

# SCOPING REPORT

For the

**Environmental and Social Impact  
Assessment (ESIA) and Development of the Environmental  
and  
Social Management Plan (ESMP) for the Proposed  
Infrastructure Development for the Wildlife Protection  
Services,  
Ministry of Environment Forestry and Tourism (MEFT)**

Project: The Integrated Wildlife Protection Management I&II  
Working Title "The Integrated Wildlife Protection Project"  
Employer: Ministry of Environment, Forestry, and Tourism c/o  
Robert Mugabe and Kenneth Kaunda Street, Troskie Building,  
Windhoek Namibia

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**Bwabwata National Park (Buffalo and Susuwe West)**

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## **PROPONENT**

**The Integrated Wildlife Protection Management I&II  
Ministry of Environment Forestry and Tourism**

## **PROPOSED PROJECT**

**Environmental and Social Impact  
Assessments and Development of the Environmental and  
Social Management Plan (ESMP) for the Proposed Infrastructure  
Development for the Wildlife Protection Services, Ministry of  
Environment, Forestry and Tourism (MEFT)**

## **ADDRESS OF PROPONENT**

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## **PROJECT LOCATION**

**Bwabwata National Park  
Kavango East and Zambezi Region**

## **PROJECT COMPETENT AUTHORITY: MINISTRY OF ENVIRONMENT FORESTRY AND TOURISM**

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## EXECUTIVE SUMMARY

The Integrated Wildlife Protection Project (IWPP) is a development project of the Government of the Republic of Namibia executed by its Ministry of Environment, Forestry, and Tourism (MEFT). The Federal Republic of Germany co-finances the project through the German Ministry for Economic Cooperation and Development (BMZ) via the KfW Development Bank. The project supports the MEFT in developing to and establishing Namibia's integrated Wildlife Protection Services (WPS). Furthermore, the Project supports the MEFT for infrastructure investments, in particular base camps, for procuring equipment for patrol staff, operation rooms, and general wildlife protection activities of the WPS. The project contributes to the conservation, restoration, and sustainable use of ecosystems and preserving biodiversity in the focal areas. The Project's expected Result 1 includes that "*Key infrastructure for the MEFT Wildlife Protection Service (base camps, fly camps, and control rooms) is operational in the project's priority intervention areas (Sesfontein settlement, North West; Etosha National Park and Bwabwata National Park)*" is the main basis for this consultancy. The strategic approach calls for establishing the necessary infrastructure to ensure that sites have the organizational capacity to provide enabling conditions to plan, execute, and supervise the effective deployments of field operations for wildlife protection.

The Ministry of Environment Forestry and Tourism (MEFT) field staff (wardens, rangers etc.) play a crucial role in terms of monitoring wildlife and curbing poaching. Still, they endure extreme conditions whilst fulfilling their roles. Their accommodation is mostly rudimentary, with very few comforts, and therefore, one of the objectives of the IWPP is to provide affordable yet comfortable accommodation for these field staff. The provisions to be developed in Bwabwata National Park include houses for wardens/rangers (ranger duets), administration buildings, common buildings, service blocks, and storage and kennel facilities for MEFT Canine Reaction Unit to be housed at Bwabwata West. This infrastructure development aims to develop safe and comfortable accommodation and necessary office space for MEFT WPS field staff working on anti-poaching and wildlife protection.

The proposed infrastructure development activities in Bwabwata National Park are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007). In fulfilment of the environmental requirements, the Proponent (IWPP-MEFT) has appointed CNM Investments as the Environmental Consultant and led Samson Mulonga as the Environmental Assessment Practitioner (EAP) to prepare this Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) Report in order to support the application for the Environmental Clearance Certificate. The scope of work also includes the development of the Grievance Redress Mechanism.

Ministry of Environment Forestry and Tourism (MEFT) field staff (wardens, rangers etc.) play a crucial role in terms of monitoring wildlife and curbing poaching. Still, they endure extreme conditions whilst fulfilling their roles. Their accommodation is mostly rudimentary, with very few comforts, and therefore, one of the objectives of the IWPP is to provide affordable yet comfortable accommodation for these field staff. The provisions to be developed in Bwabwata National Park include houses for wardens/rangers (ranger duets), administration buildings, common buildings, service blocks, and storage and kennel facilities for MEFT Canine Reaction Unit to be housed at Bwabwata West. This infrastructure development aims to develop safe and comfortable accommodation and necessary office space for MEFT WPS field staff working on anti-poaching and wildlife protection. Overall, the infrastructure development will greatly support the much needed infrastructural needs for WPS. The following is the summary of the implementation stages for each phase:

- ❖ Preconstruction,
- ❖ Construction, and;

- ❖ Operational.

The following is the summary of the key components of the receiving environment that have been considered in this report with respect to the preconstruction, construction and operational stages of each of the proposed developmental phases for the upgrading of the construction of infrastructure:

- ❖ **Physical environment** (Water quality, physical infrastructure and resources, air quality, noise and dust, landscape and topography, soil quality, and Climate change influences);
- ❖ **Biological environment** (Habitat, protected areas and resources, flora, fauna and ecosystem functions, services, use values and non-use or passive use), and;
- ❖ **Socioeconomic, cultural and archaeological environment** (Local, regional and national socioeconomic settings, subsistence agriculture, community forestry, tourism and recreation and cultural, biological and archaeological resources).

The impact assessment has been standardized to include set definitions with the allocation of the assessment ranking categories based on quantifiable criteria which can be measured. The allocated ranks refer to the resultant impact (e.g. habitat area affected, or time that the result of the impact will last), and not of the cause thereof (e.g. Sites where construction will take place, or time of active impact). Detailed assessment table with management intervention measures are provided in this report. Each activity has been assessed with respect to the type of effect that the aspect will have on the relevant component of the environment and includes “what will be affected and how?” The faunal and flora loss / disturbances are closely linked to habitat loss directly linked to the proposed project activities and are the key negative impacts which have been assessed to have high to medium localized impacts without mitigation and medium to low negative impacts with mitigations. In accordance with the results of the impact and risk assessment for the proposed infrastructure development for WPS in Bwabwata National Park, detailed Environmental Management Plan (ESMP) have been prepared covering the following components:

- ❖ Environmental and safety management systems;
- ❖ Protection of the biological diversity covering flora, fauna, habitat and rehabilitation of all disturbed areas within the Buffalo and Susuwe West developmental and surrounding areas;
- ❖ Disturbance of fauna including estuarine birds in the Kwando and Okavango Rivers by noise caused by the increased use of vehicles and boats by WPS;
- ❖ Socioeconomic issues

The Environmental Performance Monitoring activities shall be undertaken during the preconstruction, construction and operational stages of the proposed infrastructure development. The monitoring activities shall be undertaken in accordance with the provisions of the Environmental Clearance Certificate (ECC) to be issued by the Environmental Commissioner in the MEFT, the Environmental and Social Management Plan (ESMP) and International Organization for Standardization (ISO) 14001 Environmental Management System (EMS) standard. The following is summary of the environmental performance monitoring to be implemented at the for the infrastructure development at Buffalo and Susuwe West in the Bwabwata National Park during the preconstruction, construction and operational stages:

- ❖ **Implementation of the ESMP:** The implementation of the ESMP monitoring plan by MEFT is focusing on collecting and analyzing the required datasets and propose recommendations on what needs to be done for both the long-term and short (day to day) monitoring operations. The ESMP implementation will be undertaken as an in-house activity;
- ❖ **Monitoring Plan:** Environmental monitoring is partly in-house and outsource (employ a consultant) to undertake the assessment and recommend measures to be implemented. Key aspects that shall be monitored are centered on Health, Safety and Environment (HSE);
- ❖ **ESMP Auditing:** Compliance auditing of the ESMP implementation and monitoring thereof is a key component of the environmental performance monitoring. The ESMP auditing is an internal activity that is often supported by an external consultants and linked to the EMS monitoring and auditing requirements, and;
- ❖ **EMS Auditing:** Personnel within WPS are responsible for the management of these impacts through regular environmental audits to evaluate compliance and effectiveness of the company's EMS to the ISO 14001 standard, as well as compliance with statutory requirements. This includes both internal audits and external surveillance audits.

The proposed development has been well designed as per the standards of the Physical Planning department and the relevant regulatory agencies. The proposed development project will have economic benefits such as generation of income to the proponent, creation of employment, making use of un-utilized plot and increasing revenue to the National and Regional Governments. Based on the results of this Environmental and Social Impact Assessment (ESIA) and Environmental Social Management Plan (ESMP) reports, it's hereby recommended that the proponent IWPP-MEFT be issued with an Environmental Clearance Certificate (ECC) for the proposed infrastructure development at Buffalo and Susuwe in the Bwabwata National Park, Kavango East and Zambezi Region, northeast Namibia. Mitigation measures / appropriate management intervention measures to be implemented by IWPP-MEFT with respect to the impacts ranked as having either a "high" or "medium" significance are provided in the ESMP Section of this Report.

The recommendations for the prevention and mitigation of adverse impacts are as follows;

- ❖ It is important that informative signs (bill board) to be erected at the site. These should indicate the operation hours and when works are likely to be started and completed. List of all Engineers, Contractor, details of the proposed project and all the Approval numbers.
- ❖ All solid waste materials and debris resulting from excavation and construction activities must be disposed of at approved dumpsites. The wastes should be properly segregated and separated to encourage recycling of some useful waste materials; i.e. some excavated stone materials can be used as backfills.
- ❖ All construction materials and especially sand, gravel, hardcore and wood must be sourced/procured from legalized dealers.
- ❖ Construction activities must be undertaken only during the day i.e. between 0800 hours to 1700 hours. This will minimize disturbance to the general public within the proximity of the site/project especially the nearby residents

- ❖ Proper and regular maintenance of construction machinery and equipment will reduce emission of hazardous fumes and noise resulting from friction of rubbing metal bodies.
- ❖ Heavy construction activities should be limited (or avoided) during the rainy season to minimize the chances of soil degradation (soil erosion).
- ❖ Maintenance activities must be carried out in service bay to reduce chances of oils or grease or other maintenance materials, from coming into contact with environment (water or soil).
- ❖ Workers should be provided with complete personal protective equipment (PPE) and safety gear. They should have working boots, complete overalls, helmets, gloves, earmuffs, nose masks, goggles etc. A fully equipped first aid kit must be provided within the site.
- ❖ The contractor must provide adequate security during the construction period and especially during the night when there are no construction activities.
- ❖ The Proponent is advised to ensure the contractor does adhere to the architectural plans and proper backfilling and landscaping be done so as to rehabilitate the environment and improve its aesthetic value.

Further recommendations for the prevention and mitigation of adverse impacts are as identified by the study shall be mitigated as outlined in the ESMP. Finally, having gone through the ESIA process for the proposed project to its conclusion, we hereby recommend approval of this report and subsequently issuances of the ESIA license to the proponent to enable him commence implementation of the project.

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## ACRONYMS AND ABBREVIATIONS

BNP	Bwabwata National Park
CBNRM	Community Based Natural Resource Management
CBO	Community-Based Organization
DWNP	Directorate of Wildlife and National Parks
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GRM	Grievance Redress Mechanism
IWPP	Integrated Wildlife Protection Project
KAZA TFCA	Kavango-Zambezi Trans-frontier Conservation Area
KfW	KfW Entwicklungsbank (KfW Development Bank)

MEFT	Ministry of Environment, Forestry and Tourism
NGO	Non-Government Organization
PSC	Project Steering Committee
PIR	Project Implementation Review
PM	Project Manager
PMU	Project Management Unit
TA	Traditional Authority
TE	(Project) Terminal Evaluation
USAID	United States Agency for International Development
WC	Wildlife Crime

## DEFINITIONS

<b>Alternatives:</b>	A possible course of action in place of another that would meet the same purpose and need. An alternative can include other locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The 'without project' (or no-go) alternative provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid negative impacts.
<b>Baseline data:</b>	Data that describes issues and conditions at the inception of the SEA. Serves as the starting point for measuring impacts, performance, etc., and is an important reference for evaluation.
<b>Cumulative effects/impacts:</b>	Are combined or additive effects on the environment over time or space when added to other past, present or reasonably foreseeable actions. They may seem to be insignificant when seen in isolation, but collectively they have a significant effect.
<b>Ecosystem approach:</b>	As advocated by the Convention on Biological Diversity (CBD), the ecosystem approach recognises that people and their environment are part of the broader ecosystems on which they depend. Environmental management should therefore be implemented in an integrated way.
<b>Environment:</b>	The physical factors of the surroundings of the human being including land, water, atmosphere, climate, and the biological factors of fauna and flora as well as the cultural, social, and economic aspects of human activity.
<b>Environmental Assessment:</b>	Generically, a method or procedure for predicting the effects on the environment of a proposal, either for an individual project or a higher-level "strategy" (a policy, plan or programme), with the aim of taking account of these effects in decision making.
<b>Environmental impact:</b>	<ul style="list-style-type: none"> <li>❖ Effects on the environment and natural resources that may be positive and/or negative and produce benefits and/or costs.</li> <li>❖ <i>Direct impacts</i> are those that take place at the same time and in the same space as the activity.</li> <li>❖ <i>Indirect impacts</i> occur later in time or at a different place from the activity.</li> <li>❖ <i>Cumulative impacts</i> are the combined or additive effects on the environment of individual projects over time or of several projects in one geographical area. They may seem to be insignificant when seen in isolation, but collectively they may have a significant effect.</li> <li>❖ <i>Irreversible impact</i> are impacts that cannot be reversed in time, it results in the irreplaceable loss of a resource.</li> </ul>
<b>Environmental Impact Assessment (EIA):</b>	The application of impact assessment to a specific project. Typically, an EIA is carried out on a project that is already defined (i.e. in feasibility stage) and seldom considers landscape scale or cumulative impacts. An EIA may consider cumulative impacts, e.g. in respect of similar existing or planned projects,

especially in the absence of a strategic framework for development (or a SEA). An EIA is the systematic evaluation of a project to determine its impact on the environment and natural resources.

<b>Environmental Quality Objective:</b>	An EQO specifies a target for environmental quality. If EQOs are set by enforceable regulations, they are usually referred to as Environmental Quality Standards.
<b>Environmental Report:</b>	The report required as part of an environmental assessment, which identifies, describes and evaluates the likely significant effects on the environment of implementing a PPP.
<b>Environmental sustainability:</b>	Management of natural resources and the environment that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.
<b>Indicator:</b>	A measure of variables over time, that reveals progress (or lack thereof) towards objectives, and provides a means of measuring what actually happens against what has been planned in terms of quantity, quality and timeliness.
<b>Inter-generational equity:</b>	Inter-generational equity implies that the current generation chooses a development path that does not jeopardize the ability of future generations to achieve similar or better development options.
<b>Issue:</b>	A context-specific question that asks 'what, or how severe, will the impact of some activity/ aspect of the development be on some element of the environment?'
<b>Limits of Acceptable Change:</b>	Extremes of environmental quality beyond which society would find further change unacceptable. The LAC thus relate to levels of environmental quality (biophysical) that are either desired by or would be tolerable to society (largely qualitative values).
<b>Mitigation:</b>	Means actions to avoid, reduce, control or offset the potential adverse environmental and socio-economic consequences of a PPP, and include engineering works, technological improvements, management measures and restitution through replacement, restoration, compensation or any other means, to minimise harm to human health or the environment.
<b>Monitoring:</b>	Actions taken to observe, take samples or measure specific variables in order to track changes, measure performance of compliance, and/or detect problems. The objective of monitoring should always be to improve management.
<b>Objective:</b>	A statement of what is intended, specifying the desired direction of change in trends.
<b>Offset:</b>	An offset replaces or provides 'like for like or better' substitutes for residual negative impacts on the environment. Such offsets could include formal commitment to managing substitute areas of comparable or greater value for conservation, entering into a secure and permanent conservation agreement with the conservation authority, setting aside protected natural areas, establishing a trust fund for conservation, thereby enabling land acquisition and/or management, etc. Offsets focus on areas of recognised value to conservation and on ensuring the persistence of landscape-scale processes.
<b>Opportunity cost:</b>	The lost opportunities that might result from the implementation of a certain alternative. For example, a mine in a national park will likely reduce the tourism potential of the area. Therefore, there are opportunity costs to the building of the mine, namely the reduction of actual and potential touristic activity.
<b>Policy:</b>	A broad statement of intent that reflects and focus the political agenda of government and initiate a decision cycle; a general course of action or proposed overall direction that a government is or will be pursuing that guides ongoing decision making.
<b>Plan:</b>	A purposeful forward-looking strategy or design, often with co-ordinated priorities, options and measures that elaborate and implement policy.

<b>Precautionary principle:</b>	Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
<b>Project:</b>	Means the execution of construction or renovation work or other developments, installations, schemes, activities or other interventions linked to a specific development that can be "ring-fenced".
<b>Programme:</b>	A coherent, organized agenda or schedule of commitments, proposals, instruments and/or activities that elaborate and implement policy. A programme usually has a number of projects that cascade below it.
<b>Responsible Authority:</b>	The organisation which prepares and/or adopts a plan or programme subject to SEA.
<b>Risk:</b>	Likelihood of occurrence of an event and estimated magnitude/severity of its impact on the environment.
<b>Scoping:</b>	The process of deciding the scope and level of detail of an SEA, including the environmental effects and alternatives which need to be considered, the assessment methods to be used, and the structure and contents of the Environmental Report.
<b>Screening:</b>	The process of deciding whether a plan or programme requires SEA
<b>Significance:</b>	Determination of severity of an impact taking into account objective or scientific data as well as societal values. Any exercise in judging the significance of an impact should thoroughly consider (a) the importance of the environmental or social attribute in question to project decision makers, (2) the distribution of change in time and space, (c) the magnitude of change, and (d) the reliability with which change has been predicted or measured.
<b>Stakeholder:</b>	Individuals or organisations who may be interested in, potentially affected by, or influence the implementation of a PPP. In the context of an SEA applied to development co-operation, stakeholders may include the government, donor agencies, local community, NGOs and civil society
<b>Strategic Environmental Assessment (SEA):</b>	Generic term used to describe environmental assessment as applied to policies, plans and programmes (PPPs). Refers to a range of analytical and participatory approaches that aims to integrate environmental consideration into PPPs and evaluate the interlinkages with economic and social considerations. Impact assessments at strategic level encourage an 'opportunities and constraints' type approach to development, where such things as natural resources and ecosystem services at landscape scale define the 'framework' within which development can take place and the types of development that could be sustained.
<b>Significant environmental effects:</b>	Effects on the environment which are sufficiently great or important to be worthy of attention.
<b>Transboundary impacts:</b>	Means an environment, health or social impact on another state.
<b>Trigger:</b>	A particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development that may require specialist input.
<b>Threshold:</b>	Levels that should not be exceeded; points at which irreversible or serious damage could occur, either to ecosystems and/or to social systems (health, safety or wellbeing). Could also be described as a tipping point.
<b>Trade-offs:</b>	Refers to losing one quality or aspect of something in return for getting another quality or aspect. It implies a decision made with the full comprehension of both the upside and down side of a particular choice.

**Uncertainty:** The inherent unpredictability of response of the environment to an impact, the lack of knowledge and/or understanding of cause-effect-impact relationships between the development activity and the environment, and/or gaps in information that do not allow confidence in predictions of impacts.

**Vulnerable communities:** Those communities who rely heavily on those ecosystem goods and/or services likely to be affected or who live in dynamic, sensitive or harsh ecosystems, where extreme conditions make them particularly vulnerable to additional negative impacts.

# 1. INTRODUCTION

## 1.1 Wildlife crime in Namibia

Namibia has the world's largest black rhino population. It contributes to the world's largest elephant population found in the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA) which comprises parts of Angola, Botswana, Namibia, Zambia, and Zimbabwe. Rhinos also attract thousands of tourists from around the world to the country. The criminal syndicates driving illegal wildlife trade in Namibia and the KAZA TFCA continue to develop and extend their networks and use increasingly sophisticated approaches to poach or traffic wildlife products. These criminal syndicates quickly adapt to new law enforcement strategies and constantly seek ways to remain ahead of the law enforcement agencies that must respond accordingly. The illegal killing of wildlife in Namibia has implications for the environment, economy, social aspects as well as animal welfare. The economic impacts of the illegal killing of wildlife include effects in terms of financial cutbacks, job losses, and overall economic sustainability, as tourism is one of the country's priority economic sectors that is heavily dependent on the presence of wildlife.

Common to rhino and elephant poaching is that it is a localized and cross-border phenomenon, which is often orchestrated by well-organized, sophisticated and, at times, well-armed poachers. The cross-border nature of poaching puts the illegal activity beyond the capacities of most governments, including Namibia, where wildlife products are harvested. Poaching turns into illegal wildlife trade, which has been associated with well-organized crime groups or syndicates which have amassed significant resources through the unlawful trade and the complex laundering of money. Criminal syndicates pursue wildlife products with increasing sophistication using complex networks. The resources include large amounts of disposable cash, modern technology, and established corrupt transportation routes.

A first step in effectively combatting wildlife poaching and trafficking is to understand the motivations and patterns of individuals involved in wildlife crimes – whether this be poachers, complicit community members, conspirators, or traffickers. Increasing this knowledge base will lead to more effective deterrents by both communities and Law Enforcement (LE) agencies while increasing the likelihood of arrest and conviction of those involved in wildlife crime activities, effectively deterring people from engaging in these activities. Increased disincentives for participating in wildlife crime are key to reducing poaching and trafficking activities and improving safety and security.

The rhino and elephant poaching crisis has initiated a global response against wildlife crime. Governments across the world are mobilizing new legislation and resources at unprecedented levels to counter wildlife crime and trafficking. Namibia has established a coordinating mechanism to guide and synergize the investment and engagement of civil society in the fight against wildlife crime. Establishing the Wildlife Crime Working Group (WCWG)<sup>1</sup> is covered in the Revised National Strategy on Wildlife Protection and Law Enforcement. It is a good example of a support structure required for better coordination across stakeholders in supporting law enforcement agencies in their fight against wildlife crime. It has the potential for replication in other countries.

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<sup>1</sup> The WCWG is a working group composed of Namibian NGOs, private sector, international organizations and the donor community with the objective of coordination and alignment of organizations to the national strategy. Unclear mandates, roles and responsibilities lead to confusion, competition, inefficiencies and conflict between entities that should be working together. Therefore the WCWG presents a platform for proper coordination and collaboration, as well as ensuring clear roles and responsibilities on wildlife protection and security by all institutions and organizations involved, so that poaching is put to a stop.

In response to the poaching crisis, the Government of the Republic of Namibia, through the Ministry of Environment, Forestry and Tourism (MEFT), is implementing the Integrated Wildlife Protection Project (IWPP), which is supported by the German Ministry of Cooperation (BMZ) through the German Development Bank, e.g. Kreditanstalt für Wiederaufbau (KfW). The IWPP is a four-year project that commenced on 19 September 2020. The project's original intervention focuses on supporting the Wildlife Protection Services in Etosha National Park, the North-western regions, and the North-eastern Regions, including the Kavango and Zambezi and other selected sites with significant rhino and elephant populations. The project's outcome aims to effectively operationalize the Ministry's WPS (Wildlife Protection Services).

## 1.2 The Bwabwata National Park

Covering an area of 6,274 km, Bwabwata National Park is the largest of the six protected areas that make up the North-East Parks. Bwabwata is comprised of three Core Areas designated for special protection and controlled tourism – Kwando (1,345 km<sup>2</sup>), Buffalo (629km<sup>2</sup>), and Mahango (245km<sup>2</sup>), and a large Multiple Use Area (4,055 km<sup>2</sup>) zoned for community-based tourism, trophy hunting, human settlement and development by the resident community.

Except for Mahango, which is positioned on the western bank of the Kavango River, the Park completely covers the section of land formerly called the Caprivi Strip, which extends from the Kavango to the Kwando Rivers. The boundary between the Zambezi and Kavango East Regions lies roughly in the middle of the Park.

The Park is bordered by Angola to the north and Botswana to the south. The northern boundary is demarcated by only a cutline; however, the southern boundary is fenced with three veterinary standard fences, except for a 30-kilometre stretch, which lies west of the Kwando River. The rationale for these fences is the presence of cattle in the Park. This is a matter of the highest priority that is addressed in this plan.

At either end of the Park are small settlements – Kongola in the east and Divundu (a proclaimed village) in the west. The Trans-Zambezi Highway (B8), hereafter referred to as the B8 road, traverses the Park in the middle from east to west, and a minor road (C48) dissects Mahango in a north-south direction, and a 350kv powerline, which are the responsibilities of the Roads Authority and Nampower respectively (Figure 1).



Figure 1: Key infrastructure present in Bwabwata NP

A number of small settlements have emerged inside the Multiple Use Area, the largest of which are Mut'ciku, Omega, Chetto, Omega III or 3 (Tokoloshi) and Mashambo. The population of Bwabwata Multiple Use Area is approximately 5,500-6,000 residents, of which 80% are of the minority San ethnic group, the Khwe (alternatively spelled Khoe). People continue to settle in the park and the cattle population is increasing because of inadequate access control, a very important matter that is addressed in this plan.

Bwabwata NP forms a crucial transboundary link for wildlife migration between Angola, Botswana, Namibia and Zambia and for seasonal dispersal to and from the rivers. Recent research on wildlife movements has shown the extent of wildlife movements but also that large scale movements are severely constrained by fences, settlements and the B8 road through the middle of the park. This is an important issue that requires priority attention in this management plan.

Bwabwata NP's Core Areas serve as wildlife source areas, from which wildlife can disperse into neighbouring conservancies and resident communities that can benefit from conservation hunting rights and develop tourism on their own land and the Multiple Use Area.

## **2. PROJECT BACKGROUND**

### **2.1 Project Overview**

The IWPP Project of the MEFT "the Proponent", is proposing to develop infrastructure for the Wildlife Protection Service (WPS) at Buffalo and Susuwe West in Bwabwata National Park in order to support the WPS staff being recruited by MEFT.

### **2.2 The need for Infrastructure Development for Wildlife Protection Services in Bwabwata National Park**

The MEFT field staff (wardens and rangers) play a crucial role in terms of monitoring wildlife and curbing poaching, but they endure extreme conditions whilst fulfilling their roles. Their accommodation is mostly rudimentary, with very few comforts, and therefore, one of the objectives of the IWPP is to provide affordable yet comfortable accommodation for these field staff. The provisions to be developed or renovated in Bwabwata National Park include accommodation for wardens/rangers, administration buildings, common buildings, service blocks, and storage facilities.

The IWPP supports the MEFT in developing and establishing a comprehensive, integrated Wildlife Protection Service in the protected areas of Namibia. Furthermore, the Project supports the MEFT for infrastructure investments, in particular base camps and operation rooms, for procuring equipment for patrol staff, and for the general wildlife protection activities of the WPS. The project contributes to the conservation, restoration, and sustainable use of ecosystems and preserving biodiversity in the focal areas. The Project's Result I: Key infrastructure for the MEFT wildlife protection service (base camps and control rooms) is operational in the priority intervention areas (Sesfontein settlement, North West; Etosha National Park and Bwabwata National Park) is the main basis for this consultancy. The strategic approach calls for establishing the necessary infrastructure to ensure that sites have the organizational capacity to provide enabling conditions to plan, execute, and supervise the effective deployments of field operations for wildlife protection.

Therefore, this infrastructure development aims to help counter the threat of poaching in the IWPP focal areas by providing safe and comfortable accommodations for MEFT field staff



working on anti-poaching and wildlife protection. The revitalized facilities will offer a secure base for field staff operations and allow MEFT staff to be comfortable and professionally operational where they are most needed to counter poaching activities.

### **2.3 Objectives for conducting the ESIA and development of the ESMP for infrastructure development in the Bwabwata National Park**

Environmental Impact Assessment (EIA) and Environmental and Social Impact Assessment (ESIA) are tools that seek to ensure sustainable development through the evaluation of those impacts arising from a major activity that are likely to affect the natural and man-made environment significantly. It is anticipatory, participatory, systematic, and relies on multidisciplinary input. This consultancy will involve the development of the ESIA and ESMP for the IWPP-funded infrastructure renovations and development.

