, it was under Bwabwata NP which is very closer. In this regard, the infrastructure in Mahango is likely to be the same as Bwabwata.

The air strips located in this vicinity were built during colonialism of which are now out of standard, although in road access, there is quality road network system connecting Namibia to Botswana, Zambia ad Zimbabwe. However, this quality road system only leads to,

not within the parks. During the survey as shown on pictures in the methodology section, one of the limitations within the parks was access to movement, as most of the roads were filled up with water, mostly in Mamili Park.

Table 4.5: Location of air strips inside or near to the BMM parks

Park	Location of strip	Conditions
Bawabwata	. Bagani, north of Mahango core area . Omega, multiple use area . Immelmann, Kwando core area	. Dirt, excellent all weather . Tarred, excellent . Dirt, good, not usable in wet weather
Mudumu	. Northern boundary of Lianshulu concession area	. Dirt, good, not usable in wet weather
Mamili	. Nkasa Island	. Poor, not useable, old military strip, needs rehabilitation

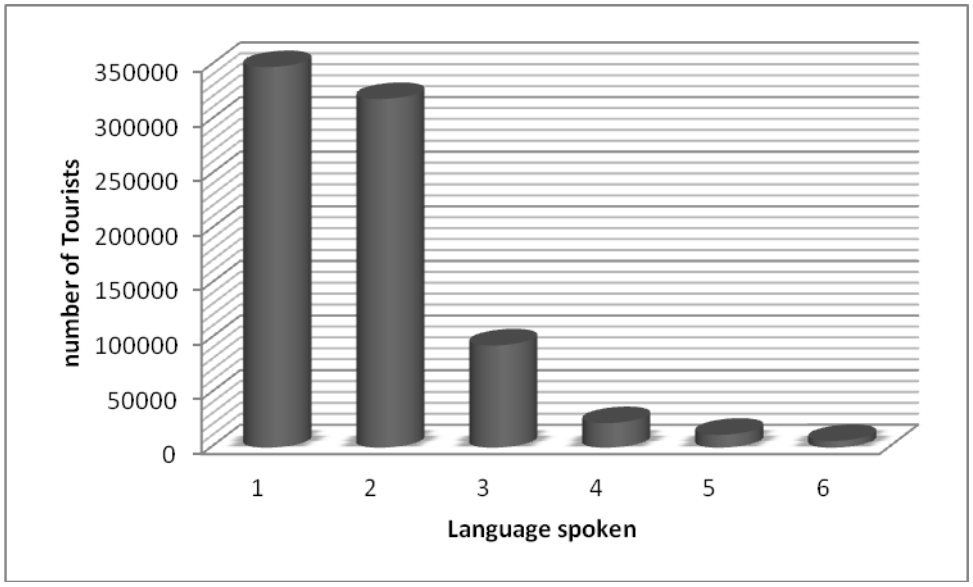
Table 4.6: Access roads to the BMM parks

Park	Access road	Conditions
Bawabwata	. B8 linking Ngoma, Katima, Kongola, Divundu & Rundu . C48 linking Divundu with Muhembo border post via Mahango Core Area	. Tarred, excellent all weather . .50% tarred, dirt with dirt section extremely muddy during wet weather
Mudumu	. C49 linking Katima with Kongola, via Linyanti	. Dirt, good, recently resurfaced, but slippery in wet weather
Mamili	. C49 linking Katima with Mamili via Linyanti . From Sangwali and Malengalenga villages, 4x4 can be taken in the park	. Poor, frequently flooded 2 pole bridges are used to cross deep channels from Sangwali

4.5. Statistics of tourism

The data was extracted from the Namibia Tourism Board website which was then processed and used in this study to show tourists arrival by nationality as of the year 2005-2008, see fig. 4.2, meanwhile, fig. 4.3 shows the results of the number of tourists' arrival by language spoken. Tourists came all over from different parts of the world with English speakers topping the list.

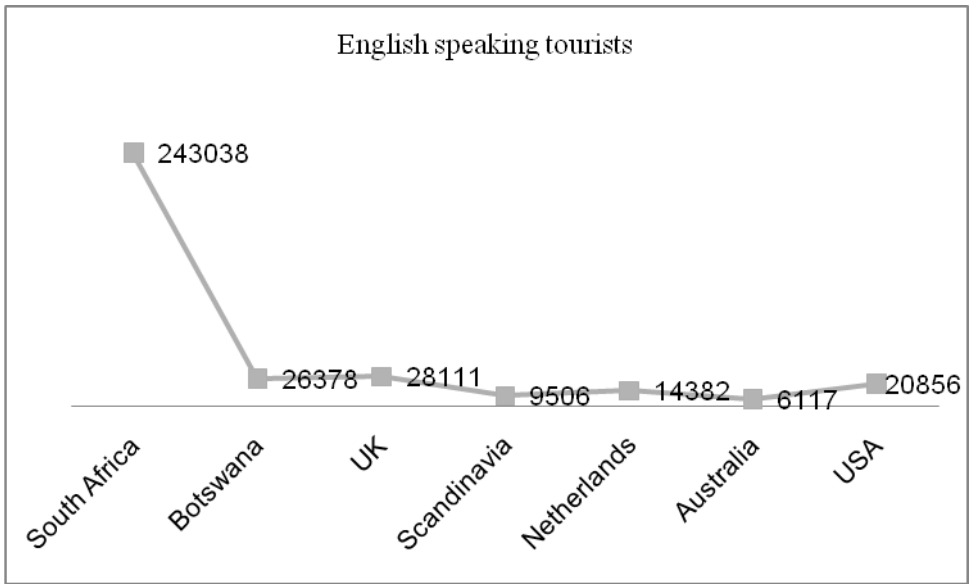
Figure 4.2: Number of tourists arrivals by language spoken (Namibian Tourism Statistics, 2008)



The figures on the x-axis represents language spoken, where as 1 stands for English, and 2 for Portuguese, 3 German, 4 French, 5 Italian and 6 for Spanish. This study attempts to conclude that the reason English speakers topping the list could be because Namibia is English speaking country as well which makes it free from language barrier for the English speakers. On the other hand, Portuguese is in the second place which is because of many tourists coming to Angola (a Portuguese speaking country) as a neighboring country of which many of them ending in Namibia since these two countries shares almost same cultures.

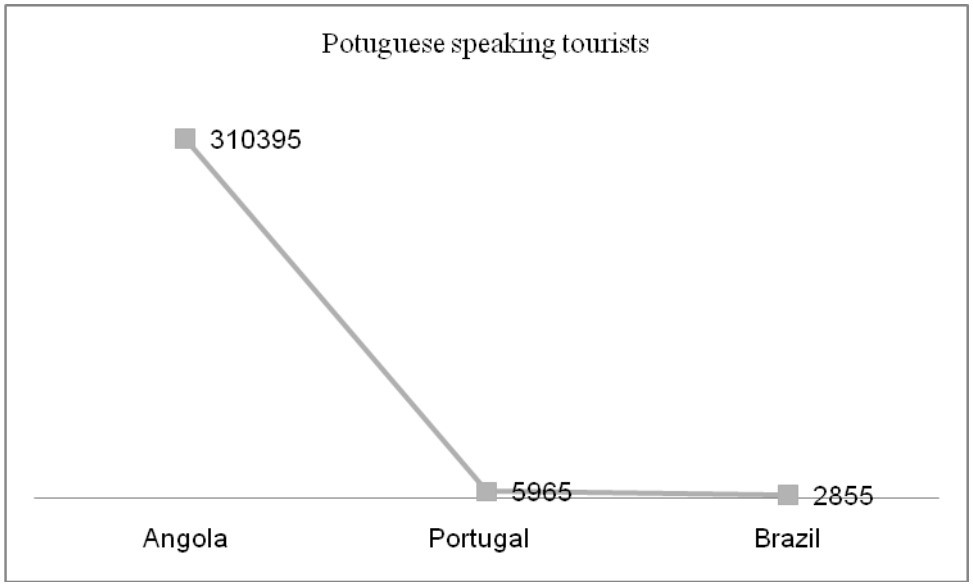
Namibia is a former German colony, of which many German remnants and historical attributes acts as attractions for the Germans speaking people.

