



Excel Dynamic Solutions (Pty) Ltd

ENVIRONMENTAL SCOPING ASSESSMENT (ESA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF ONDONGA COMMUNITY HERITAGE SHRINE AND THE BOTANICAL GARDEN IN ONDONGA VILLAGE WITHIN, OLUKONDA CONSTITUENCY, OSHIKOTO REGION, NAMIBIA

ENVIRONMENTAL ASSESSMENT REPORT:FINAL VERSION

ECC Application Reference: APP- 004793

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EXECUTIVE SUMMARY

The Ondonga Community Heritage Trust (Proponent) plans to construct and operate the Ondonga Community Heritage Shrine, Botanical garden and its associated infrastructure in the Ondonga Traditional jurisdiction; Ondonga Village (coordinates:-17.977173, 16.047278) in Olukonda Constituency ; Oshikoto region. The proposed shrine will cover an area of 11.97 hectares and the botanical garden will cover an area of 7.2 hectares, thus proposed facilities is planned to cover a surface area of 19.17 hectares.

The construction of the proposed sites and its associated facilities form part of the listed activities that may not be undertaken without an Environmental Clearance Certificate (ECC). Thus, the proposed Ondonga Community Heritage Shrine and the Botanical Garden is subjected to an ECC, to be issued by the Ministry of Environment, Forestry and Tourism (MEFT) under the department of Environmental Affairs. Subsequently, to ensure that the proposed activity is compliant with the national environmental legislation, the project Proponent appointed an independent environmental consultant, Excel Dynamic Solutions (Pty) Ltd to undertake the required Environmental Assessment (EA) process and apply for the ECC on their behalf.

The application for the ECC was compiled and submitted to the competent Authority (Ministry of Environment, Forestry and Tourism (MEFT)). Upon submission of an Environmental Scoping Assessment (ESA) Report and Draft Environmental Management Plan (EMP), an ECC for the proposed project will be considered by the Environmental Commissioner at the MEFT's Department of Environmental Affairs and Forestry (DEAF).

Brief Project Description

The proposed methods for the proposed development are divided into the following categories:

- **Phase 1:** Planning phase - The Proponent ensures that the site is legally acquired from the traditional authority and all relevant stakeholders and personnel are informed about the development. Additionally, making sure that all permits and paperwork are complete.

- **Phase 2:** Construction phase - This phase entails the site preparation and construction of the proposed community shrine and its associated infrastructure by a construction contractor appointed by the Proponent. The planned facility will include the Power Stone (*Omulilo goshilongo Shaandongga*), an amphitheater, a traditional house, administration buildings, a caretaker's house, an SME area, staff housing, a campsite, chalets, a restaurant, a conference hall, and an admission building. A botanical garden will also be established adjacent to the shrine. Construction activities will encompass the installation of essential services, such as water supply, electricity, and sewage lines. The construction period is estimated to last between 6 and 14 months and will be limited to weekdays during normal working hours (8:00 AM to 5:00 PM).
- **Phase 3:** Operational phase – This is the phase where the proposed community shrine, botanical garden and its associated infrastructure is in operation with planned activities occurring onsite.

Public Consultation

Public Consultation Activities

Regulation 21 of the EIA Regulations details steps to be taken during a public consultation process and these have been used in guiding this process. The public consultation process assisted the Environmental Consultant in identifying all potential impacts and aided in the process of identifying possible mitigation measures and alternatives to certain project activities. The communication with I&APs about the proposed project was done through the following means and in this order to ensure that the public is notified and afforded an opportunity to comment on the proposed project:

- A Background Information Document (BID) containing brief information about the proposed facility was compiled and distributed by means of email to relevant Authorities, and upon request to all new registered Interested and Affected parties (I&APs).
- Project Environmental Assessment notices were published in The Namibian Newspaper 23 August 2024 and 2 September 2024 briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.

- A consultation meeting was scheduled and held with the I&APs on the 15 October 2024 at the Shrine site in Ondonga village , Olukonda constituency at 12h30. The consultation meeting minutes were recorded.
- No issue was raised regarding the study and the project but rather community members expressed that they are looking forward to the project.

Potential Impacts identified

The following potential positive and negative impacts are anticipated to occur during the construction and operational phase of the proposed development:

Positive impacts:

- A site of historical, cultural and heritage value will be restored and preserved.
- Employment creation and skills transfer
- Facilities will be created to be used for cultural and other activities.
- Attraction of the local and international tourists to the area which will benefit the national and local economy.
- Increase in local, regional and economic development
- Improved support for local businesses through the procurement of locally available goods and services
- Promotes ecological restoration in the area
- Enhances the aesthetic of the landscape.

Negative impacts:

- Physical land / soil disturbance resulting in compaction and erosion (during construction)
- Environmental pollution (littering)
- Impact on local livestock (restricted movement)
- Risk of veld fires
- Health and safety: improper handling of materials and equipment may cause occupational health hazards.
- Potential soil and water resources pollution during construction
- Socio-economic issues (conflicts with locals, vandalism/theft of building materials and associated equipment)
- Potential Damage to Landscape: Litter, erosion, fires,
- Disturbance to livestock during construction

- Potential impact on vegetation (removal) to enable construction activities
- Potential noise during construction
- Air pollution owing to dust generation and fumes/emissions (during construction)
- Impact on archaeological and cultural heritage resources, in the case of any archaeological and heritage finds onsite (inadvertent unearthing during site preparation/excavations).

CONCLUSIONS AND RECOMMENDATIONS

The potential impacts that are anticipated from the proposed development were identified, described, and assessed. For the significant adverse (negative) impacts with a medium rating, appropriate management and mitigation measures were recommended for implementation by the Proponent, their contractors and project-related employees.

The public was consulted as required by the EMA and its 2012 EIA Regulations (Section 21 to 24). This was done via the two local newspapers (New Era and The Namibian) used for this environmental assessment. A consultation through a face-to-face meeting with the I&APs in Ondonga village was conducted, whereby they raised comments and concerns on the proposed development.

The issues and concerns raised by the registered I&APs formed the basis for this Report and the Draft EMP. The issues were addressed and incorporated into this Report whereby mitigation measures have been provided thereof to avoid and/or minimize their significance on the environmental and social components. Most of the potential impacts were found to be of medium rating significance. The effective implementation of the recommended management and mitigation measures will particularly see a reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low). To maintain the desirable rating, the implementation of management and mitigation measures should be monitored by the Proponent directly, or their Environmental Control Officer (ECO) is highly recommended. The monitoring of this implementation will not only be done to maintain the reduced impacts' rating or maintain a low rating but to also ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed right away too.

On this basis, it is the opinion of the Consultant that an ECC should be issued, on conditions that the management and mitigation measures specified in the Environmental Management Plan (EMP) are implemented and adhered to.

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Appendix E: Background Information Document (BID)

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
BID	Background Information Document
CV	Curriculum Vitae
DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EDS	Excel Dynamic Solutions
ESA	Environmental Scoping Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
I&APs	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
PPE	Personal Protective Equipment
Reg	Regulation
S	Section
TOR	Terms of Reference

DEFINITION OF TERMS

Accommodation	Facilities for overnight stay and the services commonly associated therewith, including facilities provided on any premises where camping in caravans, tents or similar devices is allowed.
Alternative	A possible course of action, in place of another that would meet the same purpose and need of the proposal.
Baseline	Work done to collect and interpret information on the condition/trends of the existing environment.
Botanical Garden	A collection of living plants for the purpose of scientific research, conservation, display, and education.
Biophysical	That part of the environment that does not originate with human activities (e.g. biological, physical and chemical processes).
Cumulative Impacts/Effects Assessment	In relation to an activity, means the impact of an activity that in it may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Ecological Processes	Processes play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of evolution).
Environmentally Sustainable Tourism	The development and operation of the tourism industry in such a manner that the assets and attractions on which the industry depends, are protected, and in a particular the safeguarding and maintaining of ecological processes, biodiversity, aesthetic and cultural qualities for the long-term benefit of the tourism industry and Namibia's people.

Environment	As defined in Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.
Environmental Management Plan	As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environments effects are to be mitigated, controlled and monitored.
Interested and Affected Party (I&AP)	In relation to the assessment of a listed activity includes - (a) any person, group of persons or organization interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity. Mitigate - practical measures to reduce adverse impacts. Proponent – as defined in the Environmental Management Act, a person who proposes to undertake a listed activity. Significant impact - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
Fauna	All of the animals found in a given area.
Flora	All of the plants found in a given area.
Mitigation	The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of a proposed action on the affected environment.

Monitoring	Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).
Nomadic Pastoralism	Nomadic pastoralists live in societies in which the husbandry of grazing animals is viewed as an ideal way of making a living and the regular movement of all or part of the society is considered a normal and natural part of life. Pastoral nomadism is commonly found where climatic conditions produce seasonal pastures but cannot support sustained agriculture.
Proponent	Organization (private or public sector) or individual intending to implement a development proposal.
Public Consultation/Involvement	A range of techniques that can be used to inform, consult or interact with stakeholders affected by the proposed activities.
Scoping	An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. Can, also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of site and surroundings and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into full EIA.
Shrine	A sacred space dedicated to a specific deity, ancestor, hero, martyr, saint, daemon, or similar figure of respect, wherein they are venerated or worshipped.
Terms of Reference (ToR)	Written requirements governing full EIA input and implementation, consultations to be held, data to be produced and form/contents of the EIA report. Often produced as an output from scoping.
Tourism	The activities of foreign visitors and Namibian residents travelling to and staying at places outside of their usual environment for

	not more than one year for the purposes of visiting, experiencing and enjoying Namibia's natural, social and self-constructed amenities, and for business and other purposes.
Tourist	Any person who travels to a destination away from his or her normal place of residence for recreational or business purposes.

1 INTRODUCTION

1.1 Project Background

The Ondonga Community Heritage Trust (Proponent) plans to construct and operate the Ondonga Community Heritage Shrine , Botanical garden and its associated infrastructure in Ondonga village (coordinates: **-17.977173, 16.047278**), Olukonda constituency in the Oshikoto region. The proposed sites fall within the Ondonga Traditional jurisdiction. The proposed shrine and its associated facilities will cover an area of 11.97 hectares while the botanical garden (adjacent to the shrine) will cover an area of 7.2 hectares, thus proposed facilities will cover a surface area of 19.17 hectares. The locality map of the proposed projects are shown in **Figure 1**.

The construction of the proposed site and its associated facilities form part of the listed activities that may not be undertaken without an Environmental Clearance Certificate (ECC). Thus, the proposed Ondonga Community Heritage Shrine and the botanical garden are subjected to an ECC, to be issued by the Ministry of Environment, Forestry and Tourism (MEFT) under the department of Environmental Affairs.

In terms of the Environmental Management Act (EMA) No. 07 of 2007, Section 27 (2j), Government Notice No. 29, Section 6 and Government Notice No. 30, the proposed project constitutes a number of listed activities that require an ECC from the Department of Environmental Affairs (DEAF) of MEFT. The relevant listed activities as per EIA regulations are:

- *Tourism Development Activities- The construction of resorts, lodges, hotels or other tourism and hospitality facilities.*
- *Other activities- Construction of cemeteries, camping, leisure and recreation sites.*
- *The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorisation in term of the Forest Act, 2001 (Act No. 12 of 2001) or any other law.*