The EIA was first formally developed as part of the National Environmental Policy Act (NEPA) of 1969 in the United States to consider possible impacts before a decision on whether a proposal should be approved to proceed. Consequently, it has become a requirement in more than 100 countries. Consultation and participation are integral to this evaluation. The EIA system is widespread worldwide, but the process differs from country to country, developed and undeveloped, and from organization to organization. Differing laws for the Environment often state that an administrative authority shall conduct an EIA of the project before granting a license. The assessment should be conducted so that environmental and social considerations are incorporated while the project is still in its planning stage, and alternatives to the project or the ways of executing it should be identified.

The alternatives should be described in ecological, technical, economic, and social terms, and special impacts associated with each alternative should be identified. Identifying effects at an early stage can help developers and public authorities with environmental responsibilities improve the quality of project planning and decision-making. EIA has become increasingly important as a tool for development decision-making.

The Environmental Management Act, 2007 (Act No. 7 of 2007) establishes the overall framework for environmental assessment as an important tool for achieving sustainable development in Namibia. The EMA regulations entail those policies, plans, and programmes prepared by an organ of state that may have a significant environmental impact requiring EIA or ESIA. The EIA is a site-specific assessment, while the ESIA is a multi-site assessment focusing on multiple sites. Hence, this is why the IWPP infrastructure development/renovations assessment requires an ESIA, as it is a multi-site assessment. However, each site will be comprehensively assessed, and impacts for each site will be identified, and mitigation measures will also be site-specific. Each site will have its own set of recommendations for mitigating impacts and monitoring and reporting frameworks.

A synchronised start of the ESIA can inform the land-use planning process by providing an overview of the present status of ecosystems, their services and stakeholders. Overexploited ecosystem services represent a development constraint and a task for the development planning to consider potential measures to address this overexploitation. Underexploited ecosystem services represent a development opportunity that can be elaborated in the development planning process. A spatial approach to ecosystem services assessment provides information on the regional distribution of constraints and opportunities. Information on physical (e.g. surface and subsurface flows of water), biological (e.g. wildlife migration), and social (e.g. seasonal labour migration) processes provides linkages to outside areas.

Work undertaken in this ESIA included:

- 1) Conduct an ESIA so that it complies with all relevant laws and regulations on environmental impact assessment (e.g. Environmental Management Act, 2007 and its regulations) to receive an environmental clearance certificate for the IWPP-funded infrastructure development and renovations for MEFT field staff.
- 2) Assessed the planned developments in Bwabwata National Park (Buffalo core area and Susuwe West), including an assessment of conflicting scenarios, and support the development of viable and sustainable alternatives if necessary and appropriate.
- 3) Identified key issues relevant to sustainability (environmental, social and economic aspects) in the identified sites and consider them in the ESMP.
- 4) Develop ESMP which will provide mitigation measures for identified impacts and recommend monitoring activities during and after the infrastructure development.

The terms of reference are for a consultant(s) to provide support for the Ministry of Environment, Forestry and Tourism (MEFT) with the management of the environmental regulatory process in terms of undertaking the proposed infrastructure development for the Wildlife Protection Services (WPS). The Consultant supported the IWPP Project with environmental assessment management as required by the Environmental Management Act 7 of 2007. This includes the application of the Environmental Clearance Certificate to undertake the proposed infrastructure development, manage the EIA process, and develop the Environmental and Social Management Plans (ESMPs).

According to the Namibian Environmental Regulations (Government Notice No. 30 GG 4878) it is a requirement that the terms of reference for an assessment must set out the approach that the proponent intends to follow in undertaking an assessment in accordance with the Act, these regulations and guidelines and must include:

- ❖ A description of all tasks to be undertaken as part of the assessment process, including any specialist to be included if needed;
- ❖ An indication of the stages at which the Environmental Commissioner is to be consulted;
- ❖ A description of the proposed method of assessing the environmental issues and alternatives; and
- ❖ The nature and extent of the public consultation processes to be conducted during the assessment process.

## 2.4 Key Principles

A number of common principles are applied throughout the process of assessment and management for this ESIA. These include the following:

- ❖ **Precautionary principle:** Apply the “precautionary principle” when designing and implementing projects. In other words, the lack of full scientific certainty shall not be used as a reason for postponing measures to prevent serious threats of social harm or environmental degradation
- ❖ **Polluter pays principle:** Follow the commonly accepted practice that those who produce pollution should bear the costs of managing it to prevent damage to human health or the environment.
- ❖ **Mitigation hierarchy:** Apply the “mitigation hierarchy” that prioritizes (i) avoidance of potential adverse impacts, and where avoidance is not possible, then (ii) minimization

and reduction; where adverse residual impacts remain, then (iii) mitigation measures need to be applied, and, as a last resort, (iv) measures to offset impacts that cannot be appropriately mitigated.

- ❖ **Direct, indirect, cumulative, and induced impacts:** Consider all direct and indirect social and environmental risks and impacts that may be caused by project activities not just in the immediate project area but also in the project's area of influence (see below). Also consider cumulative impacts from the project or from other relevant past, present and reasonably foreseeable developments in a geographic area.
- ❖ **Project area of influence:** A project's social and environmental risks and impacts may extend far beyond specific sites and locations. The project's area of influence needs to be considered when identifying and addressing project risks and impacts. It encompasses (i) the primary project site(s) and related facilities (e.g. access roads, pipelines, canals, disposal areas), (ii) associated facilities that are not funded as part of the project but are directly related, planned to be carried out contemporaneously and whose viability and existence depend on the project (e.g. transmission line to connect UNDP-supported wind energy facility), (iii) areas and communities potentially affected by cumulative impacts from the project or from other relevant past, present and reasonably foreseeable developments in the geographic area (e.g. reduction of water flow in a watershed due to multiple withdrawals), and (iv) areas and communities potentially affected by induced impacts from unplanned but predictable developments or activities caused by the project, which may occur later or at a different location (e.g. facilitation of settlements, illegal logging, agricultural activities by new roads in intact forest areas).
- ❖ **Adaptive management:** Utilize adaptive management techniques whereby lessons are learned from past management actions and are proactively utilized to predict and improve management as the project progresses. Adaptive management may also involve an iterative approach whereby project activities are reviewed to ensure appropriate risk management measures have been adopted. This also applies to the issue of unspecified project activities that may arise during project implementation and for which appropriate social and environmental risk management measures need to be applied.
- ❖ **Stakeholder engagement:** Engage stakeholders meaningfully in the process of identifying, reviewing, managing and monitoring potential impacts and risks. Stakeholder engagement is central to the assessment and management processes in that it promotes public participation in decision-making; helps identify the full range of a project's potential risks, impacts, and concerns; incorporates local knowledge and expertise in project design; and strengthens local support for project activities and maintaining project outcomes.
- ❖ **Transparency and access to information:** Ensure that relevant information on KfW projects is disclosed in a timely manner, in an accessible place, and in an appropriate form and language to help affected communities and other stakeholders to understand the opportunities, risks and potential impacts of supported activities. Access to project information is a prerequisite for effective stakeholder engagement and is to include timely disclosure of draft and final social and environmental assessments and management plans.

- ❖ **Compliance with the highest standard:** Comply with applicable national and local laws and regulations and relevant international obligations of the host country, and international Environmental Standards. While compliance must be ensured, KfW projects should not be designed merely to fulfill a set of minimum standards but to seek implementation of best possible solutions to complex issues and development challenges. The requirements of KfW environmental standards may at times be more stringent than those of national development partners. Nevertheless, KfW is obligated to follow its own standards. As part of the project's social and environmental assessment, Project Developers need to assess the adequacy of the identified applicable policy, legal/regulatory and institutional framework relative to implementing and sustaining the proposed project, especially the proposed mitigation, monitoring and institutional responsibilities. Where standards differ, UNDP requires adherence to the higher standard. In such cases, project teams will need to work closely with national counterparts including responsible parties and others who may be involved in project implementation to address gaps between national law and UNDP's SES to identify solutions to ensure compliance with the SES. In these cases, practical solutions need to be found in collaboration with the implementing partner and included in the ESMP.

## 2.5 Structure of the Report

The following is the summary structure outline of this environmental scoping report:

- ❖ **Section 1: Introduction**
- ❖ **Section 2: Project Background** covering the proposed project location;
- ❖ **Section 3: Legal Requirement/Framework** with respect to the proposed infrastructure development in the Bwabwata National Park;
- ❖ **Section 4: EIA Process Approach** summarizes the approach and methodology adopted in the preparation of the report;
- ❖ **Section 5: Public Participation** Stakeholder consultations and involvement of interested and affected parties in the ESIA process;
- ❖ **Section 6: Description of the Current Environment** covering summaries of the physical, biological and socioeconomic environments;
- ❖ **Section 7: Project Description**
- ❖ **Section 8: Assessment of Environmental and Social Impacts** covering criteria and results of the impact and risk assessment processes;
- ❖ **Section 7: Conclusions and Recommendations** - Summary of the findings and way forward.
- ❖ **Section 8: References**
- ❖ **ANNEXES:**

## 3. LEGAL AND INSTITUTIONAL FRAMEWORK

Namibia has the distinction of being one of the few countries in the world to include the

conservation and sustainable utilisation of the country's biodiversity in its constitution<sup>2</sup>. The MEFT has embarked on a major policy review of natural resource management and developed several new initiatives to meet this constitutional imperative.

The country is also party to several treaties, conventions and other multilateral agreements, including: Convention on Biological Diversity (CBD) and Nagoya Protocol; Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES); UN Framework Convention on Climate Change (UNFCCC); UN Convention to Combat Desertification (UNCCD); Convention for the Protection of World Cultural and Natural Heritage; International Convention on the Elimination of All Forms of Racial Discrimination (ICERD); International Covenant on Economic, Social and Cultural Rights (ICESCR); International Covenant on Civil and Political Rights (ICCPR); Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW); and United Nations Declaration on the Rights of IPP (UNDRIP). Additionally, Namibia takes part in various international standards, reviews and processes including: United Nations Sustainable Development Goals (SDGs); African Charter on Human and Peoples' Rights (ACHPR); and Universal Periodic Review (UPR).

The ESIA Policy of the KfW is consistent with Namibia's Environmental Management Act, other related laws and policies which ensure that developmental projects do not affect the environment and people but enhances benefits to the environment and the people. Below is a list of the laws, policies, and international conventions which are applicable to the proposed project.

### **3.1 Constitutional and National Legislation and Policy Framework**

#### **The Constitution of the Republic of Namibia (1990)**

There are two clauses contained in the Namibian Constitution that are of particular relevance to sound environmental management practice, viz. articles 91(c) and 95(l). In summary, these refer to:

- Guarding against over-utilization of biological natural resources;
- over-exploitation of non-renewable resources;
- Ensuring ecosystem functionality;
- Protecting Namibia's sense of place and character;
- Maintaining biological diversity; and
- Pursuing sustainable natural resource use.

The above-mentioned guides commit the State to actively promote and sustain environmental welfare of the nation by formulating and institutionalizing policies to accomplish the sustainable development objectives. These should also be upholding in the development and implementation of the envisaged project.

#### **Namibia's Vision 2030**

Vision 2030 states that natural environments are disappearing quickly and the natural beauty that many areas in Namibia provide are becoming sought after commodities; and must therefore be regarded as valuable natural assets. This is accompanied by promoting healthy environments basic services, economic growth and sustained livelihoods. The principles that underpin Vision 2030, a policy framework for Namibia's long-term national development, complement the ESS performance standards in tourism related activities through:

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<sup>2</sup> Article 95 states: "the state shall actively promote and maintain the welfare of the people by adopting policies aimed at, maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilisation of living natural resources for the benefit of Namibians, both present and future".

1. Good governance;
2. Partnership;
3. Capacity enhancement;
4. Comparative advantage;
5. Sustainable development;
6. Economic growth;
7. National sovereignty and human integrity;
8. Environment; and
9. Peace and security.

This envisaged project should support the goals set out in Vision 2030, by aligning its development and management plans to the principles because tourism activities in CBNRM areas have the potential to create employment and ultimately contribute to national wealth.

### **Revised National Policy on Human Wildlife Conflict Management, 2018-2027**

This Policy allows for the management of human wildlife conflict in a way that recognizes the rights and development needs of local communities, recognizes the need to promote biodiversity conservation, promotes self-reliance and ensures that decision-making is quick, efficient and based on the best available information. The Policy sets out twelve strategies which include research and monitoring; duty of care, land use planning and integrated measures to avoid human wildlife conflict; human capacity and resources; community care and engagement; delegation of decision-making authority; removal of problem causing animals; appropriate technical solutions for mitigating human wildlife conflict; disaster management; application of revenues from problem causing animals to avoid future conflicts and to address the losses of affected persons; protected areas neighbours and residents; human wildlife conflict management schemes; and public awareness, stakeholder engagement and coordination.

### **The Revised National Strategy on Wildlife Protection and Law Enforcement**

The primary objective of this strategy is to establish within the country, and within the framework of the national laws, common approaches to the protection and conservation of wildlife and to ensure the effective enforcement of laws governing wildlife resources.

### **Namibia's Environmental Management Act (EMA) (Act No 7 of 2007)**

As the main legal document on environmental sustainability, the EMA has formulated principles for sound management of the environment and natural resources in an integrated manner. Part 1 of the Act describes and puts into perspective the importance of an environment that does not pose threats to human health, proper protection of the environment, broadened focus on the part of individuals and communities, and reasonable access to information regarding the state of the environment. Part 2 of the Act is of particular significance to ESS and sets out 12 principles of environmental management, as follows:

1. Renewable resources shall be utilized on a sustainable basis for the benefit of current and future generations of Namibians.
2. Community involvement in natural resource management and sharing in the resulting benefits shall be promoted and facilitated.
3. Public participation in decisions affecting the environment shall be promoted.
4. Fair and equitable access to natural resources shall be promoted.
5. Equitable access to sufficient water of acceptable quality and adequate sanitation shall be promoted and the water needs of ecological systems shall be fulfilled to ensure the sustainability of such systems.
6. The precautionary principle and the strategy of preventative action shall be applied.

7. There shall be prior environmental assessment of projects and proposals which may significantly affect the environment or use of natural resources.
8. Sustainable development shall be promoted in land-use planning.
9. Namibia's movable and immovable cultural and natural heritage, including its biodiversity, shall be protected and respected for the benefit of current and future generations.
10. Generators of waste and polluting substances shall adopt the best practicable environmental option to reduce such generation at source; and the polluter pays principle shall be applied.
11. Reduction, reuse and recycling of waste shall be promoted.
12. Promotion of the coordinated and integrated management of the environment;

The EMA require that all projects, policies, programmes, and plans that have a detrimental effect on the environment must be accompanied by an Environmental Impact Assessment (EIA). The HWC-WC Project requires an impact assessment to be undertaken as per the following points from section 9 in the Government Notice No. 29 (2012). Since the HWC-WC is a project implemented at a landscape level and not a specific site an Environmental and Social Impact Assessment covering the entire hotspot landscape is undertaken instead of an EIA. Figure 3 below elaborates the process undertaken to develop the ESIA as required by the EMA.

### **Community rights to natural resources**

Community user rights over natural resources are recognized in principle in the National Land Policy of 1998. It provides that tenure rights allocated according to the policy and consequent legislation will include all renewable natural resources on the land subject to sustainable utilization and the details of sectoral policy and legislation. These resources include wildlife, tourist attractions, fish, water, forest resources and vegetation for grazing (GRN 1998).

Provision is made for various forms of land rights: customary grants; leasehold; freehold; licenses, certificates or permits; and state ownership. Tenure rights will be exclusive, enforcement of which will be supported by law. Among the categories of land rights holder provided for are "legally constituted bodies and institutions to exercise joint ownership rights (and) duly constituted cooperatives". This definition would include such bodies as wildlife conservancies and community forest management bodies. The policy provides for the administration of communal land to be vested in Land Boards and Traditional Authorities provided for in the Communal Land Reform Act 5 of 2002. It makes provision for long term leases (up to 99 years) for the use of communal land primarily for business purposes. Leases include the granting of tourism concessions.

### **The National Policy on Wildlife Management, Utilization and Tourism in Communal Areas**

The national Policy on Wildlife Management, Utilization and Tourism in Communal Areas was approved by Cabinet in March 1995. While the Nature Conservation Ordinance, (No. 4. of 1975) gave commercial farmers conditional ownership of certain species of game and rights to use others, similar rights were not extended to communal farmers. The policy on Wildlife, Management, Utilization and Tourism in Communal Areas sets out an approach for giving communal area residents rights over wildlife and tourism, and it uses the concept of the conservancy as the mechanism to do this.

### **The Nature Conservation Ordinance**

The Nature Conservation Ordinance (No. 4 of 1975) provides for the conservation and utilization of wildlife outside protected areas (South West Africa Administration 1975). It

provides for the declaration of hunting seasons, and different categories of game, specially protected, protected and huntable. Specially protected game receives the highest protection and may not be hunted or killed without a permit, except in defense of human life, to prevent injury or to protect livestock. Elephant, black and white rhino and hippo are among the species declared specially protected. Similar provisions exist for protected game, but the fine for offences is less.

The Ordinance states that the owner or lessee of a farm enclosed with a game-proof or adequate fence or any piece of land above 1 000 ha which is enclosed with a game proof fence shall be the owner of huntable game, huntable game birds and exotic game as long as the animals or birds are legally on the land in question. Owners of huntable game are able to use these species for their own use without permit or limitation on numbers and may charge other parties a fee to hunt huntable game on their land provided the hunter has a permit from the Ministry and subject to a limit on numbers that may be hunted. Huntable game is the following: bush pig, buffalo, oryx, kudu, springbok and warthog. The Ordinance also provides for trophy hunting and regulates the import and export of trophies and other animal products. It provides for and regulates the capture and sale of game and night culling. It prohibits certain methods of hunting and provides for the means by which problem animals may be lawfully killed. The Ordinance regulated fishing in inland waters but these provisions have 35 been replaced by the Inland Fisheries Act of 2003. The Ordinance also regulates the harvesting and commercial use of indigenous plants.

### **Draft Parks and Wildlife Management Bill**

Namibia is currently developing new legislation governing protected areas and wildlife conservation through the draft Parks and Wildlife Management Bill. Part IV of the draft Bill provides for the establishment and management of protected areas (MEFT 2008). It provides for the establishment of protected areas by the State and provides for the powers and functions of the Ministry in such protected areas. It establishes how land may be acquired to establish a State Protected Area.

The draft Bill provides for four types of protected area: National Park, Nature Reserve, Site of Special Conservation or Scientific Importance, and 34 a Protected Landscape, with a National Park having the highest level of protection. A major proposed change to existing legislation is that communal and freehold land holders and other administrative authorities would be able to apply to have land designated as one of the different types of protected area except for National Park. The draft Bill therefore provides for land holders (communal and freehold), Municipalities and Regional Councils to enter into contractual agreements with the State for the establishment of protected areas. The aim is that the contract is the foundation for the establishment of the park and defines the rights and duties of the parties to the contract. Part IV of the draft Bill also provides for the involvement of civil society on advisory boards for protected areas and it provides for collaborative management agreements to be signed with people resident in protected areas or with neighbors. Part IV also governs the regulation of mining and prospecting in State protected areas with the aim of minimizing environmental damage and enabling Ministry officials to exercise control over such activities.

### **The National Land Policy of 1998**

Community rights to natural resources Community user rights over natural resources are recognized in principle in the National Land Policy of 1998. It provides that tenure rights allocated according to the policy and consequent legislation will include all renewable natural resources on the land subject to sustainable utilization and the details of sectoral policy and legislation These resources include wildlife, tourist attractions, fish, water, forest resources and vegetation for grazing (GRN 1998). Provision is made for various forms of land rights: Customary grants; leasehold; freehold; licenses, certificates or permits; and State ownership.



Tenure rights will be exclusive, enforcement of which will be supported by law. Among the categories of land rights holder provided for are "legally constituted bodies and institutions to exercise joint ownership rights (and) duly constituted cooperatives". This definition would include such bodies as wildlife conservancies and community forest management bodies. The policy provides for the administration of communal land to be vested in Land Boards and Traditional Authorities. It makes provision for long term leases (up to 99 years) for the use of communal land primarily for business purposes. Leases include the granting of tourism concessions.

### **National Policy on Tourism and Wildlife Concessions on State Land**

The 2007 Policy on Tourism and Wildlife Concessions on State Land provides a framework and guidelines for the allocation of concessions in protected areas and other State land (MEFT 2007d). These include tourism concessions, harvesting of indigenous plant material and trophy hunting. The draft policy provides for an open, just, fair and competitive process for awarding concessions that also prioritizes the empowerment of formerly disadvantaged Namibians. It gives discretion to the Minister to allocate concessions directly to local communities under certain conditions (see below). A concessions committee has been established in MEFT in terms of the policy and it oversees the concession process with day to day administration being carried out by a concessions unit in MEFT.

### **The National Policy on Tourism for Namibia**

The National Policy on Tourism for Namibia represents the consensus of a wide consultative process with those commercially in tourism, non-governmental organizations and government officials. The policy provides a framework for the mobilization of resources in order to realize long-term national objectives. As articulated in the National Development Plan 3 and Vision 2030, these are sustained economic growth, employment creation, poverty reduction, reduced inequalities in income, gender and between regions and the promotion of economic empowerment.

The Policy covers several aspects of the economy, environment and society as a whole. This is appropriate because the "footprint" of tourism permeates many areas. Tourists are temporary residents in our country and as such share with Namibians in the benefits of services provided by all divisions of government. Both tourists and nationals want security, good roads, efficient transport services, comfortable accommodation, hygienic restaurants, good value shopping, entertainment, efficient tele-communication services and access to health services in the event of indisposition. The Policy is not limited to those areas that are under the jurisdiction of the Ministry of Environment Forestry and Tourism. It includes aspects related to tourism that are contained in the policies of other state bodies. What is present in this Policy is a compromise between a simple broad brush policy and a detailed version which would replicate large parts of many other policy documents. These include policies dealing with wildlife concessions, tourism investment, the environment, regional development, land, education, aviation etc. Tourism is not a new phenomenon in our country. It has evolved over the years notwithstanding the absence of a specific written policy. However the Policy is required because we are at the stage when important decisions need to be taken on the future of the sector whose implementation would require significant financial resources.

### **National Tourism Growth and Development Strategy**

The Government of Namibia has set itself the target to become one of the most competitive destinations in Sub-Saharan Africa through the development of the National Tourism Growth and Development Strategy (NTGDS). Through the strategy the country strives to achieve the goals set by the Government, the Ministry of Environment Forestry and Tourism for tourism

development and investment. In addition to the NTGDS the country has also developed the National Tourism Investment Profile and Promotion Strategy (NTIPPS).

As part of the NTGDS and NTIPPS development the United Nations World Trade Organization (UNWTO) conducted a benchmarking exercise with selected best performing countries in Sub-Saharan Africa and prepared a detailed report. The report, which includes an analysis of Namibia's strengths and weaknesses as a tourist destination and corresponding recommendations, guides and oversee the implementation framework of both the NTGDS and NTIPPS.

### **National Policy on Climate Change for Namibia (2011)**

The National Policy on Climate Change (NPCC) pursues constitutional obligations of the Government of the Republic of Namibia, namely for "the state to promote the welfare of its people and protection of Namibia's environment for both present and future generation." The policy recognises Namibia's environmental constraints and vulnerabilities, and seeks to outline a coherent, transparent and inclusive framework on climate risk management in accordance with Namibia's national development agenda and legal framework. Similarly, the policy takes cognizance of Namibia comparative advantages with regard to the abundant potential for renewable energy exploitation, of which this project should take into account. The overall goal of the policy is to strengthen national capacities to reduce climate change risks and build resilience for any climate change shocks. The project may therefore contribute by sensitizing local communities on matters of climate change and intensify awareness education and developing training packages on climate-resilient and sustainable management practices or techniques.

### **National Climate Change Strategy & Action Plan (NCCSAP) 2013 – 2020**

Climate change is a complex and cross-cutting issue and its impacts directly on the entire chain of national development. The NCCSAP was developed as a result of the growing concern and discourse focusing on climate variability and climate change risks and impacts affecting Namibia's social, environmental and economic developmental potential. Therefore, in order to implement the NPCC, the NCCSAP was adopted in 2013 as a key instrument and comprehensive practical tool, which offers guidance on the mechanisms, means and manner of implementation. It is clear that climate change awareness, knowledge and understanding, both in terms of the risks, impacts and responses is rapidly developing. This may call for a mid-term review process of the implementation and impact of the NCCSAP in order to better the adaptation mechanisms and guide future projects such as those related to CBNRM.

### **Water Resources Management Act (Act no. 11 of 2013)**

This Act provides a framework for managing water resources based on the principles of integrated water resources management (IWRM). It provides for the management, development, protection, conservation, and use of water resources. This relates to the performance standards assessing resource efficiency and pollution prevention; as well as biodiversity conservation and sustainable management of living natural resources.

Relevant principles of the Act include, inter alia:

- ❖ Equitable access for all people to safe drinking water is an essential basic human right to support a healthy productive life;
- ❖ Harmonization of human water needs with the requirements of environmental ecosystems and the species that depend on them, while maintaining the water quality;

- ❖ Promotion of the sustainable development and integrated management of water resources which incorporates social, technical, economic, and environmental issues;
- ❖ Development of the most cost-effective solutions, including conservation measures, to infrastructure for the provision of water; and
- ❖ Prioritizing water awareness and the participation of interested and affected stakeholders in the decision-making process of any water resource development initiative.

The Department of Water Affairs and Forestry (DWAF) in the Ministry of Agriculture, Water and Land Reform (MAWLR), is the legal custodian for the implementation of the Act. Key components of the Act, of relevance to the proposed project are with regards to wastewater management and ground and surface water abstraction. In accordance with Sections 68 to 75 of the Water Act No 11 of 2013, details of any water treatment facility must be submitted to the DWAF for the issuing of a water abstraction/water treatment/wastewater / brine discharge licence. It is therefore necessary that any facility which would be considered in the CBNRM project meets these requirements.

### **Water Act (Act 54 of 1956)**

This Act is partially replaced by the Water Resource Management Act, which consolidates and amends the laws relating to the control, conservation and use of water for domestic, agricultural, urban and industrial purposes. The Act will phase out once Regulations for the Water Resources Management of 2013 come into effect. The main purpose of the Water Act is to provide for the sustainable development and use of water resources, and restricts the pollution of waters by means of any activity. This Act requires proposed developments to investigate and implement measures to ensure sustainable use of water resources and ensure that no pollution of any above or below ground water takes place.

### **Forestry Act (Act 12 of 2001), As Amended**

The Act deals with forests in general and matters incidental thereto. Of importance to the proposed development is that the Act affords general protection of the environment (Part IV). Section 22 affords protection to natural vegetation stipulating that no living tree, bush or shrub within 100 m from any river, stream or watercourse may be removed without the necessary license. Permits are required for the removal of trees, bushes or shrubs, or any indigenous plants. Therefore, proposed developments must comply with these requirements.

### **Soil Conservation Act (Act 76 of 1969), As Amended**

Partially similar to the other Acts and ordinances in 5.7 – 5.13.13 above, this Act addresses the issues of vegetation and ground water, but also includes the matter of soil. In specific the Act focuses on combating and preventing soil erosion; the conservation, protection and improvement of soil and vegetation and water sources and resources. The propose project should therefore comply with the soil conservation measures outline in this Act to prevent soil erosion in the proposed areas.

### **Pollution Control and Waste Management Bill (in preparation)**

This Bill seeks to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) when it comes into force. In terms of water pollution, it will be illegal to discharge of, or dispose of, pollutants into any watercourse without a Water Pollution Licence (apart from certain accepted discharges). Similarly, an Air Quality Licence will be required for any pollution discharged to air above a certain threshold. The Bill also provides for noise, dust or odour control that may be considered a nuisance; and advocates for duty of care with respect to waste management affecting humans and the environment and

calls for a waste management licence for any activity relating to waste or hazardous waste management in a CBNRM area.