Fig. 4.3 Number of tourists arrivals by Nationality (Namibian Tourism Statistics, 2008)



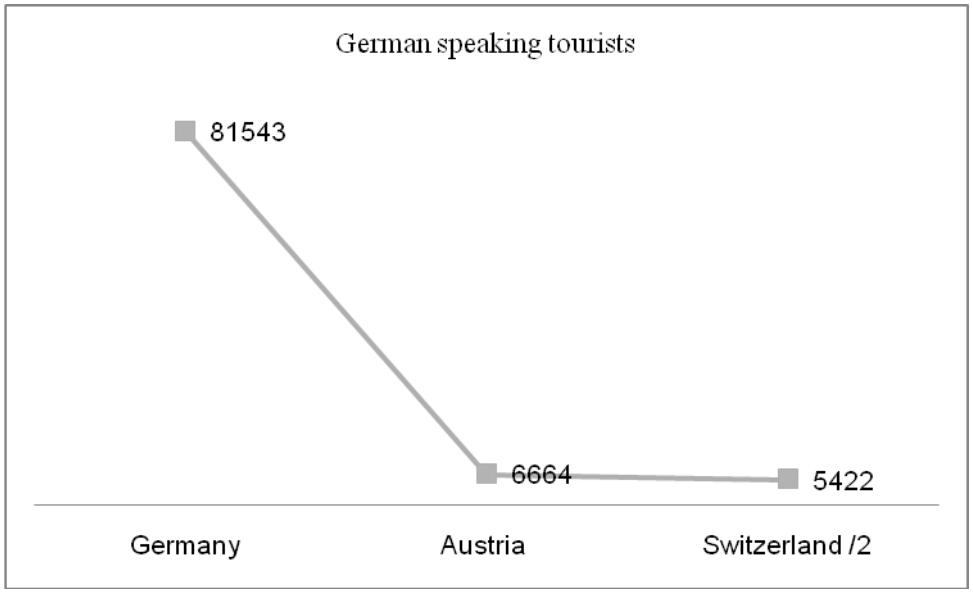
The total number for Englis speaking tourists is **348388**, where as South Africa being the most source of tourists visiting the land of contrast-Namibia. However, the results indicates that in the region Botswana could be realiable as the figures are not so bad compared to other countries on the continent.

UK and the United States are in the same categories with little difference in the figures, meanwhile, Australia is the least country when it comes to number of tourists landing on the land of the brave.

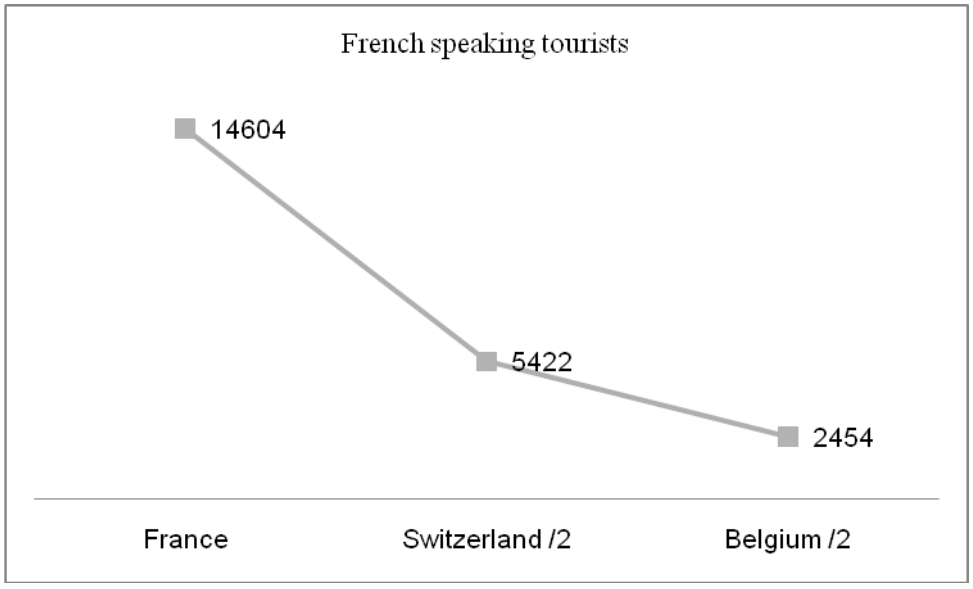


As for the Potuguese speaking tourists, the total arrival number is **319215**. Angola is a leader in the group as indicated on figure above. Statistically, the number is so significant, given the figures from other countries in the group.

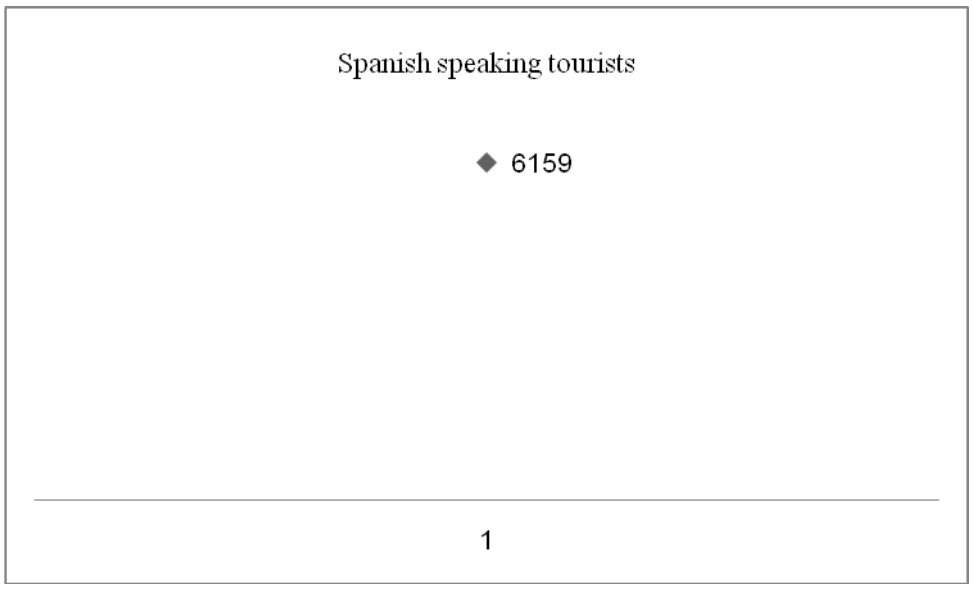
The study therefore, stresses that, since Angola and Namibia share border it makes it easier for the tourists visiting Angola to also visit Namibia since the two contries shares a lot in common. Both two, Portugal and Brazil are portuguese speaking countries who frenquently visit Angola. Moreover, some portuguese Angolan nationality do business in Namibia.



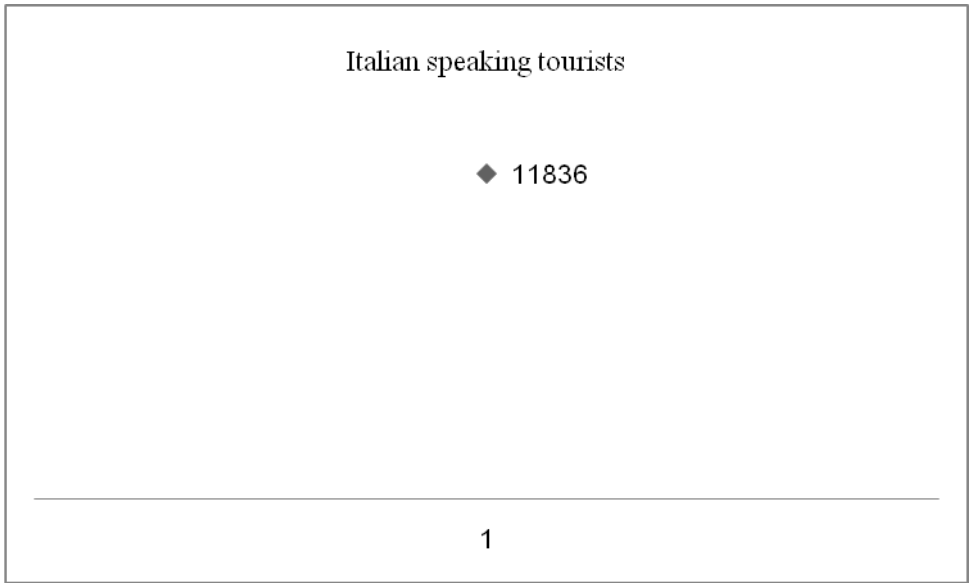
For the german speaking tourists, German as a country leads the group with 81543 tourists visiting Namibian PAs. However, the total number for both German speaking tourists is **93629**. Austria and Switzerland collectivelly makes the group as well. Simultaneously, half of Switzerland is Germany speaking and the other half is French speaking, this could be the reason Austria is the second place over Switzerland as shown on the figure above.



The French speaking nationalities collectivelly are in the third postion, totalling **22480**. Belgium like Switzerland, half of Belgians are French speaking whereas Switzerland, roughly half of Switzerland German speaking and the other is French speaking. However, Namibia doesn't share any physical border with any French speaking country.



Spain, unlike other countries in this study it is the only country with Italy seperately which act as lone nations. All Spanish speaking tourists recorded come from Spain, and the total number is **6159**.