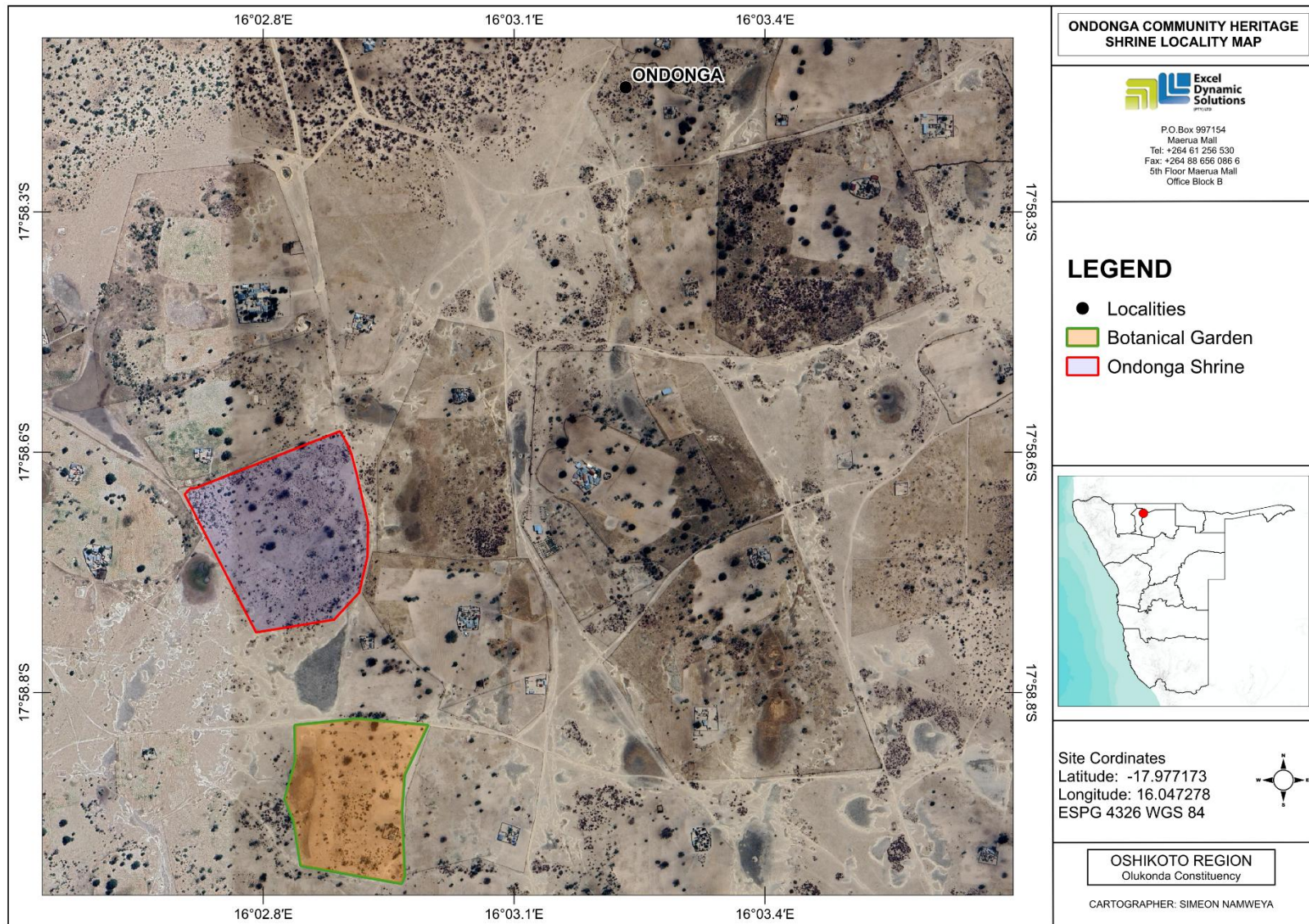


Figure 1: The locality map of the proposed projects in Ondonga village

1.2 Terms of Reference and Scope of Works

Excel Dynamic Solutions (Pty) Ltd (EDS) has been appointed by The Proponent to undertake an environmental assessment (EA), and thereafter, apply for an ECC for the proposed development. There were no formal Terms of Reference (ToR) provided to EDS by the Proponent. The consultant, instead, relied on the requirements of the Environmental Management Act (No. 7 of 2007) (EMA) and its Environmental Impact Assessment (EIA) Regulations (GN. No. 30 of 2012) to conduct the study.

The application for the ECC was compiled and submitted to the Competent Authority (Ministry of Environment, Forestry and Tourism (MEFT)) (**Appendix A**) as the environmental custodian for project registration purposes. Upon submission of an Environmental Scoping Assessment (ESA) Report and Draft Environmental Management Plan (EMP), an ECC for the proposed development will be considered by the Environmental Commissioner at the MEFT's Department of Environmental Affairs and Forestry (DEAF).

1.3 Appointed Environmental Assessment Practitioner

To satisfy the requirements of the EMA and its 2012 EIA Regulations, The Proponent appointed EDS, to conduct the required EA process on their (Proponent's) behalf. The findings of the EA are incorporated into this report and the draft EMP – (**Appendix B**). These documents will be submitted as part of the ECC application to the Environmental Commissioner at the DEAF. The consultation process and reporting are done by Ms. Aili lipinge. Ms. lipinge CV is presented in **Appendix C**.

1.4 Motive of the Proposed Project

The Ondonga Community Heritage Trust, through its leadership structures and under the guidance of His Majesty Tate Omukwaniilwa Filemon Shuumbwa Nangolo, has initiated a cultural revival programme aimed at restoring and preserving the heritage of the Ondonga Kingdom. A key element of this revival is the rehabilitation of the "Ompaampa", the sacred royal

burial site for the kings of Ondonga. As of now, the restoration of all royal graves has commenced, as illustrated in *Figure 2* below.

In line with this initiative, the Trust proposes the construction of a Community Shrine (Memorial Shrine), a Botanical Garden, and associated infrastructure in Ondonga village, located in the Olukonda Constituency of the Oshikoto Region. The shrine will be constructed at the historic *Ompaampa* site of the late Omukwaniilwa Nangolo Dhamutenya, the fifth king of Ondonga, who reigned from 1810 to 1857. He is widely remembered as “*a man of the people.*” The Botanical Garden is planned for development on the land that was traditionally used for wedding ceremonies in the 1960s.

The proposed site will hold significant cultural, educational, and environmental value. It will serve the following purposes:

- **Preservation and Display of Historical Materials:** The site will host a museum for the safe-keeping and exhibition of historical artifacts, traditional utensils, tools, and production implements that represent different generations of Ondonga heritage.
- **Construction of a Shrine for Sacred Items:** A traditional shrine or structure will be built to house culturally significant items, including the revered *power stones* of the Ondonga Traditional Authority.
- **Cultural Repatriation and Reintegration:** The initiative seeks to reintegrate and restore cultural artifacts and fragments that are traditionally part of the Ondonga community’s heritage—whether currently dispersed, lost, or in disuse.
- **Land Restoration and Indigenous Knowledge Promotion:** Through the establishment of a Botanical Garden, the project aims to rehabilitate the land by cultivating indigenous plant species. This will promote environmental sustainability, preserve traditional ecological knowledge, and provide a space for education and medicinal plant research.

This multifaceted project not only honors the legacy of past leaders but also ensures that cultural identity, ecological sustainability, and community education are preserved and passed on to future generations.



Figure 2 the grave “Ompaampa” of late Omukwaniilwa Tatatekulu Nangolo dhAmumutenya.

2 PROJECT DESCRIPTION

The Proponent has obtained the right to build, operate, manage and maintain the proposed construction and operation of the proposed site. The proposed methods for the proposed project are divided into the following categories:

2.1 Pre-development (Site Preparation) Phase

This will include the Proponent ensuring that the appointed contractor has cleared the land in a sustainable and ecological manner and the contractor erecting site offices (the botanical site as there was still a homestead that was in the process of demolishing, as the shrine site have already been cleared and fenced off) and construction equipment storage rooms, and to enable the commencement of the construction phase. This is also the phase where the Proponent ensures that all utilities needed for the development are available if not available. **Figure 3 , 4 , 5** below shows the overview of the site overview of : the Shrine, the botanical garden, and the site layout for the proposed site.



Figure 3 an overview of the shrine site



Figure 4 the existing homestead in site proposed for botanical garden



Figure 5: The architectural design of the proposed shrine

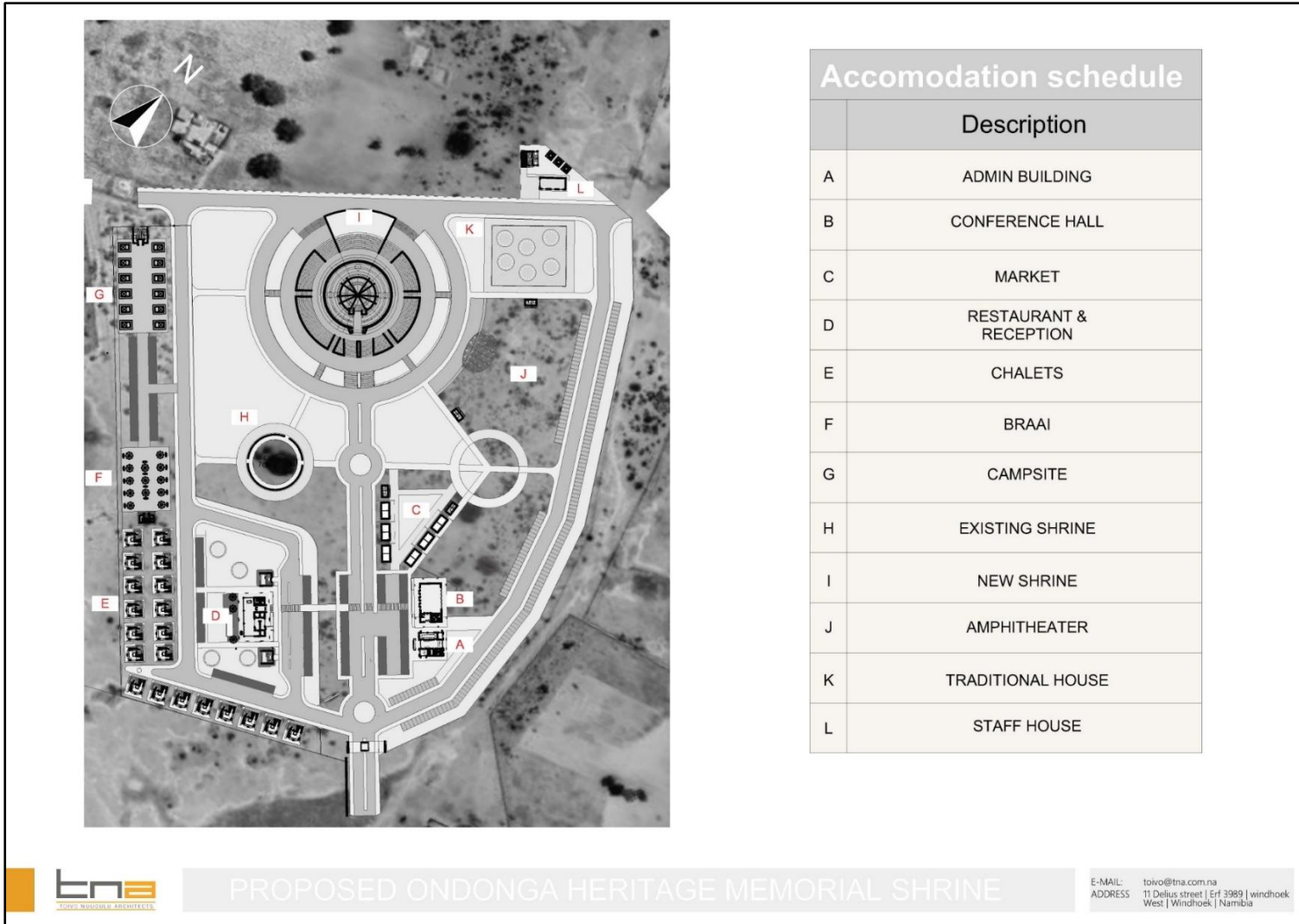


Figure 6 The site layout of the proposed site

2.2 Construction and Operational Phase

This phase will involve the construction of the proposed project by a qualified and experienced contractor/s through following the project building design of the proposed development. The proposed facility will have the Power stone (*Omulilo goshilongo Shaandongga*), amphitheater, traditional house, administration buildings, care taker house, SME area, staff house, campsite, chalets restaurant, conference hall and admission building. There will be the a botanical gardern adjusted to the shrine Construction will also include the installation of services such as water, electricity supply and sewage lines. Other aspects involved during the construction phase include:

2.2.1 Services and Infrastructure

Water: there is a water meter (NAMWATER) on site, thus about 4 000 liters of water will be required per month for construction and domestic activities. This water will be used for cooling down and washing equipment, and ablution and domestic activities. During operation, the proponent will be using around 6 000 liters of water for operation all purposes and other activities such as gardening in a month.

Power supply: Power required during the construction phase will be provided from a diesel generator. About 2,500 litres of diesel will be used per day, a bunded diesel bowser which will be on site, will be filled 2 – 3 times a week by a diesel bowser. During operational phase, the proponent will need to apply for a connection with the NORED office in Ondangwa.

Fuel (diesel for generators and other equipment): The fuel (diesel) required for construction purposes and it will be stored in a tank mounted on a mobile trailer, and drip trays will be readily available on this trailer and monitored to ensure that accidental fuel spills are cleaned up as soon as they have been detected observed. Fuel may also be stored in jerry cans placed on plastic sheeting to avoid unnecessary contamination of the ground.