### **Hazardous Substance Ordinance (No 14 of 1974), As Amended**

This ordinance provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances. It covers manufacturing, sale, use, disposal and dumping as well as import and export. These substances are grouped (Group I, II, III, and IV) in terms of section 3(1) of the mentioned Ordinance. The responsibility lies with the proponent of the project to conform to the Hazardous Substances Ordinance (No 14 of 1974). Caution is required in the storage and handling of any hazardous substances as it pose potential harm to humans and the natural environment if incorrectly applied or handled.

### **The Public Health Act (Act no 36 of 1919)**

This Act covers a variety of aspects with relevance to the general wellbeing and health of the public. With relevance to the development and associated infrastructure this Act refers to the control of nuisance, but also the prevention of pollution of public waters.

Section 119 of the Act prohibits the existence of a 'nuisance' on any land owned or occupied by any person. Having relevance to the proposed development, the Act defines 'nuisance' as:

- ❖ any stream, pool, lagoon, ditch, gutter, watercourse, sink, cistern, water closet, earth closet, privy, urinal, cesspool, drain, sewer, dung pit, slop tank, ash pit or manure heap so foul or in such a state or so situated or constructed as to be offensive or to be injurious or dangerous to health;
- ❖ any well or other source of water supply or any cistern or other receptacle for water, whether public or private, the water from which is used or is likely to be used by man for drinking or domestic purposes or in connection with any dairy or milk shop or in connection with the manufacture or preparation of any article of food intended for human consumption, which is polluted or otherwise liable to render any such water injurious or dangerous to health;
- ❖ any factory or trade premises not kept in a cleanly state and free from offensive smells arising from any drain, privy, water closet, earth closet, or urinal, or not ventilated so as to destroy or render harmless and inoffensive as far as practicable any gases, vapors, dust or other impurities generated, or so overcrowded or so badly lighted or ventilated as to be injurious or dangerous to the health of those employed therein;
- ❖ any factory or trade premises causing or giving rise to smells or effluvia which are offensive, or which are injurious or dangerous to health;
- ❖ any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health;
- ❖ Any other condition whatever which is offensive, injurious or dangerous to health.

Part III of the General Regulations promulgated under the Health Act (Act 36 of 1919) focus on the prevention of pollution of public surface or ground water by various means.

### **The Ministry of Environment Forestry and Tourism (MEFT) Policy on HIV & AIDS**

The relevance of this policy for the proposed project stems from the fact that clearing, and development activities may involve the establishment of temporary workforce within the rural areas. Experience with other construction projects in a developing-world context has shown that, where construction workers have the opportunity to interact with local community, a significant risk is created for the development of social conditions and behaviours that contribute to the spread of HIV and AIDS. In response to the threat the pandemic poses, MEFT has developed a policy on HIV and AIDS. This policy provides for a non-discriminatory work

environment and for workplace programs managed by a Ministry-wide committee. Adhering to these programs should be mandatory.

### **The Labour Act (Act no 11 of 2007)**

In this Act, occupational exposure to employees is covered under the regulations relating to the Health and Safety of employees at work. Sub-contractors however will not be subject to any provisions of the Act, as sub-contractors are not considered to be employees in terms of Namibian common law.

Section 3 (1) of the Regulations stipulates that in areas where it is suspected that noise levels are above 85dB(A) over an eight-hour period, the employer shall take reasonable steps to reduce the levels to below 85dB(A). If this is not possible, noise areas (those above 85 dB (A)) must be clearly marked and measured every 36 months. Employees who work in noisy areas must be provided with hearing protection devices free of charge and must undergo medical surveillance at least once every 36 months. Employees who are exposed to levels exceeding 85 dB (A) must be adequately and comprehensively informed and trained regarding the wearing of personal protective equipment and the potential risks of exposure to noise and the precautions to be taken to protect against the risks associated with the exposure to noise.

Chapter IV of the Regulations stipulates that all employees have the right to health and safety at the workplace. A Health and Safety Officer must be appointed in order to maintain a healthy and safe environment to all workers during the Construction phase. Prior to the promulgation of the Labour Act (Act of 1997), a large number of regulations had been gazetted dealing with different aspects of employer and employee rights and obligations. Included in these are regulations relating to health and safety in the workplace. The administration of these regulations, however, is assigned to various ministries by Proclamation 10/1997, as published in Government Gazette 1615.

### **The National Heritage Act (Act no 27 of 2004)**

The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. The National Heritage Council has been established to identify, conserve, manage and protect places and objects of heritage significance. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains (defined in Part 1, Definitions 1), while Section 48 F sets out the procedure for application and granting of permits such as might be required in the event of damage to a protected site or object occurring as an inevitable result of development. Section 51 (3) sets out the requirements for impact assessment. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council.

## **3.2 International Conventions and Treaties**

### **United Nations Sustainable Development Goals (SDGs)**

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. The 17 SDGs are integrated—they recognize that action in one area will affect outcomes in others, and that development must balance social, economic and environmental sustainability.

Countries have committed to prioritize progress for those who're furthest behind. The SDGs are designed to end poverty, hunger, AIDS, and discrimination against women and girls. The creativity, knowhow, technology and financial resources from all of society is necessary to achieve the SDGs in every context.

### **African Charter on Human and Peoples' Rights (ACHPR)**

The African Charter on Human and Peoples' Rights (ACHPR) is the principle regional human rights treaty for the African continent. Adopted in 1981, there is now a significant body of jurisprudence and interpretation by its African Commission on Human and Peoples' Rights and the African Court. This volume provides a comprehensive article-by-article legal analysis of the provisions of the Charter as it draws upon the documents adopted by the African Commission, including resolutions, case law, and concluding observations. Where relevant, case law adopted by the African Court on Human and Peoples' Rights, and that of other sub-regional courts and tribunals and domestic courts in Africa, are also incorporated.

The book examines not only the substantive rights in the African Charter but also the work of the African Commission on Human and Peoples' Rights and provides a full examination of its mandate. A critical analysis of each of the provisions of the ACHPR is led principally by the jurisprudence and documentation of the African Commission and African Court. The text also identifies the overall development of the ACHPR within the broader regional and international human rights legal arena.

### **Universal Periodic Review (UPR)**

The Universal Periodic Review (UPR) is a unique mechanism of the Human Rights Council that calls for each UN Member State to undergo a peer review of its human rights records every 4.5 years. The UPR provides each State the opportunity to regularly:

- ❖ Report on the actions it has taken to improve the human rights situations in their countries and to overcome challenges to the enjoyment of human rights; and
- ❖ Receive recommendations – informed by multi-stakeholder input and pre-session reports – from UN Member States for continuous improvement.

Established in March 2006 by the UN General Assembly in resolution 60/251, the UPR is designed to prompt, support, and expand the promotion and protection of human rights in every country.

### **United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)**

The United Nations Declaration on the Rights of IPP (UNDRIP). The Declaration is the most comprehensive instrument detailing the rights of IPP in international law and policy, containing minimum standards for the recognition, protection and promotion of these rights. It establishes a universal framework of minimum standards for the survival, dignity, wellbeing and rights of the world's IPP.

The Declaration addresses both individual and collective rights; cultural rights and identity; rights to education, health, employment, language, and others. It outlaws discrimination against IPP and promotes their full and effective participation in all matters that concern them. It also ensures their right to remain distinct and to pursue their own priorities in economic, social and cultural development. The Declaration explicitly encourages harmonious and cooperative relations between States and IPP.

### **Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW)**

The Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) is an international legal instrument that requires countries to eliminate discrimination against women and girls in all areas and promotes women's and girls' equal rights. CEDAW is often described as the international bill of rights for women, and is one of the key international

agreements that guides the work of UN Women in achieving gender equality and empowering all women and girls.

### **International Covenant on Civil and Political Rights (ICCPR)**

The International Covenant on Civil and Political Rights (ICCPR) is a multilateral treaty that commits nations to respect the civil and political rights of individuals, including the right to life, freedom of religion, freedom of speech, freedom of assembly, electoral rights and rights to due process and a fair trial. It was adopted by United Nations General Assembly Resolution 2200A (XXI) on 16 December 1966 and entered into force on 23 March 1976 after its thirty-fifth ratification or accession. As of June 2022, the Covenant has 173 parties and six more signatories without ratification, most notably the People's Republic of China and Cuba; North Korea is the only state that has tried to withdraw.

The ICCPR is considered a seminal document in the history of international law and human rights, forming part of the International Bill of Human Rights, along with the International Covenant on Economic, Social and Cultural Rights (ICESCR) and the Universal Declaration of Human Rights (UDHR).

Compliance with the ICCPR is monitored by the United Nations Human Rights Committee, which reviews regular reports of states parties on how the rights are being implemented. States must report one year after acceding to the Covenant and then whenever the Committee requests (usually every four years). The Committee normally meets at the UN Office at Geneva, Switzerland and typically holds three sessions per year.

### **International Covenant on Economic, Social and Cultural Rights (ICESCR):**

The International Covenant on Economic, Social and Cultural Rights (ICESCR) is a multilateral treaty adopted by the United Nations General Assembly (GA) on 16 December 1966 through GA. Resolution 2200A (XXI), and came into force on 3 January 1976. It commits its parties to work toward the granting of economic, social, and cultural rights (ESCR) to all individuals including those living in Non-Self-Governing and Trust Territories. The rights include labour rights, the right to health, the right to education, and the right to an adequate standard of living. As of July 2020, the Covenant has 171 parties. A further four countries, including the United States, have signed but not ratified the Covenant.

The ICESCR (and its Optional Protocol) is part of the International Bill of Human Rights, along with the Universal Declaration of Human Rights (UDHR) and the International Covenant on Civil and Political Rights (ICCPR), including the latter's first and second Optional Protocols. The Covenant is monitored by the UN Committee on Economic, Social and Cultural Rights.

### **International Convention on the Elimination of All Forms of Racial Discrimination (ICERD)**

The International Convention on the Elimination of All Forms of Racial Discrimination (ICERD) is a United Nations convention. A third-generation human rights instrument, the Convention commits its members to the elimination of racial discrimination and the promotion of understanding among all races.<sup>[6]</sup> The Convention also requires its parties to criminalize hate speech and criminalize membership in racist organizations. The Convention also includes an individual complaints mechanism, effectively making it enforceable against its parties. This has led to the development of a limited jurisprudence on the interpretation and implementation of the Convention.

The convention was adopted and opened for signature by the United Nations General Assembly on 21 December 1965, and entered into force on 4 January 1969. As of July 2020, it has 88 signatories and 182 parties.

### **Convention for the Protection of World Cultural and Natural Heritage**

The Convention defines the kind of natural or cultural sites which can be considered for inscription on the World Heritage List. The Convention sets out the duties of States Parties in identifying potential sites and their role in protecting and preserving them. By signing the Convention, each country pledges to conserve not only the World Heritage sites situated on its territory, but also to protect its national heritage. The States Parties are encouraged to integrate the protection of the cultural and natural heritage into regional planning programmes, set up staff and services at their sites, undertake scientific and technical conservation research and adopt measures which give this heritage a function in the day-to-day life of the community.

### **Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES)**

Namibia is a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), a multilateral treaty to protect endangered plants and animals. CITES aims to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species in the wild and accords varying degrees of trade restrictions to species of animals and plants.

### **United Nations Convention on Biological Diversity (UNCBD), 1993**

As the demands on natural resources such as soil, water and vegetation increases, the state of the resources continues to deteriorate. The pressures are aggravated by changes in the climate and these impacts heavily on already vulnerable communities. The objective of the UNCBD is therefore to maintain biological diversity, ensure the sustainable use of its components, and ensure equitable sharing of benefits derived from these resources including access thereto.

The proposed project may contribute to achieving this objective by ensuring that its activities conform to the requirements of the Convention and are monitor their impacts.

### **UN Convention to Combat Desertification (UNCCD)**

The United Nations Convention to Combat Desertification (UNCCD), adopted in 1994, is the sole legally binding international agreement linking environment and development to sustainable land management. The Convention addresses specifically the arid, semi-arid, and dry sub-humid areas, known as the drylands, where some of the most vulnerable ecosystems and peoples can be found. Parties to the Convention meet in Conferences of the Parties (COPs) every two years, as well as in technical meetings throughout the year, to advance the aims and ambitions of the Convention and achieve progress in its implementation.

When land is degraded and usable land becomes scarce, women are differentially and disproportionately affected given their substantial role in agriculture and food production, greater vulnerability to poverty, and typically weaker legal protections and social status. Nearly 80 per cent of employed women in least developed countries report agriculture as their primary source of livelihood, while women comprise 43 per cent of the world's agricultural labour force.

### **United Nations Framework Convention on Climate Change (UNFCCC), 1992**

Namibia is signatory to this international environmental treaty committed to develop programs to reduce its anthropogenic emissions of greenhouse gases by sources and removal by sinks. The overall objective of this Convention is to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. This should be done in accordance with the relevant provisions of the Convention.



This legal instrument ties in well with the direction of the proposed project to reduce effects of climate change in the tourism industry; and thus the proposed activities should take into considerations the commitments provided for in this convention during development.

### **BAMA KO Convention, 1991**

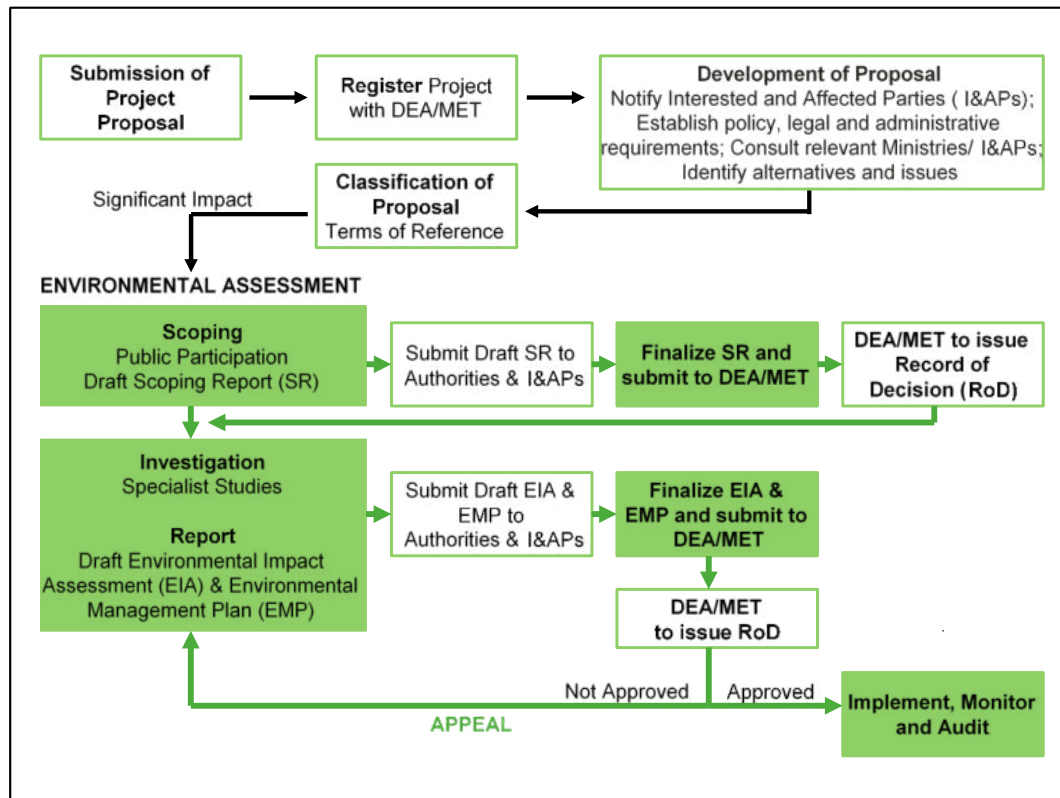
The African States signatory to this convention, of which Namibia is part of, are mindful of the growing threat to human health and the environment due to the increased generation of hazardous waste; and acknowledges that mechanisms must be put in place to ensure that the producer of the waste carries the responsibility of transporting and disposing the waste in a manner that protects human health and the environment. The BAMA KO Conventions emphasizes the importance of a 'toxic free' environment by the implementation of environmentally sound legal instruments and management systems for the welfare of current and future generations.

The above policies, laws and regulations are consistent with the AF interim performance standards. Therefore, the envisage project proposal should take into consideration of the above policies, laws and regulation during the proposal development to ensure the acceptance of the project by community members found in the target areas and also compliance to the national and international standards and laws.

## **4. METHODOLOGY AND OVERVIEW OF THE APPROACH**

### **4.1 Overview**

The preparation of this ESIA and ESMP reports has taken into considerations the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) and KfW Sustainability guidelines (Assessment and management of Environmental, Social and Climate aspects: Principles and procedures). The ESIA and ESMP has been prepared in line with the January 2015 Ministry of Environment Forestry and Tourism (MEFT) Environmental Assessment Reporting Guideline. Fig. 2 summarizes the Environmental Assessment process in Namibia as adopted for this project.



**Figure. 2 The Environmental Assessment process in Namibia as adopted for this project.**

To ensure the collection of representative risks and impacts of the proposed infrastructure development the following approaches were used; (a) meetings with stakeholders in the target area (in and around the Bwabwata National Park (BNP) and, (b) consultative meetings with key stakeholders in Windhoek (c) study of literature and maps of the BNP including biophysical features. These approaches were found to be adequate and representative as sufficient data gathering exercises for the ESIA and its associated documentation and plans. A wide range of stakeholders, particularly local communities, were consulted during the scoping and fieldwork undertaken as part of the ESIA process development. At the outset of the design and development processes for the infrastructure development in BNP, the IWPP and MEFT hosted and led consultative meetings involving stakeholders at national, regional, and local levels.

## 4.2 Terms of Reference for this Report

Summary of the proposed activities, alternatives and key issues considered during the Environmental Assessment (EA) process covering ESIA and ESMP stages are provided in Table 1 below.

**Table 1: Summary of the proposed activities, alternatives and key issues to be considered during the Environmental Assessment (EA) process covering ESIA and ESMP provided as part of the Terms of Reference**

PROPOSED PROJECT ACTIVITIES	ALTERNATIVES CONSIDERED	KEY ISSUES TO BE EVALUATED AND ASSESSED WITH ENVIRONMENTAL MANAGEMENT PLAN (ESMP) / MITIGATION MEASURES PREPARED
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<p><b>1. Preconstruction:</b></p> <ul style="list-style-type: none"> <li>❖ Planning, designing and permitting;</li> <li>❖ Mobilization and implementation;</li> <li>❖ Site access plan and surveying;</li> <li>❖ Determination of locally available construction materials (sand / gravel) excavations, and;</li> <li>❖ Demolition / excavations and erection of security and safety zones.</li> </ul> <p><b>2. Construction:</b></p> <ul style="list-style-type: none"> <li>❖ Soil / ground preparation and supporting Infrastructure construction;</li> <li>❖ Foundation excavations and building;</li> <li>❖ Structural development / Actual construction;</li> <li>❖ Supporting infrastructure (internal access, energy requirements, water supply, waste water management and solid waste management).</li> </ul> <p><b>3. Operational:</b></p> <p>Day to day running of the WPS Station and surrounding areas and generating liquid and solid waste, noise, dusty, interact with local people, visitors, wildlife and the broader natural receiving environment.</p>	<p>(i) Designs of the buildings and layout (ii) Other Alternative Land Uses: Conservation and Tourism</p> <p>(iii) Ecosystem Function (What the Ecosystem Does)</p> <p>(iv) Ecosystem Services</p> <p>(v) Use Values</p> <p>(vi) Non-Use, or Passive Use</p> <p>(vii) The No-Action Alternative</p> <p>(viii) Others to be identified during the public consultation process</p>	Potential land use conflicts / opportunities for coexistence between proposed activities and other existing land uses such as conservation, tourism and urban development	
		<b>Physical Environment</b>	<ol style="list-style-type: none"> <li>1. Water quality</li> <li>2. Physical infrastructure and resources</li> <li>3. Air quality, noise and dust</li> <li>4. Landscape and topography</li> <li>5. Soil quality</li> <li>6. Climate change influences.</li> </ol>
		<b>Biological Environment</b>	<ol style="list-style-type: none"> <li>1. Habitat</li> <li>2. Protected areas and resources</li> <li>3. Flora</li> <li>4. Fauna</li> <li>5. Ecosystem functions, services, use values and non-use or passive use.</li> </ol>
		<b>Socioeconomic, cultural and archaeological environment</b>	Local, regional and national socioeconomic settings Tourism and recreation Cultural, biological and archaeological resources
		<b>Environmental Management Plan (ESMP) Providing Mitigation Measures and Monitoring Plan</b>	<p>Mitigation focuses on the following in order of preference:</p> <ol style="list-style-type: none"> <li>1. Enhancement, e.g. provision of new habitats;</li> <li>2. Avoidance, e.g. alternative / sensitive design to avoid effects on ecological receptors;</li> <li>3. Reduction, e.g. limitation of effects on receptors through design changes; and</li> <li>4. Compensation, e.g. community benefits such as a water well being provided.</li> </ol>

### 4.3 Environmental Assessment Process Adopted

The following assessment steps as recommended in the Scoping Report/BID were implemented:

- ❖ Project screening process was undertaken in May 2024; registered with the Environmental Commissioner
- ❖ A Draft Environmental Scoping / Background Information Document (BID) Report prepared in May to June 2024;
- ❖ Specialist studies (Flora, fauna, and Socioeconomic) implemented in June 2024;
- ❖ Stakeholder meetings undertaken in June 2024
- ❖ In July 2024 the consultant prepared the Draft ESIA and ESMP Reports and finalized the Scoping / BID Report;
- ❖ In August 2024 the consultants will finalize the ESIA and ESMP Reports and submit to the Environmental Commissioner in the MEFT through the Competent Authority by the week starting 5 August 2024.

## **4.4 Inception of the consultancy and desktop-based research**

An Inception Meeting was held on the 8<sup>th</sup> of May 2024 between the consultant, and IWPP project staff. The inception meeting involved discussions on the following:

- ❖ Official introduction of consultants
- ❖ Scope of the project with reference to the ESIA development
- ❖ Expectations in terms of deliverables
- ❖ Proposed methodology for implementation of activities

As part of the Inception Phase, the consultant familiarised with the project, the methodology, earlier experiences and existing documentation, expectations and the project in its entirety. This was undertaken co-currently with the desktop-based research. The desk-based research included project documentation, key literature and documents from MEFT, online desk research, literature from government published information as well as research undertaken on the subject matter in Namibia and across the world. With regards to documentation consulted the credentials of the author/s, including a determination of their knowledge on the subject matter. Sources included NGO reports, newspaper reports, and other forms of pertinent commentary.

## **4.5 Public and Stakeholders Consultation Process**

Public participation and consultations with stakeholders were undertaken in line with the Environmental Management Act 7 of 2007. Please see details in Section 5. However due to the sensitivity of Wildlife Protection Services activities the Department of Wildlife and National Parks of the MEFT requested the Environmental Commissioner to allow the ESIA to be developed with minimum public participation. A letter was prepared in this regard from the Deputy Executive Director to the Environmental Commissioner.

## **4.6 Mapping**

In addition to all the data and information collected as part of the Project, the consultant worked on detailed mapping of the sites at Susuwe and Buffalo as well the BNP in its entirety. Some of the information that was collected includes:

- ❖ Natural resources within the hotspot
- ❖ Villages
- ❖ Dwellings
- ❖ Roads, schools, clinics
- ❖ Conservancy and community forests

From the collected data baseline maps have been produced and integrated into the ESIA. With the use of the base map, key sensitive areas will further be discussed with relevant stakeholders and mapped.

## **4.7 Site assessments**

The consultant undertook a detailed assessment of the proposed sites which included collection of data on biophysical and socio-economic parameters of the BNP. The site-specific assessment included a desktop review, use of participatory research tools for data collection to determine sites for construction of the infrastructure.

## 4.8 Public Participation

Public and stakeholder consultation process for this project has been implemented in accordance with the provisions of the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 and the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007). The identification and assessment of stakeholders and issues of importance to them was one of the key steps of the ESIA process. The assessment of the key stakeholders in terms of their likely interest and role to the ESIA process for the proposed project has been undertaken during the Scoping Phase. During the preparation of the Scoping Report / BID, central government (Line Ministries), regional governments as well as local environmental groups have been evaluated as potential consultees. However, due to the sensitive nature of the work done by WPS it was decided by the MEFT Department of Wildlife and National Parks that the only form of stakeholder communication will be targeted stakeholder meeting with bordering communities, Community Based Organizations e.g. conservancies, the Kyaramacan Trust as well as the tourism industry and local communities. Furthermore meetings with the WPS team in both Kavango East and Zambezi Region were undertaken inclusive of site visits to both Buffalo and Susuwe West.

Field visits allowed consultants to collect relevant data and information (through implementation of data collection tools (Focus Group Discussions, and a semi-structured questionnaires) and be able to fill any gaps from literature review. A participatory approach was adopted by the consultant in the undertaking of the ESIA and development of the ESMP and associated documentation. The specific objectives of the stakeholder consultations was to:

- ❖ Build ownership and buy-in amongst decision makers and other interested and affected stakeholders.
- ❖ Provide information to decision makers.
- ❖ Gather information about biophysical and socio-economic components of the area

The consultations included meetings in and around the Bwabwata National Park. The consultant facilitated local meetings, which were relevant and useful to the ESIA process. Consultations were undertaken in English with local translation in the indigenous languages. Existing platforms such as conservancy committees were used as forums to engage stakeholders. A variety of methodology were used to meet the objectives of the stakeholder participation, and these included one-on-one interviews and small group interviews/meetings, focused group discussions (FGDs) and multi stakeholder dialogues/workshops. Specifically, stakeholder consultations allowed for:

- ❖ Introduction of the project (goals, objectives, activities and methodology) to stakeholders and solicit their input
- ❖ Gain more insight into stakeholders and access their knowledge about wildlife crime in the regions (past and present)
- ❖ Identify issues and concerns regarding the hotspot landscape
- ❖ Identify existing and planned projects/initiatives
- ❖ Understand the status quo of existing landscape management initiatives (if any)
- ❖ Identify priorities and interventions
- ❖ Identify existing and needs for capacity development, including technical capacity for the implementation of ESIA/ESMP
- ❖ Identify existing communication mechanisms for the implementation of the project
- ❖ Interact with stakeholders and update stakeholders on project activities
- ❖ Workshop and get inputs on the development of the Grievance Redress Mechanism (GRM)

The draft ESIA, ESMP, GRM, will be circulated to stakeholders for comments and inputs as required by the EMA 7 of 2007. Comments and inputs from stakeholders have been integrated in the final reports to be submitted to the client and the Department of Environmental Affairs for Approval. Once the ESIA has been approved the infrastructure development in BNP will begin with the contractor moving to site to start with the construction process.

#### **4.9 Specialist Studies Undertaken**

Flora and fauna, archaeological and socioeconomic specialist studies were undertaken as part of the Environmental Assessment Process leading to the preparation of the ESIA and ESMP Report for the proposed infrastructure development as recommended in the Inception Report / BID.

#### **4.10 Environmental and Social Management Plan (ESMP) Framework**

Environmental management plans have only been developed to ameliorate aspects / risks of medium to high significance identified through the impact assessment. In line with the EMA 7 of 2007 and the KfW environmental management system, management plans included in this report are divided into two (2) categories and these are:

- ❖ Strategic management plans which form part of the ESIA and ESMP report and range to be updated in line with EMA and;
- ❖ Short term plans concerned with day-to-day operations, which include areas such as codes of practice, specific responsibilities and monitoring which are integrated separately into the Environmental Management System.

The overall focus of the ESMP framework has been to development mitigation measures appropriate for each activity with medium to high significant impact on the receiving environment. Mitigation is the purposeful implementation of decisions or activities designed to reduce the undesirable impacts of a proposed action on the affected environment. A hierarchy of methods for mitigating significant adverse effects that adopted in order of preference are:

- ❖ Enhancement, e.g. provision of new habitats;
- ❖ Avoidance, e.g. sensitive design to avoid effects on ecological receptors;
- ❖ Reduction, e.g. limitation of effects on receptors through design changes, and;
- ❖ Compensation, e.g. community benefits.

#### **4.11 Government of Namibia Environmental Management System (EMS)**

This ESIA and ESMP report will be integrated in the ISO 14001 Environmental Management Systems (EMSs) which is approved by Government of the Republic of Namibia.