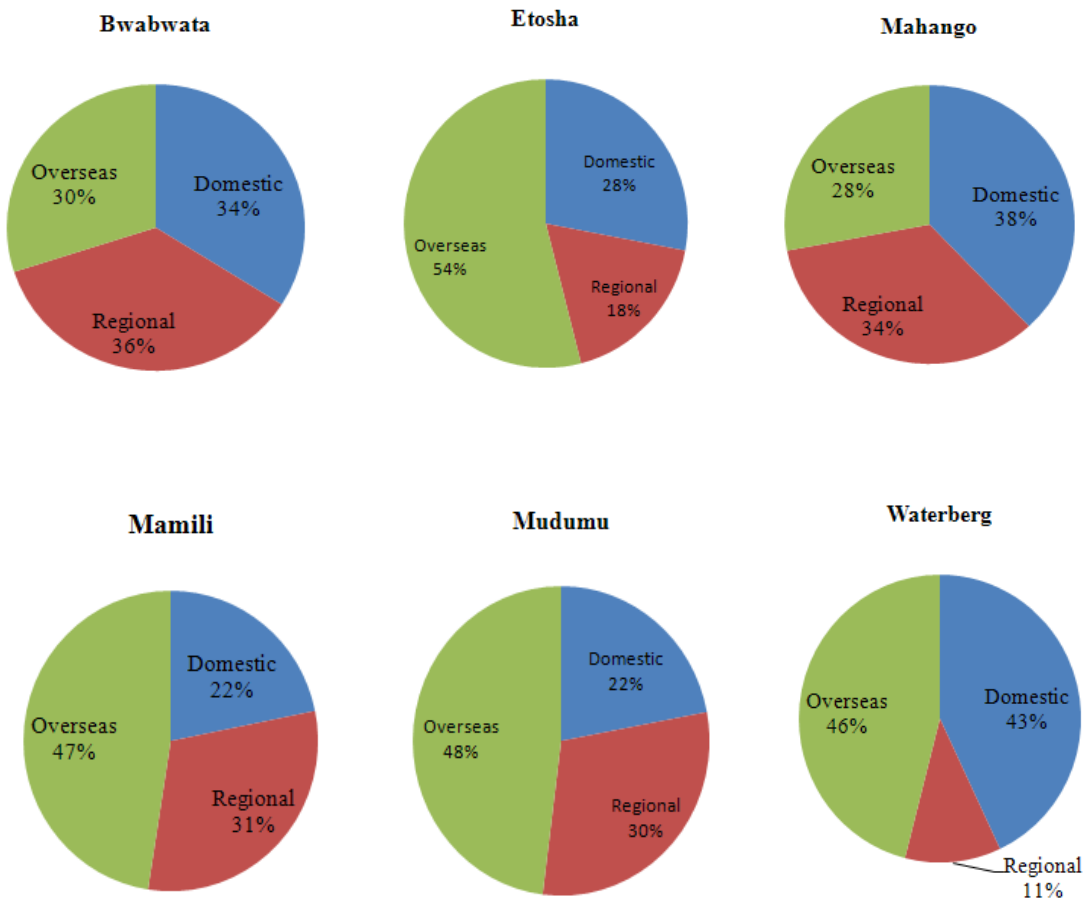


Italian speaking tourists is the least in this study with only **11836** tourists in total. This is because like Spain as the only two nationalities in this study which stands on their own.

4.5.1. Visitors to the Parks

As stressed in the literature review, some empirical studies that investigate tourism's contribution to economic growth, statistically verifies that tourism industry significantly contribute both to the current level of GDP and economic growth of African countries (Fayissa, 2007), Namibia inclusively. Statistical data on tourists visiting Namibian PAs shows that Namibia receives quiet a number of visitors each year. Wherefore, in this study, 2 of the best national parks (Etosha & Waterberg Plateau Park) were compared to the 4 selected parks (Fig. 3.2).

Figure 4.4: Number of visitors in 4 selected areas compared to Etosha & Waterberg Plateau Park



Data obtained from different park administration through observation were also compared to those tracked from different studies, wherefore; in this section the result indicates different composition of tourist visiting these parks. The more tourist infrastructure closer and inside the park is the more tourist attraction in any park countrywide. Etosha and Waterberg are considered as one of the best NPs in Namibia with best infrastructure, tourist facilities, administration and management as well. The 4 selected parks have low domestic number of tourist visiting the parks as indicated on Fig 4.4, whereas regional tourists visit these places regularly. On the other hand, Etosha dominates with overseas tourists than any other park; this could be due to its widespread reputation and favorableness. Meanwhile, Bwabwata and Mahango in comparison to others, little is known about them since they were both recently proclaimed. This study analyzes that these parks are not well known to science; therefore more studies are needed as well as marketing. As it was found in both 4 parks

(BMMM) that there are poor tourist infrastructures, these could be the main hindrance for visitors to these parks. Therefore, it is believed that poor infrastructure turn to be discouraging visitors especially in Mamili where in most cases roads within the park are under water.

As for Bwabwata where indigenous people live in and outside the Park, the study discovered that tourists visiting these areas are not happy with the presence of people in the parks as that diminishes the naturalness of the parks. Furthermore, there are more street kids begging for money and food from tourists, which could be also disturbing for the visitors. Distance from the capital city could be also another obstacle for the tourists particularly for Mudumu and Mamili in comparison to Etosha and Waterberg where these 2 are closer to major towns of Namibia such as Otjiwarongo and Oshakati. Even within the 4 selected, overseas tourists figures is more significant in Mamili and Mudumu than Bwabwata and Mahango this could be due to the civil war which recently ended in Angola neighboring Namibia through Bwabwata as the remnants of landmines and other war caches are still visible in the area.

4.6. Species potential

Field data collected and data obtained from previous studies based on species potential shows that Caprivi Strip where all the 4 parks marked for study area is richly blessed in biodiversity. Moreover, it is a home to permanent water which comprises of rivers such as Chobe, Kwando, Linyanti and Zambezi which sets as boundaries separating Namibia with Botswana, Zambia, and Zimbabwe. Different studies on biodiversity stresses that, almost 70 % of the bird species found in Namibia have been recorded in the Caprivi Strip.

4.6.1. Species diversity

Many studies on biodiversity conducted in this region contemplate on species diversity as one of the region Namibia's species abundance is. Upon the literature review, this study found that the Caprivi floodplains are of major global biodiversity importance with their rivers rich in fish species diversity and other endemic species of both fauna and flora.

4.6.1.1. Bwabwata National Park

This park is a home to both visible and invisible species of many kinds. It was discovered that since it falls under Savanna woodland biome, many species turn to prefer lodging in this area, although people make part of it as well.

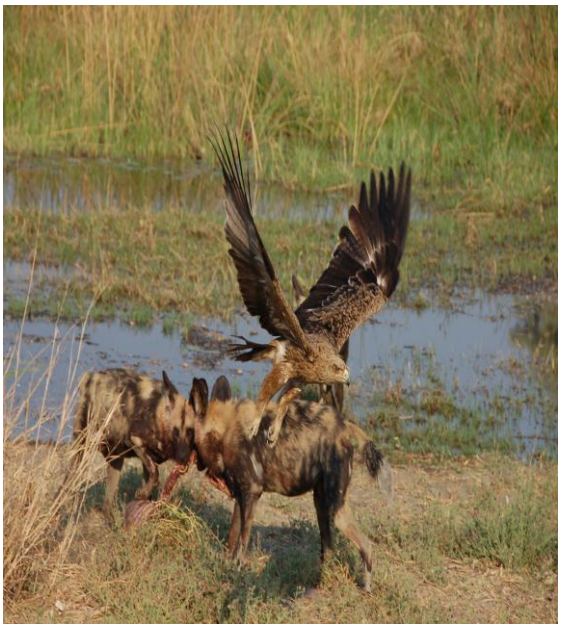
Among plant species found are: Broad leafed Kalahari woodland with trees such as the Zambezi teak, Mopane, Camelthorn and the leadwood in the Omurambas; in addition, reeds and papyrus on the floodplains. As for wildlife, the park is always filled with large concentration of elephants, buffalos and antelopes.

Predators are: lions, leopard, cheetah, and hyenas.

Among the river dwellers are: Common lecwe, sitatunga and hippo

Bird species are: Wattled crane, African skimmer western-banded snake eagle, wood owl, Pel's fishing owl, narina trogon, Cape parrot, red-billed and yellow-billed oxpekers.

Pic. 4.1 & 4.2: Bwabwata wild dog's and People as Park dwellers in Bwabwata (Source: MET).



4.6.1.2. Mahango National Park

Mahango is the smallest among all the four. Like Bwabwata, the species composition is almost the same.

Animal species are: elephants, cheetahs, lion, antelope, warthogs, baboons, hippos, crocodiles, reedbuck, tsessebe, kudu, chobe bush buck, duiker, steenbok and many bird species. Vervet monkey are part of wildlife in Mahango.

Plant species: the most common is baobab trees. Grassland with tall acacia, bush willow and many plant species that are found in bwabwata also found in this park.