2.2.2 Accessibility to Site

The proposed development is accessible via the existing road from Ondagwa to Olukonda .Therefore, project related vehicles will be using these existing roads to access the site. It is also anticipated that, if necessary, onsite new tracks to the site may be created. The Proponent may need to do some upgrade on the site access road to ensure that it is fit to accommodate project related vehicles, such as heavy trucks that will supply building equipment and materials and during the operation .

2.2.2 Building Materials

Building materials such as bricks, stones, cements, thatch and mortar are envisioned to be used during the construction phase of the project. Building sand will be sourced from the existing barrow-pit for the proposed development. However, deemed building sands will be sourced from a barrow-pit that does not exist, required permits may need to be acquired from at the relevant authorities.

2.2.3 Waste Management

The site will be equipped with secured waste bins (during the construction and operational phase) for each type of waste (i.e., domestic, hazardous, and recyclable). Depending on the amount generated, waste will be sorted and collected weekly or monthly and taken to the nearest certified landfill site. An agreement will need to be reached with different waste management facility operators/owners and authorization or permits will be obtained prior to utilizing these facilities.

Solid Waste Management: Solid waste for the proposed development will be managed with reverence to the moralities outlined in the hierarchy of waste prevention, re-use and recycle, where waste minimisation and recycling is ideal to waste treatment and disposal.

Hazardous waste: All vehicles, machinery and fuel-consuming equipment onsite will be provided with drip trays to capture potential fuel spills and waste oils.The waste fuel/oils will be carefully stored in a standardized container and disposed of at the nearest approved hazardous waste management facility in the country.

2.2.4 Health and Safety

Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel while on and working at the site. A minimum of five first aid kits will be readily available on-site to attend to potential minor injuries during construction .

Fire management: A minimum of basic firefighting equipment, i.e., four fire extinguishers will be readily available in vehicles, at the working sites and camps.

On-site Workers' Safety: Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel while on and working at site. A minimum of five first aid kits will be readily available on-site to attend to potential minor injuries.

2.2.5 Accommodation

The working personnel will be accommodated near the site for those that are not from the village. The proponent will then have to inform the community members and the headmen before setting them up. Construction activities will take place during daytime only and staff will commute to the site (s) from their place of accommodation.

2.3 Construction Closure Phase

Once the construction phase of the proposed project is completed, the proponent will be required to dismantle and remove the site offices and campsites that were erected during the construction phase of the proposed project. Furthermore, this phase also involves the dismantling all the construction related equipment and the removal of building materials that were leftover during the construction phase of the proposed development.

3 PROJECT ALTERNATIVES

Alternatives are defined as the “different means of meeting the general purpose and requirements of the activity” (EMA, 2007). This section will highlight the different ways in which the project can be undertaken and to identify the alternative that will be the most practical, but least damaging to the environment is identified.

Once the alternatives have been established, these are examined by asking the following three questions:

- What alternatives are technically and economically feasible?
- What are the environmental effects associated with the feasible alternatives?
- What is the rationale for selecting the preferred alternative?

The alternatives considered for the proposed development are discussed in the following subsections.

3.1 Alternatives Considered

The environmental assessment for the proposed development has accommodated the ordeal which might take into consideration. This includes the review of the likelihood of the construction activities. It should be noted that the best alternative option shall be identified to ensure the impacts on the environment and society are minimized. Furthermore, the supplemental construction activities may be considered as another alternative to cater for any impacts that are of serious concern.

4 LEGAL FRAMEWORK: LEGISLATION, POLICIES AND GUIDELINES

This Chapter outlines the regulatory framework applicable to the proposed project. **Table 1** Provides a list of applicable and relevant framework for the project.

4.1 Namibia Tourism Board Act (No. 21 of 2000)

The core objective of this act is to establish the Namibia Tourism Board and to provide for its functions, to provide for the registration and grading of accommodation establishments, to provide for the declaration of any sector of the tourism industry as a regulated sector and for the registration of business falling within a regulated sector; and to provide for matters incidental thereto.

4.2 The Environmental Management Act (No. 7 of 2007)

This EIA was carried out according to the Environmental Management Act (EMA) and its Environmental Impact Assessment (EIA) Regulations (GG No. 4878 GN No. 30).

The EMA has stipulated requirements to complete the required documentation to obtain an Environmental Clearance Certificate (ECC) for permission to undertake certain listed activities. These activities are listed under the following Regulations:

- *Tourism Development Activities- The construction of resorts, lodges, hotels or other tourism and hospitality facilities.*
- *Other activities- Construction of cemeteries, camping, leisure and recreation sites.*
- *The clearance of forest areas, deforestation, afforestation, timber harvesting, or any other related activity that requires authorization in terms of the Forest Act, 2001 (Act No. 12 of 2001) or any other law.*

The Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878) detail requirements for public consultation within a given environmental assessment process (GN 30 S21). The EIA regulations also outline the required details of a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15).

Other legal obligations that are relevant to the proposed activities are presented in Error! Reference source not found..

Table 1: Applicable local, national and international standards, policies and guidelines governing the proposed development

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
The Constitution of the Republic of Namibia, 1990 as amended	<p>The Constitution of the Republic of Namibia (1990 as amended) addresses matters relating to environmental protection and sustainable development. Article 91(c) defines the functions of the Ombudsman to include:</p> <p>“...the duty to investigate complaints concerning the over-utilisation of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia...”</p>	<p>By implementing the environmental management plan, the establishment will be in conformant to the constitution in terms of environmental management and sustainability.</p> <p>Ecological sustainability will be main priority for the proposed development.</p>
Health & Safety Regulations, 10th Draft	<p>Makes provision for the health and safety of persons employed or otherwise present in the development area. These deal with among other matters; clothing and devices; design, use, operation, supervision and control of machinery; fencing and guards; and safety measures during repairs and maintenance.</p>	<p>The Proponent should comply with all these regulations with respect to their employees.</p>
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	<p>Regulation 3(2)(b) states that “No person shall possess [sic] or store any fuel except under authority of a license or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area”</p>	<p>The Proponent should obtain the necessary authorization from the Ministry of Mines and Energy for the storage of fuel on-site.</p>

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
The Regional Councils Act (No. 22 of 1992)	This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning point of view, their duties include, as described in section 28 “to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment.	The relevant Regional Councils are considered to be I&APs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the Oshikoto Regional Council; therefore, they should be consulted regarding any development onsite .
Local Authorities Act No. 23 of 1992	To provide for the determination, for purposes of traditional government, of traditional authority councils; the establishment of such traditional authority councils; and to define the powers, duties and functions of traditional authority councils; and to provide for incidental matters.	The Olukonda Constituency is the responsible local Authority of the area therefore they should be consulted regarding any development onsite.
Water Act 54 of 1956	The Water Resources Management Act 11 of 2013 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force: Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duty of care to prevent pollution (S3 (k)).	The protection (both quality and quantity/abstraction) of water resources should be a priority.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	<p>Provides for control and protection of groundwater (S66 (1), (d (ii))).</p> <p>Liability of clean-up costs after closure/abandonment of an activity (S3 (l)). (l)).</p>	
Water Resources Management Act (No 11 of 2013)	<p>The Act provides for the management, protection, development, use and conservation of water resources; and provides for the regulation and monitoring of water services and to provide for incidental matters. The objects of this Act are to:</p> <p>Ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (Section 68).</p>	
National Heritage Act No. 27 of 2004	<p>To provide for the protection and conservation of places and objects of heritage significance and the registration of such places and objects; to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.</p>	

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
The National Monuments Act (No. 28 of 1969)	The Act enables the proclamation of national monuments and protects archaeological sites.	The Proponent should ensure compliance with these Acts requirements. The necessary management measures and related permitting requirements must be taken. This done by the consulting with the National Heritage Council of Namibia.
Soil Conservation Act (No 76 of 1969)	The Act makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources and resources, through directives declared by the Minister.	Duty of care must be applied to soil conservation and management measures must be included in the EMP.
Public Health Act (No. 36 of 1919)	Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”	The Proponent and all its employees should ensure compliance with the provisions of these legal instruments.
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety of labours.	

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Road Traffic and Transport Act, No. 22 of 1999	The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto. Should the Proponent wish to undertake activities involving road transportation or access onto existing roads, the relevant permits will be required.	Mitigation measures should be provided for, if the roads and traffic impact cannot be avoided, the relevant permits must be applied for.
Labour Act (No. 6 of 1992)	Ministry of Labour (MOL) is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety and enhanced labour market services for the benefit of all Namibians. This ministry insures effective implementation of the Labour Act no. 6 of 1992.	The Proponent should ensure that the development do not compromise the safety and welfare of workers.

4.3 International Policies, Principles, Standards, Treaties and Conventions

The international policies, principles, standards, treaties, and conventions applicable to the project are as listed in **Table 2** below.

Table 2: International Policies, Principles, Standards, Treaties and Convention applicable to the project

Statute	Provisions	Project Implications
Equator Principles	A financial industry benchmark for determining, assessing, and managing	These principles are an attempt to:

Statute	Provisions	Project Implications
	<p>environmental and social risk in projects (August 2013). The Equator Principles have been developed in conjunction with the International Finance Corporation (IFC), to establish an International Standard with which companies must comply with to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The Principles apply to all new project financings globally across all sectors.</p> <p>Principle 1: Review and Categorization</p> <p>Principle 2: Environmental and Social Assessment</p> <p>Principle 3: Applicable Environmental and Social Standards</p> <p>Principle 4: Environmental and Social Management System and Equator Principles Action Plan</p> <p>Principle 5: Stakeholder Engagement</p> <p>Principle 6: Grievance Mechanism</p> <p>Principle 7: Independent Review</p> <p>Principle 8: Covenants</p> <p>Principle 9: Independent Monitoring and Reporting</p> <p>Principle 10: Reporting and Transparency</p>	<p>‘...encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.’</p>
The International Finance Corporation	The International Finance Corporation’s (IFC) Sustainability Framework articulates the Corporation’s strategic commitment to	The Performance Standards are directed towards clients,

Statute	Provisions	Project Implications
(IFC) Performance Standards	<p>sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability.</p> <p>As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires a project Proponents to meet throughout the life of an investment. These standard requirements are briefly described below.</p> <p>Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts</p> <p>Performance Standard 2: Labour and Working Conditions</p> <p>Performance Standard 3: Resource Efficient and Pollution Prevention and Management</p> <p>Performance Standard 4: Community Health and Safety</p>	<p>providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the Client (Borrower) in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives</p>

Statute	Provisions	Project Implications
	<p>Performance Standard 5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement</p> <p>Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p> <p>Performance Standard 7: Indigenous Peoples/Sub-Saharan African Historically Undeserved Traditional Local Communities</p> <p>Performance Standard 8: Cultural Heritage</p> <p>Performance Standard 9: Financial Intermediaries (FIs)</p> <p>Performance Standard 10: Stakeholder Engagement and Information</p> <p>A full description of the IFC Standards can be obtained from</p> <p>http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-social-standards?cq_ck=1522164538151#ess1</p>	<p>to direct the business activities of the Corporation to achieve its overall development objectives.</p>
<p>The United Nations Convention to Combat Desertification (UNCCD) 1992</p>	<p>Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change.</p> <p>The convention objective is to forge a global partnership to reverse and prevent</p>	<p>The project activities should not be such that they contribute to desertification.</p>

Statute	Provisions	Project Implications
	desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability United Nation Convention.	
Convention on Biological Diversity 1992	Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use. Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings.	Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimised
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: “a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.

Relevant international Treaties and Protocols ratified by the Namibian Government

- Convention on International Trade and Endangered Species of Wild Fauna and Flora (CITES), 1973.
- Convention on Biological Diversity, 1992.
- World Heritage Convention, 1972.

5 ENVIRONMENTAL BASELINE

The proposed activities will be undertaken in specific environmental and social conditions. Understanding the pre-project conditions of the environment will aid in providing background "information" on the status quo and future projections of environmental conditions after proposed works on the site has been done. This also helps the EAP in identifying the sensitive environmental features that may need to be protected through the recommendations and effective implementation of mitigation measures provided.

The baseline information presented below is sourced from a variety of sources including reports of studies conducted in the Oshikoto Region. Further information was obtained by the Consultant during the public consultation meeting and during the site visit.

5.1 Biophysical Environment

5.2 Climate

The Oshikoto Region has an annual rainfall average that range from 350 mm in the south-west to 550 mm in the north-east. Usually most of the rain falls between November and April with a peak in February. Temperatures are similar to those reported for Ohangwena region, reaching 45° C in summer, but relatively easy to bear due to high humidity (Mendelsohn, 2003). During April to October, the Oshikoto region does not receive any rain and average minimum temperatures range between 4° and 50° C. In general the summers are hot and winters are mild but the nights are cold.