#### **4.12 Gender and Youth Action Plan**

The consultant made it a priority for data collected and stakeholder consultations processes to involve women, youth, and Indigenous People. Therefore, targeted invitations and target group discussions ensured that these groups participated in all processes of the consultancy.

#### **4.13 Grievance Redress Mechanism**

The grievance redress mechanism (GRM) was developed to ensure that members of communities affected by the project activities within the landscape are able to freely channel their concerns, issues or claims through a complaint process. The project is being implemented through the limits of the Namibian government national legislation. Furthermore, the project is hosted by the Ministry of Environment Forestry and Tourism. The GRM was discussed and formulated with communities and stakeholders during the ESIA consultation process to ensure that communities are aware of the objectives and process for development of the GRM. The GRM needs to include the following elements:

- ❖ Eligibility: Who can make a complaint
- ❖ Process for lodging a grievance related to the project
- ❖ Lodging the Grievance with the GRM Focal person
- ❖ Grievance review process
- ❖ Establishing the validity and relevance of grievance
- ❖ Determine the severity of the grievance
- ❖ IWPP handling and resolving the grievance
- ❖ Establishment of the Grievance Redress Mechanism Committee (GRMC) to be responsible for decisions and verdicts on the reported grievances
- ❖ Delivering a decision/verdict within 30 days of hearing the aggrieved person/stakeholder;
- ❖ The GRM Focal person will be the grievance focal point in receiving grievances and managing the grievance mechanism register in which all written and oral grievances will be lodged and recorded
- ❖ The ultimate decision for the GRM will be made by the GRMC for the IWPP in consultation with the MEFT
- ❖ The GRM Focal person in consultation with the GRMC will close the grievance once it is resolved

#### **4.14 Stakeholder inputs**

- ❖ The construction of the WPS stations is good initiative as it will lead to improved anti-poaching patrols and activities and hence lead to mitigation of poaching activities
- ❖ Stakeholders indicated that the construction work must employ local people instead of bringing people from other parts of the country
- ❖ Conservancy adjacent to Susuwe indicated that the new WPS station must not be built in wildlife corridors or paths where wildlife moves into the conservancies as this blocks movement of wildlife to conservancies and impedes sustainable utilization
- ❖ The new stations should not be built close to rivers or streams to avoid potential pollution
- ❖ The construction of the WPS stations should not impede tourism activities in the park hence avoid construction traffic and tourism traffic from

## **6. DESCRIPTION OF THE CURRENT ENVIRONMENT**

### **6.1 Biophysical Baseline Overview**

#### **6.1.2 Climate**

The Bwabwata National Park straddles from Kavango East Region and the Zambezi Region which includes the area as one with the higher rainfall, high evaporation and a warmer winter

than the rest of Namibia, providing a home to many tropical plants that are unable to survive elsewhere in Namibia' (Mendelsohn & Roberts, 1997).

Rainfall averages about 700 mm per year in the wetter north-east part of the Hotspot Landscape, and about 500 mm in Kavango East Region. The climate can be divided into two main seasons – a dry season between April and November, and a shorter wet season which stretches from November to early April. Rainfall, as in the rest of Namibia, is highly variable, with standard deviation values from 30–40% (Mendelsohn & Roberts, 1997). For example, the long-term rainfall record from Katima Mulilo (1945–present, with a 9-year gap in the 70s-80s) shows annual totals over 1,000 mm in four of the years and falls less than 400 mm in three years. This variability directly affects the livelihoods of farmers, exposing them to the risk of crop failure and poor grazing in some years, and floods in others.

Climate variability and climate change are concepts that are closely linked, but clearly, we cannot blame the present high variability on climate change. Climate change is expected to increase the variability, adding even more uncertainty and extreme weather for farmers.

Temperatures are moderate during summer months in the hotspot landscape mostly due to cloudy conditions in these months. The highest temperatures are between September to November when there is less cloud cover and average daily maximums of 32-35°C can be reached. In the winter months, the area has a more moderate winter than the rest of Namibia with maximum daily temperature of between 18 -25 °C and minimum temperatures of 5 °C. Frost is unusual in the northeast, but may occur in some years in low-lying river valleys, especially in the eastern part of the landscape (Mendelsohn & Roberts, 1997).

The highest rate of evaporation takes place during September to October when it is hot, dry and clouds are sparse. The potential evaporation of 2,500 mm is over four times the volume of water normally provided by rain (Mendelsohn & Roberts, 1997). The Hotspot Landscape has a mean annual rainfall of 348 – 700 mm that can be expected 90% of the time. However, the lowest rainfall recorded was only 288mm and the highest was 1,005mm – an indication of the high variability of the area's rainfall.

### **6.1.3 Topography and geology**

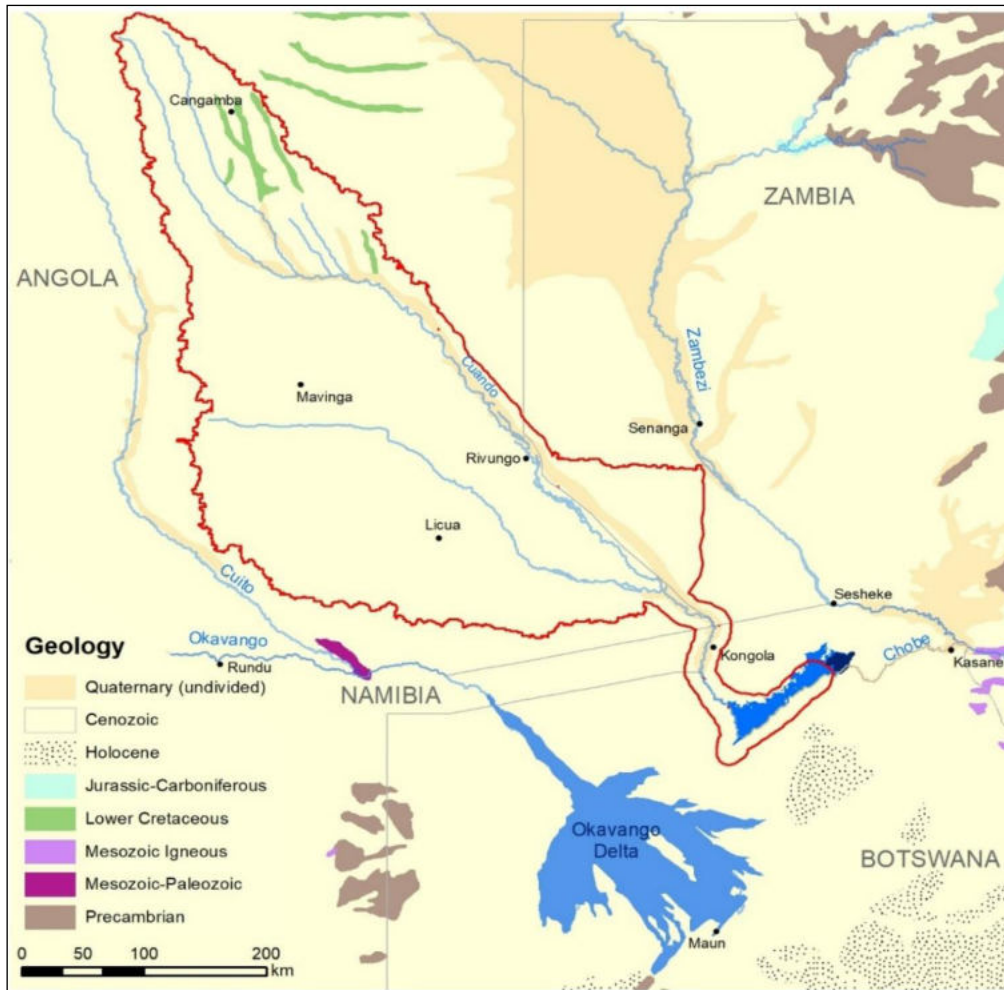
#### **Topography**

The BNP lies in within the geological limits of the Kalahari Basin. The landscape is flat with a very shallow downward slope to the southeast. The very flat terrain explains why both the Okavango and Kwando Rivers are so sluggish, and how this gives rise to their meandering courses and wide floodplains. There is no significant drainage system to either the Kwando or Linyanti rivers. The flat topography excludes the potential for deep erosion by water, as well as the possibility of major dams.

#### **Geology**

The basement rocks in the landscape comprise metamorphosed sediments of the Damara Group, and sedimentary and basaltic rocks of the Karoo Group. Kimberlite pipes occur, which are the likely origin of diamonds that influenced exploration activities have been undertaken in the past. Most of these above-mentioned rocks are blanketed by Kalahari sand.





**Figure 3: Geological features of the area**

**Geology of the Kwando River Basin**

Structural features in the basement dictate the route and pattern of the Kwando River on the surface. A set of parallel faults determines the south-eastwards orientation of the river tributaries. With the Kwando River the larger of these faults extend 400 km south-eastwards, creating a long thin slice in the basement which the Kwando follows as it flows into Namibia. The unusual sharp turn of the Kwando River at its lower end, where it makes a 90 degree angle, is determined by the Linyanti Fault. The upside of the fault lies on the southeastern bank, making a clearly defined linear obstacle, forcing the water to spread out into the Linyanti Swamp on the lower, northwestern side of the fault. The Linyanti continues in a north-east direction determined by the Linyanti fault, and the Chobe River is similarly structurally determined by the Chobe fault.

**Geology of the Okavango River Basin**

The Okavango Basin is subdivided into three prevalent landscape units: the Angolan highlands in the north, the lowlands to the south, and the Okavango Delta in Botswana. The highlands reach altitudes of 1,600 to 1,800 m a.s.l., and constitute the largest part of the hydrologically active catchment of the river system. The geomorphological situation is the result of upheaval and faulting processes during the over thrust of the Precambrian continental Lithosphere of the Congo Craton over the Kalahari Craton in the early Paleocene (Grünert 2003). The landscape descends towards the lowlands of the Kalahari in the south-east: an

extensive, slightly undulating plain with significantly lower relief intensity. The Kalahari is a vast sand body with hardly any surface water. Its basal structure is a pen plain developed on Ancient Gondwanan rocks, upon which terrestrial cretaceous sediments accumulated. Although in places the Kalahari sand is most probably of alluvial origin, it was largely deposited after aeolian transport under desert conditions. The characteristic longitudinal paleodunes of the north-western Kalahari can extend up to several hundred kilometres. They formed about 20,000 years ago under cooler and drier conditions and became stabilized about 5,000 years ago.

## **6.2 Hydrology**

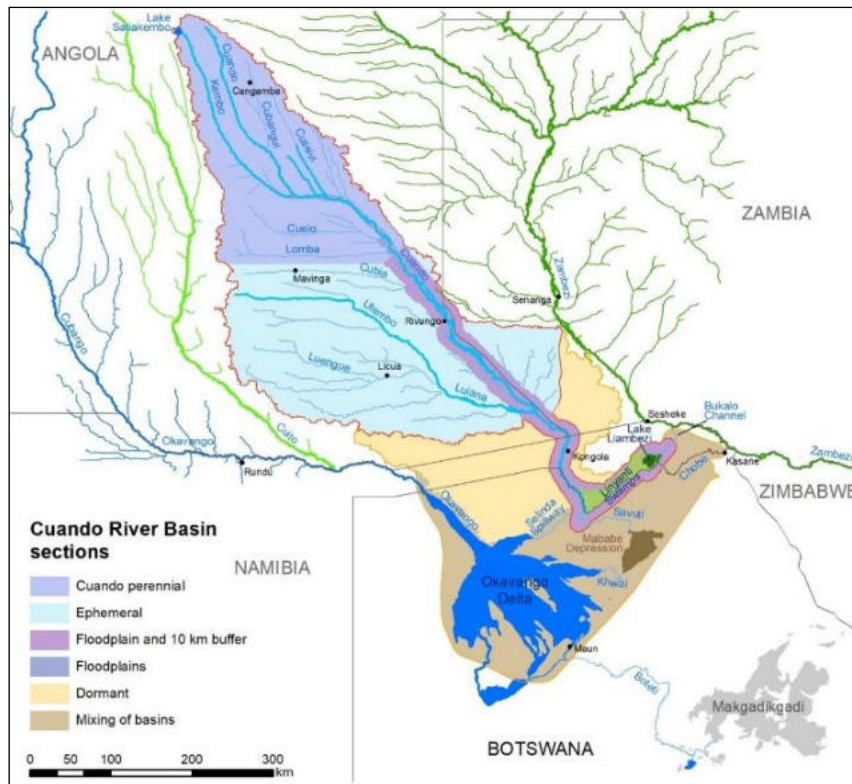
The BNP experiences perennial flows in the Kwando and Okavango rivers and its tributaries. Groundwater quality in much of the hotspot landscape is generally good, especially within 5–20 km from the rivers, which recharges the aquifers. But the quality can be variable and tends to deteriorate rapidly away from the rivers and with increasing depth (Christelis & Struckmeier, 2001). There are some large areas where it is unpalatable and unfit for human consumption, mainly in the area north of the Linyanti Swamps (Mendelsohn & Roberts, 1997).

Over the years, boreholes have been drilled in the park to provide water for people and livestock. These are concentrated along the main access road (the B8 main road) and serve as focal areas for increased settlement. Varying water quality and unreliable yields from these have resulted in water being supplied via pipelines.

The capacity of the few boreholes in the BNP range between 1-5m<sup>3</sup>/hr, with a few boreholes with yields less than 1m<sup>3</sup>/hr. The depths of the above boreholes range between 20-50 meters. Average yields from boreholes in the study area can be expected to be 4m<sup>3</sup>/hour at depths ranging from 22m to 61m.

### **6.2.1 Kwando River Basin**

The water in the Kwando is derived almost entirely from Angola, where there are a number of tributaries that collect rainfall in the highlands of the Bie Plateau, and channel it towards the main stem of the river that flows south-eastwards towards the south-eastern corner of Angola. This area of perennial flows makes up about 42% of the total basin area. The areas of ephemeral flows in scattered tributaries in south-eastern Angola and western Zambia contribute only small volumes of water, and only sporadically, to the total discharge of the river. No significant tributaries enter the main stem of the river in Namibia and Botswana.



**Figure 4: The Okavango and Kwando River Basins**

The Kwando basin area is defined, like all rivers, by the area of its catchment where perennial and ephemeral tributaries contribute flows to the main stem of the river. In the southern part, where there are no tributaries, the limit of the basin is rather arbitrarily defined by a 10 km distance from the river and the margin of its floodplain.

The Kwando is made more unusual by the anomaly that its river channels cross the boundaries of the basin in the south-western and south-eastern reaches. These links only occur in years when the water levels in the rivers are exceptionally high, and the direction of flow is determined by the relative height of water in the Okavango, Kwando and Zambezi Basins (Pallett *et al.* 2022). In the south-western corner of the Kwando, water may spill into the Savuti Channel, or towards the Okavango River Basin via the Selinda Spillway. At the south-eastern end of the Kwando, water can connect with the Zambezi Basin via the Linyanti Swamps and Lake Liambizi. Using remote sensing images, this was observed to occur in only 3 out of 40 years that clear images were available from 1972 -2002 (Pallett *et al.* 2022). It is more common for Lake Liambizi to receive water from the Zambezi via the Bukalo Channel, and when the water is this high, the Chobe Swamp may push water towards Lake Liambizi. Lake Liambizi, when it holds water, should therefore be considered as a backwater of the Zambezi River.

These connections to the Okavango and Zambezi Basins only occur sporadically, when water levels are high from exceptional rains in their catchments. The links are infrequent (less than 10% of time in the recent reliable record), so the Kwando should more correctly be considered as a river basin in its own right, not as a sub-basin of the Zambezi.

### **Discharge of the Kwando**

Annual total discharge of the Kwando River has been consistently measured at Kongola since the 1969-70 season. The annual average discharge is 1,0 million Mm<sup>3</sup>. The Kwando is therefore a very much smaller river than its neighbours the Okavango (annual average

discharge = 9 million Mm<sup>3</sup>), and the Zambezi (annual average discharge = 34 million Mm<sup>3</sup>)<sup>3</sup>. Being such a small river, the Kwando has very limited potential for large-scale offtake for irrigation schemes and other commercial-scale uses. This is important when considering the potential future uses of Kwando water.

The long-term record of Kwando flows measured at Kongola show great variability, with the maximum of 2,200 Mm<sup>3</sup> being 4.5 times higher than the minimum of 490 Mm<sup>3</sup>. This further underscores the risk of abstracting large volumes of water from the Kwando, as this could dry up much of the flow at the distal end of the Basin in low-flow years.

The monthly records of flow from the Kongola gauging station show that the flow of the Kwando is relatively constant through the years. Differences between the highest and lowest flows during the year are very modest: from an average of about 27 m<sup>3</sup>/s in December to 39 in July. The July peak is about six months later than the peak rainfall month in the upper catchment. The reason for this rather unvarying flow is the Kwando's enormous floodplains, which cover about 3,450 km<sup>2</sup> over a straight line distance of just over 500 km of the river. The main river channel is small, but the marshy area on either side is covered in tall grasses, phragmites reeds and papyrus. These cause huge evapotranspiration losses, and slow down the flow.

### **Water quality**

Kwando River water is exceptionally clear, because it is derived from areas of sand that add no fine sediment or clay minerals, which typically cloud the water of other rivers. There is very little input of human-derived pollutants because there are so few humans in the upper parts of the Basin. Short sections of the channels downstream of towns such as Cangamba and Mavinga in Angola carry pollution, but the purifying effect of the floodplains absorb this within a few tens of kilometres downstream. All the indices for water quality measured upstream of Rivungo – pH, Oxidation-Reduction Potential, Total Dissolved Solids, Dissolved Oxygen, Conductivity and Salinity – showed healthy water conditions (NGOWP 2020<sup>4</sup>).

There is no data on water quality in the stretches downstream of Rivungo, but the water is still clear in its distal reaches in the Linyanti. There are concerns about effluent flows and seepage of sewage into the river from Kongola and villages close to the river in Namibia (from stakeholder consultations, and probably similar conditions prevail in the portions of Zambia and Botswana).

### **Groundwater**

In the upper Kwando, water held in the sand moves laterally where it meets subsurface hardpan layers, and this contributes water to the river. The sands therefore function like a sponge, absorbing and then gradually releasing water, which keeps the river channels flowing. However in the southern part of the basin, where hardpan layers are absent, this does not occur, and the river loses water by infiltration out of the channels. Groundwater benefits from this within only a few kilometres of the river. This explains why groundwater resources in the Namibian part of the Basin are patchy, both in quality and quantity; many boreholes immediately north of the Linyanti Swamps yield unpalatable water (DWA 2005<sup>5</sup>). This is from the Upper Kalahari Aquifer. There is a purported much deeper Lower Kalahari Aquifer (130 – 250 m deep) but its existence is unclear. The groundwater situation of the Kwando Basin overall is poorly understood and deserves further attention.

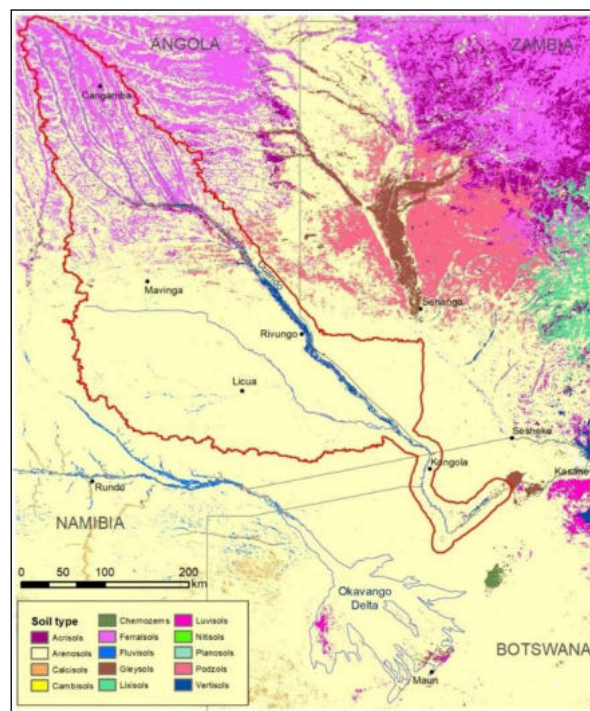
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<sup>4</sup> National Geographic Okavango Wilderness Project, 2020. Final Report: Scientific Exploration in Angola During 2018. Pp 70

<sup>5</sup> DWA. 2005. Investigation of Groundwater Resources and Airborne-Geophysical Investigation of Selected Mineral Targets in Namibia Volume IV.GW.2.1. Groundwater Investigations in the Eastern Caprivi Region. Main Hydrogeological Report. Department of Water Affairs, Ministry of Agriculture, Water and Forestry, Windhoek.

## Soils

Almost the entire Kwando Basin has a substrate of sand, as it sits within the geological Kalahari Basin, the largest continuous area of sand on Earth. The deep arenosols have very low fertility and very low water retention. Organic matter in the soil is confined to the uppermost horizon, originating from what leaf litter accumulates and decomposes on the surface. Thus any removal of the vegetation cover (such as for cropping) depletes the soil of its main nutrient source and shade, and leads to rapid degradation of the soil quality. The arenosols in the upper parts of the Basin have hard cemented layers called hardpans which play an important role in directing water laterally into the river channels.



**Figure 5: Major soil types of the Kwando River Basin (From Pallett et al. 2022)**

The northern part of the Basin is dominated by deeply weathered, acidic soil known as ferralsols, even though they are, on the basis of their sandy texture, also arenosols. The red, orange and yellow-coloured ferralsols indicate the presence of iron and aluminium, which derive from very weathered clay material, which in turn derive from the basement rocks they sit on. These soils are also very low in nutrients and have limited use for cultivation. Fields are established on a short-term, shifting basis, for cultivation of maize, sorghum, millet and cassava, but yields are very low.

The broad marshes of the middle and lower Kwando have a bed of alluvial sediments of silt and clay, deposited during periodic floods. These fluvisols may appear to be ideal for crop production but they are derived from acidic parent material, and that acidity increases from being frequently saturated, so they are also poorly suited for cultivation. Peat deposits are a prominent feature of the marshes. They are important as they act like a sponge, becoming fully saturated then releasing the water slowly into river channels, keeping them steadily recharged.

The main point about Kwando soils is that they are exceptionally poor in terms of fertility and water-holding capacity. For example, yields of maize and millet average about 700 and 300 kilograms per hectare, which are among the lowest in Africa (<https://datamarket.com>). Soil productivity does increase towards the south, probably because soils there are less leached than in the higher rainfall areas in the north.

#### **6.4.2 The Okavango River Basin**

The Okavango forms the border for the western boundary of the landscape hotspot and also the boundary for the BNP. Basin is situated in southern Africa within the three countries Angola, Namibia and Botswana. It can be subdivided into three prevalent landscape units: the Angolan highlands in the north, the lowlands to the south, and the Okavango Delta in Botswana. The highlands reach altitudes of 1,600 to 1,800 m a.s.l. and constitute the largest part of the hydrologically active catchment of the river system. The geomorphological situation is the result of upheaval and faulting processes during the over thrust of the Precambrian continental Lithosphere of the Congo Craton over the Kalahari Craton in the early Paleocene (Grünert 2003). The landscape descends towards the lowlands of the Kalahari in the south-east: an extensive, slightly undulating plain with significantly lower relief intensity. The Kalahari is a vast sand body with hardly any surface water. Its basal structure is a pene plain developed on ancient Gondwanan rocks, upon which terrestrial cretaceous sediments, accumulated. Although in places the Kalahari sand is most probably of alluvial origin, it was largely deposited after aeolian transport under desert conditions. The characteristic longitudinal paleodunes of the north-western Kalahari can extend up to several hundred kilometres. They formed about 20,000 years ago under cooler and drier conditions and became stabilized about.

#### **Discharge of the Okavango**

Water leaving Kavango and entering the Okavango Delta is provided both by the Okavango and Cuito Rivers. The actual contributions made by the two rivers can be measured by comparing the flow of the Okavango at Rundu (before they join) with that at Mukwe (below the Cuito confluence). These are the two places where water flow is gauged, and subtracting the Mukwe runoff from that measured at Rundu gives a measure of input from the Cuito. The figures show that the Cuito contributes about 45% and the Okavango 55% of the total water flow per vary greatly during the year. The Okavango's peak flow measured at Rundu is usually in April, while that of the Cuito is normally in April or May. The peak flows later reach the lower reaches of the Okavango Delta in Botswana about three or four months after passing Rundu. The highest flows at Rundu are much higher (the average in April is 405 cubic meters/second (m<sup>3</sup>/s)) than peaks for the Cuito (average of only 175 m<sup>3</sup>/s in April), and so the Okavango brings in much more water during floods. The Okavango also has a much more variable flow than the Cuito: the highest rate of flow ever recorded for the Okavango (962 m<sup>3</sup>/s) is about 90 times greater than the lowest rate ever recorded (11.1 m<sup>3</sup>/s). The same figures for the Cuito only vary by a factor of less than 10: from a highest of between 550 and 600 m<sup>3</sup>/s to the lowest of 64 m<sup>3</sup>/s. The higher discharge rates of the Okavango means that it carries more water than the Cuito between January and May, but it then drops so much that the Cuito contributes more water for the remaining seven months of the year. The following table provides measures of annual runoffs above the Cuito's confluence (at Rundu) and below the Cuito at Bagani. The differences between maximum and minimum volumes are substantial: about four times at Rundu and about three times at Bagani.

#### **Water quality**

Information on the quality of water in the Kavango is not available, but the Okavango's water is generally clean and clear along its entire course. There are few nutrients or sediments, and its turbidity (or muddiness) is low. The chemical composition of river water measured during a survey shows that the concentrations of chemicals are generally higher in the river's backwaters than in the main stream. It is likely that concentrations of phosphates have increased in recent years, especially close to Rundu as a result of effluent from the town. Such chemicals from sewage and fertilizers could have severe effects on aquatic life in the river, and there is concern that increasing chemical concentrations may rise as the number of people and farming activities along the river increase.

## Soils

Soils in Okavango Basin are dominated by wind-blown sands deposited as a mantle across the landscape during much drier times long ago. Different kinds of soil are generally characterized by the way in which water, air and mineral and organic components are arranged within the soil body. Soils in Kavango are completely dominated by sand especially fine wind-blown sands deposited as a mantle across the region during much drier times long ago. The fine sands, loosely called Kalahari sands, are more correctly termed *arenosols*, and they usually extend to a depth of at least one meter. Other than sand, which generally makes up more than 70% of the body of the soil, less than 10% of the soil consists of clay and silt. The sandy texture allows water to drain away rapidly, leaving very little moisture at depths to which most plant roots can reach. The porous sand also holds very few nutrients, and the loose structure of sand means that there is little run-off and water erosion.

The porous texture allows water to drain away rapidly, leaving little moisture in the soil and also holding very few nutrients. Crops do not grow well in these sands as a result. The loose structure of the sand means that there is little run-off or water erosion. Smaller areas of soils somewhat better suited to crops occur along the Okavango, omurambas (dry rivers) and interdune valleys.

## **6.3 The Bwabwata National Park**

### **6.3.1 Introduction**

Shaped by water, woodlands, floods and fire, human history and ancient animal migration routes, Bwabwata National Park is rich in biodiversity and history. Effective management of Bwabwata, together with the other North-East Parks (Khaudum, Nkasa Rupara, Mangetti and Mudumu National Parks) (Figure 1) ensures the conservation of important habitats, safeguard corridors for regional wildlife migration; provide engines for economic growth in poor rural areas; and provide access to natural areas for local, regional and international visitors.