4.6.1.3. Mamili National Park

This is one of the wettest parks among the 4; it is richly blessed with diversity of life because of its water abundance.

Among flora species are: Reeds, sedges, papyrus, wild date palms (*Phoenix reclinata*), and tall trees such as jackal berry (*Diospyros mesiliformis*), Mangosteen (Garcinia livingstonei).

Fauna species comprises of: elephants, lions, hippo, land and water monitor lizards, African wild dog, kudu, warthog, spotted necked otter, red lechwe, leopard, hyena, common impalas and loan antelope.

Bird species are mainly: breeding pairs of rare wattled cranes; slaty egret, Stanley's bustard, rosy-throated longclaw, Dickinson's kestrel, Allen's gallinule, lesser jacana, black winged and red winged pratincoles, long toed lapwing, luapula cisticola, coppery-tailed coucal and black cocal.

Picture 4.3 & 4.4 Water monitor and breeding pairs of rare wattled cranes (Digby-Clarke, 2008).

4.6.1.4. Mudumu National Park

Translocation of different wildlife is mostly common in this park. However, the park is home to almost the same species composition in Mamili national park.

Plant species are: Mopane woodland (*Colophospermum mopane*), leadwood (Combretum imberbe) and Mangsteen (Garcinia livingstonii) among others.

Wildlife species are: like other parks, elephants are the most rooming animal species in the park. Lions, leopards, buffalos, spotted hyenas, African wild dogs, cheetahs, hippos, crocodile, spotted necked otter, sitatunga, red lecwe, Burchell's zebra, sable antelope, wild beast, giraffe and many others.

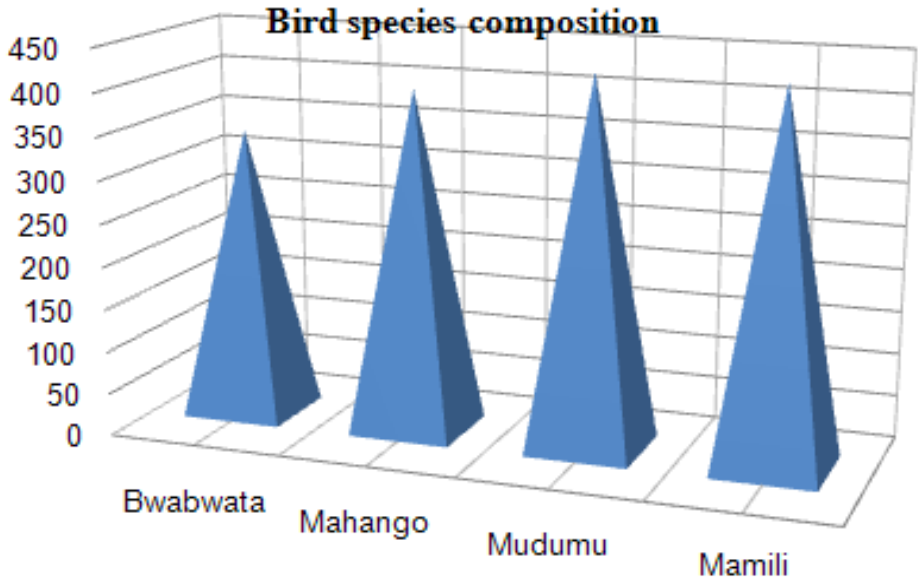
Among fish species are: tiger fish and tilapia.

Bird species are the same as those found in Mudumu.

4.6.2. Bird species composition

All the 4 parks are regarded as a paradise of bird's species within the country. The number of bird species on Fig. 4.5 shows that all parks are almost equal in abundance of birds. However, Mamili has higher number such that Mudumu is equivalent to it as well; this is because of the ramsar sites that attract different types of bird species for breeding.

Figure 4.5: Composition of bird species

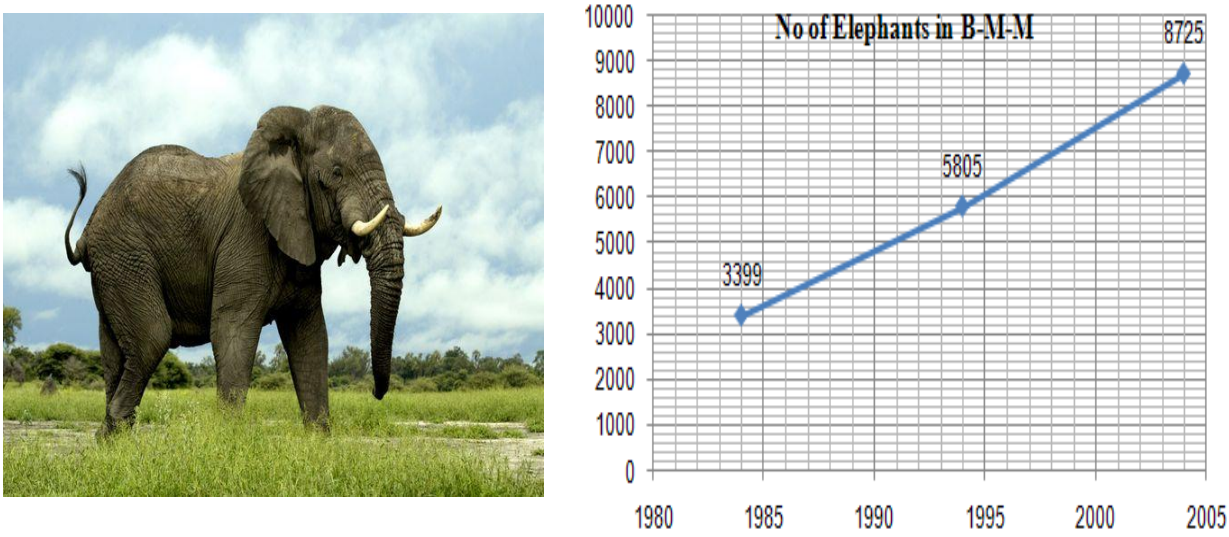


4.6.3. Flagship species

The status of flagship species such as elephant, lion, buffalo, leopards and others was evaluated and some are presented in this section. Information based on these species was taken from census and other repots and studies.

However, in this study only elephants were evaluated. The movement of this species in B-M-M is interconnected which makes it easier to track them during counting period, unlike in other regions.

Figure 4.6: Number of Elephants in BMM (NNF, 2005)



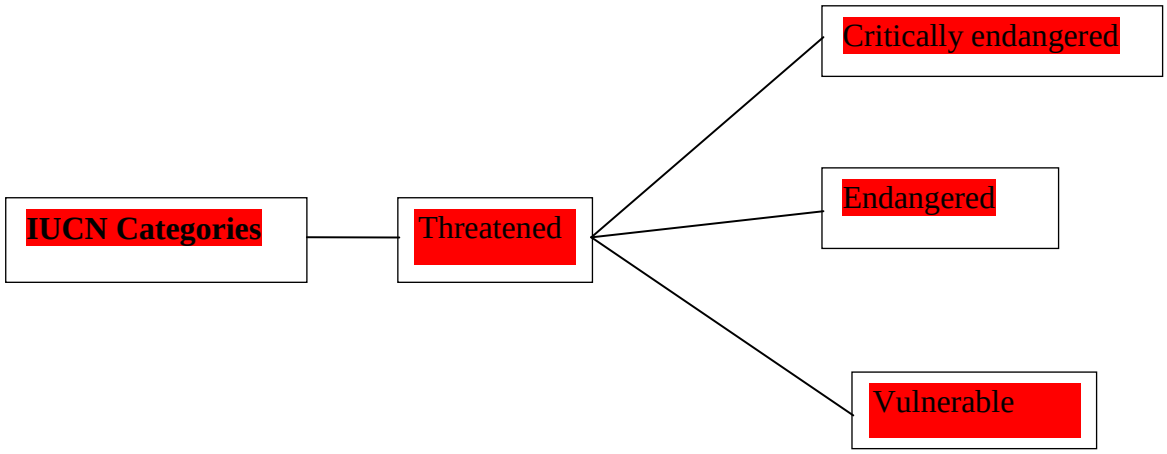
The data was processed to show elephant population growth in the 4 selected areas, however in this study; preference was to start data processing as from 1994 to 2004 as indicated on the figure above, whereas the original data starts from 1966. Unfortunately, on the original data sheet, this area there is no data indicated.

Fig. 4.6 shows that elephant population has been increasing ever since the first census was conducted. With conservation in place within these parks, it is estimated that the number will continue to grow, although some studies argue that with poaching on increase in the region, it could be a threat as well as habitat loss.

4.6.4. Threatened species

IUCN 2004 presented both plant and animal species which are threatened in Namibian PAs. Therefore, this study extracted data from it in order to fulfill one of the objectives on biodiversity.

Figure 4.7: Shows IUCN illustration on threatened species (IUCN, 1994).