5.3 Topography

The proposed development is located within the Kalahari Sandveld landscape. This extensive flat area extending over most of northern and eastern Namibia is covered by largely unconsolidated sands of the Kalahari Basin. Additionally Kalahari Sandveld is dominated by the savanna woodland growing on sands deposited by wind over the last 70-65 million years ago (Mendelsohn, 2003). The altitudes ranges between 1, 100 m and 1, 150 m above sea level. **Figure 7** shows the landscape and topography setup of the project area.

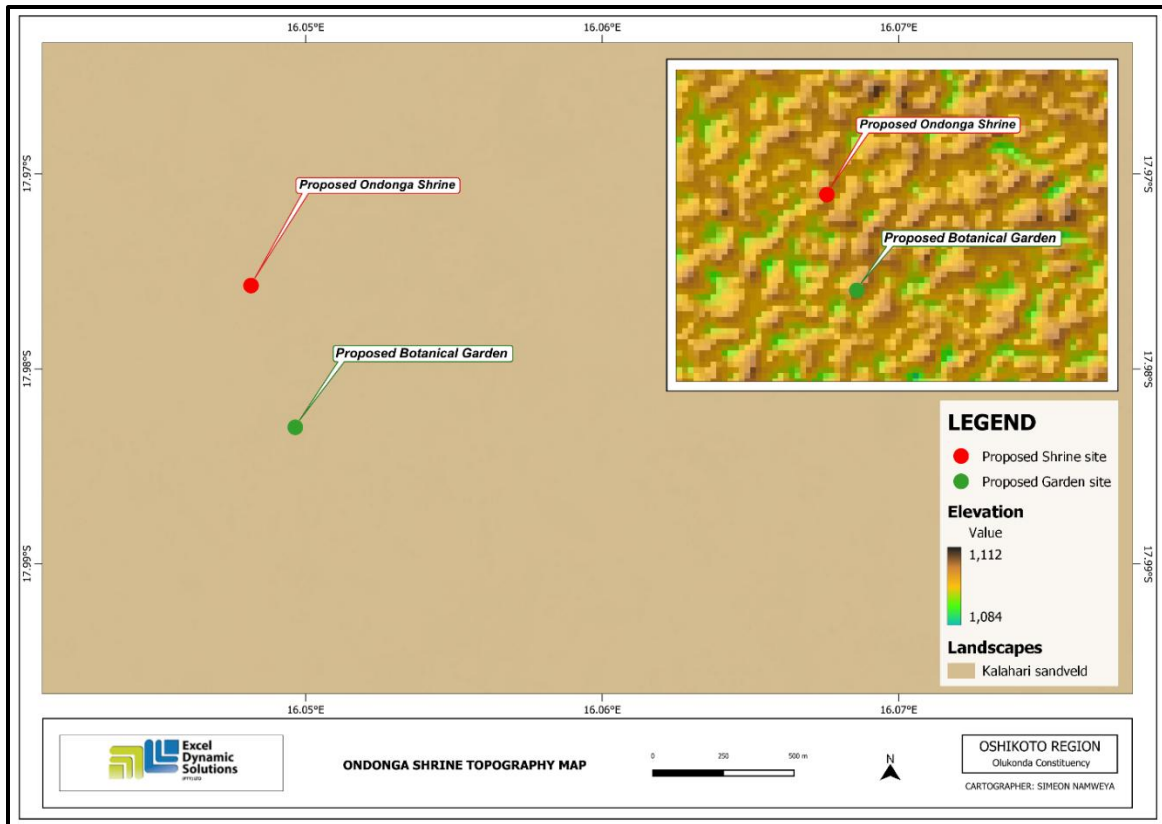


Figure 7: Shows the landscape and topographical of the project area

5.4 Soil

Oshikoto region is found within the north-central part of Namibia. It is predominated by rock types such as Damara sandstone, Otavi dolomites and Nosib quartzite.

In terms of soil type, the region lies within the Northern Kalahari Sandveld, in which the eastern part, is covered by Aeolian Sands and the northern area of the region with parches of Soloneze Soils. The Soloneze soil is a medium textured, bleached or even white. It covers all plains and drainage depressions and has a very low clay content. The sites are Areas bordering Etosha have non-soloneeze soils that are fertile. **Figure 8** shows the soils of the project area.

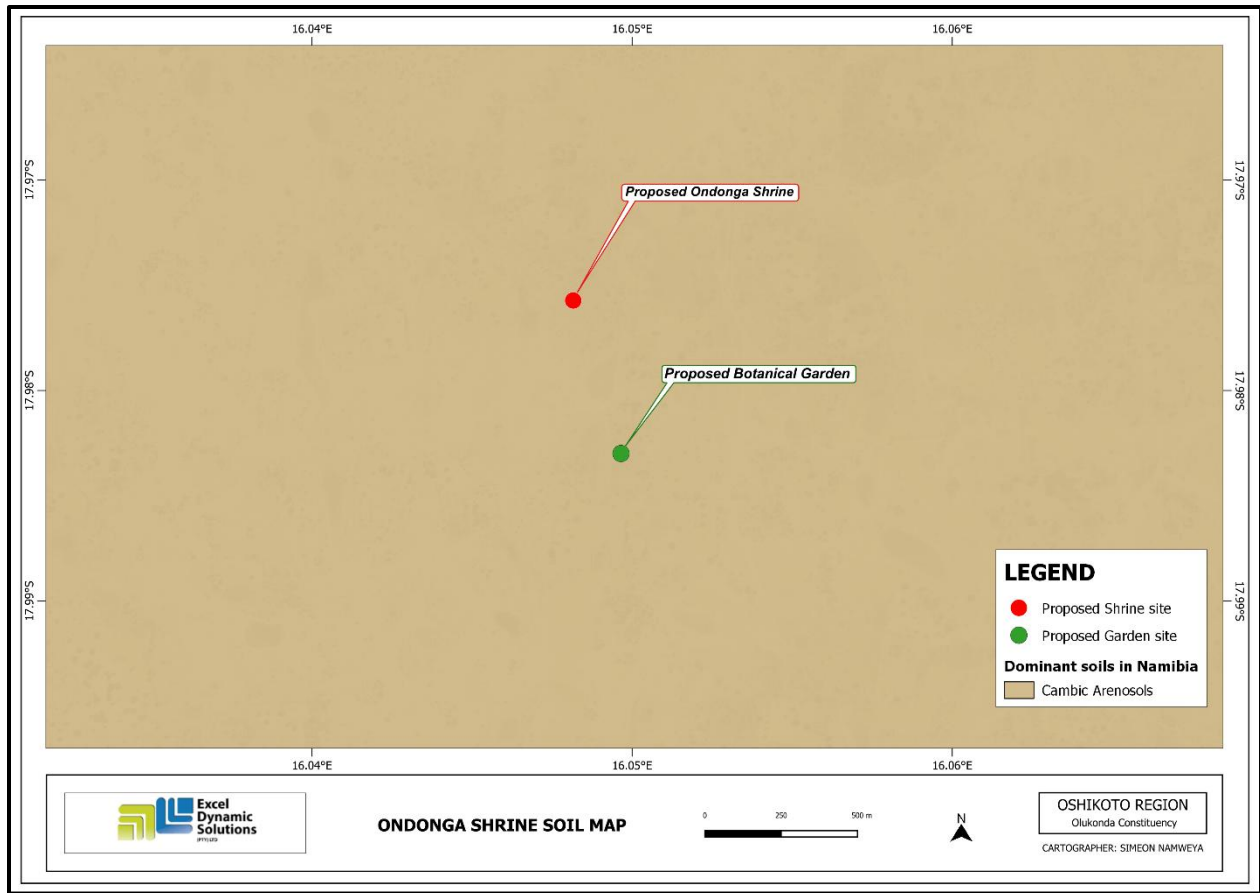


Figure 8: Shows the soils for the proposed project

5.5 Hydrology and Water Resources

With regards to groundwater (hydrogeology), the development is mainly covered by porous aquifer with moderate water storage moderately prone to groundwater pollution. **Figure 9** shows the hydrology map of the proposed site area

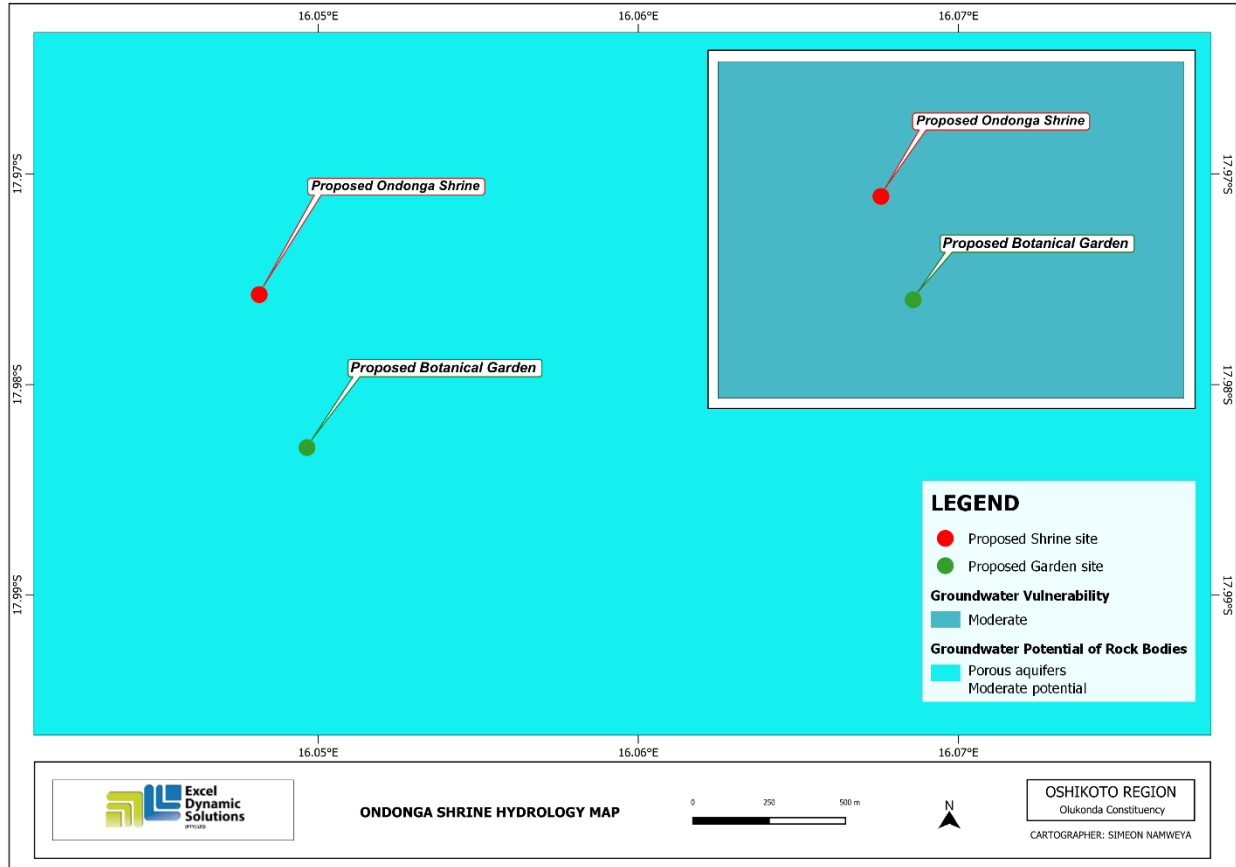


Figure 9 : Shows hydrology map for the proposed development

5.6 Flora and Fauna

Flora

The Oshikoto Region is characterised by extensive woodland (Strohbach, 2000) and (Klaassen & Kwembeya, 2013). The piece of land earmarked for the construction and cleared (the proposed site of the shrine). During the screening assessment, only a few tiny shrubs of *Pechuel-loeschea leubnitziae* (locally known as iizimba), the *Screllocarya birea* (Marurla tree) *Hyphaena petesiana* (Palm tree) and patches of grass specie of *Eragrostis trichophora* were observed. **Figure 9** shows the vegetation structure and coverage for the proposed project.