**Figure 6: The Bwabwata National Park lies in an area surrounded by Angola, Botswana, and Zambia transacted by the Kwando, and Kavango Rivers.**

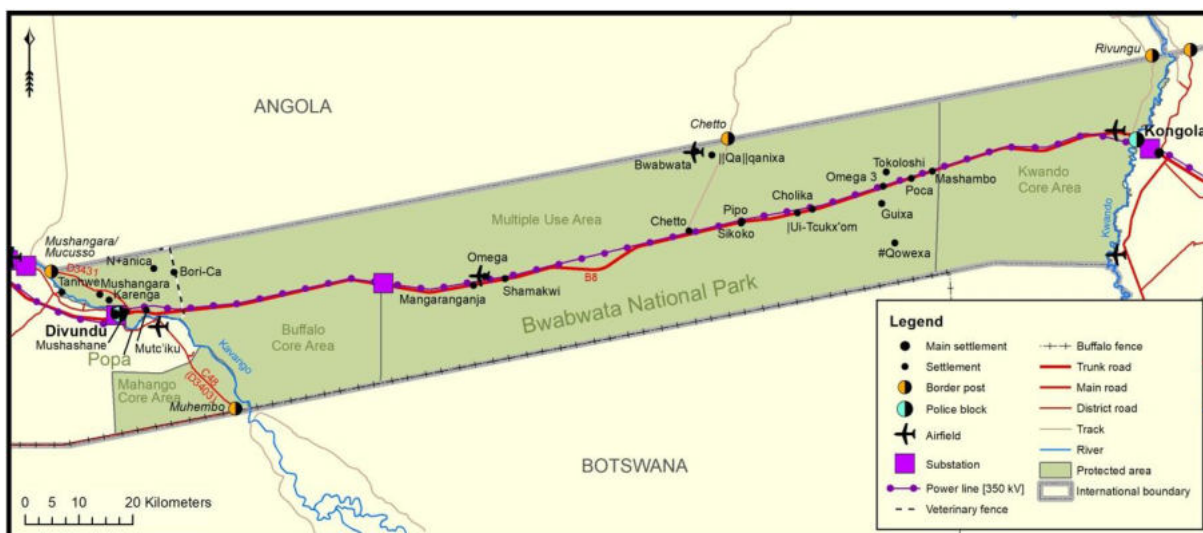
Covering an area of 6,274 km<sup>2</sup>, Bwabwata National Park is the largest of the six protected areas that make up the North-East Parks. Bwabwata is comprised of three Core Areas designated for special protection and controlled tourism – Kwando (1,345 km<sup>2</sup>), Buffalo (629km<sup>2</sup>), and Mahango (245km<sup>2</sup>), and a large Multiple Use Area (4,055 km<sup>2</sup>) zoned for community-based tourism, trophy hunting, human settlement and development by the resident community.

Except for Mahango, which is positioned on the western bank of the Kavango River, the Park completely covers the section of land formerly called the Caprivi Strip, which extends from the Kavango to the Kwando Rivers. The boundary between the Zambezi and Kavango East Regions lies roughly in the middle of the Park.

The Park is bordered by Angola to the north and Botswana to the south. The northern boundary is demarcated by only a cutline; however, the southern boundary is fenced with three veterinary standard fences, except for a 30-kilometre stretch, which lies west of the Kwando River. The rationale for these fences is the presence of cattle in the Park. This is a matter of the highest priority which handled at government bilateral platforms.

At either end of the Park are small settlements – Kongola in the east and Divundu (a proclaimed village) in the west. The Trans-Zambezi Highway (B8), hereafter referred to as the B8 road, traverses the Park in the middle from east to west, and a minor road (C48) dissects Mahango in a north-south direction, and a 350kv power line, which are the responsibilities of the Roads Authority and Nampower respectively (Figure 2).

A number of small settlements have emerged inside the Multiple Use Area, the largest of which are Mut'ciku, Omega, Chetto, Omega III or 3 (Tokoloshi) and Mashambo. The population of Bwabwata Multiple Use Area is approximately 5,500-6,000 residents, of which 80% are of the minority San ethnic group, the Khwe (alternatively spelled Khoe). People continue to settle in the park and the cattle population is increasing because of inadequate access control.



**Figure 7: Key infrastructure present in Bwabwata NP**

Bwabwata NP forms a crucial transboundary link for wildlife migration between Angola, Botswana, Namibia and Zambia and for seasonal dispersal to and from the rivers. Recent research on wildlife movements has shown the extent of wildlife movements but also that large scale movements are severely constrained by fences, settlements and the B8 road through the middle of the park. This is an important issue that requires priority attention in this management plan.

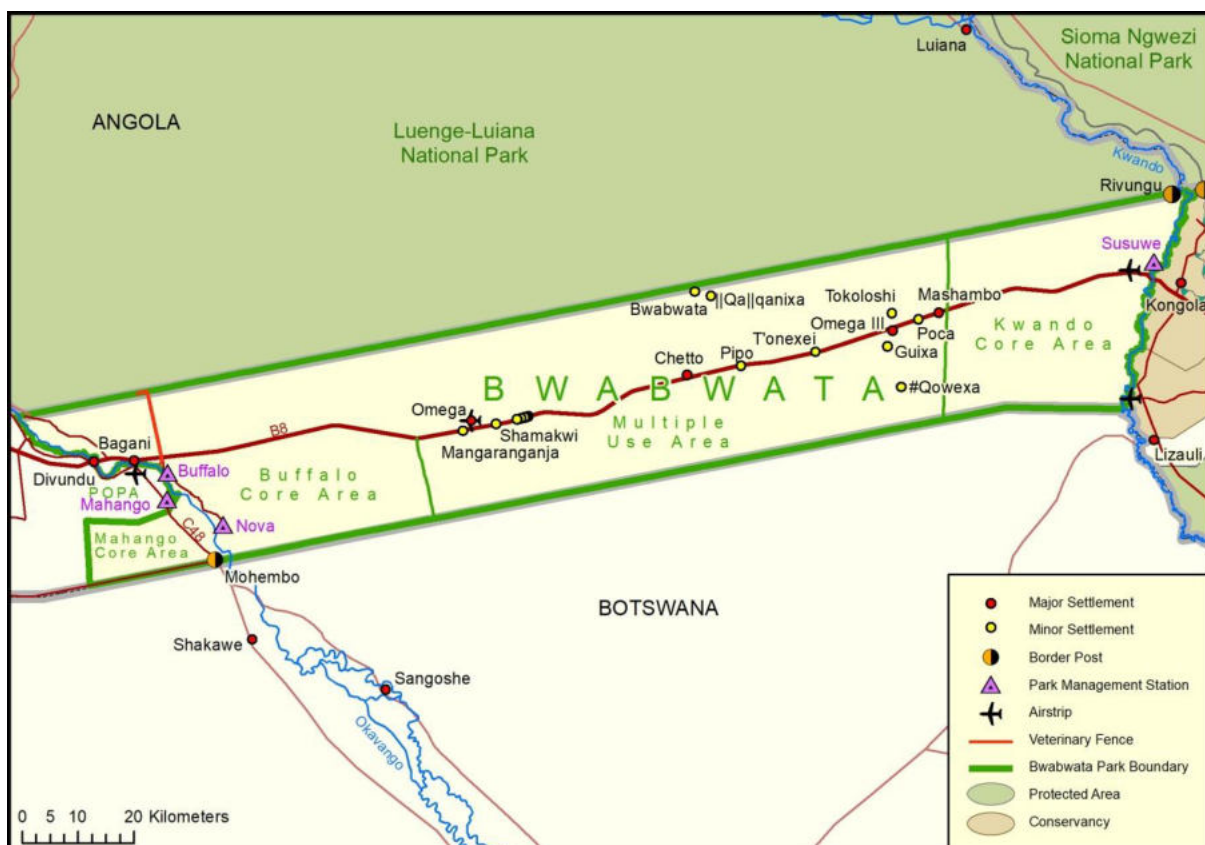


Bwabwata NP's Core Areas serve as wildlife source areas, from which wildlife can disperse into neighbouring conservancies and resident communities that can benefit from conservation hunting rights and develop tourism on their own land and the Multiple Use Area.

### **Natural Environment**

Bwabwata NP straddles the largest section of Kalahari Woodland in Namibia, stretching from the Kwando River in the east to the Kavango River in the west. The biodiversity of the *mulapo* and associated fringe woodlands is considered to be moderately sensitive, while the riparian woodlands and floodplains are highly sensitive. Broadleaved woodlands are considered to be less sensitive.

An outstanding feature of Bwabwata NP is the high number of large mammal and bird species that are nationally rare. The *mulapos* and their associated grasslands are habitat for roan (*Hippotragus equinus*), sable (*Hippotragus niger*) and tsessebe (*Damaliscus lunatus lunatus*). Typical trees include mukusi or Zambezi teak (*Baikea plurijuga*), mukwa (*Pterocarpus angolensis*), musheshe, (*Burkea africana*), mungongo (*Schinziophyton rautanenii*) and several others. Plant species composition varies greatly between grassland, broadleaf woodland on deep sands, mixed woodland on the loamier soils of the alluvial floodplains of the Kavango River, and riparian woodland.



**Figure 8: Bwabwata National Park<sup>6</sup>**

The Mahango Core Area is listed as an internationally Important Bird Area (supporting globally threatened species) and is an avian diversity hotspot. Some bird species of

<sup>6</sup> Ministry of Environment Forestry and Tourism, 2013. Management plan for Bwabwata National Park 2013/14 to 2017/18

conservation concern that occur in Bwabwata include the critically endangered Eurasian bittern and Pel's fishing owl and the endangered African marsh-harrier, rock pratincole, rufous-bellied heron, slaty egret, southern ground hornbill and wattled crane. The latter is a globally threatened species.

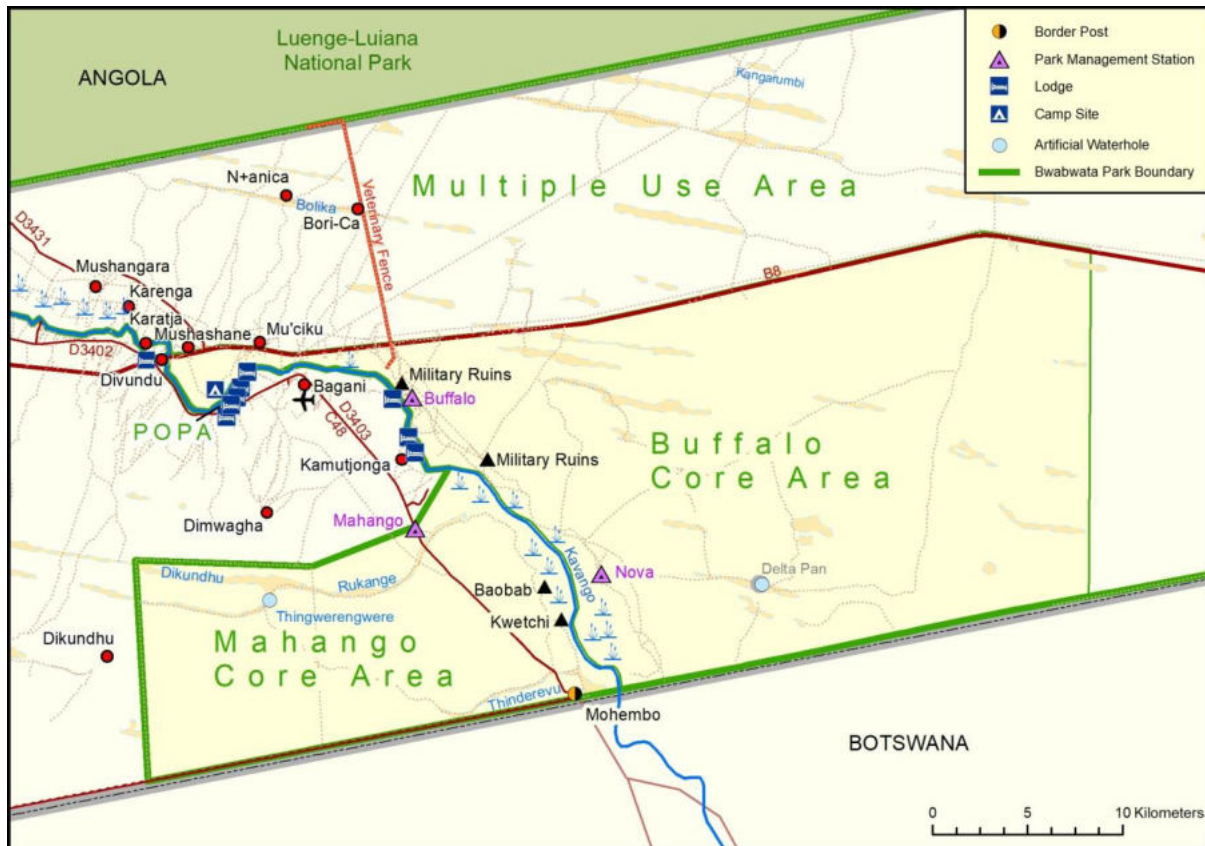
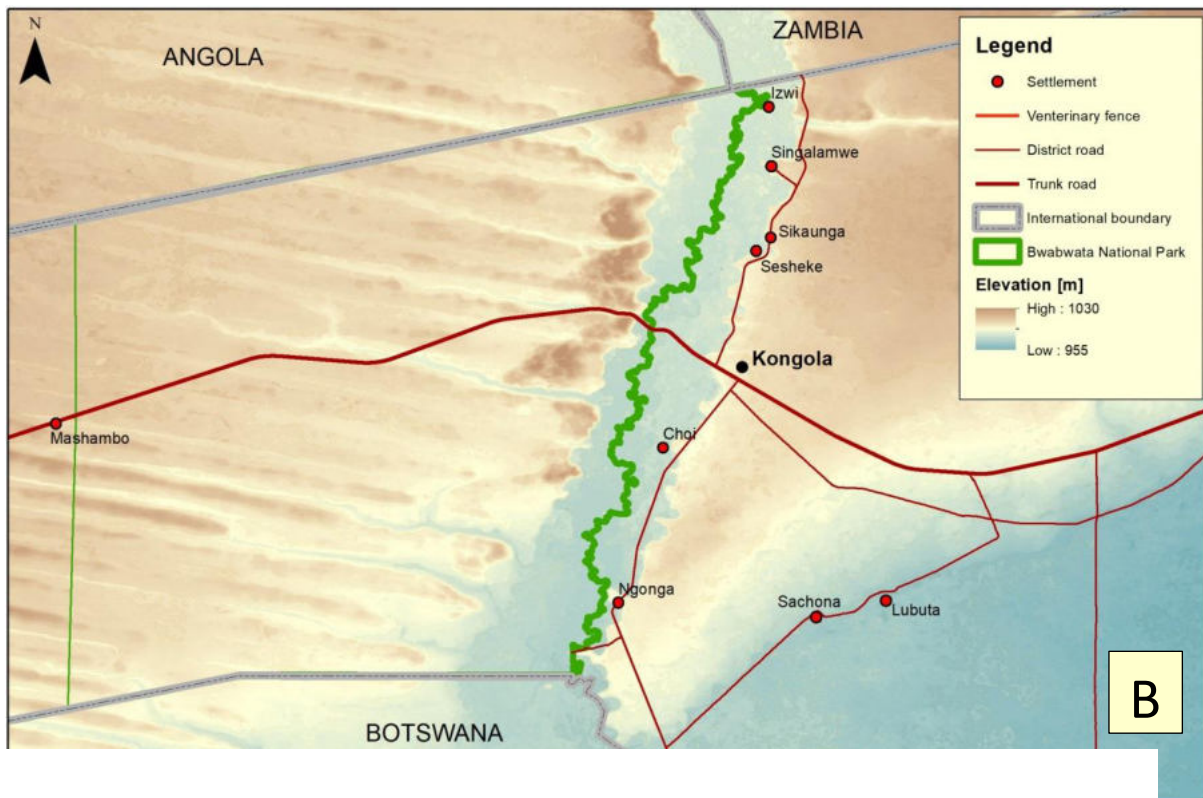
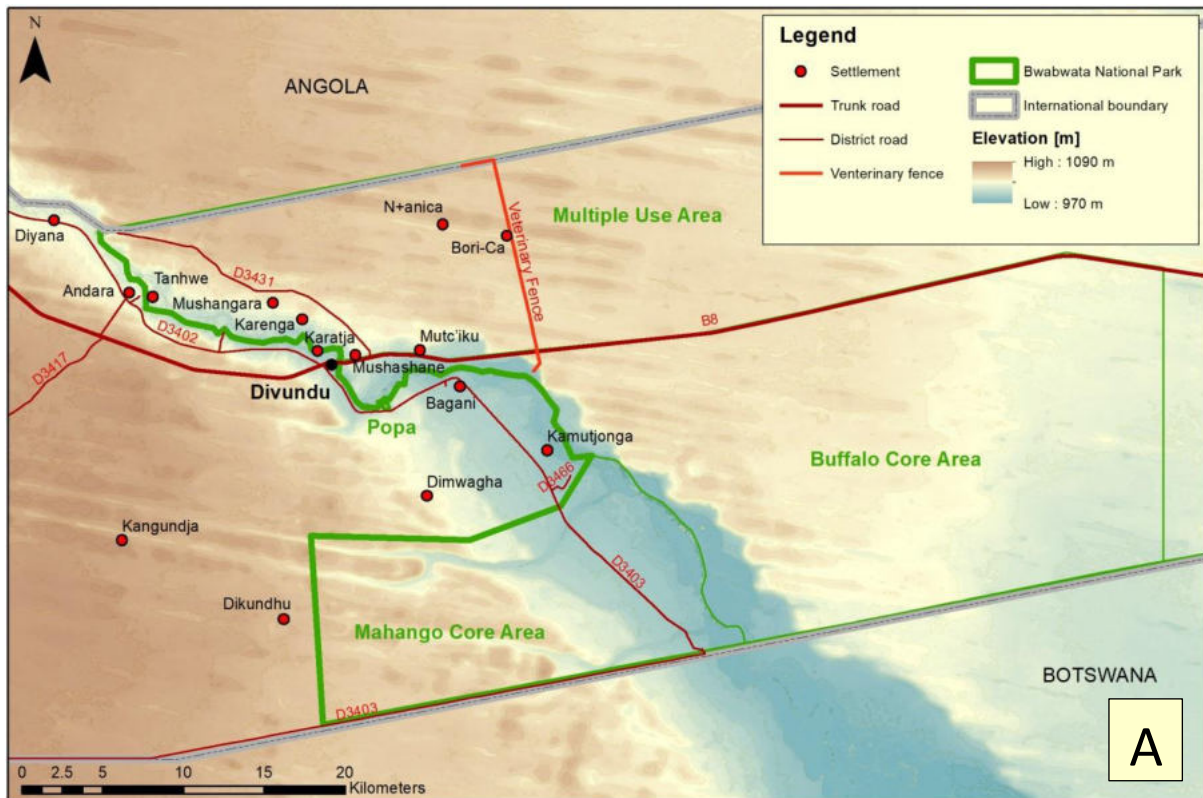


Figure 9: The Mahango and Buffalo Core Areas in western Bwabwata National Park<sup>7</sup>

<sup>7</sup> Ministry of Environment Forestry and Tourism, 2013. Management plan for Bwabwata National Park 2013/14 to 2017/18



**Figure 10: Digital Elevation Models for western Bwabwata NP (A) and eastern Bwabwata NP (B) showing the landforms of the Park**

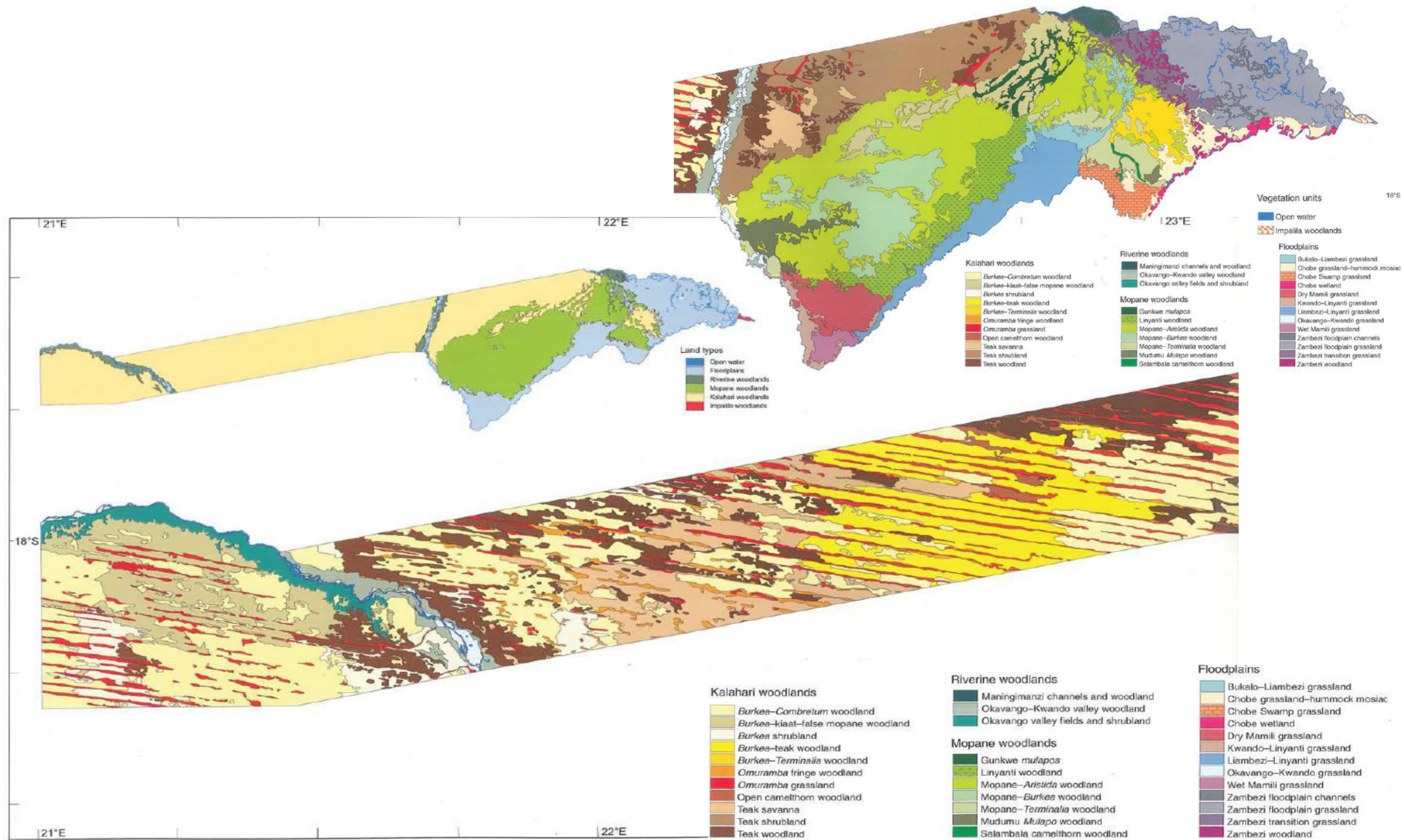
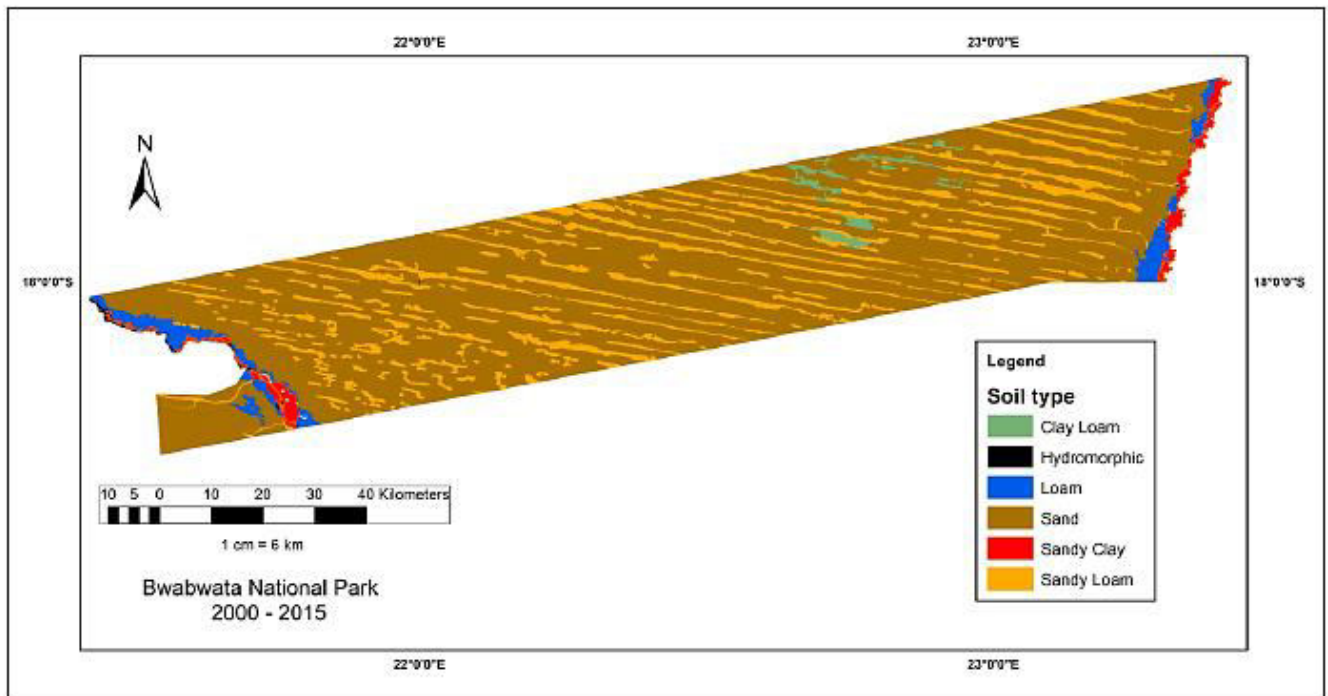


Figure 11 Vegetation types Kavango East and Zambezi Regions

The primary driver of ecological patterns in Bwabwata National Park is soil types. Infertile deep sands are contained in paleo dunes interspersed with more fertile clays in broad interdunal valleys (*mulapos*). In general, the dunes carry large broadleaved trees (such as Zambezi Teak), while acacia<sup>8</sup> species and lead wood dominate the interdunal mulapos where clay soils tend to dominate. The Mahango Core Area contains a large discrete area of highly erodible soils (possibly sodic) that support a distinct plant community.



**Figure 12: Soil types of Bwabwata NP (from Mendelsohn & Roberts (1997) in Humphrey (2018<sup>9</sup>))**

Apart from the strong influence of soil types, dominance, and hence structure of vegetation, is often determined by the relative frequency and intensity of fires experienced over the last decade or more, as well as by impacts associated with elephant. Humans, both resident in Bwabwata NP and transient, are undoubtedly the cause of most of the fires. Mendelsohn and Roberts 1997<sup>10</sup> provided the following brief descriptions of the main vegetation types (paraphrased) (Figure 12).

Okavango-Kwando valley woodland: consists of high, open woodlands along the Okavango and Kwando Rivers. Trees along the rivers are tall and diverse in species composition. The

<sup>8</sup> In this ESIA the use of the name acacia or the generic name *Acacia* is retained for species reclassified as *Vachellia* or *Senegalia* spp.

<sup>9</sup> Humphrey, G. 2018. The role of humans, climate and vegetation in the complex fire regimes of north-east Namibia. PhD thesis, University of Cape Town

<sup>10</sup> Mendelsohn, J., & Roberts, R. 1997. Environmental Profile of the Caprivi Strip. Windhoek, Namibia. Struik, Cape Town. The vegetation map and the descriptions of the main vegetation types given here were done by John Mendelsohn and Chris Hines and appear not to have been published elsewhere.

loamy soils support the greatest diversity of animals and plants. The wetlands are heavily utilized by wildlife and livestock and are probably the most threatened habitats in the region.