Legend:

- Critically endangered – *a species with a 50 % chance of going extinction in 5 years.*
- Endangered – *a species with a 20 % chance of going extinction in 20 years.*
- Vulnerable – *a species with a 10 % chance of going extinction in 100 years.*

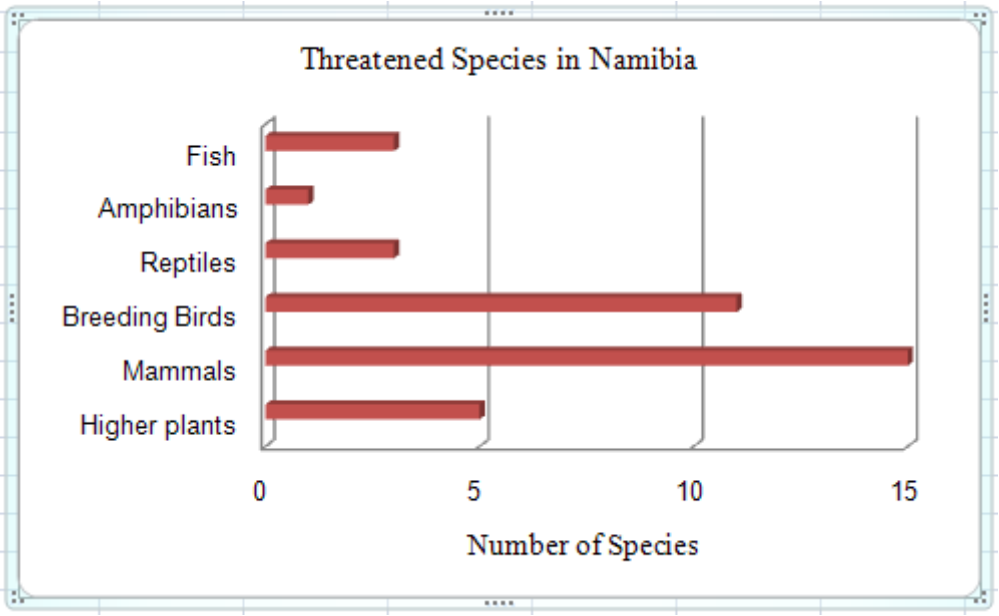
Following the IUC on threatened species, the figure above is used in determining Namibia's threatened species in all parks and specifically the 4 selected.

1. Critically endangered
    - Black Rhinoceros (*Diceros bicomis*).
2. Endangered
    - Blue Whale (*Balaenoptera musculus*).
    - Fin Whale (*Balaenoptera physalus*).
    - Mountain Zebra (*Equus zebra*).

- Namib Long-eared Bat (*Laephotis namibensis*).
- Wild dog (*Lycaon pictus*). Found in B-M-M-M

3. Vulnerable
    - African Elephant (*Loxodonta Africana*). Found in B-M-M-M
    - Angolan Hairy Bat (*Myotis seabrai*). Estimated to be found in Bwabwata
    - Black footed Cat (*Felis nigripes*).
    - Cheetah (Acinonyx jubatus). Found in B-M-M-M
    - Gant's Golden Mole (*Eremitalpa granti*).
    - Lion (*Leo panther*). Found in B-M-M-M
    - Short eared Elephant Shrew (*Macroscelides proboscideus*).
    - Spotted-necked Otter (*Lutra maculicollis*). Found in B-M-M-M
    - Springhare (*Pedetes capensis*). Found in B-M-M-M

Figure 4.8: Overall composition of threatened species (Earth Trends, 2003).



Data on threatened species in Namibia was collected online from Earth Trends, a comprehensive online database on environment. Wherefore, the Fig above signifies the actual number of threatened species led by mammals. About 15 % number of Mammal Species is threatened countrywide including the 4 selected areas. On the second position is breeding bird species which is rated as second threatened species due to some ecological constraints. Plants are not spared as indicated on the figure, about 5 % are said to be threatened as well. However, fish and reptiles share the same percentage and few number of amphibian threatened species.

4.7. Economic values of the parks to the local communities

With the statistical data on social economic values, it indicates that Namibia has gained a worldwide reputation for its innovative approaches of linking conservation to poverty alleviation through its communal areas and pro-poor tourism initiatives as reviewed by the (MET, 2010). It is a clear scenario as most of protected areas more especially Bwabwata (people's park) the goal has been fulfilled in poverty alleviation. The study found that local people (the marginalized in particular) are benefiting from this park through wildlife and tourism.

The statistic data collected shows that the economic benefits to communities have increased from less than N$ 600, 000 in 1998 to N$ 42 million an equivalent of US$ 5.7 million), with primary growth coming from tourism industry.

4.8. Government budget for the protected area system

Unlike other countries, in Namibia's case, this study found that the government budget allocation to MET is the main source of funding the parks, supplemented by 25 % of the park entry fees and hunting concession fees generated by the parks countrywide. The government budget allocation to the parks as that of 2009/2010 financial years, the sum of N$ 137 million was allocated to all PAs management program.

As stated on Parks profile expenditure, the financial gap is in the order of N$ 8.8 million per annum which is for the minimum expenditure to maintain the status quo, whereas the gap under the optimal expenditure scenario to make a dramatic improvement in order to achieve the park vision is in the order of N$ 113 million per annum. After the review of parks expenditure profile, the study analyses that the government budget allocation is insufficient to

carry out the park management activities hence the wide difference in between the figures. Vividly as it was indicated in the interview with park administrators in Mudumu Bwabwa and Mimili, park managers on many occasions could abandon some already planned activities. They report that many at times they fail to track and follow up poachers due to lack of facilities used in the field. In both parks they have limited number of cars; sometimes they turn to run out of fuel especially when having emergency pertaining to park management.

4.9. The SWOT analysis

The SWOT analysis was carried out to determine the operation of the 4 selected areas. It was based on empirical field observation and on secondary sources. However, the environmental and socio-economic factors were taken into consideration for the SWOT analysis as indicated on Table 4.7 below. The analysis indicates that the involvements of local and indigenous people in conservation as well as the unique features were the main strength, whereas lack of strict rules for the parks and difficult accessibility for the tourist were the main weakness. On the other hand, income generating through ecotourism and environmental awareness through education they were found to be the main opportunities. Poaching and other anthropogenic activities such as farmers' encroachment especially in Bwabwata NP were the main threats.

Table 4.7: the SWOT analysis

Strength	**Weakness**
• Local communities involved in conservation • Experienced staffs • Unique features • Naturalness of the parks, especially Mamili and Mudumu • Cheaper entrance fees • Used for research purposes	• Difficult accessibly by tourists • Lack of strict rules for the parks • Lack of fencing, especially Mudumu, whereas fencing could be another weakness in case of Mahango • Absence of waste management within the parks • Lack of educated personnel • Poor management

Opportunity	**Threats**
• Generate income through ecotourism • Provide food and other staffs such as wood and building materials • They create environmental awareness through education	• Poaching • Hunting • Cutting grass for building • Farmers encroachment • Tracks • Fire • Illegal fishing especially in Mudumu

5. DISCUSSION

5.1. Discussion and analysis of National Parks

National parks are the most effective mechanisms for conserving and protection of biodiversity through out the world. Therefore, it's important to determine the effectiveness of the management in these areas and generally on a larger scale of protected areas. They should be in line with the objectives for which they were created (Mulonga, 2010). However, they are not only meant for biodiversity sanctuaries but act as income generating as well (Nath, 1992). A good example is that of Wales, where the economic evidence through environment is fundamental to prosperity of the country. About 6 billion pound of Wales' GDP is directly dependent on the environment, whereas 1 in 6 Welsh jobs is supported by the environment. Moreover, the environment contributes 1.8 billion in wages to the economy of the country each year (National Trust, 2006 et al.). There are some major revenue generating activities which must be of great significance for the management of national parks, and these include:

- Park entrance fees
- Accommodation concessions
- Hunting concessions/licenses and quotas
- River usage
- Leases and rentals
- Fishing permits and many others.

As (Tizora, 2001) concludes, the park management can be enhanced through increased revenue streams, therefore, park pricing need to take the political economy aspects into account. As if this is the case, most of African sub-Saharan countries face corruption as a challenge. With this, then corruption issues should be a key aspect to consider, because in some instances, revenue collection has been hampered by the prevalence of corruption rather than the levels at which tariffs are paged. In the case of Namibia, The ministry of Environment and Tourism implemented a project for Strengthening Protected Areas Network (SPAN) with financial support from UNDP GEF (Chapeyama & Schalken, 2009). And the purpose of this project was to draw the objective aiming to strengthen and better the management system of the national parks, whose objectives is to 1) monitor and evaluate results and impacts; 2) to provide a basis for decision making on necessary amendments and

improvements; 3) to promote accountability for resource use, and last 4) to document, provide feedback on, and disseminate lessons learned.

In addition, generally, the evaluation processes in the national parks are meant to provide an overall assessment of administrative and technical strategic issues for the NP to flourish according to (Child, 2005).