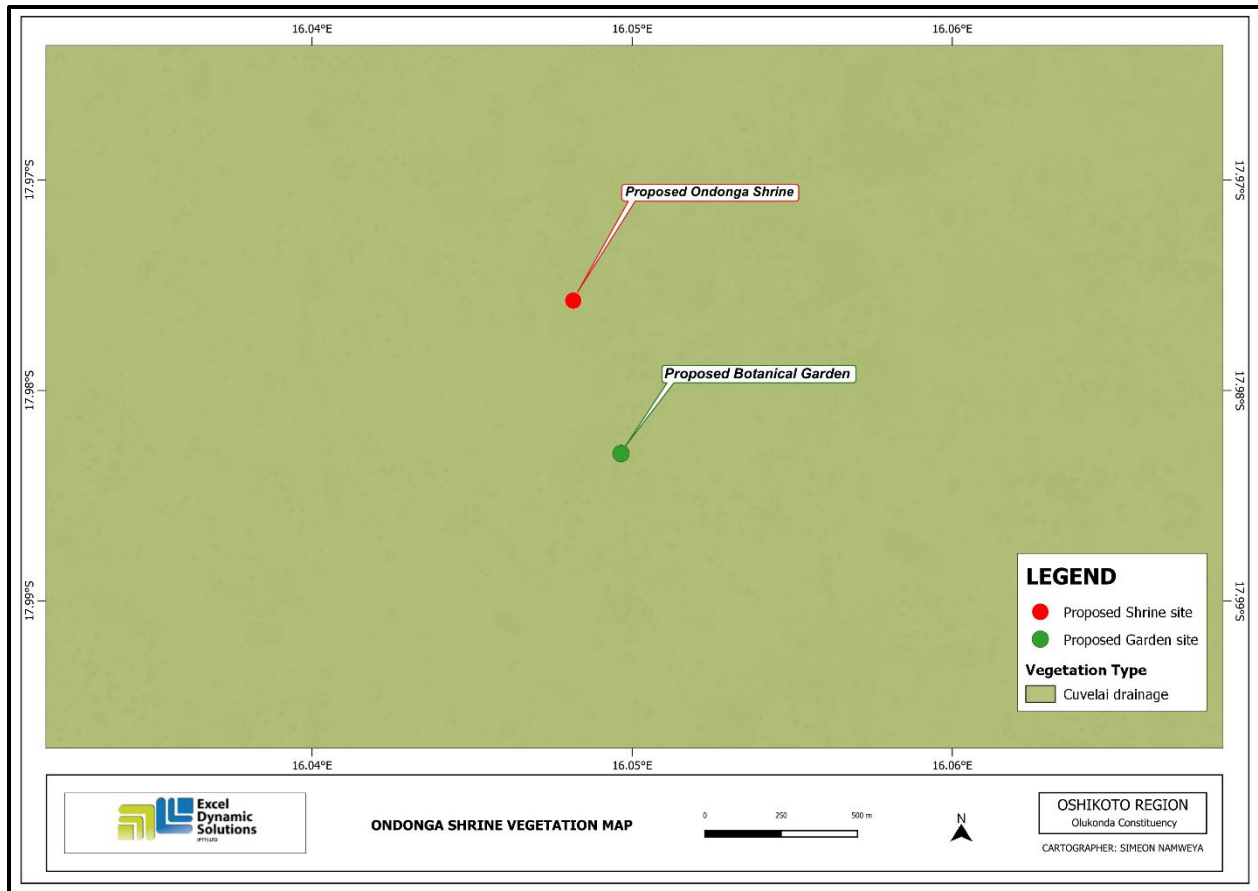


Figure 7: Shows the vegetation cover for the proposed project

Fauna

The project area falls within a communal land (village), residents are practicing subsistence farming with cattle, goats, sheep, chicken and some donkey. Furthermore, due to the flat landscape of the project area, this provide an opportunity which makes a good nesting environment for bird species in the area. However, due to the limited rocks in the area, reptiles and small organisms are limited in the area.

5.7 Heritage and Archaeology

Archaeological sites in Namibia are protected under the National Heritage Act of 2004 (No. 27 of 2004). Evidence shows that the emergence of modern humans and their ancestors have lived in Namibia for more than one million years, and there are fossil remains of lineal hominin ancestors as early as the Miocene Epoch (Kinahan, 2017). Namibia has a relatively complete sequence covering the mid-Pleistocene to the Recent Holocene period, represented by thousands of

archaeological sites mainly concentrated in the central highlands, escarpment, and the Namib Desert.

During the site visit, the consultant observed the grave “Oompampa” of the late Omukwaniilwa Nangolo Dhamutenya within the shrine site . Apart from that there are graves adjacent to the shrine site , making the site archeologically significant .Therefore, it is highly recommended that the National Heritage act, 27 of 2004 should be adhered to on-site, and a qualified archaeologist should always be on standby/call during the setting up of the site to ensure that no archaeological resources that may be discovered on site are affected/ damaged.

5.8 Socio-Economic conditions

Location and Population

Olukonda is a settlement located in the Oshikoto Region of northern Namibia and serves as the district capital of the Olukonda Electoral Constituency. It is a strategically positioned area with both historical significance and modern connectivity, lying in close proximity to the town of Ondangwa, which allows residents to conveniently commute for employment and services.

According to the Namibia Statistics Agency's 2023 Population & Housing Census Preliminary Report, Olukonda Constituency has a total population of 14,318, comprising 6,761 males and 7,557 females. This reflects a significant increase from the 2011 Census, which recorded a population of 9,559, indicating notable demographic growth over the past decade.

The constituency spans a total area of 241.05 square kilometers. Of the population, approximately 76% reside in rural areas, while 24% live in the urbanized Onethindi Settlement Area. The population density of Olukonda stands at 39.6 persons per square kilometer, ranking as the third highest in the Oshikoto Region. This high density is primarily attributed to the concentration of residents in the Oniipa–Onethindi Settlement Area, which straddles both Oniipa and Olukonda Constituencies.

The close geographic proximity to Ondangwa, a major urban center, enhances the constituency's accessibility and economic linkage, particularly for those employed in the town. This makes Olukonda a key location for community-based projects and investments that aim to integrate cultural preservation with socio-economic development

Economic Activities

Agriculture

Agricultural activities are the dominate economic activities in Olukonda constituency. Majority of the households depend directly on agriculture by subsistence farming. Mahangu is the common crop grown in Olukonda.

Business activities

Business is also one of the economic activities in Olukonda constituency with most traders engaged in liquor trading, bricks manufacturing, basket weaving and those in the hospitality industry to accommodate the growing population of Oniipa-Onethindi settlement area.

Potential areas of investment

Potential investment opportunities in Olukonda constituency include enhancement of agricultural production, i.e. Mahangu output and value addition rather than producing on a subsistence basis. Moreover, investment opportunities exist for informal traders such as basket weavers and bricks manufacture to become formalized and competitive through training, capacity building and mentorship programs. Opportunities also exists to market existing tourism attraction places such as Nakambale museum.

Development Infrastructure

Education

Olukonda constituency has a total of 9 schools that comprises of 4 primary schools, 3 combined schools and 2 secondary schools. Olukonda became a very large and developed village.

Health

There are 2 clinics within the constituency, no health centre or district hospital. One of the clinics are close to the Nakambale Museum and also the Lyaangula Centre named after a pastor Efraim Angula with an office for gender equality.

Tourism

Olukonda is known as a tourism attraction constituency with the Nakambale Museum and rest camp affording interesting insights into the activities of the Finnish Mission and few European agents involved with the Aawambo people in pre-colonial times. Nakambale Museum is situated 11 km south west of the Oniipa Town. Visitors can experience local hospitality in the form of traditional food and reconstructed traditional Ndonga homestead. A great variety of museum displays can be viewed and guided tours of the museum are offered. The original Nakambale

mission church, the Nakambale Mission House and the cemetery have been proclaimed as a national monument. Overnight stays in this tranquil rural setting are also available.

6 PUBLIC CONSULTATION PROCESS

Public consultation forms an important component of an Environmental Assessment (EA) process. It provides potential Interested and Affected Parties (I&APs) with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process, thus assisting the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and to what extent further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures. Public consultation for this scoping study has been done in accordance with the EMA and its EIA Regulations.

6.1 Pre-identified and Registered Interested and Affected Parties (I&APs)

Relevant and applicable national, regional, and local authorities, local leaders, and other interested members of the public were identified. Pre-identified I&APs were contacted directly, while other parties who contacted the Consultant after project advertisement notices in the newspapers, were registered as I&APs upon their request. Newspaper advertisements of the proposed development were placed in two widely-read national newspapers in the region (The Namibian Newspaper and New Era Newspaper). The project advertisement/announcement ran for two consecutive weeks inviting members of the public to register as I&APs and submit their comments. The summary of pre-identified and registered I&APs is listed in **Table 3** below and the complete list of I&APs is provided in **Appendix D**.

Table 3: Summary of Interested and Affected Parties (I&APs)

National (Ministries and State-Owned Enterprises)
Ministry of Environment, Forestry and Tourism
Ministry of Health and Social Services
Regional, Local and Traditional Authorities
Oshikoto Regional Council
Olukonda Village Council
General Public
Interested members of the public
Namibia Community Based Tourism Association

6.2 Communication with I&APs

Regulation 21 of the EIA Regulations details the steps to be taken during a public consultation process and these have been used in guiding this process. Communication with I&APs with regards to the proposed development was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the proposed facility was compiled (**Appendix E**) and emailed to relevant Authoritative Ministries, and upon request to all new registered Interested and Affected Parties (I&APs);
- Project Environmental Assessment notices were published in The Namibian Newspaper 23 August 2024 and 2 September 2024 briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- A consultation meeting was scheduled and held with the I&APs on the 15 October 2024 at the shrine site in Ondonga village , Olukonda constituency 12h30. The consultation meeting minutes were recorded.
- The issues and concerns raised were noted and used to form a basis for the ESA Report and EMP.



Figure 8: Public notices placed at a local cuca shop around the proposed



Figure 9: Public meeting occurred in Ondonga village

Issues were raised by affected and interested parties and these issues have been recorded and incorporated in the environmental report and EMP. The summarized issues raised during the public meeting are presented below;

- 1. The community members are in support of the proposed project and they are looking forward to the commencement of the project .**

7 IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION MEASURES

7.1 Impact Identification

Proposed development activities are usually associated with different potential positive and/or negative impacts. For an environmental assessment, the focus is placed mainly on the negative impacts. This is done to ensure that these impacts are addressed by providing adequate mitigation measures such that an impact's significance is brought under control, while maximizing the positive impacts of the development. The potential positive and negative impacts that have been identified from the proposed development activities are listed as follow:

Positive impacts:

- A site of historical, cultural and heritage value will be restored and preserved.
- Employment creation and skills transfer
- Facilities will be created to be used for cultural and other activities.
- Attraction of the local and international tourists to the area which will benefit the national and local economy.
- Increase in local, regional and economic development
- Improved support for local businesses through the procurement of locally available goods and services
- Promotes ecological restoration in the area
- Enhances the aesthetic of the landscape.

Negative impacts:

- Physical land / soil disturbance resulting in compaction and erosion (during construction)
- Environmental pollution (littering)
- Health and safety: improper handling of materials and equipment may cause occupational health hazards.
- Potential soil and water resources pollution during construction
- Socio-economic issues (conflicts with locals, vandalism/theft of building materials and associated equipment)

- Disturbance to livestock during construction
- Potential impact on vegetation (removal) to enable construction activities
- Potential noise during construction
- Air pollution owing to dust generation and fumes/emissions (during construction)
- Impact on archaeological and cultural heritage resources, in the case of any archaeological and heritage finds onsite (inadvertent unearthing during site preparation/excavations).

7.2 Impact Assessment Methodology

The Environmental Assessment process primarily ensures that potential impacts that may occur from project activity are identified, and addressed with environmentally cautious approaches and legal compliance. The impact assessment method used for this project is in accordance with Namibia's Environmental Management Act (No. 7 of 2007) and its Regulations of 2012, as well as the International Finance Corporation (IFC) Performance Standards.

The identified impacts were assessed in terms of scale/extent (spatial scale), duration (temporal scale), magnitude (severity) and probability (likelihood of occurring), as presented in **Table 5**, **Table 6**, **Table 7** and **Table 8**, respectively.

In order to enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable. It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following process will be applied to each potential impact:

- Provision of a brief explanation of the impact;
- Assessment of the pre-mitigation significance of the impact; and
- Description of recommended mitigation measures.

The recommended mitigation measures prescribed for each of the potential impacts contribute toward the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment. The following criteria were applied in this impact assessment:

7.2.1 Extent (spatial scale)

Extent is an indication of the physical and spatial scale of the impact. **Table 5** shows rating of impact in terms of extent of spatial scale.

Table 4: Extent or spatial impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Impact is localized within the site boundary: Site only	Impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond site boundary: Regional	Impact extend National or over international boundaries

7.2.2 Duration

Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project. **Table 6** shows the rating of impact in terms of duration.