Kalahari woodlands: occurs in the Kalahari Sands of the hotspot landscape basin and consists of:

- Burkea-Combretum woodland is a unit typically dominated by high Burkea at varying densities with kiasat, false mopane and Mangetti occurring less frequently. *Terminalia sericea* dominates the low tree layer and the shrub layer is open with *Baphia massaiensis*, *Bauhinia petersiana* and *Grewia retinervis* giving most of the cover. *Diospyros chamaethamnus*, a mat-forming woody species is common in areas burnt often. Grass cover is generally low.
- Burkea-kiasat-false mopane woodland occurs west of the Kavango River on undulating sandy plains. Burkea dominates the tall tree layer which with false mopane, kiasat and mangetti trees provides a dense woodland. Grasses are predominantly perennials with species such as *Schmidtia pappophoroides*, *Stipagrostis uniplumis*, *Aristida stipitata* and *Digitaria eriantha* characteristic at low cover.
- Burkea shrubland has little value for grazing. Trees of over four meters high are rare. The shrub layer is characterized by *Terminalia sericea*, *Philonoptera nelsii*, *Bauhinia petersiana*, *Baphia massaiensis*, *Burkea africana* and *Grewia retinervis*. The shrub layer can be as much as 50% in areas badly damaged by fire.
- Burkea-teak woodland is a unit on well-developed dunes in eastern Bwabwata NP. There is a tall tree layer made up largely of Burkea, teak, false mopane, kiasat and mangetti. A second layer of trees, six to eight meters high is present. The shrub cover is low and grasses are predominantly annuals.
- Omuramba (Mulapo) fringe woodland unit forms a distinct fringe along the slopes of dunes and mulapo margins. Camelthorn, leadwood and knob-thorn trees form a distinct layer 10-15m high covering a substantial area. The vegetation is characteristic of both heavy soils and Kalahari sands and provides important habitat for wildlife.
- Omuramba (mulapo) grassland is found in the mulapo valleys throughout the Kalahari sand areas. The grass *Imperata cylindrical* dominates the wetter areas while a variety of palatable species grow in the drier areas such as *Schmidtia pappophoroides*, *Brachiaria nigropedata*, *Digitaria eriantha* and *Antephora pubescens*. These are some of the best grazing resources in the park. The sandy loam soils are extensively cultivated at Omega.
- Open camelthorn woodland is limited to a small area in the Kwando Core Area on clay loam soils. Camelthorns are well distributed and tall (15m) and there is a distinct understory of low trees. Perennial grasses are well represented so this area is presumed to have a high value as a grazing resource.
- Teak savanna is widely distributed in the park and occurs in areas of deflated dunes where the landscape consists of gently rolling sandy plains. Tall teak trees are prominent but occur at moderate densities, giving the landscape a savanna-like appearance. The shrub layer is sparse with a relatively high proportion of perennial grasses.

- Teak woodland is tall, often fairly dense and widely distributed on deep well drained sandy plains and dunes. A very dense layer of shrubs may be present.

Two groups of vegetation types in particular are causes of concern. In comparison with woodlands outside the park, the teak woodlands and associated savanna and shrubland elements are significantly degraded, particularly in the western part of the park and focussed along the B8 road and in the area with the highest human density. Drastic management intervention will be needed to enable recovery. The second group of vulnerable vegetation types is the Okavango-Kwando valley woodlands and Okavango Valley fields and shrubland. These vegetation types are characterized by tall riparian forests following the courses of the two rivers (and occurring on the many islands) and occurring at various widths, but in some instances only a few tens of meters. It is in fact hard to know how wide the riparian forests were because of severe degradation in places. Only a very small portion of the Okavango Valley fields and shrubland veld type occurs in the Park, the rest falls outside the park on the south bank of the Kavango River. This portion is very severely degraded.

Elephant populations have increased over the past three decades, with high densities often occurring in the Buffalo Core Area and along the Kwando woodlands, where they regularly move between Namibia, Angola, Botswana and Zambia. Disturbances by fire and elephant are both part of the natural ecological dynamics of these woodlands. As long as water is seasonally available in the veld away from the rivers, and providing elephant are allowed to freely move between countries and not encouraged to stay in the area by provision of artificial water, they are unlikely to have irreversible impacts on the vegetation (at least at their current population levels).

Ensuring landscape connectivity for elephants and other large mammals is therefore of the highest importance. This entails understanding the functioning of movement corridors and dispersal areas and monitoring and improving this where necessary by removing or preventing obstacles and deterrents to free movement such as human settlement or human disturbance. Importantly, movement corridors are needed for sudden linear movements or displacements from one park or one area to another, but also as safe contiguous habitat linking different parts of the distribution range and thus enabling more gradual dispersal over a wider area.

Seasonal movements by several game species to and from both rivers are prominent in the *mulapo* systems of Bwabwata NP. These game species, which include elephant, buffalo, zebra, wildebeest and (to a lesser extent) roan, tend to cluster at the rivers during the dry season and move inland during the wet season. This natural seasonal cycle is an important mechanism that maintains vegetation structure, as most vegetation experiences a resting period during some part of the year.

Parts of the riparian woodlands and thickets in Bwabwata NP are still intact. These areas and the rivers themselves are the habitat for highly prized (by birdwatchers) bird species such as Souza's shrike, rock pratincole and white-backed night-heron. The main river channel of the Kwando River is supplemented by several smaller channels and oxbow lakes, leading to a constantly changing arrangement of dry and wet areas and the presence of some permanent islands. Permanently wet areas are home to several aquatic and semi-aquatic species, amongst which are some healthy populations of hippo and crocodile and less conspicuous species such as the spotted-necked otter and the Cape clawless otter. Floodplain grasslands form important habitat for wetlands mammals such as lechwe, sitatunga and reedbuck. There is concern over the status of some of the grassland and wetland species that occur in the park,

e.g. tsessebe. Other species are absent and should be considered for reintroduction e.g. oribi, Sharpe's grysbok and puku.

Bwabwata NP is bisected by the Trans-Zambezi Highway, which carries large volumes of transit traffic (including heavy freight traffic). A number of vehicle accidents involving wild animals take place on this road, and these result in human casualties and mortalities in wildlife – including rare and endangered species such as African wild dogs. Bwabwata NP is one of the most important areas for the African wild dog in Namibia. The population of this species in the park is undoubtedly part of a larger population in the KAZA area. Very little is known about the incidence of breeding in the park or the level of conflict and resulting mortalities from interactions with the human resident park community. The Ministry is in the process of finalizing a conservation strategy for this species which should be regarded as one of the highest conservation priorities for the park.

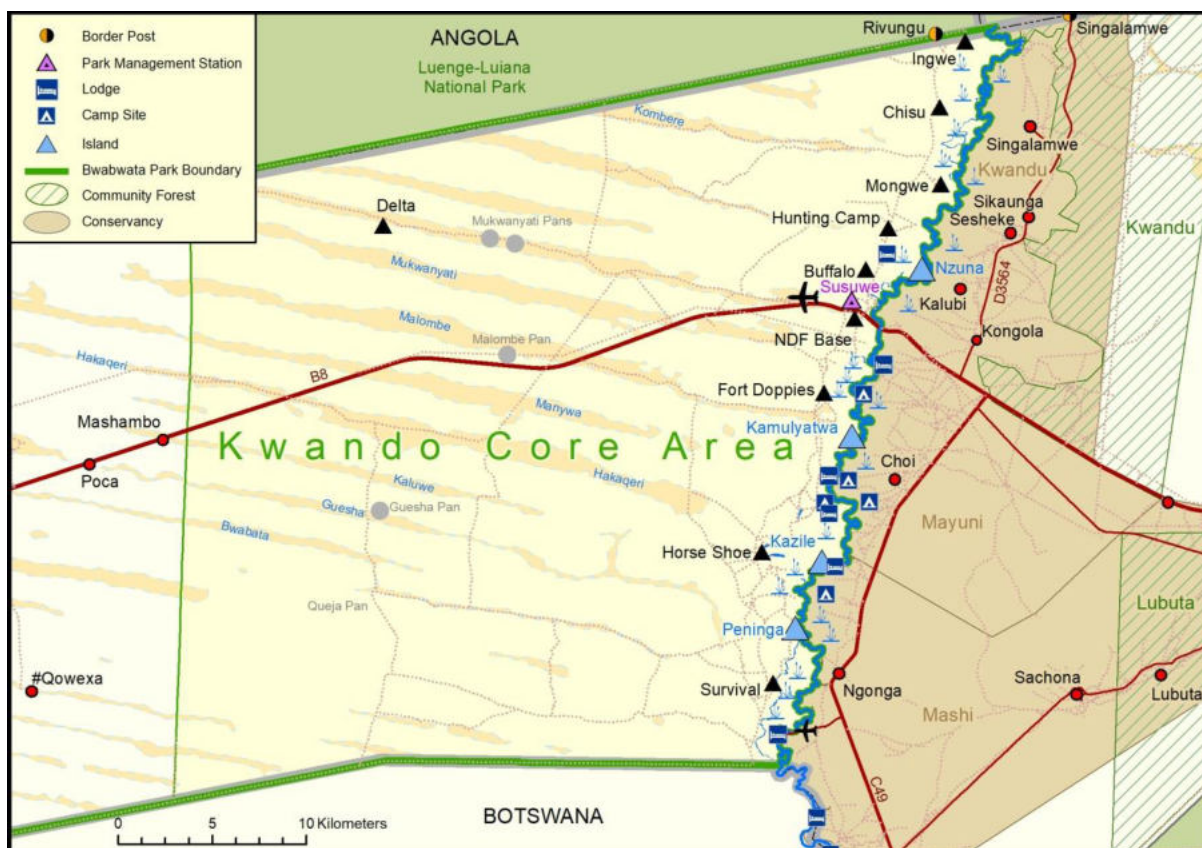


Figure 13: The Kwando Core Area in Bwabwata National Park lies to the west of the Kwando River.

### 6.3.2 History and legal status of Bwabwata National Park

The history of this protected area is complex, with various proclamations and policies affecting the North-East Parks and neighbouring communities. It consists of the former Caprivi Game Park, Mahango Game Park and the Kwando Triangle, which in the past did not have explicit conservation status.



The first people to live in the area now referred to as Bwabwata National Park were the San (Khwe and Kung), before the first Bantu tribes entered the area in the late 18th century. In 1945, following tsetse fly infestation, resident Hambukushu, Mafwe and Mayeyi people moved out of the low-lying areas in the Park.

The Zambezi Strip between the Kavango and Kwando rivers was first proclaimed as a Nature Park in 1963, mostly for strategic military reasons in view of independence struggles starting in Namibia, Angola and Zambia. In 1964, a recommendation by the Odendaal Commission to create a homeland for the Khwe in the Zambezi Strip, which would allow them to continue their traditional livelihood of hunting and gathering, was dismissed.

The Caprivi Nature Park had its conservation status elevated to that of Game Park in 1968 following a survey that clearly confirmed the significant ecological value of the area. However, since its proclamation in 1968 up until the Independence of Namibia in 1990, the entire area was treated as a military zone by the South African Defence Force, which meant that officials of the Department of Agriculture and Nature Conservation were denied access to the area. Only in 1990, when the military forces left Namibia, could conservation staff work in the Caprivi Game Park for the first time. Upon the disbanding of the South African military in Namibia, the Khwe communities staying at military bases inside the Park were allowed to continue living there.

Mahango was settled by the Hambukushu around 1800 and occupied thereafter until 1982. The park has always been an important traditional hunting and fishing area to this community. In 1982 an agreement was signed between the Administration of Kavango and the Department of Agriculture and Nature Conservation to proclaim Mahango as a State protected area (along with Khaudum and Popa Falls). Based on this agreement, the Administrator General of South West Africa approved the declaration of Mahango as a game park in 1988. Mahango was officially gazetted in February 1989.

Following Independence, the Ministry of Environment Forestry and Tourism (MEFT) commissioned a socio-ecological survey that included Bwabwata National Park and Mahango Game Park and surrounding areas. One outcome of the survey led to the introduction of legislation in 1996 to enable residents on communal land to form conservancies, thus granting them the same rights over wildlife and tourism as private landowners. Three conservancies were subsequently registered on the eastern boundary of Bwabwata: Kwando (1999), Mayuni (1999) and Mashi (2003). Kwando is also registered as a community forest.

In 1998, also following recommendations of the socio-ecological survey, a vision for the North-East Parks was developed. This paper documented the vision shared by stakeholders for conservation, tourism development, equity and the creation of partnerships in the parks. Cabinet approved this vision in 1999, which in summary included the following:

- ❖ To merge Mahango Game Park and Caprivi Game Park to form the newly renamed Bwabwata National Park;
- ❖ To extend the eastern boundary of the Park to the middle of the Kwando River, thus including the 'Kwando Triangle';
- ❖ To zone the three Core Areas (Kwando, Buffalo and Mahango) for special protection and controlled tourism;
- ❖ To zone the central area of Bwabwata National Park to provide for a Multiple-Use Area of community-based tourism, trophy hunting, human settlement and development;
- ❖ To prohibit cattle in Bwabwata National Park (and all North-East Parks);

- ❖ To give neighbouring and resident communities conditional tourism rights within the Park to allow for tourism facilities in own initiative or as joint-ventures;
- ❖ To invite tender proposals for developing a tourism lodge at Buffalo Camp in the Buffalo Core Area.

The Bwabwata NP, incorporating the Caprivi Game Park and the Mahango Game Park was accordingly proclaimed in Government Notice 2014 of 15 November 2007. The park covers an area of 6 274 km<sup>2</sup> (627 400 ha). Government Notice 2014 gives the description of geographic boundaries of Bwabwata NP as follows:

The point of beginning is beacon 1 called the western terminal situated on the western edge of Dikuyu Island in the Kavango River. From Beacon 1 (called the western terminal) with geographical coordinates of latitude 18 01'32.75"S and longitude 21 25'28.81"E and which is situated on the western edge of Dikuyu Island in Kavango River then along the Angola /Namibia border in an eastern direction until the intersection with the middle of the Kwando River, and then southwards along the middle of the Kwando River until the intersection with the Botswana/ Namibia border being the latitude 18 degrees south, then westwards along the Botswana/ Namibia border of Beacon M6 depicted on Survey Diagram No. A550/83, continuing in a clockwise direction along the boundary as depicted on Survey Diagram No. A550/83 until the intersection with the middle of the Kavango River; then along the middle of the Kavango River back to the point of beginning".

If this boundary description is plotted on a map or a satellite image a number of problems become apparent regarding the western and eastern boundaries. These boundaries are (except the western boundary of the Mahango part) defined as following the middle of the river. This is a problem in both cases as neither the Kavango River nor the Kwando River has a permanent main channel. Both rivers have floodplains (typical of endorheic rivers<sup>11</sup> where the flow gradients are very low due to undifferentiated topographies) and their flows, usually in the form of multiple channels, meander over these floodplains along courses that change over time.

The convention followed by land surveyors in Namibia concerning inland river boundaries is to use the middle of the river<sup>12</sup> (exactly as reflected in the park boundary description). For international river boundaries there is a different convention, namely to follow the deepest channel. The problem is in defining the middle of the river. Neither of the two rivers has been hydrographically surveyed to any extent that will support the use of any delineation of the river other than the outer banks of its high flood lines, i.e. the outer margins of the floodplains.

On the ground this will mean that there are entire sections of the main river flow (that is navigable by canoe or low draught vessels) that fall entirely within the park boundary. This has implications for access control. While access to the water of the river at every stage of the flow is the right of each park neighbour that is resident on land that borders the park where that

<sup>11</sup> Both the Kavango and the Kwando Rivers are endorheic, meaning that they flow inland and end in a final sump, in this case the Okavango Delta and the Linyanti wetlands (Namibia's mini Okavango Delta).

<sup>12</sup> "The middle of the river is defined by the middle between the left and the right bank of a river. The bank of the river is defined as the line just above the high-water mark, being the line reached by an ordinary seasonal flood. In areas, where the bank of a river is steep on one side but gently sloping on the other side, the dividing line may fall well away from the lowest stream. ... It should be noticed, however, that access to the water of the river at every stage of the flow is the right of each riparian proprietor and not dependent on his ownership of the riverbed or channel up to that flow.... Where an island is divided by the middle line between the banks, such island is shared accordingly by the owner on either side." De Smidt, T. 1973. Random Notes on Land Survey Practice Procedure in the Republic of South Africa. In: Simpson, K.W. & Sweeney, G.H.J. 1973. The land surveyor and the law. University of Natal Press, Pietermaritzburg

boundary is formed by a river (“riparian proprietor and not dependent on his or her ownership of the river bed or channel up to that flow” (De Smidt, 1973)), this does not necessarily mean that the Kavango River is navigable by the public as entire sections of the river in various places fall within the park. It is therefore to be expected that there may be problems to enforce legislation when the boundaries of the park are not clear and where it may be unclear when someone has illegally entered the national park.

The situation in the Kwando River is even much more complex as the floodplain is far more extensive. If the outer boundaries of the flood plain are used, as visible from satellite imagery, virtually the entire river flow in the non-flood season will be confined to the park. If anything but the outer boundaries are used, e.g. following the more recent flood regime based on the colour and relative abundance of water in the western half of the floodplain, the conservation status of this critically important part of Bwabwata NP will be reduced.

The best course of action is to apply the current Park boundaries as they are known to MEFT and neighbouring communities and when resources become available, to amend the boundary description of the Park to more accurately describe the physical boundaries that have been used for decades and remain in use. The following are the roles and responsibilities of the government agencies and other organisations working in Bwabwata NP:

#### Ministry of Environment Forestry and Tourism (MEFT)

MEFT is the statutory body responsible for management of the park. As such, it should ensure the coordination of the activities of other government agencies and other organisations. Individuals from other government agencies and NGOs should operate in the park through permits issued by MEFT.

#### Bwabwata NP Advisory Committee

The Bwabwata NP Advisory Committee provides the main channel through which coordination of all agencies and organisations working in the park takes place (see Figure 15). All development proposals must be approved by the Bwabwata NP and submitted as recommendations to the Minister of Environment and Tourism for final approval. The advisory committee must ensure that development proposals are in accordance with the park management plan, the Land Use Plan for the Managed Resource Use Zone and are subject to an environmental impact assessment process in accordance with national legislation.

#### Regional Council

The Regional Council is responsible for the preparation of development proposals by government agencies and NGOs which will be submitted to the Bwabwata NP Advisory Committee and for overseeing their implementation once finally approved by the Minister of Environment and Tourism. The Regional Council should ensure that such development proposals and activities do not overlap, duplicate each other and that they are according to development best practice.

#### Line Ministries

Line ministries are responsible for carrying out activities within their mandate that provide services to the residents of the park. However, their activities should not take place in isolation. Planned activities should be coordinated through the Regional Council and the Bwabwata NP

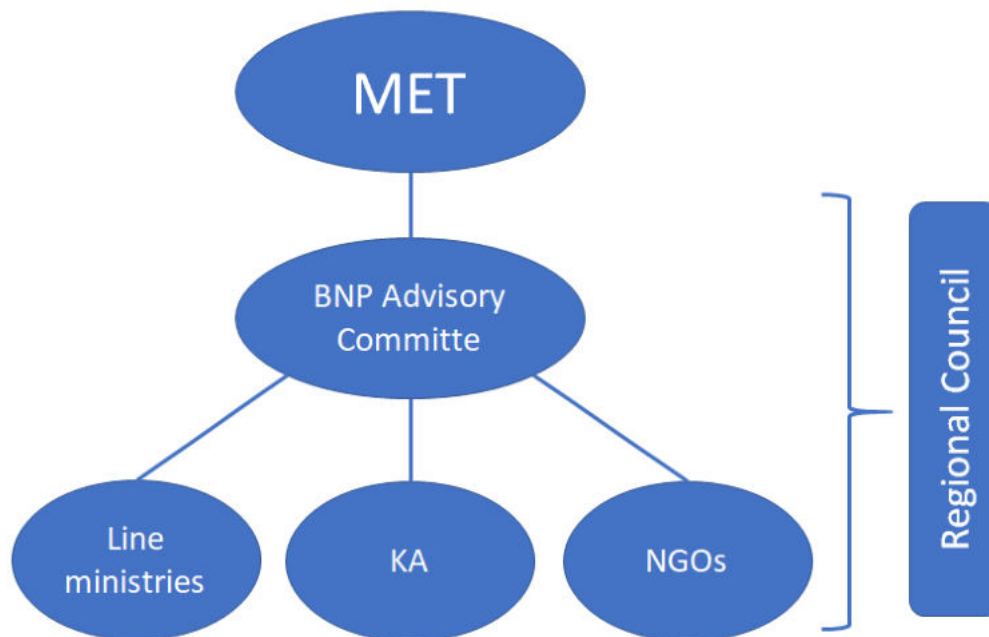
Advisory Committee and should conform to the park management plan and the Land Use Plan for the Multiple Use Area.

### NGOs

NGOs are responsible for technical and advisory support to the Kyaramacan Association. These include Integrated Rural Development and Nature Conservation (IRDNC), World Wildlife Fund (WWF) and the Working Group of Indigenous Minorities in Southern Africa (WIMSA). NGOs should continue to build on their strong track record of close collaboration with MEFT to strengthen community engagement, and support to Kyaramacan Association with natural resource management, organisational strengthening and business development. This support should expand to include agricultural (horticulture and conservation agriculture) training and extension services, with oversight and support from MAWLR. NGOs working in the health and education sectors are expected to work closely with their parent ministries. Faith-based NGOs offering community welfare and other services should communicate their plans with MEFT and the Regional Council.

### Kyaramacan Association (KA)

The role of the Kyaramacan Association is to represent the interests of legitimate park residents, promote their general welfare, and assist in the conservation and sustainable use of natural resources. The KA and MEFT develop joint management activities to ensure the objectives of the park management plan and any associated development plans are met.



**Figure 14: Structure of government agencies and other organisations working in the Bwabwata NP**

## **Economic opportunities**

Bwabwata is the most visited park in north-eastern Namibia because it is easily accessible. Tourism holds major socioeconomic potential for the Park. It also offers income to local residents, jobs and business opportunities to communities and entrepreneurs, and economic benefits to the two regions (Kavango East and Zambezi Region) and Namibia as a whole.

## **6.5 Archaeological and Heritage Context**

Both the Kavango East and the Zambezi Region have relatively short archaeological sequence representing the introduction of agricultural resettlements to the area within the past two thousand years. Research coverage to identify archaeological sites in the two regions has been poor. Some studies have been done during environmental impact assessments (EIAs) for developments such as power lines. In some areas, remains from burials are found, but not recognised as formal graveyards. This is because funerals in the rural areas are often not done formally. Such sites could be disturbed or destroyed during future construction projects (Kinahan, 2004).

An archaeological survey was done for the 400-kV power line running from Zambia, through the Zambezi Region to East Kavango (Kinahan, 2004). The assessment identified two sites which have significance to the archaeological record. On the west bank of the Kwando River at Kongola, the dune cover overlies a calcareous tufa-like deposit with a dense hump of root casts from what appear to be reeds and sedges. The upper surface of the tufa-like deposit represents the former water level of the adjacent wetland. The second site is of recent alluvial deposits north of Kasheshe, near Katima Mulilo. They indicate shifts in the course of the middle Zambezi River in the Quaternary Period. A few artefacts including sub-fossil bones and freshwater molluscan shells were found.

Historically, both Kavango East and Zambezi Region have few monuments of Namibia's colonial past. A building at Luhonono (former Schuckmansburg) still stands, that served as an ammunition storage during the German period (Otto et al., 2014). Schuckmansburg served as the administrative centre for the region at that time. From more recently, there is a monument for the Singalamwe massacre, where people were tortured and killed for supporting the liberation struggle. Today there is a graveyard at Masida village for them.

It is unlikely that the planned activities for the HWC–WC Project will impact any significant archaeological resources, however an accidental find procedure will be required. In any area where archaeological sites have been recorded in the general vicinity and even in cases where they have not, it is possible that unrecorded archaeological sites are present below the ground surface and may be exposed by earthworks. If an archaeological site is exposed, the National Heritage Council will be informed immediately. The accidental find procedure entails that:

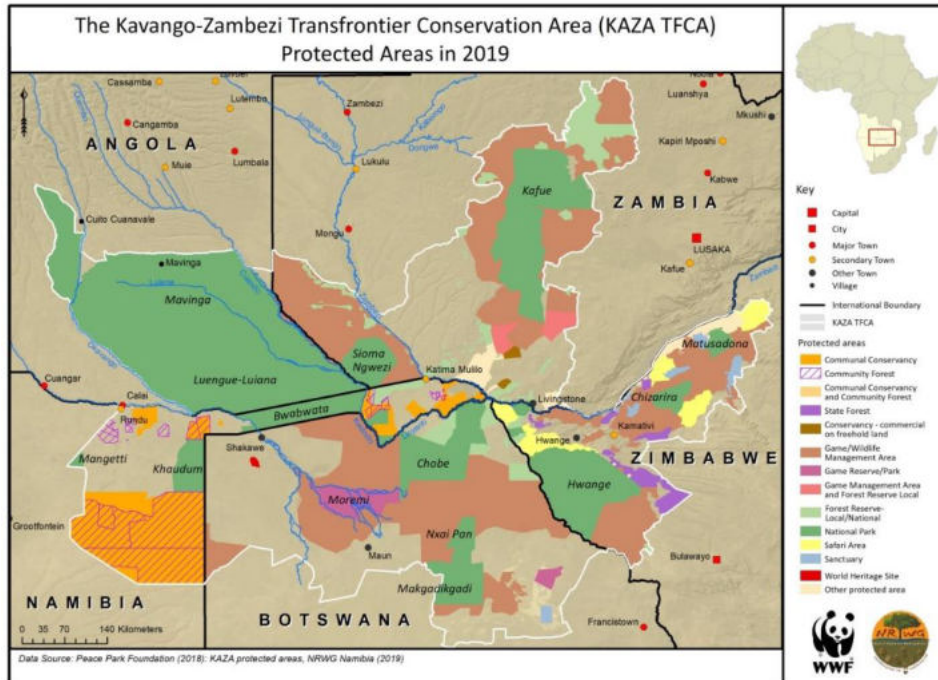
- ❖ All work on the site will cease immediately. The contractor/works supervisor will shut down all equipment and activity.
- ❖ The contractor/works supervisor/owner will take immediate steps to secure the site (tape it off) to ensure the archaeological remains are undisturbed and the site is safe in terms of health and safety requirements. Work may continue outside of the site area.
- ❖ The contractor/works supervisor/owner will notify the proponent who will notify the environmental specialist and the National Heritage Council (NHC).
- ❖ The NHC will appoint a qualified archaeologist who will confirm the nature of the accidentally discovered material.

- ❖ If the material is confirmed as being archaeological, under the terms of the Historic Places Act, the landowner will ensure that an archaeological assessment is carried out by a qualified archaeologist, and if appropriate, an archaeological authority is obtained from the Trust before work resumes.
- ❖ If burials, human remains are uncovered, steps 1 to 3 above must be taken and the Area Archaeologist of the NHC representative for the area must be contacted immediately. The area must be treated with discretion and respect and dealt with according to law.
- ❖ Work at the site area shall not recommence until an archaeological assessment has been made, all archaeological material has been dealt with appropriately, and statutory requirements met. All parties will work towards work recommencement in the shortest possible timeframe while ensuring that archaeological and cultural requirements are complied with.

## **6.6 Kavango Zambezi Transfrontier Conservation Area**

Supporting large herds of elephant and buffalo, plus rare species such as roan and sable antelope, Bwabwata NP together with the other North-East Parks constitutes important corridors for animal movement within the greater region in Namibia and surrounding countries. It is in this context that the North-East Parks form the geographical heart of the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA). This massive area includes numerous proclaimed national parks (including Bwabwata NP), game reserves, community conservation areas, forest reserves, and iconic tourism destinations such as the Victoria Falls and Okavango Delta. KAZA TFCA aims to broaden the protected areas network, thus increasing biodiversity, expanding and restoring historical game migration routes and drawing more tourists to the area. In a place where local people often bear the costs of living with wildlife, KAZA TFCA aims to make the protection of wildlife and wild places economically more attractive to rural communities.

With a strong history of community and conservancy involvement, Namibia's North-East Parks and neighbours are well-placed to contribute significantly to the KAZA TFCA. Namibia's establishment of conservancies is recognized as among the most successful efforts by developing nations to enhance natural resource management by increasing local responsibility and ownership over wildlife. Rural residents benefit financially from wildlife and tourism through a range of activities, including harvesting quotas, conservation hunting, sale of live game, and from tourism concessions.



**Figure 15: The Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA), a five-country initiative involving Angola, Botswana, Namibia, Zambia and Zimbabwe encompasses an area of about 520,000 km<sup>2</sup>. Source of map: NRWG, NACSO.**

Formally protected areas are generally too small to conserve all ecological processes and ecosystem services adequately on their own. The effectiveness of conservation also gains as it increases in scale: the greater the area under conservation status and management, the larger the benefit. It is therefore in everyone's interests to promote conservation activities, compatible land-use practices, and management and development initiatives, ultimately to benefit all collaborating partners throughout the broader area around Bwabwata National Park, the North-East Parks and the KAZA TFCA.