5.2. Namibia's biodiversity status in the world

Under the results, the above findings clearly indicates that biodiversity in Namibia is of important significance, hence, the abundance of species diversity, the endemism of species, the ecosystem functioning and the unique habitat type like that of Succulent found only in Namibia and South Africa. The table below compares Namibia with other Sub Saharan African countries as well as the World at large.

Table 5.1 Biodiversity data on Namibia (Earth Trends, 2003).

	Namibia	Africa	World
Total Land Area (000 ha)	82, 429	2, 429, 241	13, 328, 979
Protected Areas			
Extent of Protected Areas by IUCN Category (000 ha), 2003			
Nature Reserve, Wilderness Area and National Park	3,159	78,828	438,448
Natural Monuments, Species Management Areas, and Protected landscape and Seascapes (category III, IV, and V)	55	63, 482	326, 503
Areas Managed for Sustainable use and unclasfied areas (category VI and others)	1,385	122,080	692,723
Total Area Protected (all categories)	4,600	264,390	1,457,674
Marine and Littoral Protected area {a}	7,402	X	417,970
Protected Areas as a percent of total land area , 2003 {b}	5.60%	10.90%	10.80%
Number of PAs, 2003	196	6,867	98,400
Number of Areas > 100, 000 ha, 2003	5	425	2,091
Number of Areas > 1 million ha, 2003	1	50	243
Wetlands of International Importance (Ramsar Sites), 2002:			
Number of Sites	4	X	1,179
Total Area (000 ha)	630	X	102,283
Biosphere Reserves, 2002			
Number of Sites	X	46	408
Total Area (000 ha)	X	X	439,000
Number and Status of Species			
Higer plants			
Total Known Species (number), 1992-2002	3,174	X	X
Number of threatened Species, 2002	5	X	5,714
Mammals			
Total known Species (number), 1992-2002	250	X	X
Number of threatened species, 2002	15	X	1,137
Breeding Birds			
Total known Species (number), 1992-2002	201	X	X
Number of threatened Species, 2002	11	X	1,192

It is understandable that Namibia's biodiversity with the evidence from different results of different studies are correlating and thus marks the country on a world map. However as shown on Table 5.1, there are many species which are threatened under IUCN terminology. The latest data collection was that of 2002 which presents the overall number of threatened species totaling 21. This comprises of breeding Birds makes 11, Mammals about 15 and plant species estimated to be 5.

On the other hand, the wetlands of international importance (Ramsar sites), Namibia have less compared to other countries. It only has 4 sites due to its arable state, as 3 quarter of the whole land is dry. Meanwhile, the biosphere reserve, there is no figures available.

5.3. The national system of PAs

In some cases the analysis showed some problematic issues in some certain areas of the national system of protected areas. It is quite interesting to note that all PAs in Namibia fall under government administration but some parks differ from others. For example, some parks have better tourist infrastructure whereas some have less. The current situation in the 4 selected NPs is far much way behind compared to the others especially those in other regions, such as central and southern part of the country. This study found that Etosha National Park is one of the best Parks not only within the country but in the region as well. Different studies on protected areas in sub Saharan Africa have documented that too. One of the other significant parks is the Namib-Skeleton Coast National Park which puts Namibia on the world map; this is the only park in Africa rated as one of the 10 largest protected areas in the World (appendix 10). Meanwhile, the Ai-Ais which is also transfrontier park connecting to Richtersveld of South Africa is a home to endemic species of Namibia. This Park was also declared by the IUCN as biodiversity hotspot. All these parks when compared to the selected 4 of the study are far much better in terms of infrastructures, facilities and administration as well as management. In the result, the study presented that long distance from the main city to location of each protected area determine the difference. The farer the place from the city is the poorer the place is, since government activities are less decentralized. Wherefore, the most affected PAs in Namibia are those found in remote areas.

On the contrary, political influence could be one of the causes why the other parks are deemed to be of importance in the context of national view of PAs system. The government

seems to be less concerned and so relaxant as this issue has been going on since the country gained its independence. Practical implementations show inconsistencies in dealing with issues of this caliber as lack of transparence is the evidence towards that. Upon the field work and consultation with some expats, some were of opinion that if protected areas were to be privatized, the state of the conditions in most parks were going to be better. Some believed that improving of the system of categories, more consistent interpretation and implementation of categories could help significantly improve the national system of protected areas in the entire country.

5.4. Threat field

As stated in the results, the SWOT analysis found many threats to the parks. Anthropogenic activities, mainly poaching and extraction of natural resources from the parks were among the threats to the park (Table 3.5). Despite all listed threats on Table 6 in the result of this study, some previous studies on Namibian protected areas reported that unstable political situation and lack of political involvement as well as weak policy implementation are the major threats, which is in contrast with the result of this study. With that been said, more studies are needed in this sphere.

Massyn et al., (2009), argue that unregulated tourism activities within the park could also be a threat. Infrastructure development and some other management activities has been considered threats in other countries, as these activities have negative impact on the environment and in the parks as they disturb wild animals and pollute the parks especially in the case of Bwabwata NP. According to the tourists visiting this park, noise pollution could be another threat as many species of wildlife has disappeared or have drawn back from the site of visitors. Therefore, many support the issue of the removal of indigenous people out of the park and translocated somewhere.

5.5. The IUCN system of management categories

Following the analysis of the national system of Namibia's protected areas, more importantly the 4 selected ones as a case study in comparison to the IUCN category system; the study concludes that a lot must be done in order to match the IUCN categories' objectives. Most of the parks are below IUCN standard, wherefore not suiting categories under which they have been placed. In Bwabwata's case for instance as indicated in the results, the park's category is unknown making it difficult to analyze the management activities and thus

consequently failing to provide the appropriate set of different conservational methods in harmony with adaptation of any specific situation. However, it has been argued by many scholars with the academic discipline that one of the appropriate tools for improvement of national system of categories would be the IUCN system of management categories.

There is clear evidence that the national system in some cases might not be fully compatible with the IUCN system as it is the case in most countries particularly developing countries. Therefore time is needed in order to afford them transformation especially for the newly proclaimed protected areas such as Bwabwata and Mahango. For the improvement of the system of categories and the management practices in each protected areas, the example of the table below should be used argued Thomas et al., (2003).

National category	**IUCN category**
Strict nature reserve	Ia
Special nature reserve	IV
Natural monument	III
National Park	II
Landscape of exceptional features	V
Nature park	VI
Protected habitat	IV

This structure is a reference for further development of protected areas which in real sense does not reflect the actual relationship between existing PAs and international categories. However, this is not the only obstacle for further development of management of protected areas in this region particularly in the 4 selected.

On the other hand, tourism infrastructure, facilities and services as presented in the result contributes to visitors perception which have impact in parks; whereas if the standards and performance are inadequate, it will have negative influence on tourist attraction. In the

contrast to tourism, the study examined biodiversity in the 4 selected PAs of the field study. After the review analysis of the SWOT as a tool used to measure species potential, the study found that there are many threats to these parks compared to strengths and opportunities. The most anthropogenic activities threatening these parks are: poaching, hunting, cutting grass for building, Farmers encroachment, tracks within the parks, fire and others as mentioned earlier (Table 3.5). These activities do not only affect the parks but also species diversities. One of the main causes of loss of species (driver to extinction) is habitat loss. The more the unnatural activities within PAs, the more habitats are lost. As in the case of Bwabwata where indigenous people dwell, the ecological habitat structure has been intensively degraded mostly at the edge. With this trend, it is believable that wildlife animals are in constant stress by the presence of human beings in the park.

Meanwhile in Mudumu national parks livestock grazing is another problem that has been affecting the park since its inception. This is similarly to Bwabwata where the park is not fenced. In many occasion, ecological threats was observed from elephants debarking and knocking down trees in the parks leaving a wild vast of open land.

6. CONCLUSION

Upon reviewing all sections in this study, the assessment and analysis of the findings serves as a platform where conclusion could be drawn. Since it was found that the 4 selected are unmatchable with others within the country, both BMMM, cooperation between them could be a key factor for improvement; moreover, this could be then extended to national and regional level as all these 4 are part of the KAZA transfrontier which plays an important role in demarcation bordering Namibia with 4 countries (Angola, Botswana, Zambia and Zimbabwe). Therefore, more tourism infrastructure is needed in this area. The stakeholders should also join hands with the government in bolstering tourism industry by engaging in investment in human capital for better services and produce professionalism through training programs.

Etosha National park, the best in the country should continue taking the lead as that encourages newly proclaimed parks like Mahango and others. Certain protected area that resides in the same vicinity with Etosha has been inspired with Etosha National park's reputation which has earned it international recognition. Its services and facilities are on world class. On the contrary, Mudumu and Mamili needs to be marketed as in many studies these parks are not covered, little is know about them. Information system as well as tourism information centers should be erected countrywide to market these idle PAs. Moreover, information concerning tourism should be framed and planned to meet target group needs.