Table 5: Duration impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Immediate mitigating measures, immediate progress	Impact is quickly reversible, short term impacts (0-5 years)	Reversible over time; medium term (5-15 years)	Impact is long-term	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources

7.2.3 Intensity, Magnitude / severity

Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. The magnitude of alteration can either be positive or negative. These ratings were also taken into consideration during the assessment of severity. **Table 7** shows the rating of impact in terms of intensity, magnitude or severity.

Table 6: Intensity, magnitude or severity impact rating

Type of criteria	Negative				
	H- (10)	M/H- (8)	M- (6)	M/L- (4)	L- (2)
Qualitative	Very high deterioration, high quantity of deaths, injury of illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	Substantial deterioration, death, illness or injury, loss of habitat / diversity or resource, severe alteration or disturbance of important processes	Moderate deterioration, discomfort, partial loss of habitat / biodiversity or resource, moderate alteration	Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers	Minor deterioration, nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration.

7.2.4 Probability of occurrence

Probability describes the likelihood of the impacts actually occurring. This determination is based on previous experience with similar projects and/or based on professional judgment. **Table 8** shows impact rating in terms of probability of occurrence.

Table 7: Probability of occurrence impact rating

Low (1)	Medium/Low (2)	Medium (3)	Medium/High (4)	High (5)
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.

7.2.5 Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact “without mitigation” is the main determinant of the nature and degree of

mitigation required. As stated in the introduction to this section, for this assessment, the significance of the impact without prescribed mitigation actions is measured.

Once the above factors (**Table 4, Table 5, Table 6 and Table 7**) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

$$\text{SIGNIFICANCE POINTS (SP)} = (\text{MAGNITUDE} + \text{DURATION} + \text{SCALE}) \times \text{PROBABILITY}$$

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate or low significance, based on the following significance rating scale (**Table 9**).

Table 8: Significance rating scale

<i>Significance</i>	<i>Environmental Significance Points</i>	<i>Colour Code</i>
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	1 to 30	L
Neutral	0	N
Low (negative)	-1 to -30	L
Medium (negative)	-30 to -60	M
High (negative)	<-60	H

Positive (+) – Beneficial impact

Negative (-) – Deleterious/ adverse+ Impact

Neutral – Impacts are neither beneficial nor adverse

For an impact with a significance rating of high (-ve), mitigation measures are recommended to reduce the impact to a medium (-ve) or low (-ve) significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation

measures. To maintain a low or medium significance rating, monitoring is recommended for a period of time to enable the confirmation of the significance of the impact as low or medium and under control.

The assessment of the development phases is done for pre-mitigation and post-mitigation.

The risk/impact assessment is driven by three factors:

Source: The cause or source of the contamination.

Pathway: The route taken by the source to reach a given receptor

Receptor: A person, animal, plant, ecosystem, property, or a controlled water source. If contamination is to cause harm or impact, it must reach a receptor.

A pollutant linkage occurs when a source, pathway, and receptor exist together. Mitigation measures aim firstly, to avoid risk and if the risk cannot be avoided, mitigation measures to minimize the impact are recommended. Once mitigation measures have been applied, the identified risk would be reduced to lower significance (Booth, 2011).

The potential negative impacts stemming from the proposed project are described, assessed and mitigation measures in the form of management action plans are provided in the Draft Environmental Management Plan.

7.3 Assessment of Potential Negative Impacts

The main potential negative impacts associated with the operation and maintenance phase are identified and assessed below:

7.3.1 Land Disturbance and Loss of Biodiversity

The project site is located on a fenced-off piece and cleared off area of land (where the shrine will be) and an open area (where the botanical garden will be). Site preparation and construction activities such as site clearing and trenching/pitting plus other earth-moving activities can potentially lead to the disturbance of the land and slight disruption in their habitat can result in extinction (micro-organism) or put them at high risk of being wiped out. The presence and movement of the workforce and construction of project equipment and heavy vehicles would disturb the species. In terms of flora, the dust emissions from land clearing and construction may affect surrounding vegetation through the fall of dust. Some loss of vegetation is an inevitable consequence of the development.

Under the status, the impact can be of a medium significance rating. With the implementation of appropriate mitigation measures, the rating will be reduced to a low significance rating. The impact is assessed in **Table 11** below.

Table 9: Assessment of the impacts of the project on biodiversity

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -3	M: -3	M: -6	M/H: 4	M: -48
Post mitigation	L/M: -2	L/M: -2	L/M: -4	L/M: 2	L: -16

7.3.2 Generation of Dust (Air Quality)

Dust emanating from site access roads when transporting equipment to and from site (time-to-time) may compromise the air quality in the area. Vehicular movements from heavy vehicles such as trucks would potentially create dust even though it is not always so severe. Additionally, activities carried out as part of the construction works would contribute to the dust levels in the air. The medium significance of this impact can be reduced to a low significance rating by properly implementing mitigation measures. The impact is assessed in **Table 12** below.

Table 10: Assessment of the impacts of the project on air quality

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -3	M: -3	M/L: -4	M/H: 4	M: -40
Post mitigation	L - 1	L - 1	L - 2	L - 1	L - 4

7.3.3 Soil and Water Resources Pollution

The proposed project activities are associated with a variety of potential pollution sources (i.e., lubricants, fuel, and wastewater) that may contaminate/pollute soils and eventually groundwater and surface water. The anticipated potential source of pollution to water resources from the project activities would be hydrocarbons (oil) from project vehicles, machinery, and equipment as well as potential wastewater/effluent from construction related activities.

The spills (depending on volumes spilled on the soils) from these machinery, vehicles and equipment could infiltrate into the ground and pollute the fractured or faulted aquifers on site, and with time reach further groundwater systems in the area. However, it should be noted that the scale and extent/footprint of the activities where potential sources of pollution will be handled is relatively small. Therefore, the impact will be moderately low.

Pre-mitigation measure implementation, the impact significance is low to moderate and upon implementation, the significance will be reduced to low. The impact is assessed in **Table 11** below.

Table 11: Assessment of the project impact on soils and water resources (pollution)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	M - 6	M - 3	M - 39
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L - 8

7.3.4 Waste Generation

Domestic and general waste may be produced on-site. To prevent these issues, biodegradable and non-biodegradable wastes must be stored in separate containers and collected regularly for disposal at a recognized landfill/dump site (Ondangwa dumping site and Oshakati landfill). Any hazardous waste that may have an impact on the animals, vegetation, water resources and the general environment should be handled cautiously and disposed off carefully. Without any mitigation measures, the general impact of waste generation has a medium significance. The impact will reduce to low significance, upon implementing the mitigation measures. The assessment of this impact is given in **Table 12**.

Table 12: Assessment of waste generation impact

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	M - 6	M - 3	M - 30
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L - 8

7.3.5 Occupational Health and Safety Risks

Project personnel (workers) involved in the proposed construction activities may be exposed to health and safety risks. These are in terms of accidental injury, owing to either minor (i.e., superficial physical injury) or major (i.e., involving heavy machinery or vehicles) accidents. The site safety of all personnel will be the Proponent’s responsibility and should be adhered to as per the requirements of the Labour Act (No. 11 of 2007) and the Public Health Act (No. 36 of 1919). The heavy vehicle, equipment and fuel storage area should be properly secured to prevent any harm or injury to the Proponent’s personnel or local domestic animals. If machinery and equipment are not properly stored and packed, the safety risk may be a concern for project workers.

The impact is probable and has a medium significance rating. However, with adequate mitigation measures, the impact rating will be reduced to low. This impact is assessed in **Table 13** below and mitigation measures provided.

Table 13: Assessment of the impacts of construction activities on health and safety

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M – 3	M - 6	M/H - 4	M – 48
Post mitigation	L/M - 2	L/M – 2	L - 2	L/M - 2	L - 12

7.3.6 Vehicular Traffic Use and Safety

Depending on the project needs, trucks, and medium and small vehicles will be frequenting the area to and from sites. This would potentially increase slow-moving heavy vehicular traffic along these roads. The impact would not only be felt by the district road users but also the local road users. This would add additional pressure on the roads.

However, only so many times a week or even monthly that construction related heavy trucks will be transporting materials and equipment to the site. Therefore, the risk is anticipated to be short-term, not frequent, and therefore of medium significance. Pre-mitigation, the impact can be rated medium and with the implementation of mitigation measures, the significance will be low as assessed in **Table 14** below.

Table 14: Assessment of the impacts of construction activities on road use (vehicular traffic)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	L/M - 4	M/H - 4	M - 44
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

7.3.7 Noise and vibrations

Construction activities for the proposed project may be a nuisance to surrounding communities due to the noise produced by the activity. Excessive noise and vibrations can be a health risk to workers on site. Equipment used on site is of medium size and the noise level is bound to be limited to the site only, therefore, the impact likelihood is minimal. Without any mitigation, the impact is rated as of medium significance. To change the impact significance from the pre-mitigation significance to low rating, the mitigation measures should be implemented. This impact is assessed in **Table 15** below.

Table 15: Assessment of the impacts of noise and vibrations

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	M - 6	M/H - 3	M - 30
Post mitigation	L - 1	L/M - 2	L - 2	L/M - 2	L - 10

7.3.8 Social Nuisance: Local Property intrusion and Disturbance or Damage

The presence of some workers who are not from the area may lead to social annoyance to the local community. This could particularly be a concern when they or some of those workers enter or damage properties of the locals, private properties of the locals could be houses, fences, vegetation, or domestic or any properties of economic or cultural value to the landowners or occupiers of the land. The damage or disturbance to properties may not only be private but local public properties. The unpermitted and unauthorized entry to private properties may cause clashes between the affected landowners and the Proponent.

Pre-implementation of mitigation measures, the impact is rated as of medium significance. However, upon mitigation (post-mitigation), the significance will change from medium to low rating. The impact is assessed below (**Table 16**).

Table 16: Assessment of social impact of community property damage or disturbance

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M/H - 4	M - 48
Post mitigation	L - 1	L - 1	M/L - 4	M/L - 2	L - 12

7.3.9 Disturbance to Archaeological and Heritage resources

There is a possibility of unveiling/discovering new archeological and/or cultural materials in the proposed project area. If such materials are found, the areas must be mapped, and coordinates taken to establish “No-Go-Areas”, due to their sensitivity; and must be documented. They may be protected either by fencing them off or demarcation for preservation purposes, or excluding them from any development i.e., no exploration activities should be conducted near these recorded areas through establishment of buffer zones.

This impact can be rated as medium significance if there are no mitigation measures in place. Upon implementation of the necessary measures, the impact significance will be reduced to a lower rating. The impact is assessed in **Table 19**.

Table 19: Assessment of impacts of exploration on archaeology & heritage resources

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 5	M/H - 4	M - 4	M/H - 5	M - 52
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

7.3.10 Social Nuisance: Job seeking and Differing Norms, Culture and Values

The proposed project activities could attract a potential influx of people from outside the project area in search of job opportunities. Such influxes during the construction and operational phase may lead to social annoyance to the local community as well as conflicts. This is generally considered a concern, given the current unemployment rate of youth in Namibia. People from other areas/regions may learn of the project intentions through EIA notices in the newspapers and be forced to go look for work opportunities in the area. Different people may come with different ways of living to the area, which could interfere with the local norms, culture, and values. This could potentially lead to social clashes between the locals and outsiders (out-of-area job seekers).

Pre-implementation of mitigation measures, the impact is rated as of medium significance. However, upon mitigation (post-mitigation) – see mitigation measures below, the significance will change from medium to low rating. The impact is assessed in **Table 17** below.

Table 17: Social impact assessment of outsiders' influx into the area (job seeking related)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M/H - 4	M – 48
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

Recommendations measure to reduce the influx of outsiders into the area

- The Proponent should prioritize the employment of more local people, and only if necessary and due to lack of skills in the area, out-of-area people can be given some of the work. This is to avoid the influx of outsiders into the area for works that can be done the locals.
- The workers should be engaged in health talks and training about the dangers of engaging in unprotected sexual relations which results in contracting HIV/AIDS and other sexual related infections.

- Out-of-area workers that may be employed (due to their unique work skills) on site should be sensitized on the importance of respecting the local values and norms, so that they can co-live-in harmony with the local communities during the duration of their employment period on site.

7.4 Mitigations and Recommendations for Construction Closure phase

- The construction closure of the project will include but not limited to the following:
- All the management and mitigation measures provided in the EMP are effectively and progressively implemented.
- All required permits and approvals for the proposed activities should be obtained as required.
- The Proponent and all project workers and contractors must comply with the legal requirements governing the project and ensure that all required permits and or approvals are obtained and renewed as stipulated by the issuing authorities.
- Site areas where construction activities have ceased are rehabilitated, as far as practicable, to their pre-used state.