It is also important to develop synergies with cropping and livestock activities and mitigate conflicts between land uses. For example, the adoption of planned grazing and herding of livestock can improve pastures and decrease predator-livestock conflicts significantly. Local planning is also required to ensure that grazing areas are secured for livestock and wildlife over the long term.

## 6.7 Socio-Economic Baseline Overview

### Population

The population within the landscape is found mainly in rural and small urban settlements next to the main roads. Kongola is the largest town and is spread linearly along the three main roads, heading northwards and southwards parallel to the river, and east-west along the main B8 road. Other villages are Sangwali, Choi and Sesheke, connected to Kongola and Katima Mulilo along B8 tarred road, and there are other smaller settlements close to the Kwando River floodplain.

## **Land use**

The soils within the landscape are mostly poor and farming is difficult. Where settlements exist, there are usually a few cleared fields, growing crops such as maize, sweet potatoes, beans and melons. There is some diversity in cultivation: the staples are maize, millet and sorghum, and these are complemented with pumpkins, groundnuts and beans<sup>13</sup>. Fields are typically used only for a few years before being abandoned, requiring new areas to be cleared. Sources of protein includes livestock, poultry, fish and bushmeat.

The system of dryland cropping is used almost entirely for own consumption; grain storage rooms stand off the ground and can keep grain safe and fungus-free for less than a year, holding enough for a family's own use until the next crop is harvested. Some marketing of local produce happens in the scattered towns, but this probably makes up a very small proportion of total production. Overall, there is relatively little money in circulation, and people rely heavily on what resources they can harvest from the natural environment. Sources of protein includes livestock, poultry; fish and bushmeat.

Some marketing of local produce happens in the scattered towns, but this probably makes up a very small proportion of total production. Within the Mudumu Landscape small-scale mixed crop and livestock farming is both subsistence level and commercial, with surplus crops of maize and sorghum going to markets in Katima Mulilo and further afield. Stock farming is dominated by cattle, which are valued for their draught power, milk, meat and cash income, and they give status in terms of rights to land and social standing. Cattle are slaughtered in bush markets, and at the Katima Mulilo abattoir when Foot and Mouth Disease (FMD) restrictions imposed by Government are not in force.

Since 1990, Namibia has emphasised conservation as a viable land use and more than 90% of the Landscape is Protected Area or communal conservancies.

## **Forestry**

Wood is an obviously important resource for people within the landscape. Local users mainly collect firewood for cooking, and harvest standing trees for construction purposes<sup>14</sup>.

The woodlands contain a few species that have recently become a focus for commercial logging: rosewood (*Guibourtia coleosperma*), Zambezi teak (*Baikaiea plurijuga*) and Angolan teak (*Pterocarpus angolensis*) are the main targets. Large specimens of these slow-growing trees are over 100 years old<sup>15</sup>, so there are concerns about over-exploitation and an upsurge in illegal logging<sup>16</sup>.

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<sup>13</sup> Information drawn from Raison, 2019. River catchments and development prospects in south-eastern Angola. DoF. 2014. Forest management plan, Lubuta community. Unpublished report, Directorate of Forestry, Ministry of Agriculture, Water and Forestry, Windhoek.

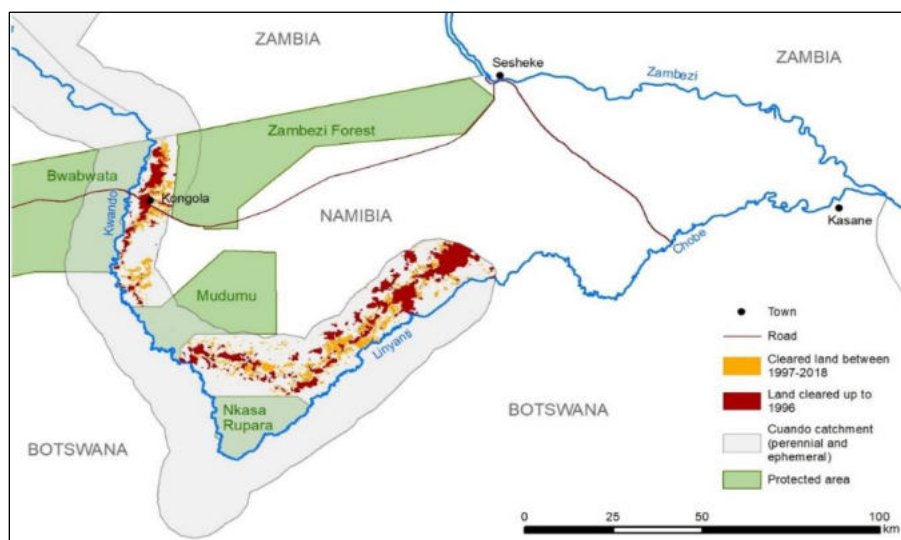
<sup>14</sup> De Cauwer V, Knox N, Kobue-Lekalake R, Lepetu JP, Matenanga O, Naidoo S, Nott A, Parduhn D, Sichone P, Tshwenyane S, Yeboah E & Revermann R. 2018. Woodland resources and management in southern Africa. In: Climate change and adaptive land management in southern Africa – assessments, changes, challenges, and solutions (ed. by Revermann R, Krewenka KM, Schmiedel U, Olwoch JM, Helmschrot J & Jürgens N), pp. 296-308, Biodiversity & Ecology, 6, Klaus Hess Publishers, Göttingen & Windhoek. doi:10.7809/b-e.00337

<sup>15</sup> i) Kayofa F. 2015. Natural Regeneration Potential of *Pterocarpus angolensis* (Kiaat Tree) in the dry forests of northern Namibia. MSc dissertation, University of Stellenbosch ii) Mendelsohn J, el Obeid S. 2005. Forests and woodlands of Namibia. Research and Information Services of Namibia (RAISON), Windhoek.

<sup>16</sup> <https://www.traffic.org/news/angola-namibia-and-zambia-vow-to-take-action-on-illegal-timber-trade/>



Extensive wood resources are also lost to uncontrolled fires and land clearing for cropping. Clearing of land for fields is ongoing due to the growing population and the short lifespan of fields which is a consequence of the low fertility of the sandy soils. The extent of land cleared – and therefore large trees lost – in the Namibian part of the Kwando Basin is shown in Figure 18.



**Figure 16: Land clearing in the Namibian part of the Kwando River Basin<sup>17</sup>.**

### **Mining**

There is no conventional mining in the Bwabwata National Park and surrounding areas. Application for Exclusive Prospecting Licence for diamonds in the area of the Sobbe Conservancy was turned down after opposition from the conservancy<sup>18</sup>. Geophysical and geological prospecting for ore bodies is likely to continue, stoking hopes by entrepreneurs for economic growth from proposed mines. However the deep blanket of the Kalahari sand that covers the bedrock is a significant obstacle for development of a viable mine.

### **Tourism**

Tourism within the Bwabwata and surrounding areas makes a substantial contribution to the national and local economy. There are 18 tourism establishments along the Kwando and Linyanti Rivers, and nine along the Okavango River opposite the Bwabwata National Park. Tourist activities offered include boat cruises, game drives, and cultural visits to traditional villages, hunting and fishing. The lodges and camp sites are usually set up in Joint Venture arrangements with local conservancies, and pay a proportion of their profits to the conservancies. Tourism also provides employment to local people.

An opinion voiced during stakeholder engagements for this project was that there are now enough tourism establishments within the Mudumu Landscape, and that the carrying capacity has been exceeded. There was general disillusionment with the prospect of new, large, luxury lodges being tendered in the National Parks.

### **Urban development**

<sup>17</sup> Calculated for the Kwando State of the Basin Report, 2021, based on remote sensing images.

<sup>18</sup> Stakeholder engagements for this project, Namibia, March 2023.

Towns and villages serve as local service centres offering markets to the surrounding areas. Within the landscape this role is made less effective because people tend to settle along the main roads in '*ribbon development*'. This brings other negative impacts such as safety risks to children and livestock, and interference with wildlife corridors.

## 7. PROJECT DESCRIPTION

This section therefore summarizes the detailed design information for the five priority locations as far as new IWPP infrastructure development (administration buildings, service buildings, common buildings, accommodation units, ablution blocks, carports, services, etc.) is concerned, and serves as a reference of the ESIA development.

### 7.1 Design concepts

The northeast parks exhibit unique landscapes, climatic conditions and different infrastructure needs from those implemented during the preceding stages of NamParks (Phase I – Phase IV). Therefore, the designs needed to consider these differences whilst simultaneously enhancing sustainability. The overall approach for infrastructure development for this project included the following:

- ❖ Address all requirements at once, rather than having to return to site to complete or add infrastructure later (although considering budget restrictions);
- ❖ Adopt environmentally appropriate and sensitive designs, including the use of solar water heating, photovoltaic power supply, wind turbines (in the absence of grid power), and correct orientation and design to maximize passive cooling and heating;
- ❖ Have a compact footprint to reduce building costs and environmental damage;
- ❖ Use brownfield (already impacted) sites where appropriate;
- ❖ Relocate park management infrastructure from sites that would otherwise pose an opportunity cost in terms of future tourism development; and
- ❖ Consideration of maintenance efforts.

### 7.2 Overall Principles

The design follows the guidelines and requirements as defined in SANS 10400 XA and SANS 204 pertaining to the following aspects:

- ❖ Site and Building Locations and Orientation (passive energy design models),
- ❖ Building Design (suitable roof overhangs for shading in the interior areas),
- ❖ Building Sealing (based on thermal modelling) cavity walls & roof insulation),
- ❖ Local material (where available and suitable),
- ❖ Heating (gas cooking in lieu of electrical stoves),
- ❖ Ventilation and Air Conditioning (natural cross ventilation),

- ❖ Water Supply (saving technologies, i.e. low flow showers, cistern modifications, metering for monitoring consumption),
- ❖ Electricity Supply (active electricity demand management by metering).

## 7.3 Building Materials

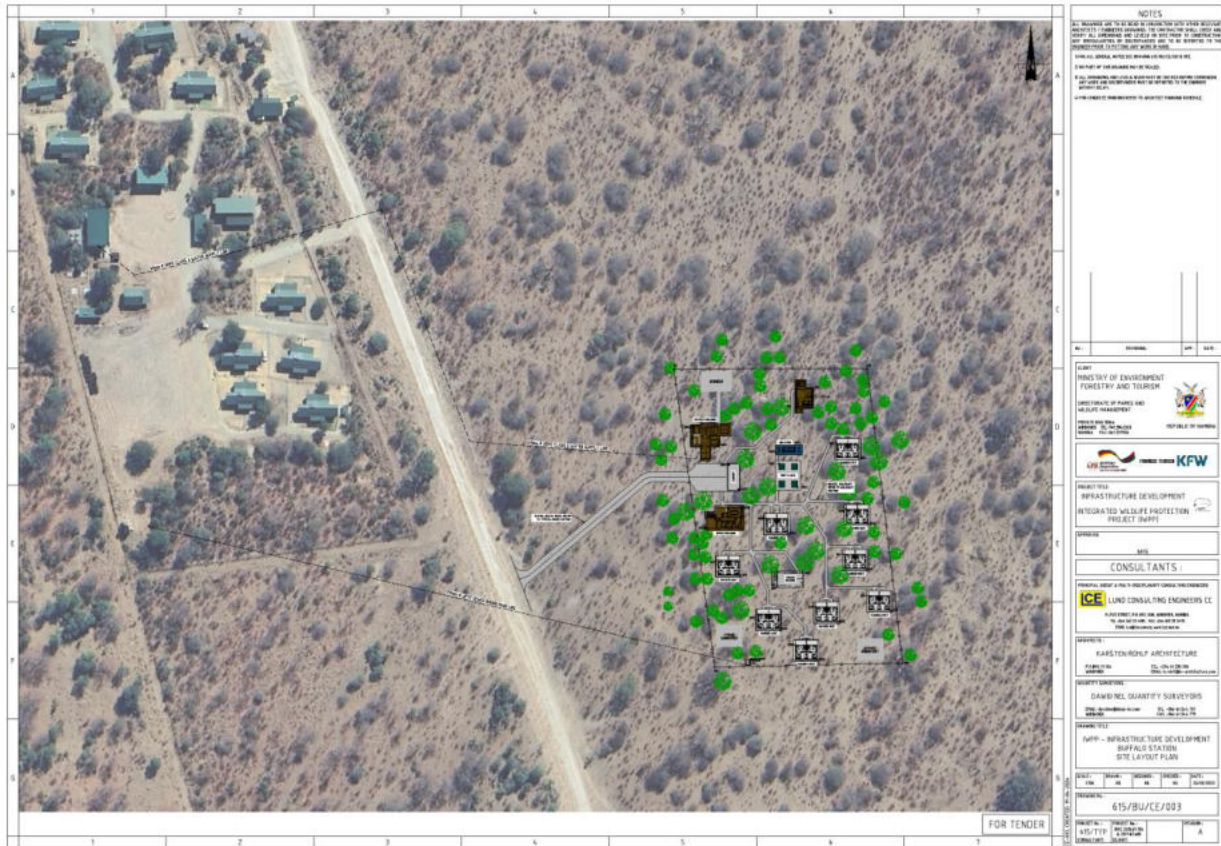
**Table 2: Building materials**

<b>Floors</b>	Granolithic screeds, floor tiles, porcelain tiles in showers,
<b>Walls</b>	Brick with plaster and paint / bagging combination,
<b>Paint</b>	Water based, non-toxic paint with earthen colors,
<b>Windows</b>	Standard steel windows,
<b>Doors (internal)</b>	Semi solid wood
<b>Doors (external)</b>	Custom / standard steel/wood doors, gates, security gates
<b>Ceilings</b>	IBR ceiling to steel bearers, painted with textured paint,
<b>Sanitary &amp; Fittings</b>	General white porcelain fittings
<b>Insulation</b>	50 / 76 mm "rockwool insulation.
<b>Structural steel</b>	Mild steel trusses / rafters — treated. 7 850 kg/m <sup>3</sup> , E 206000 MPa
<b>Roof covering</b>	0.47 mm thick 700 Colorbond "klip-lok",
<b>Hot water</b>	Solar hot water geysers
<b>Structural concrete</b>	30/19, density 2 400 kg/m <sup>3</sup>
<b>Reinforcement</b>	Y-steel - 425 MPa, R-steel - 250 MPa
<b>Soil parameters</b>	Varies, see Geotechnical Information

## 7.4 Geotechnical Aspects

### 7.4.1 Buffalo Station

Geotechnical investigations were previously conducted at Buffalo and included Dynamic Cone Penetrometer (DCP) tests at several locations in the vicinity and by excavating two trail pits to obtain soils samples, which were analyzed in a laboratory in Windhoek.



**Figure 17: Layout of the proposed Buffalo WPS station in relation to current Buffalo Park Management Station**

### **Foundation Design**

The in-situ material is a medium dense and unconsolidated sandy material with organic matter in the top 250 mm. Expectations are that this soil consolidates very fast, resulting in small and sudden settlement. It is thus recommended to over excavate all foundation trenches to 900 mm below the bottom of foundations. The excavated in-situ material should be mixed with ordinary Portland cement to achieve a 1 MPa soil Crete which should be poured and vibrated into the trenches. All strip foundations should be nominal reinforced with 5 Y12 reinforcement bars at the top and bottom with R8 mild steel stirrups at 250 mm spacing. Foundations should also be protected from the ingress of water by providing aprons around all buildings and by ensuring sufficient drainage of any storm water away from buildings. The width of the foundations shall be designed for a low allowable bearing pressure of 75 kPa. A reinforced plinth beam is proposed and butt joints in the superstructure brickwork below and above windows and doors are to be provided. Sufficient brickforce in every layer of foundation and every third layer in the super structure needs to be provided.

### **Borrow Pit Material**

The most feasible option for obtaining suitable gravel material for the construction of road works and for the backfilling underneath the surface beds seems to be using an existing borrow pit in Divundu, approximately 17 km from the designated site. Soil samples were taken to establish the

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exact material properties in the laboratory. The sampled material classifies as G6 material (COLTO) and is suitable for subbase material in pavement design, as wearing course material and as final fill layer underneath surface beds. The sourced material is therefore suitable for the intended purpose and no further exploration is deemed necessary.

### **Building sand**

The tests conducted on the in-situ sand material from the trail pits taken previously on site revealed that the sand in its natural form is suitable for mortar or concrete, but not for internal and external plaster due to too many fine particles, which increases the shrinkage potential of the plaster. However, the in-situ sand can be used for these purposes with slight modifications and the following recommendations are made:

- ❖ For the use of the in-situ sand for internal and external plaster, building lime should be added to make the plaster less susceptible to shrinkage and moisture migrations. This can be done with laboratory tests together with the appointed contractor at the start of the construction phase.
- ❖ For the use of the in-situ sand for mortar and concrete, the in-situ material can be used for these purposes, however, higher cement consumption per m<sup>3</sup> will be required due to more fines in the sandy aggregate. This can be considered in the concrete mix design of the contractor, which will have to be approved by the Engineer.

### **Concrete Aggregate**

No suitable concrete aggregate is available at Buffalo and quartzite or dolomite concrete aggregate needs to be imported from Grootfontein.

### **7.4.2 Susuwe Station**

Geotechnical investigations were previously conducted for another site in close proximity to the proposed new WPS site at Susuwe. The proposed new site occupies a flat area on the crest of a dune, about 200 m north of the B8 trunk road. Access to the site involves traversing a small gulley and then climbing a gentle dune. The site is characterized by thick Kalahari sands.



**Figure 18: Layout of the proposed Susuwe West WPS station in relation to current Susuwe Park Management Station**

### **Foundation Design**

Very similar to the Buffalo site, the in-situ material is a medium dense and unconsolidated sandy material with organic matter in the top 250 mm. Expectations are that this soil consolidates very fast, resulting in small and sudden settlement. It is thus recommended to over excavate all foundation trenches to 900 mm below the bottom of foundations. The excavated in-situ material should be mixed with ordinary Portland cement to achieve a 1 MPa soilcrete which should be poured and vibrated into the trenches. All strip foundations should be nominal reinforced with 5 Y12 reinforcement bars at the top and bottom with R8 mild steel stirrups at 250 mm spacing. Foundations should also be protected from the ingress of water by providing aprons around all buildings and by ensuring sufficient drainage of any storm water away from buildings. The width of the foundations shall be designed for a low allowable bearing pressure of 75 kPa. A reinforced plinth beam is proposed and butt joints in the superstructure brickwork below and above windows and doors are to be provided. Sufficient brickforce in every layer of foundation and every third layer in the super structure needs to be provided.

### **Borrow Pit Material**

The nearest borrow pit that contains a gravel material of G6 quality (TRH 14) is located in Choi Village, south-east of Susuwe. The village can be reached travelling along the trunk road B8 to Katima Mulilo for about 9 km, turning south at Kongola and travelling along the trunk road C49 to Sangwali for approximately 6 km. Test results available for this material indicate a PI ranging from

6-12, GM 2.53 -2.66 and a CBR of 49 at 98% mod. AASHTO max dry density. The material is thus suitable for subbase material in pavement design, as wearing course material and as final fill layer underneath surface beds.

### **Building sand**

The in-situ sand material, in its natural form, is suitable for mortar or concrete, but not for internal and external plaster due to too many fine particles, which increases the shrinkage potential of the plaster. However, the in-situ sand can be used for these purposes with slight modifications and the following recommendations are made:

- ❖ For the use of the in-situ sand for internal and external plaster, building lime should be added to make the plaster less susceptible to shrinkage and moisture migrations. This can be done with laboratory tests together with the appointed contractor at the start of the construction phase.
- ❖ For the use of the in-situ sand for mortar and concrete, the in-situ material can be used for these purposes, however, higher cement consumption per m<sup>3</sup> will be required due to more fines in the sandy aggregate. This can be considered in the concrete mix design of the contractor, which will have to be approved by the Engineer.

### **Concrete Aggregate:**

No suitable concrete aggregate is available at Susuwe and quartzite or dolomite concrete aggregate needs to be imported from Katima Mulilo.

## **7.5 Relevant Codes and Standards for Structural Design**

- ❖ The design codes applied for the structural analysis and detailing are:
- ❖ SANS 10100-1:200 The structural use concrete Part 1: Design
- ❖ SANS 10160:1989 The general procedures and loadings to be adopted in the design of buildings
- ❖ SANS 10144:1995 Detailing of steel reinforcement for concrete
- ❖ SANS 282:2004 Bending dimensions and scheduling of steel reinforcement for concrete.
- ❖ SANS 10161: 1980 The design of building foundations
- ❖ SANS 102 2005 The structural use of steel Part 1: Limit-state design of hot-rolled steelwork
- ❖ EN. 1992.1.12004 Eurocode2: Design of concrete structures — Part 1-1: General rules and rules for buildings
- ❖ SANS 10163-1 - The structural use of timber: Limit States Design
- ❖ SANS 10163-2 - The structural use of timber: Allowable Stress Design
- ❖ SANS 10243 — The manufacture and erection of timber trusses
- ❖ Sans 10400 — The application of the National Building Regulations Part L - Roofs.

## **7.6 Water Supply Infrastructure**

## **Buffalo Station**

A new borehole (WW204789) was drilled for the Buffalo Park Management Station into the alluvial sediments of the Okavango River to 64 m depth. The recommended abstraction yield is 4 m<sup>3</sup>/h (24 m<sup>3</sup>/day with a 6-hour pumping period). The water was classified Group A (excellent water quality).

The borehole was installed with an electrical driven borehole pump. An approx. 900m long pipeline supplies the water to the elevated reservoir (12m height) located in the Buffalo Park Management Station. The pump is controlled via level sensor. It is proposed to connect the new WPS station to the elevated tanks at the park management station (for supply under gravity flow).

## **Susuwe Station**

A borehole which is located within the perimeter fence of the Susuwe Park Management Station supplies water to a 12m high elevated tank stand. The borehole is installed with an electrically driven submersible pump. Samples of the water were taken on 21 July 2023 and analyzed by the NamWater laboratory in Windhoek. According to the test results the water quality is of Group B (good water), only due to Iron (Fe) 0.28 mg/l compared to 0.2 mg/l for Group A (excellent water) limits.

It is proposed to connect the new WPS station to the elevated tanks at the park management station (for supply under gravity flow). If the pressure should be insufficient a small electrical driven booster pump needs to be installed underneath the elevated reservoir at the Park Management Station.

## **7.7 Waste Water**

It is proposed that the new Buffalo WPS Station connect to the waste-water treatment plant (trickling filter technology) at the Buffalo Park Management Station which has surplus capacity. The proposed new Susuwe WPS is located close to a pristine river/wetland system and groundwater pollution is a risk. As an alternative to the expensive trickling filter plants installed under NamParks III and IV, a more feasible solution is available and is described below. Regardless of the treatment alternative, an effluent discharge permit is required from the Ministry of Agriculture, Water and Land Reform and requires a comprehensive motivation with the application.

Clarus Fusion @Series Treatment systems are drop-in wastewater treatment units designed for use in decentralized applications where the effluent quality needs to meet or exceed DWS standards (RSA). More than 200 units have been installed in southern Africa and the system is suitable for residential, commercial and communal applications and is available in a variety of treatment capacities. Effluent disposal options include conventional percolation trenches, dams, irrigation or direct discharge. Test results received from a plant installed recently proves that the treated effluent complies with Namibia's Water Quality General Standards for Effluent disposed.



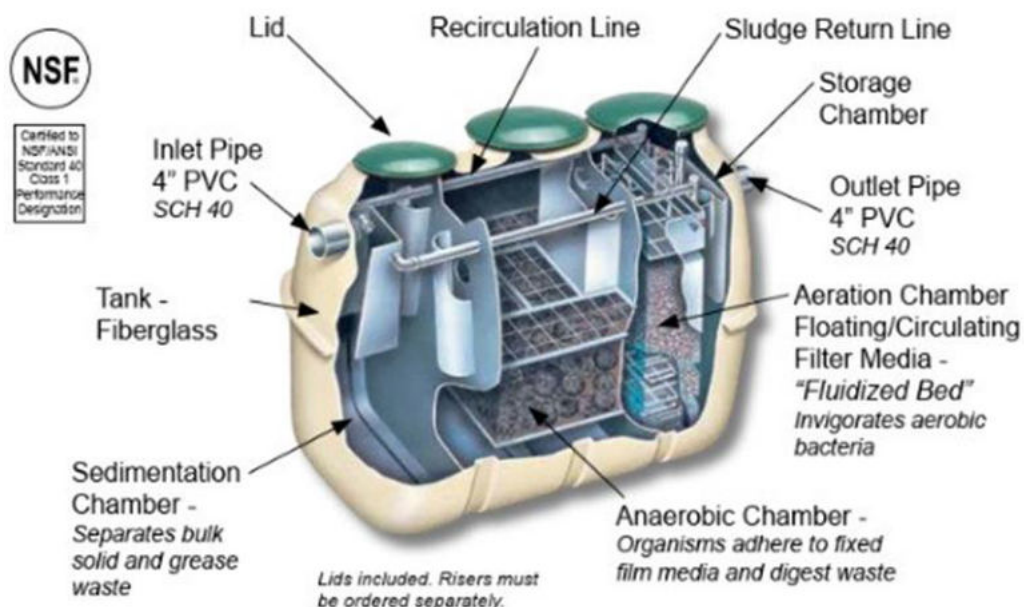


Figure 17: Clarus Fusion@ Series Treatment Systems

## 7.8 Electrical Supply

### Buffalo Station

Electrical supply for the new WPS Base station is available from a transformer connected to the National Power Grid in close proximity (approx. 250 — 300 m away). As with all other stations programmable electrical dispenser devices will be installed to manage the power consumption of the individual units.

### Susuwe Station

Electrical supply for the new WPS Base station is available from a transformer connected to the National Power Grid in close proximity (approx. 400 — 450 m away). As with all other stations programmable electrical dispenser devices will be installed to manage the power consumption of the individual units.

### Electrical Distribution

The electrical power and communication cable reticulation for each station shall be as invisible as possible by means of underground and flush mounted cables and cable ways. This will also sustain the lifespan of the electrical infrastructure for much longer.

The administration buildings will be equipped with data and communication networks to provide these services to each workstation. Internet and communication link shall be via Very Small Aperture Terminal (V-SAT) system of latest technology offered by various Namibian Providers. Light fittings at all stations shall be of the latest LED type with the highest available rated lifespan.

All luminaires shall be suitable for the harsh environmental conditions. Low level bollard LED type area lights shall be installed along internal roads and walkways at approximately 30 meters spacing. All light controls shall be automated via daylight switches.

Staff houses will receive provisions for Digital Satellite Television (DSTV) by means of installed and commissioned satellite dishes and cabling, ready for staff to plug in their own decoders and TV sets. Electrical installations in staff houses shall allow for connecting a fridge-freezer, the usage of electrical iron and electric water kettle.

### **Water Heaters**

Roof-mounted Solar Hot Water Geysers will be provided for all housing units but shall have an electric back up element. Simultaneous operation of appliances in the individual houses will be restricted with current limiters and timers. The solar water heaters shall be of the collector / storage combination type (Close-coupled), with an indirect heat transfer method and a thermosiphon circulation method. One 180-litre SHWG shall be installed per accommodation duet.

## **7.9 Roads and Storm Water**

All access roads, internal roadworks and parking areas will be constructed using locally available suitable gravel or gypsum material of minimum G6 classification. At all locations suitable gravel material is available from nearby borrow pits. Furthermore, all roads and parking areas inside the new stations will be constructed of two layers of 150 mm thickness each as a subbase pavement layer and as a wearing course. Walkways to the individual plots shall be constructed with only one layer of 150 mm thickness wearing course.

Storm water provision will be included where appropriate. The geometry of all graveled areas will be designed such that surface water can drain off the areas quickly. The cross-falls are to be kept shallow to prevent rapid material loss from the erosion of surfaces. However, where elephants and predators are to be expected, the fences need to be electrified to prevent damage and vandalism to fences and structures.