Although currently parks, economically are not viable for the GDP of the country, if more is done surely these protected areas are not only going to be a cornerstone for biodiversity but socio economically worth as well. Therefore, below are tips for recommendations to better tourism in this area of study:

- ✓ Install a service and fuel station at nearby villages such as Lizauli or either Lianshulu to avoid long distance for tourists visiting Mudumu and Mamili parks. Many need to travel about 45kms and 150kms to Kongola fuel station which on many occasions is closed leaving visitors with no option but to drive another 110kms to Katima Mulilo, a nearby town.

- ✓ Each park should create a visitors' feedback book or box where they could leave comments about the parks; this could be used for improvement.
- ✓ Regular assessment of visitors' activities and appreciation on services rendered.
- ✓ Maintenance of roads and other infrastructures.
- ✓ Keep cleanliness.
- ✓ Proper training for tour staff management guides and etc.

Namibia as a developing country faces many challenges like any other developing country in the management of protected areas. Much has been said about protected areas inability to proper functioning as national system categories need to be reviewed, on the other hand, in tourism industry a lot must be done in fulfilling MET's objectives. The other constraint is the government budget allocation to the parks.

The study analyzes that, one of the major hindrance to reaching parks objectives is lack of financial funds. The government budget allocation to the parks is very low and insufficient to carry out all work assigned for the management of protected areas countrywide. However, this work points out that the 4 selected suffer the most when it comes to financial constraints.

Upon the interview and questionnaire sent to both management team and some expats involved in nature protection, many had different views as some believed that the government should do more than what is done to acquire more funds for these parks. The government should engage in seeking donors to bail these parks out of bad situations they are. Some were of opinion that the government should prioritize the management of protected areas than other priorities such as defense, culture and music industry. All government allocation to these priorities should be transferred to parks funding. Other people could suggest that the government need to privatize some of this institution because of its incompetence. Some believe that park fees should be increased to generate more funds.

However, some of these arguments might be constructive; while on the other hand could be destructive as well. Some authors in this field of study believe that sustainable financing should require not only securing adequate funds but also considering the quality,

form, timing, targeting use and sources of funding. True it may seem to be; funds should also be managed and administered efficiently in order to achieve coast effectiveness of management operations. The USAID and other international organizations for development has pleaded more financial assistance in park development of the 4 selected, but with little outcomes the parks remain the same. In addition the federal states of Germany have done a lot in that sphere particularly for the 4 selected parks as indicated in the literature review of this work. But the question is where does all these financial assistance go? Or are the financial assistance not enough? All these were the questions asked during the field, therefore the study conclude that politics is more involved in the whole issue.

Politics is another cause of the discrepancy between the parks. It is another core problem why there is difference between management of protected areas in each region as Namibia is divided by regions through tribes. Tribalism fueled by politics has brought instability especially in the Caprivi region where the government has recently changed the demarcation separating the Kavango and Caprivi region geographically affecting Mahango and Bwabwata National Parks (Fig. 2 & 3) in methodology. Politics has caused Namibia highly rated in the world on inequality of income distribution. The latest statistic is that of 2009 by the World Bank group, where Namibia was rated number 1 in the world with unequal income distribution, whereby the richest 4.5% of the households consumes 52% of the total GDP per capita. Moreover, the Gini coefficient for Namibia stands at 0.707 in comparison to Denmark which is with the lowest Gini coefficient of 0.232. Wherefore, it is believed that some of the causes of inequality income distribution are: corruption, poor governance, lack of access to resources and others.

This raises doubt in fulfillment of Vision 2030 set by the government stating that by 2030 Namibia would be joining the ranks of developed countries. In order to fulfill this objective, the government should come up with policy friendly that could harmonize peace and stability among the citizens. In the view of this study on this issue, political parties should always come after the nation. One Namibia one Nation, if people go by this moto, not only will it bring about unity in the country but peace as well which will harmonize the interaction of people countrywide removing political demarcations that has negatively affected biogeographical demarcation.

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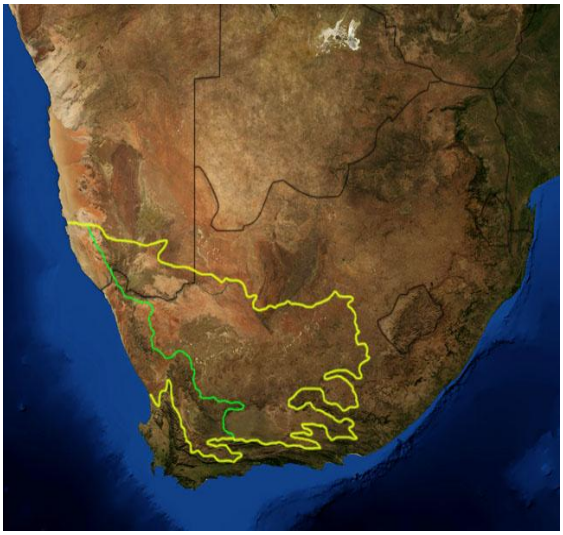
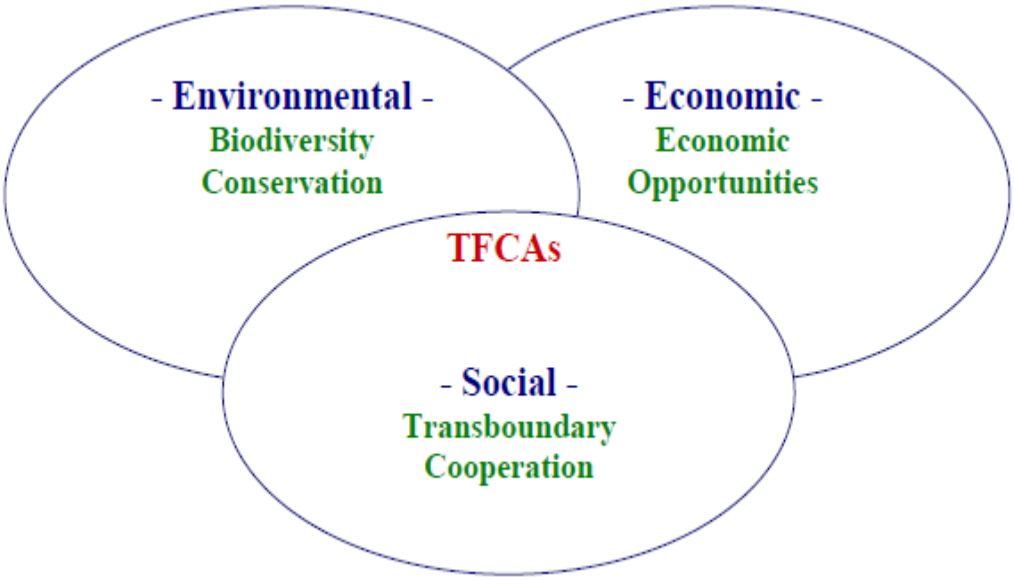
8. Appendix

Appendix 1: Karoo Ecoregions Namibia & SA Karoo landscape



Appendix 2: A Fish River Canyon in

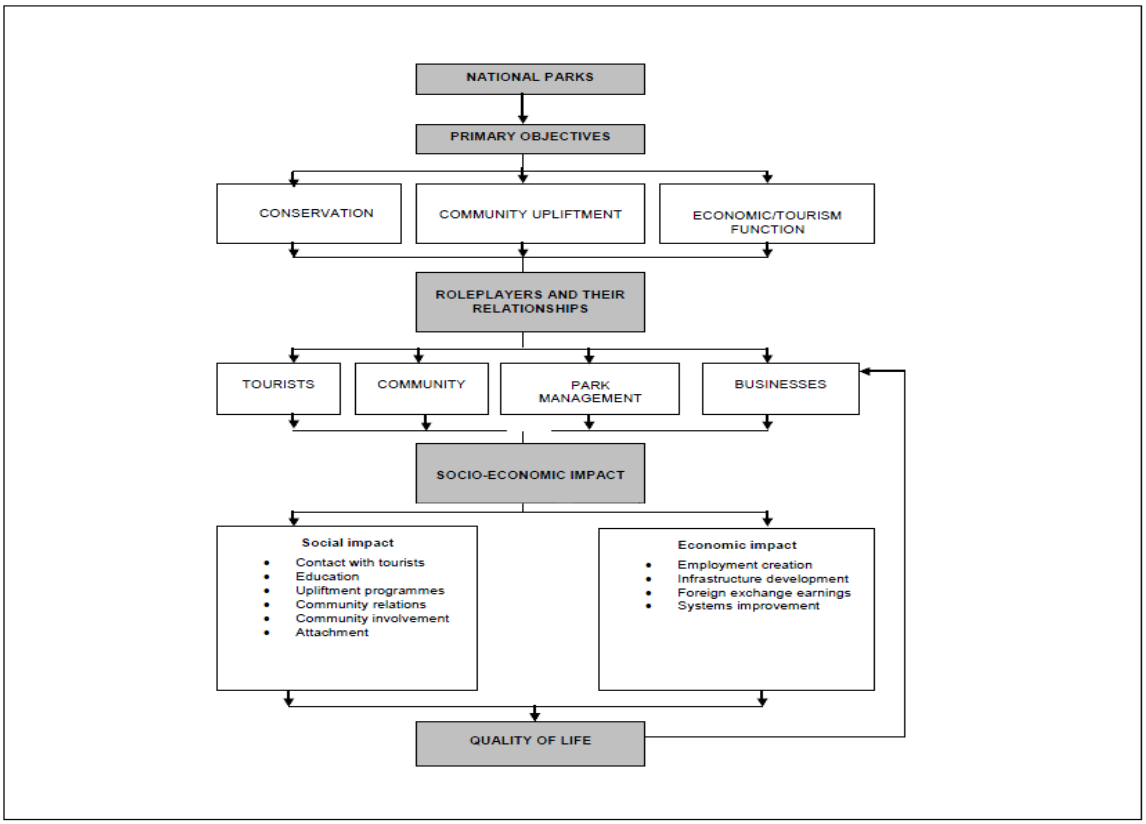
Appendix 3: TFCAs and the 3 Dimensions of Sustainable