7.5 Mitigation Measures for the Operation of a Botanical Garden

1. Invasive Species Control

- Avoid planting invasive or non-native species that could spread beyond the garden and threaten local ecosystems.
- Regularly monitor and remove invasive species as part of routine maintenance.

2. Water Management

- Implement water-efficient irrigation systems such as drip irrigation or rainwater harvesting.
- Schedule watering during cooler parts of the day to reduce evaporation and water waste.

3. Use of Indigenous Plants

- Prioritize indigenous and drought-tolerant plant species that are well adapted to the local climate and soil conditions.
- Highlight culturally significant flora to support conservation and education.

4. Soil Protection

- Avoid over-cultivation and compaction of soil through well-defined walking paths and designated planting areas.
- Use organic mulch and compost to improve soil health and reduce erosion.

5. Pest and Disease Management

- Use integrated pest management (IPM) practices that minimize chemical pesticide use.
- Encourage natural predators and maintain plant health to reduce susceptibility to pests.

6. Waste Management

- Ensure proper collection and composting of garden waste.
- Avoid open burning and dispose of non-compostable waste in an environmentally responsible manner.

7. Chemical Use

- Minimize the use of synthetic fertilizers and pesticides.
- Store and apply any necessary chemicals according to environmental and safety regulations.

8. Educational Outreach and Signage

- Provide educational signage to raise awareness about local biodiversity and the importance of conservation.
- Engage visitors in eco-friendly practices, such as staying on designated paths and not picking plants.

8 CONCLUSIONS AND RECOMMENDATIONS

The potential impacts that are anticipated from the proposed project activities were identified, described, and assessed. For the significant adverse (negative) impacts with a medium rating, appropriate management and mitigation measures were recommended for implementation by the Proponent, their contractors and project related employees.

The public was consulted as required by the EMA and its 2012 EIA Regulations (Section 21 to 24). This was done via the two newspapers (New Era and The Namibian) used for this environmental assessment. A consultation through a face-to-face meeting with I&APs in Ondonga Village , in the Olukonda constituency was conducted, whereby they raised comments and concerns on the proposed project activities.

The issues and concern raised by the registered I&APs formed the basis for this Report and the Draft EMP. The issues were addressed and incorporated into this Report whereby mitigation measures have been provided thereof to avoid and/or minimize their significance on the environmental and social components. Most of the potential impacts were found to be of medium rating significance. The effective implementation of the recommended management and mitigation measures will particularly see a reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low). To maintain the desirable rating, the implementation of management and mitigation measures should be monitored by the Proponent directly, or their Environmental Control Officer (ECO) is highly recommended. The monitoring of this implementation will not only be done to maintain the reduced impacts' rating or maintain a low rating but to also ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed right away too.

On this basis, it is the opinion of the Consultant that an ECC should be issued, on conditions that the management and mitigation measures specified in the Environmental Management Plan (EMP) are implemented and adhered to.

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List of plant species in the botanical Garden

Indigenous food-producing plants of Namibia

Trees

<i>Scientific name</i>	Family	English name	Alternative names	Himba name	Edible parts	Nutrients	Drought resistance	Native distribution	Notes	Growth rate
<i>Acacia nilotica</i>	Fabaceae	Gum Arabic Tree			The young pods, young leaves and shoots are used as vegetables. The sprouted seeds are consumed. Medicine for sore throat, cough, chest pains, dysentery and stomach ulcers					
<i>Adansonia digitata</i>	Malvaceae	Baobab	Omakwa, monkey-bread tree, upside-down tree, cream of tartar tree, dead-rat tree	Omuzu	Fruits, leaves. The pulp around the seed is eaten when dry. The pulp is left in water to soften to make a very delicious porridge	Protein, amino-acids, vitamin A, riboflavin, vitamin C; calcium, iron, potassium, magnesium, manganese, molybdenum, phosphorus	Drought resistance	Namibia native		Relatively fast rate of growth. Seeds germinate easily.

<i>Balanites angolensis</i>	Zygophyllaceae	Angola green-thorn		Omutungambara	edible fruit, fencing, roots used to treat breast complaints in nursing mothers					
<i>Bauhinia petersiana</i>	Fabaceae	white bauhinia	koffiebos, muhusi, mupondo	Omutiuk atjipera	Young green pods roasted in ash, and beans eaten ; mature beans roasted and eaten as snacks; roasted beans used as a coffee; roots are roasted, and the root cortex eaten as a 'meat'				? Nitrogen fixer	
<i>Berchemia discolor</i>	Rhamnaceae	Eembe	Bird plum, brown ivory	Omuve	Very sweet fruit; abundant fruits are dried for storage; dry or fresh fruit pulped in water, kernels removed, pulp eaten as porridge, or fermented for beer.	Vitamin C, Potassium, Sugar, Calcium, Magnesium	Drought resistant	Namibia, Angola, Botswana, South Africa	Fruit and bark traditional cure for infertility	60–80 cm/year; Mature tree up to 20 m tall
<i>Boscia albitrunca</i>	Brassicaceae	Shepherd tree	Omunkunzi, Tree of Life	Omutendere	Edible berries (small fruits), roots used to make porridge and a coffee-like drink; flower buds used as caper substitute to make pickle		Hardy and drought-resistant. It is easily propagated and grows from shoot and root cuttings.	Namibia etc.	Roots used to treat hemorrhoids and make beer	

<i>Boscia foetida subsp. foetida</i>	Capparaceae	Stink shepherd's tree	Bushveld shepherds tree, Smelly shepherds tree	Otjinautoni	Edible berries 1 cm in size, roots pounded and made into a porridge.		Grows on rocky, semidesert or dry soil	Namibia	Known for the particularly unpleasant smell of its flowers which appear during early spring, to which its specific name foetida alludes	Small tree 1-3 m high, 3 m wide
<i>Carissa bispinosa</i>	Apocynaceae	Common Num-num			Fruit, sweet when ripe					
<i>Clerodendrum glabrum</i>	Lamiaceae	Smooth Tindewood			Fruit. Treatment of cold, cough and colic. Root used as snake bite remedy. Also used to treat arthritis and rheumatism					
<i>Combretum hereroense</i>	Combretaceae	Mouse-eared Combretum		Omutapati	Edible gum, fruit, dried leaves used in tea, roots used in medicine.					
<i>Commiphora africana</i>	Burseraceae	African Myrrh		Ongareya	sap quenches thirst, gum is edible. Leaves and roots used to treat snake bites.					
<i>Commiphora angolensis</i>	Burseraceae	Sand Corkwood			Fruit, moisture in bark					

<i>Cordia sinensis</i>	Boraginaceae	Grey-leaved Saucer-berry	omusepa, omupombo	Omupombo	Fruit is edible, sweet and abundant; is very sticky, but widely enjoyed. Used to clean teeth.			Namibia, India etc.		Grows up to 9m
<i>Dialium engleranum</i>	Fabaceae	Kalahari podberry	Omufimba, nonsimba, thimba	Omutjimba	Fruit			Namibia		Tree up to 20 m
<i>Diospyros lycioides</i>	Ebenaceae	Bluebush	Star-apple, monkey plum	Omuryambandje	Raw fruit; roasted seeds used to make coffee-like drink		Likes well-drained and rocky soil	Namibia	Roots/twigs used to make toothbrushes; antibacterial; wood used for construction and spoons	Height 3-5 m; produces fruit after 4+ years
<i>Diospyros mespiliformis</i>	Ebenaceae	Jackalberry	African ebony, Jakkalsbesie, Eenyandi, Omwandi	Omuryandi	Fruits used to increase nutritional value of baby porridge. Fruit pulp is soft and very sweet. Normally consumed while fresh. The remaining fruits are dried and consumed at a later time	Vitamin C, carbohydrates, minerals	Drought resistant, grows on sandy soil	Savannahs in the eastern part of the African continent, from Ethiopia to the south of Swaziland	Lemony taste; termite symbiotic (mutualism); leaves, roots and bark have tannin which stops bleeding; roots purge parasites. symbiotic with termites.	Adult tree 4-25 m. fairly slow growing and requires plenty of water to speed up the growth rate
<i>Dombeya rotundifolia</i>	Malvaceae	Wild Pear		Omuryahere	Fruit					
<i>Elaeodendron</i>	Celastraceae	Bushveld Saffron		Omupya	Edible fruit, bark infusion used to treat skin problem					

<i>transvaalense</i>					and relieve stomach cramps. Best grown on lime.					
<i>Erythrina decora</i>	Fabaceae	Namib Coral Tree			Edible beans. Medicine for cough.					
<i>Euclea pseudebenus</i>	Ebenaceae	Ebony guarri	Cape ebony, false ebony, black cape ebony, wild ebony tree, Ebenholzbaum	Omuzema	Fruits are edible when ripe...astringent taste		Drought resistance	Namibia native	Roots and twigs used for toothpicks	
<i>Faidherbia albida</i> , (formerly <i>Acacia albida</i>)	Fabaceae	Ana tree	Acacia albida, apple-ring acacia, gao tree, winter thorn	Omue	Edible seeds and gum			Namibia native		
<i>Ficus capreifolia</i>	Moraceae	River Sandpaper Fig		Omuzuva kuvare	Fruit					
<i>Ficus ilicina</i>	Moraceae	Laurel Fig		Omupendarwa	Small but edible fruit, great in rocky soil					
<i>Ficus sycomorus</i>	Moraceae	Sycamore fig	Fig-mulberry, Omukwiyu	Omukuyu	Fruit			Namibia, Lebanon, most of Africa	Leaves and twigs medicinal	Grows to 20 m tall
<i>Gardenia volkensii</i>	Rubiaceae	Savanna Gardenia		Omundano	Fruit					
<i>Guibourtia coleosperma</i>	Fabaceae	African rosewood	Large false mopane. Omushii, machibi		Fruit to increase nutritional value of infant porridge; The red aril is edible,			Namibia etc.		Up to 20 m

					and soup is made from the arils. Seeds are baked and pounded and cooked as porridge.					
<i>Hyphaene petersiana</i>	Arecaceae	Makalani palm	Real fan palm, Omulunga		Fruit which has liquid similar to coconut milk		Grows in the savannah or in secondary vegetation; it grows on sodic-saline alluvial soils with high water tables	Namibia, South Africa, Botswana etc.	Leaves used as toothbrushes and to weave baskets; fruit used to make liquor	Grows up to 20m tall
<i>Kigelia africana</i>	Bignoniaceae	Sausage tree	Cucumber tree, worsboom		Fruits have to be dried or roasted... poisonous when raw. Seeds can be roasted and eaten.			Namibia etc.		
<i>Kirka acuminata</i>	Kirkiaceae	Common Kirkia		Omuho	sweet sap quenches thirst, roots are chewed to quench thirst. Mountains and rocky outcrops.					
<i>Maerua juncea</i>	Capparidaceae	Rough-skinned bush cherry		Orueti	Fruit					
<i>Maerua schinzii</i>	Capparidaceae	Ringwood	Kringboom	Omuhasuvirua	Fruit					

<i>Manilkara mochisia</i>	Sapotaceae	Lowveld Milkberry			Fruit					
<i>Moringa ovalifolia</i>	Moringaceae	Moringa	Sprokies boom (fairy tale tree)	Omutindi	Pods, leaves, seeds, roots, sap	Potassium, protein, beta carotene	Drought tolerant	Namibia escarpment	Nitrogen fixer, viagra seeds	
<i>Mystroxylo n aethiopicum</i>	Celastraceae	Kooboo berry			Fruit					
<i>Olea europaea subsp. Africana</i>	Oleaceae	Wild Olive		Omuninga	Olives. Leaves are used for tea.					
<i>Ozoroa insignis</i>	Anacardiaceae	African Resin Tree		Omutareka	Fruit					
<i>Pappea capensis</i>	Sapindaceae	Jacket Plum			Edible fruit, can prepare jellies. Oil of seed has similar effect to castor oil.					
<i>Parinari curatellifolia</i>	Chrysobalanaceae	Mobolo plum			Fruit is eaten; this is one of the major southern African fruit trees,		Grows in central Caprivi, and east of that. Not sure how well it will do in more arid env, but well worth a trial	Namibia native		