## **7.10 Fences**

To ensure safety from wild animals and to provide general security of the infrastructure, suitable fencing along the entire perimeter of the stations is required. At least 2.4 m high predator proof fences with diamond mesh to protect the facilities from scavenging jackals are required.



**Figure 18: Electrified 2.4 m high predator proof fence at Shisinze Station (source: LCE)**

### **Buffalo WPS Station**

The fenced-in area of the proposed new Buffalo WPS Station is 17,730 m<sup>2</sup> in size with a 520 m long perimeter. Due to the occurrence of elephants, an electrified and predator-proof fence is required. For safety reasons a single entrance and exit gate is proposed. The gate is to be large enough to allow a bus or truck to pass. The locking mechanism for the gate is to be sturdy and secure and the gates also need to be connected to the electrified perimeter fence.

### **Susuwe WPS Station**

The fenced-in area of the proposed new Susuwe WPS Station is 10,780 m<sup>2</sup> in size with a 410 m long perimeter. Due to the occurrence of elephants, an electrified and predator-proof fence is required. For safety reasons a single entrance and exit gate is proposed. The gate is to be large enough to allow a bus or truck to pass. The locking mechanism for the gate is to be sturdy and secure and the gates also need to be connected to the electrified perimeter fence.

## **7.11 Design Drawings**

This section includes site specific drawings applicable to the identified priority stations at Buffalo and Susuwe respectively. The typical drawings that are applicable to all stations, and includes some selective civil and structural drawings.

## **8. ASSESSMENTS OF ENVIRONMENTAL AND SOCIAL IMPACTS**

### **8.1 Approach to the Evaluation of Impacts**

As part of the Environmental Impact Assessment process, all the environmental aspects and their associated impacts included as part of the Environmental Impact Assessment have been assessed. A user-friendly assessment from which impacts ranked as having medium or high significance have been identified and assessed. In line with KfW guidelines and the Namibia's

EMA of focusing attention specifically on impacts of potentially significant risk and how best to mitigate for these, the following approach was recommended regarding the concept of whether issues in the ESIA table need to be actively addressed in the ESMP:

- ❖ If environmental aspects are evaluated to be of low significance, they do not require specific management plans, and need not be actively addressed in the ESMP (although they may still be listed and reported on);
- ❖ A decision on the need to actively address any issue with a "Medium" significance ranking will require consideration of other relevant factors, such as the nature of the impact, risks associated with possible cumulative aspects, and the degree of concern of stakeholders, and;
- ❖ If environmental aspects receive a "High" significance ranking, they must be addressed by means of active management, mitigation or rehabilitation measures.

For each negative impact of high or medium significance, mitigation objectives are set (i.e. ways of reducing negative impacts), and attainable management actions are subsequently addressed in the ESMP in line with the mitigation framework of KfW sustainable development guidelines. Without management, these impacts would either breach statutory limits or be unacceptable to statutory authorities or to stakeholders, as they would result in a significant deterioration of one or more environmental resources.

## 8.2 Environmental Impact Assessment Rankings

To ensure consistency in the evaluation of environmental impacts associated with WPS's activities for all of their operations, the rating criteria for the impact assessment have been standardized to include set definitions applied in the risk assessment. To the extent possible, allocation to rank categories is based on quantifiable criteria which can be measured as detailed in Table 5. Furthermore, when evaluating impacts, the allocated ranks refer to the resultant impact (e.g. habitat area affected, or time that the result of the impact will last), and not of the *cause* thereof (e.g. time of active impact).

Each activity has been assessed with respect to the type of effect that the aspect will have on the relevant component of the environment and includes "what will be affected and how?" The criteria used to determine the significance rating of the impact(s) is detailed in Table 5.

**Table 5: Definition of impact categories.**

Rating	Definition of Rating
<b><i>Status of the Impact – in terms of meeting the objective of maintaining a healthy environment.</i></b>	
Positive	The impact benefits the environment
Negative	The impact results in a cost to the environment
Neutral	The impact has no effect
<b><i>Probability – the likelihood of the impact occurring</i></b>	
Negligible	Possibility negligible
Improbable	Possibility very low
Probable	Distinct possibility
Highly Probable	Most likely
Definite	Impact will occur regardless of preventive measures

<b><i>Degree of confidence in predictions – in terms of basing the assessment on available information</i></b>	
Low	Assessment based on extrapolated data
Medium	Information base available but lacking
High	Information base comparatively reliable
<b><i>Extent – the area over which the impact will be experienced</i></b>	
Site specific	Confined to within < 1 km of the project
Local	Confined to the study area or within 5 km of the project
Regional	Confined to the region, i.e. > 5 km but < National
National	Nationally
International	Beyond the borders of Namibia
<b><i>Duration – the time frame for which the impact will be experienced</i></b>	
Very short	Less than 2 years
Short-term	2 to 5 years
Medium-term	6 to 15 years
Long-term	More than 15 years
Permanent	Generations
<b><i>Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment</i></b>	
Negligible	Natural functions and processes are negligibly altered due to adaptation by the receptor(s) to high natural environmental variability
Mild	Natural functions and processes continue albeit in a modified way that <b>does not</b> appear to have a significant disruptive effect (i.e. changes are temporary)
Moderate	Natural functions and processes continue albeit in a modified way that <b>does</b> appear to have a noticeable disruptive effect (i.e. changes are permanent)
Severe	Natural functions or processes are altered to the extent that they temporarily cease resulting in severe deterioration of the impacted environment
Very Severe	Natural functions or processes permanently cease or are completely disrupted

**Table 6: The criteria used to determine the significance rating of the impact(s)**

<b>Low:</b>	Where the impact will have a negligible influence on the environment and no modifications or mitigations are necessary for the given project description. This would be allocated to impacts of any severity/magnitude, if at a local scale/ extent and of temporary duration/time.
<b>Medium:</b>	Where the impact could have an influence on the environment, which will require modification of the project design and/or alternative mitigation. This would be allocated to impacts of moderate severity, locally to regionally, and in the short term.
<b>High:</b>	Where the impact could have a significant influence on the environment and, in the event of a negative impact, the activity(ies) causing it should not be permitted without substantial mitigation and management, and pro-active rehabilitation commitments (i.e. there could be a 'no-go' implication for the project). This would be allocated to impacts of severe magnitude, locally over the medium-term, and/or of severe magnitude regionally and beyond.

### 8.3 Likely Positive Impacts

The following is summary of the positive socioeconomic impacts identified during the ESIA process for the proposed infrastructure:

- ❖ Employment creation through new WPS personnel;

- ❖ Improved local, regional and national social services through expanded WPS operations;
- ❖ Training and skills transfer through expanded WPS operations;
- ❖ Boost to local economies through expanded WPS personnel spending at local businesses;

## **8.4 Identification of Likely Negative Impacts**

### **Summary of Sources and Likely Key Negative Impacts**

This Environmental Assessment process has taken into consideration the sensitivity of the receiving environment (physical, biological, socioeconomic and ecosystem services and functions) with respect to the proposed development. The following is the summary of the likely sources of negative impacts on the receiving environment that have been evaluated and assessed in this report with respect to the proposed WPS infrastructure development at Buffalo and Susuwe Station:

#### **Preconstruction:**

- ❖ Planning, designing and permitting;
- ❖ Mobilization and implementation;
- ❖ Site access plan and surveying;
- ❖ Determination of locally available construction materials (sand / gravel) excavations, and;
- ❖ Demolition / excavations and erection of security and safety zones.

#### **Construction:**

- ❖ Soil / ground preparation and supporting Infrastructure construction;
- ❖ Foundation excavations and building;
- ❖ Structural development / Actual construction;
- ❖ Supporting infrastructure (internal access, energy requirements, water supply, waste water management and solid waste management).

#### **Operational:**

Day to day running of the WPS station and surrounding areas and generating liquid and solid waste, noise, dusty, interact with local people, visitors, wild life and the broader natural receiving environment.

## **8.5 Summary of Receptors Likely to be Negatively Impacted**

The following is the summary of the key environmental receptors that may be negatively impacted by the proposed activities during the preconstruction, construction and operational stages of the proposed infrastructure development at Buffalo and Susuwe WPS Stations:

- ❖ Faunal loss expected to occur with the proposed infrastructure development at Buffalo and Susuwe WPS Stations;
- ❖ Floral loss expected to occur with the infrastructure development at Buffalo and Susuwe WPS Stations;
- ❖ Disruption / disturbance of the area and potential habitats within the infrastructure development at Buffalo and Susuwe WPS Stations developmental and surrounding areas;
- ❖ Disruption / disturbance of the area and potential habitats around the construction sites
- ❖ Disturbance of fauna including estuarine birds at the Bwabwata-Okavango Ramsar Site by noise caused by the increased use of helicopters by WPS;
- ❖ Effects on the ecosystem functions, services, use values and non-use use;
- ❖ Visual and land degradation;
- ❖ Land and water pollution;
- ❖ Resource use;
- ❖ Air quality, noise and dust;
- ❖ Refueling spillages;
- ❖ Solid waste management;
- ❖ Sewage disposal;
- ❖ Accident;
- ❖ Archaeological, paleontological and historical aspects, and;
- ❖ General MEFT procedures for ESMP implementation in line with WPS operations and EMS

## **8.6 Results of the Environmental Impact Assessment for Buffalo and Susuwe West**

### **Positive Impacts Results**

Tables 6 below summarizes the impact assessment results associated with positive impacts linked to the socioeconomic benefits covering employment, improved social services, training and skills transfer, boost to local economies, development of technology and technological advancement, support to use of non-renewable resources.

**Table 6: Employment creation through temporary construction jobs expanded WPS staff**

Provision additional employment opportunities through temporary construction jobs expanded with WPS staff	<i>Status</i>	Positive
	<i>Probability</i>	Definite
	<i>Confidence</i>	High
	<i>Extent</i>	Employees will be all from Namibia.
	<i>Duration</i>	Medium-term
	<i>Intensity</i>	High
	<i>Significance</i>	High; a significant number of especially Namibian families will be supported financially over a long period.

**Table 7: Improved local, regional and national social services through temporary construction jobs expanded WPS staff**

Provision of wellness and environmental awareness programmes	<i>Status</i>	Positive
	<i>Probability</i>	Definite
	<i>Confidence</i>	High
	<i>Extent</i>	International
	<i>Duration</i>	Medium-term
	<i>Intensity</i>	Moderate
	<i>Significance</i>	Medium

**Table 8: Training and skills transfer through temporary construction jobs and new WPS jobs**

Provision of employee training and development of skills	<i>Status</i>	Positive
	<i>Probability</i>	Definite
	<i>Confidence</i>	High
	<i>Extent</i>	International
	<i>Duration</i>	Long-term
	<i>Intensity</i>	High
	<i>Significance</i>	High

**Table 9: Boost to local economies through temporary construction jobs expanded and new WPS jobs**

Purchasing of local goods & services, Use of local vendors, local employment and local economic boost.	<i>Status</i>	Positive
	<i>Probability</i>	Definite
	<i>Confidence</i>	High
	<i>Extent</i>	Local to Regional
	<i>Duration</i>	Long-term
	<i>Intensity</i>	High (=Severe)



## 8.7 Negative Impacts Results

Tables 10 summarizes the negative impact assessment results associated with temporary construction jobs expanded WPS staff activities covering the preconstruction, construction and operational stages of each of the proposed phases (complete proposed project lifecycle) with respect to the receiving environment (physical, biological and socioeconomic).

**Table 10: Faunal loss expected to occur within the proposed WPS infrastructure development at Buffalo and Susuwe**

<b>Description</b>	Faunal loss/disturbance will vary depending on the scale/intensity of the development operation and associated and inevitable infrastructure. The impacts would be contained and/or limited depending on the various proposed developments envisaged. Each development would have to be assessed individually to ascertain the scale of impact.
<b>Extent</b>	Localized disruption/destruction of the habitat and thus consequently flora associated directly with this habitat and the actual development sites. This however, would be limited to the development area with localized implications. Further developments – e.g. road construction, etc. – throughout the area would however increase the extent of impact.
<b>Duration</b>	The duration of the impact is expected to be permanent over most of the proposed development sites once established. Most fauna species (especially species associated with the surrounding areas – e.g. various reptiles and small mammals) are expected to recolonise the areas not actually changed after completion of the development(s). Duration viewed as medium term. No species would be able to recolonise areas permanently altered (e.g. roads, etc.). Duration viewed as long term. Disturbances to larger mammals (e.g. elephant, Buffalo, kudu etc.), not viewed as sedentary and/or permanently associated with the area, would not be affected as severely as these species move over large area and not exclusively associated with the construction area.
<b>Intensity</b>	The actual development site would be permanently altered with the intensity of faunal loss/disturbance depending on the species involved – e.g. slow moving and sedentary species will succumb to development while the more mobile species are expected to vacate the area. Implications are expected to be localized, depending on the scale of developments. The areas adjacent the development site should not be significantly affected. This, however, would depend on the proposed development, but should be limited to localized implications. Areas not directly affected by the development, although within the immediate vicinity, would be affected minimally. This would include dust, noise and other associated disturbances mainly associated with the excavation phase(s).
<b>Frequency of occurrence</b>	Expected to be “once off” and only affecting the selected site(s).
<b>Probability</b>	Definite (100%) negative impact on fauna – especially slow moving and/or sedentary species (e.g. reptiles) – is expected in the development areas. Highly Probable (75%) negative impact on fauna is expected in the general areas as a result of noise, increased activities, etc. Probable (50%) negative impact on fauna is expected from the infrastructure (roads/tracks). Precautionary principle (e.g. avoid important habitat features as well as adhering to the proposed mitigating measures would minimize this) would decrease the significance of these potential impacts.
<b>Significance</b>	Before mitigation: <b>High</b> and After mitigation: <b>Medium to Low</b>
<b>Status of the impact</b>	Negative: localized unique wildlife movement paths (corridors) with associated fauna would bear the brunt of this proposed development, but be limited in extent and only permanent at the actual development sites and access routes.

<b>Legal requirements</b>	Fauna related: Nature Conservation Ordinance No. 4 of 1975, CITES, IUCN and SARDB Habitat – Flora related: Forest Act No.12 of 2001, Nature Conservation Ordinance No. 4 of 1975, CITES
<b>Degree of confidence in predictions</b>	As an ecologist I am sure of the above-mentioned predictions made and would suggest that the mitigation measures be implemented to minimize potentially negative aspects regarding the local fauna in the area.

**Table 11: Floral loss expected to occur within the proposed WPS infrastructure development at Buffalo and Susuwe**

<b>Description</b>	Floral loss/disturbance will vary depending on the scale/intensity of the development operation and associated and inevitable infrastructure. The impacts would be contained and/or limited depending on the various proposed developments envisaged. Each development would have to be assessed individually to ascertain the scale of impact.
<b>Extent</b>	Localized disruption/destruction of the habitat and thus consequently flora associated directly with this habitat and the actual development sites. This however, would be limited to the development area with localized implications. Further developments – e.g. road construction, etc. – throughout the area would however increase the extent of impact.
<b>Duration</b>	The duration of the impact is expected to be permanent over most of the proposed development sites once established. Most flora species are not expected to recolonize the areas permanently altered (e.g. runway, etc.) after completion of the development(s). Duration viewed as long term. This however, would be limited to the development area with localized implications.
<b>Intensity</b>	The actual development sites would be permanently altered with the intensity of floral loss depending on the species involved – e.g. slow growing species will be affected most. Implications are expected to be localized, depending on the scale of developments. The areas adjacent to the development sites will not be significantly affected. This, however, would depend on the proposed development, but should be limited to localized implications. Areas not directly affected by the development, although within the immediate vicinity, would be affected minimally.
<b>Frequency of occurrence</b>	Expected to be a “once off” issue affecting the selected site(s).
<b>Probability</b>	Definite (100%) negative impact on flora is expected in the development areas as well as the access route construction sites. This however, would be much localized and cover limited areas. Highly Probable (75%) negative impact on flora is expected from the infrastructure (roads/tracks). Precautionary principle (e.g. avoid unique habitat features as well as adhering to the proposed mitigating measures would minimize this) would decrease the significance of these potential impacts.
<b>Significance</b>	Before mitigation: <b>High</b> After mitigation: <b>Medium to Low</b>
<b>Status of the impact</b>	Negative: Localized unique habitats with associated flora would bear the brunt of this proposed development, but be limited in extent and only permanent at the actual development sites and access routes.
<b>Legal requirements</b>	Flora related: Forest Act No. 12 of 2001, Nature Conservation Ordinance No. 4 of 1975, CITES
<b>Degree of confidence in predictions</b>	As an ecologist I am sure of the above mentioned predictions made and would suggest that the mitigation measures be implemented to minimize potentially negative aspects regarding the local flora in the area.

**Table 12: Disruption / disturbance of the area and potential habitats within the infrastructure developmental and surrounding areas**

Disturbance of the Bwabwata Okavango RAMSAR site by infrastructure development	<i>Status</i>	Negative
	<i>Probability</i>	Probable; Although the proposed development will leave the Bwabwata-Okavango RAMSAR Site untouched,
	<i>Confidence</i>	Medium
	<i>Extent</i>	Local (within 5 km of project area)
	<i>Duration</i>	Long-term
	<i>Intensity</i>	Mild
	<i>Significance</i>	Medium

**Table 13: Disruption/disturbance of the area and potential habitats around the developmental and surrounding areas**

Disturbance / disruption of the surrounding area including the supporting infrastructure areas such access road, water, sewage lines as well as borrow pits (sources of construction materials such as sand and gravel)	<i>Status</i>	Negative
	<i>Probability</i>	Probable; Supporting infrastructure areas such access road, water, sewage lines as well as borrow pits (sources of construction materials such as sand and gravel)
	<i>Confidence</i>	Medium
	<i>Extent</i>	Local (within 5 km of project area)
	<i>Duration</i>	Long-term
	<i>Intensity</i>	Mild
	<i>Significance</i>	Medium to low

**Table 14: Disturbance of fauna including estuarine birds at the Bwabwata-Okavango RAMSAR site by noise caused by the increased use of helicopters by WPS**

Disturbance of fauna and birds at the Bwabwata-Okavango RAMSAR site by noise caused by the increased use of helicopters for transfer of crew by WPS	<i>Status</i>	Negative
	<i>Probability</i>	Improbable; flight paths adjusted to avoid most sensitive areas around the Bwabwata-Okavango RAMSAR. Other fauna will not be affected because the proposed development is confined within the BNP
	<i>Confidence</i>	Medium
	<i>Extent</i>	Local (within 5 km of project area)
	<i>Duration</i>	Very Short;
	<i>Intensity</i>	Mild
	<i>Significance</i>	Medium to Low

**Table 15: Effects on the ecosystem functions, services, use values and non-use or passive use**

	<i>Status</i>	Negative
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Influences on the ecosystem functions, services, use values and non-use or passive use	<i>Probability</i>	Improbable; Ecosystem functions, services, use values and non-use or passive use will not be affected in any way
	<i>Confidence</i>	Medium
	<i>Extent</i>	Local (within 5 km of project area)
	<i>Duration</i>	Long-term
	<i>Intensity</i>	Mild
	<i>Significance</i>	Low

**Table16: Visual and land degradation**

Visual effects of the proposed additional structures resulting in land degradation	<i>Status</i>	Negative
	<i>Probability</i>	Improbable; Addition to the already existing structures and disturbed land
	<i>Confidence</i>	Medium
	<i>Extent</i>	Local (within 1 km of project area)
	<i>Duration</i>	Long-term
	<i>Intensity</i>	Mild
	<i>Significance</i>	Low

**Table 17: Land and water pollution**

Pollution of the land and water resources	<i>Status</i>	Negative
	<i>Probability</i>	Improbable; Addition to the already existing structures with limited land and water polluting activities
	<i>Confidence</i>	Medium
	<i>Extent</i>	Local (within 5 km of project area)
	<i>Duration</i>	Long-term
	<i>Intensity</i>	Mild
	<i>Significance</i>	Low

**Table 18: Resource use**

Depletion of natural and non-renewable resources through engine machinery operation, electricity generation, fresh water consumption, paper consumption etc.	<i>Status</i>	Negative
	<i>Probability</i>	Definite (impact will occur regardless of prevention measures)
	<i>Confidence</i>	High
	<i>Extent</i>	Site specific
	<i>Duration</i>	Long-term
	<i>Intensity</i>	Mild
	<i>Significance</i>	Low

**Table 19: Refueling spillages**

Land pollution from small spills during connection and disconnection while refueling vehicles	<i>Status</i>	Negative
	<i>Probability</i>	Improbable; due to strict control and procedures implemented as well as pollution / spill containments available onsite
	<i>Confidence</i>	Medium
	<i>Extent</i>	Site specific; limited to immediate area around the refueling point / station
	<i>Duration</i>	Very Short and contained on site
	<i>Intensity</i>	Mild re-fuelling takes around an engineered area with spillage containments
	<i>Significance</i>	Low

**Table 20: Solid waste management**

Increased in litter and violating national solid waste management legislation	<i>Status</i>	Negative
	<i>Probability</i>	Improbable; Limited volumes with waste management procedures in place and sources sorting infrastructures for effective solid waste management will be provided
	<i>Confidence</i>	Medium
	<i>Extent</i>	Local (<5 km)
	<i>Duration</i>	Long-term
	<i>Intensity</i>	Negligible
	<i>Significance</i>	Low

**Table 21: Sewage disposal**

Violating waste water standards / discharge permit requirements	<i>Status</i>	Negative
	<i>Probability</i>	Improbable; due to adherence to the already existing protocol and supporting infrastructure
	<i>Confidence</i>	High
	<i>Extent</i>	Site specific (<1 km)
	<i>Duration</i>	Long-term
	<i>Intensity</i>	Negligible
	<i>Significance</i>	Low

**Table 22: Accident**

Fire, accident or spillage of fuel due to increased activities at the WPS Stations	<i>Status</i>	Negative
	<i>Probability</i>	Improbable; There is an Emergence Response Plan (ERP) and additional equipment such as firefighting equipment

<i>Confidence</i>	Medium
<i>Extent</i>	Site specific (<1 km)
<i>Duration</i>	Very Short; fires likely to be rapidly extinguished
<i>Intensity</i>	Mild
<i>Significance</i>	Low

**Table 23: Archaeological, paleontological and historical aspects**

Disturbance / damage of sites of archaeological, historical and/or cultural value during preconstruction and construction of the WPS infrastructure	<i>Status</i>	Negative
	<i>Probability</i>	Unknown, but improbable because the proposed project areas are already disturbed with park management station and other infrastructure
	<i>Confidence</i>	Low; with regard to the value of the archaeological resource as a sound information base is lacking
	<i>Extent</i>	Site Specific
	<i>Duration</i>	Permanent
	<i>Intensity</i>	Very Severe; if archaeological artefacts, cultural or historical sites are destroyed
	<i>Significance</i>	Medium

## 8.8 Risk Assessment of Potential Impacts

### **Risk Assessment Criteria**

The risk assessment has been conducted to identify medium- and high-risk aspects associated with the proposed upgrading of the WPS infrastructure development at Buffalo and Susuwe and that may result in environmentally unacceptable impacts. The risk assessment has been undertaken in accordance to the Anglo American Risk Matrix.

### **Negative Impacts Risk Assessment**

The environmental aspects and their associated negative impacts included as part of the Environmental Impact Assessment of all potential negative impacts associated with the proposed WPS infrastructure development at Buffalo and Susuwe have been assessed as detailed in The faunal and flora loss / disturbances are closely linked to habitat loss directly linked to the proposed project activities, are the key negative impacts with high to medium localized impacts without mitigation and medium to low negative impacts with mitigations.

### **Socio-economic Risk Assessment**

The overall economic gains associated with the proposed upgrading of the WPS infrastructure development at Buffalo and Susuwe resulting in increased WPS operations are made up of employment creation, and improved social services. A significant number of Namibians benefit

from employment opportunities, contractual and local procurement preferential support, the skills transferred, training, awareness raising in various subjects, and other direct and indirect benefits received by the wider society. The employees are from across the country, therefore the gains are widespread and for an extended period, benefiting extended families and various generations.

### **Cumulative Risks Assessment**

The cumulative risks associated with the proposed upgrading of the WPS infrastructure development at Buffalo and Susuwe is negligible from an overall negative contribution prepositives. However, from an overall positive perspective, the cumulative risk assessment outputs are high with potential to not only support the proposed expanded WPS operations with its positive socioeconomic benefits but also support the growth of other sectors such leisure, travel and tourism.

## **9. ANALYSIS OF ALTERNATIVES**

Implementation of the Bwabwata WPS Infrastructure Project is expected to bring benefits through local procurement and provision of short term employment. The creation of employment opportunities through the construction labour based jobs will positively contribute towards the local economic development in the area. Based on the direct and indirect project benefits, a No Project option is not a viable alternative for this project. Considering the fact, the potential project impacts can be avoided or mitigated effectively, the project benefits outweigh the costs in terms of impacts.

## **10. THE GRIEVANCE REDRESS MECHANISM**

During the implementation phase of the project, a person or group of people who are adversely affected, directly or indirectly due to the project activities will register their grievances through the project GRM. The grievances can be related to social issues such as eligibility criteria and entitlements, disruption of services, temporary or permanent loss of livelihoods and other social and cultural issues. Grievances also related to environmental issues such as damage to infrastructure due to construction related vibrations or transportation of raw material, noise, traffic congestions, decrease in quality or quantity of private/ public surface/ ground water resources during drilling of boreholes, damage to home gardens and agricultural lands etc., can be raised. Therefore the project allows those that have a complaint or that feel aggrieved by the project to be able to communicate their concern, complaints and/or grievances through an appropriate process.

To achieve this objective, a GRM has been included in this ESIA for the project (See full GRM in Annex 5). The Complaints Register which will form part of the GRM set out in this ESIA is to be used as part of the project and will provide an accessible, rapid, fair and effective response to concerned stakeholders, especially any vulnerable group who often lack access to formal legal regimes.

While recognizing that many complaints may be resolved immediately, the Complaints Register and GRM set out in this ESIA encourages mutually acceptable resolution of issues as they arise. The GRM set out in this ESIA have been designed to:

- ❖ be a legitimate process that allows for trust to be built between stakeholder groups and assures stakeholders that their concerns will be assessed in a fair and transparent manner;
- ❖ allow simple and streamlined access to the Complaints Register and GRM for all stakeholders and provide adequate assistance for those that may have faced barriers in the past to be able to raise their concerns;
- ❖ provide clear and known procedures for each stage of the GRM processes, and provides clarity on the types of outcomes available to individuals and groups;
- ❖ ensure equitable treatment to all concerned and aggrieved individuals and groups through a consistent, formal approach that, is fair, informed and respectful to a concern, complaints and/or grievances;
- ❖ to provide a transparent approach, by keeping any aggrieved individual/group informed of the progress of their complaint, the information that was used when assessing their complaint and information about the mechanisms that will be used to address it; and
- ❖ enable continuous learning and improvements to the GRM through continued assessment, the learnings may reduce potential complaints and grievances.

Eligibility criteria for the GRM include:

- ❖ Perceived negative economic, social or environmental impact on an individual and/or group, or concern about the potential to cause an impact;
- ❖ clearly specified kind of impact that has occurred or has the potential to occur; and explanation of how the project caused or may cause such impact; and
- ❖ individual and/or group filing of a complaint and/or grievance is impacted, or at risk of being impacted; or the individual and/or group filing a complaint and/or grievance demonstrates that it has authority from an individual and or group that have been or may potentially be impacted on to represent their interest.

Local communities and IP and other interested stakeholders may raise a grievance/complaint at all times to the MEFT or PMU. Affected local communities should be informed about the ESIA provisions, including its grievance mechanism and how to make a complaint.

## **11. CONCLUSIONS**

The results of this impact assessment present the potential for additional negative environmental impacts that can all be mitigated to acceptable levels. The consideration of mitigation measures prior to any project development activities forms part of the initial planning process. In this regard, relevant mitigation measures have been provided and are included in the ESMP section of the report. CNM believes that a thorough assessment of the proposed project has been achieved and that the environmental clearance certificates can be awarded on conditions that the management and mitigation measure in the ESMP are to be implemented successfully.



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