Appendix 4: SADC-TFCAs
Transfrontier Park

Appendix 5: */Ai-/Ais-Richterveld*

Appendix 6: Conceptual framework for social economic research in National Parks



Sources: Ferreira (2008), Massyn (2008), Relly (2008), Saayman *et al.* (2009a), Streuders (2008), Van der Merwe (2008)

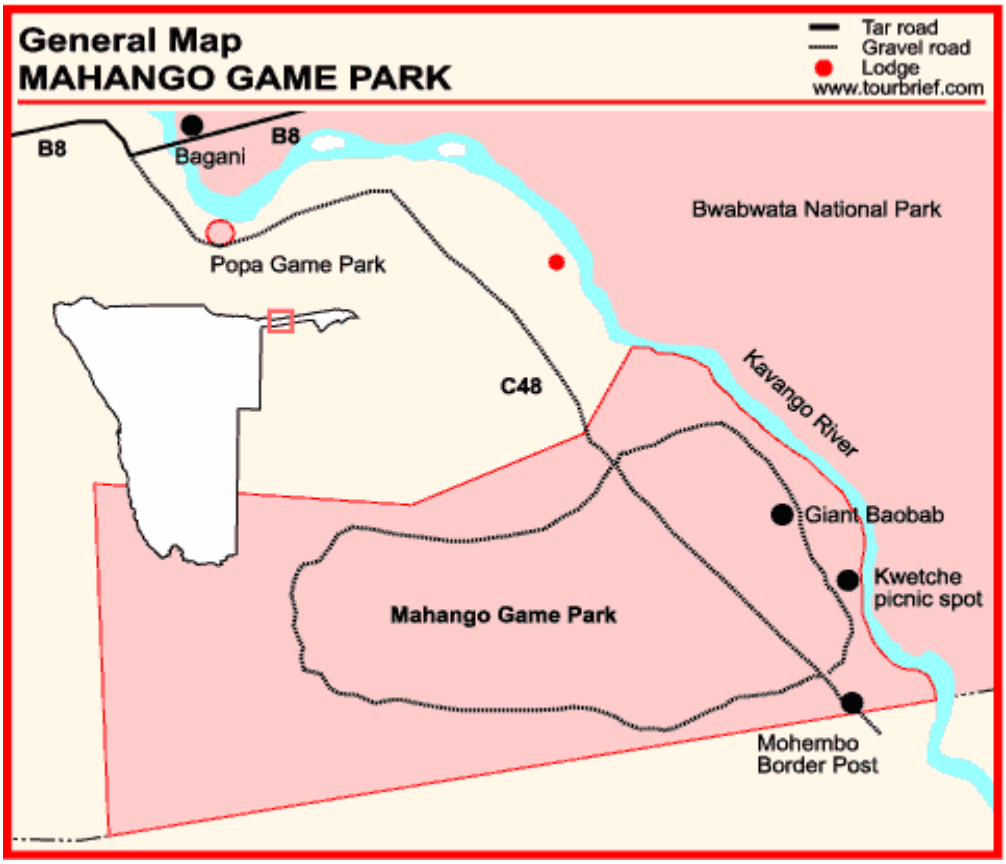
FIGURE 2

Conceptual framework for socio-economic research in National Parks

Appendix 7: Contribution of PAs Tourism to GDP, 2003 (N$ million) (Turpie et al., 2005).

Contribution	Lower bound estimate	Upper bound estimate
Total protected-area tourism expenditure[18]	1,172	2,332
Contribution to GDP		
- Direct impact	546	1,103
- Total impact	1,013	2,022
- Multiplier	1.86	1.83
Protected-area tourism: Share of GDP[19]		
- Direct impact	1.7%	3.4%
- Total impact	3.1%	6.3%

Appendix 8: Mahango, formally known as Caprivi Game Reserve, a protected area between Okavango and Kwando Rivers is shared between two regions Kavango and Caprivi



Appendix 9: The Questionnaire

Dear respondents,

My name is Ernest Kulumelo, a student at the Czech University of Life Sciences Prague. I kindly ask to spare few minutes out of your valuable time to fill this questionnaire. This questionnaire has been designed to collect data based on 4 selected NPs (BMMM) of Namibia.

All the information will be treated confidentially.

Thank you for your time!

1. **Do households gain from community based natural resources management?** Yes or No if Yes, please give details

   _____

   _____

   _____

2. **Given the status of PAs in Namibia, would you say that PAs should be governed by the Government or private Stakeholders?** Yes or No if Yes, please give details

   _____

   ___

3. **What do you think of the budget allocation to these NPs, is it enough to carry out the work assigned or more should be done?**

   A) Yes B) No C) Maybe D) More details

   _____

   ___

4. **Could you think of other innovative ways to generate funds for the PAs particularly the B-M-M-M project that makes part of KAZA transfrontier?**

   Yes or No if yes, please give details

   _____

   ___

5. **What are the management activities done in these PAs?**

_____

_____

_____

6. **Are there some anthropogenic activities done in these PAs which turn to disturb the ecological and ecosystem functioning? Such as Agriculture, Pasturing, Silviculture, Forestry and etc.**

   Circle any of those listed above, you can also give detail if possible

   _____

   ___

7. **How is the law enforcements within these PAs are, Relevant or Irrelevant?**

   _____

   ___

8. **Are there any impacts of KAZA transfrontier on these four NPs?**

   Yes or No if yes, please give details

   _____

   ___

9. **Are the local communities involved in protection of these areas?**

   Yes or No if yes, please give details

   _____

   ___

10. **What are the social economic benefits of the PAs to the indigenous people?**

A) Education B) Environmental awareness C) Income generation D) Others

Specify_____

__

11. How satisfactory are the visitors to these 4 NPs?

A) Very satisfactory B) Satisfactory C) Unsatisfactory

12. Do these parks need more people in terms of management?

Yes or No if yes, please give details

_____

___

13. **Mark or denote the percentage of threats to these PAs, where as 1 indicating the highest threat and the last figure representing the lowest threats.** For example: Poaching, Tracks within the park, construction, development, financial constraints and others

14. **What are the parks worth of in terms of protection?** 1. Biodiversity, 2. Economic equity and 3. Social purposes

or

others_____

___

15. Any other idea you would like to share, or any other suggestion is welcomed.

_____

_____

_____

_____

_____

Thank you for your contribution!!

Appendix 10

The 10 largest protected areas in the world

No.	Name	Ecosystem	Country	Size (ha)
1	Greenland's National Park	Terrestrial and coastal; Arctic Island	Greenland	97,200,000
2	Ar-Rub'al-Khali Wildlife Management Area	Terrestrial; Desert	Saudi Arabia	64,000,000
3	Great Barrier Reef Marine Park	Marine & Coastal	Australia	34,500,000
4	Northwestern Hawaiian Island's Coral Reef Ecosystem Reserve	Marine & Coastal	USA	34,000,000
5	Amazonia Forest Reserve	Terrestrial; Tropical Rainforest	Colombia	32,000,000
6	Qiang Tang Nature Reserve	Terrestrial; Alpine Tibetan plateau grasslands	China	25,000,000
7	Cape Churchill Wildlife Management Area	Terrestrial; Intertidal & Marine	Canada	14,000,000

8	**Namib-Skeleton Coast National Park**	**Terrestrial & Coastal Desert Ecosystems**	**Namibia**	**10,754,000**
9	Northern Wildlife Management Zone	Terrestrial & Desert	Saudi Arabia	10,000,000