<i>Piliostigma thonningii</i>	Fabaceae	monkey bread	mupapama , omtuutuu		Pounded pods are nutritious; eaten in times of famine			Namibia	? Nitrogen fixer	
<i>Schinziophyton rautanenii</i> (formerly <i>Ricinodendron rautanenii</i>)	Euphorbiaceae	Mongongo	Manketti nut, Omunkete	Omungeti	Outer flesh/pulp of the fruit is a relish, eaten raw or cooked. The nut/kernel which is rich in Vitamin E, is finely crushed and added to vegetables. The protein content of the nut is nearly 30%	Vitamin E, linoleic acid, erucic acid, nervonic acid , protein, calcium, magnesium	Can withstand several years of drought	northern Namibia, Botswana, Zambia, Zimbabwe	Stores for long periods	
<i>Sclerocarya birrea</i>	Anacardiaceae	Marula	Omwoongo, Omugongo, Umganu, mufula, Inkanyi	Omungongo	Fruits edible, kernels used for oil	Vitamin C, Protein, calcium, magnesium, phosphorus, potassium,	Drought tolerant; grows on sandy and loamy (clay) soils	Subspecies Caffra native to Africa from Ethiopia to SA and Senegal	Traditional flu medicine; fruit harvest Dec-Mar. Three subspecies: birrea, caffra and multifoliolata . Bark has many medicinal uses. Separate male and female trees; a male must be planted in vicinity of females for fruit to develop.	Growth rate of up to 1.5 m per year

<i>Searsia cilata</i>	Anacardiaceae	Sour Karee		Okasauroro	Eible sour fruit					
<i>Searsia quartiniana</i>	Anacardiaceae	Ribver Rhus		Omuryangwari	Fruit					
<i>Sterculia africana</i>	Malvaceae	African Star-chestnut		Omuhako	Edible chest nuts that can be roasted. Need to avoid irritating hairs on fruit capsules.					
<i>Sterculia quinqueloba</i>	Malvaceae	Large-leaved Sterculia		Omuhako	Edible seeds, can be roasted and pounded					
<i>Strychnos cocculoides</i>	Loganiaceae	Corky Monkey orange	Kavango Lemon		Fruit, seeds	Vitamin C, zinc, iron, magnesium	Drought-tolerant	Southern Africa	Taste similar to orange-banana	
<i>Strychnos pungens</i>	Loganiaceae	Spine-leaved monkey-orange	Omupwaka	Omuhuru	Fruit pulp, but seeds poisonous	Citric acid; Mg, Na, Zn, K, and Cu	Drought-tolerant; typically grows in mixed woodland or in rocky places	northern Namibia, South Africa, Botswana	Watch out for the seeds	Adult about 5m tall
<i>Strychnos spinosa</i>	Loganiaceae	Spiny Monkey-orange	Green monkey orange, natal orange, spiny orange, klapper, morapa, Omuuni		Fruit	Vitamin C, Potassium, Sodium	Drought-tolerant	Prefers Bushveld(woodland)... South Africa, Botswana. Also northern Namibia	Medicine for snakebites, low lactation. Green when unripe and ripens to orange	

<i>Syzigium guineense</i>	Myrtaceae	Water pear	Water berry	Omuhomb o	Fruits and Leaves.					
<i>Tamarix usneoides</i>	Tamaricaceae	Wild Tamarisk		Omungwati	Edible pods					
<i>Terminalia prunioides</i>	Combretaceae	Purple-pod Terminalia		Omuhama	Sweet, edible gum, bark chewed and sap swallowed to relieve coughs and sore throat.					
<i>Vachellia erioloba</i> (formerly <i>Acacia erioloba</i>)	Fabaceae	Camel thorn	Giraffe thorn, <i>Acacia erioloba</i>	Omumbonde	Fruit+E16:E30s, pods pulp edible		Very drought hardy		Seeds used to make coffeelike drink	
<i>Vachellia tortilis</i> ssp. <i>heteracantha</i>	Fabaceae	Umbrella thorn acacia	Basterkame eldoring, krulpeul, Afrikaans: haak-en-steek, Hebrew: Shitat ha'sochech	Orupunguya	Pod pulp without the seeds is made into a porridge by the Namibia Topnaar. Gum also edible.		Tolerates drought, wind, salinity and a wide range of soil types	Namibia, Israel, most of Africa	Nitrogen fixer	
<i>Vangueria infausta</i>	Rubiaceae	Medlar	African medlar	Omundjenya	Raw fruit, roasted seeds, fruit dried and stored	Potassium, calcium, phosphorus, magnesium and iron	Drought resistant	Namibia, South Africa, Botswana etc.		
<i>Ximenia americana</i>	Olacaceae	Tallow wood	Hog plum, yellow plum, sea lemon, Oshikukulu	Omuninga	Yellow, orange or red fruit			Namibia	Traditional hair product made from seed oil. Roots, barks and leaves	

									used in traditional medicine	
<i>Ximenia caffra</i>	Olacaceae	Sourplum	Wild plum, large sourplum, mtundakula, mpingi, Oshimbyup eke	Omumbek e	Red fruit edible	Oleic acid, Potassium, protein, vitamin C, amino acids; rich in ascorbic acid	Seedlings vulnerable to drought and animal grazing; adult tree moderately drought tolerant	Namibia	Kernel is edible and is used to make jam. Is rich in protein, and has as much oleic acid as olive oil	
<i>Ziziphus mucronata</i>	Rhamnaceae	Buffalo thorn	Omukekete	Omukaru	Fruit, young leaves			Namibia		Reaches 10 m
Shrubs/ Bushes										
<i>Azima tetraantha</i>	Salvadoraceae	Bee Sting Bush	Four-thorns	Onyarawongwe	Fruit					
<i>Capparis hereroensis</i>	Capparaceae	Namib Caper	Herero caper bush, Siirub		Fruit.					
<i>Commiphora krauseliana</i>	Burseraceae	Feather-leaved Corkwood		Omumbungu	Fruit					
<i>Commiphora pyracanthoides</i>	Burseraceae	Firethorn Corkwood			roots are edible when bark is removed, gum is edible. Elephants may dig up roots.					
<i>Commiphora saxicola</i>	Burseraceae	Rock Corkwood		Omumbo	fruit edible, stem chewed as a thirst quencher, leaf					

					extract has anti-tumor properties					
<i>Diospyros chamaethamnus</i>	Ebenaceae	Sand Apple	Dwarf Jackal-berry		Fruit					
<i>Flueggea virosa</i>	Phyllanthaceae	Whiteberry Bush		Okahunondo	Fruit					
<i>Grewia avellana</i>	Tiliaceae (jute family)	Omukopakopa	Muzunzuvani	Omatakowawatwa	Fruit					Shrub grows up to 2m
<i>Grewia bicolor</i>	Tiliaceae	Two-coloured Grewia			Fruit					
<i>Grewia flava</i>	Tiliaceae (jute family)	velvet raisin bush	omuvapu, ehonga, rupoundu,	Omuvapu	abundant fruit, dry leaves used as a pleasant-tasting health tea, and as a beverage in place of coffee					
<i>Grewia flavescens</i>	Tiliaceae (jute family)	Sandpaper Raisin	Omushe	Omuhe	Fruit					
<i>Grewia Olukondae</i>	Tiliaceae	Soft-leaved raisin		Omuhe	Fruit					
<i>Grewia retinervis</i>	Tiliaceae	Kalahari Raisin Bush		Omuhe	Fruit, sweet taste similar to raisin, good fresh or dried					
<i>Grewia schinzii</i>	Tiliaceae (jute family)	Shaggy Raisin	Omushe	Omuhore	Fruit			Namibia		Grows around 3m high
<i>Grewia subspathulata</i>	Tiliaceae	False Grey Raisin		Omupundukaina	Fruit					
<i>Grewia tenax</i>	Tiliaceae	Small-leaved	White Crossberry	Omundjendjere	Fruit (berry) eaten raw		Grows in semi-	Namibia, India		Shrub up to 2 m tall

		white raisin					desert areas			
<i>Grewia villosa</i>	Tiliaceae	Mallow Raisin		Omanjem bere	Fruit					
<i>Ipomoea adenioides</i>	Convolvulaceae	Trumpet -flower		Omuti- wotjipindo	Edible roots					
<i>Lannea discolor</i>	Anacardiaceae	Live- long		Omundjim une	Fruit. Bark and roots are medicinal.					
<i>Lycium cinereum</i>	Solanaceae	Boxthorn	Bokdoring, kraaldoring, slangbessie , hebrew: Atad		Fruit when ripe			Namibia etc.		
<i>Ochna pulchra</i>	Ochnaceae	peeling bark ochna	muzwe, eruvize, munyelenye le	Eruvize	ripe fruit cooked and eaten; has very high edible oil content - oil is skimmed off boiling fruit and used as cooking and edible oil		drough- resistant			
<i>Parinari capensis</i>	Chrysobalanaceae	Dwarf Mobola Plum	Muchkatapasi		Fruit raw or dried. Juice can be enjoyed or concentrated as a gruel.					
<i>Pygmaeothamnus zeyheri</i>	Rubiaceae	Sand Apple	Goorappel		Fruit, sweet flavor.					
<i>Salacia luebbertii</i>	Celastraceae	Salacia	Okandongo ndongo		Edible fruit		Grows in Kalahari Sand	Namibia etc.	Roots mix used to treat chest pains; leaves as a general medicine; related Salacia species	50 cm bush

									used medically in Indian ayurveda	
<i>Salvadora persica</i>	Salvadora ceae	Toothbrush tree	Salt bush, mustard tree	Omungambu	Raw fruits smell like cress, are edible, but cause diarrhea. Dried fruits are used as a knapsack food for travellers.		drought-resistant	Namibia native	Fruits edible but cause diarrhea	
<i>Searsia pyroides</i>	Anacardiaceae	Firethorn Rhus			Fruit					
<i>Searsia tenuinervis</i>	Anacardiaceae	Kalahari Currant		Omutaareka	Sour edible fruit					
<i>Talinum caffrum & Talinum crispatum</i>	Portulacaceae	Porcupine Root			Fresh leaves are stripped off the stems and eaten directly; or fresh leaves are pounded to make a pesto-like relish					
<i>Tylosema esculenta</i>	Fabaceae	Morama bean			Roasted beans, young roots.		Huge underground tuber develops, drought-resistant	Namibia, Botswana	Young tubers are edible; the beans are delicious. Propagation studies have been done; strong interest in agriculture to make morama beans a commercial species.	

<i>Vangueria cyanescens</i>	Rubiaceae	Kalahari Wild Medlar		Omundjeya	Fruit					
<i>Welwitschia mirabilis</i>	Welwitschiaceae	Welwitschia, tree tumbo		Onyanga	Cone. Indigenous people eat the cone of this plant by eating it raw or baking it in hot ashes. One of its names, onyanga translates to 'onion of the desert'		Endemic to Kaokoveld desert, an area with almost zero rainfall. Populations tend to occur in ephemeral watercourses, indicating a dependence on groundwater in addition to precipitation from fog.	Namib desert	Can grow up over 1,000 years. Only has a single pair of leaves.	Can be grown from seed
Desert vines										
<i>Acanthosicyos horridus</i>	Cucurbitaceae	Nara (!Nara)	Botterpitte	Omungaraha	Namibia's indigenous, edible desert melon		Creates hummocks(hills) in sandy desert,	Namibia only	significant for ecosystem. Provides food for	Grows on wild, communal nara fields.

							but never on stony plains. Can survive many years without water thanks to extensive root system.		many species	Cultivation only beginning to be researched
<i>Acanthosicyos naudinianus</i>	Cucurbitaceae	gemsbok cucumber			ripe fruit consumed raw, or roasted.					
<i>Citrullus ecirrhosus</i>	Cucurbitaceae	Tsamma melon	Namib tsamma, bitter apple		Melon fruit roasted and eaten; seeds edible		desert melon	Namibia	Namibian Ovambo mix oil from the seed with red ochre to make a cosmetic	
<i>Citrullus lanatus</i>	Cucurbitaceae	Tsamma melon	Etanga		Melon eaten ; seeds pounded and eaten. This is the most important species of Tsamma melon				Fruit can be stored for up to 7 months. Note that non-bitter varieties must be selected for cultivation	
<i>Cucumis metuliferus</i>	Cucurbitaceae	African horned cucumber	Jelly melon, spiked melon		Melon eaten, peel sometimes eaten	Peel is rich in vitamin C and fiber, fruit good source of				

						iron, magnesium, water during dry season				
<i>Pergularia daemia</i>	Apocynaceae	Trellis-vine			Leaves eaten in South Africa as a wild spinach. Many medicinal uses				medicinal uses (analgesic, laxative, treats infantile diarrhea, antiparasite etc.)	
<i>Vigna Vexillata</i> (sub sp. <i>Lobatifolia</i>)	Fabaceae	Zombi Pea	Wild cowpea		Edible tubers (used as cover crop)					