

ENVIRONMENTAL IMPACT ASSESSMENT

FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A 410
KWP SOLAR PV PLANT AT THE UNAM OGONGO CAMPUS, OMUSATI
REGION, NAMIBIA



ENVIRONMENTAL SCOPING REPORT

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Acronyms

| TERMS | DEFINITION |
|-----------|--|
| BID | Background Information Document |
| CA | Competent Authorities |
| EAP | Environmental Assessment Practitioners |
| ECC | Environmental Clearance Certificate |
| ECO | Environmental Control Officer |
| EIA | Environmental Impact Assessment |
| ESIA | Environmental and Social Impact Assessment |
| EMP | Environmental Management Plan |
| GDP | Gross Domestic Product |
| GHG | Greenhouse Gasses |
| ISO | International Organization for Standardization |
| I&Aps | Interested and Affected Parties |
| JBIC | Junior Baiano Industrial Consultants |
| MEFT: DEA | Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs |
| PPE | Personal Protective Equipment |

EXECUTIVE SUMMARY

Junior Baiano Industrial Consultants (JBIC) cc has been engaged by the Inceptus Energy (Pty) Ltd to conduct an Environmental Impact Assessment (EIA), develop an Environmental Management Plan (EMP) and apply for an Environmental Clearance Certificate for the Environmental Impact Assessment for the proposed construction and operation of a 410 kWp Solar PV Plant at the UNAM Ogongo Campus, Omusati Region, Namibia. In terms of the Environmental Impact Assessment Regulations 2012, the proposed project triggered the application for an environmental clearance certificate because of the following activities:

Environmental Impacts

- Generation of waste during construction and operation.
- Impacts on vegetation and biodiversity through clearing of land during construction.
- Health and safety impacts during construction and operation.
- Surface and groundwater impacts during construction.

Social and Economic Impacts

- Improved energy supply.
- Creation of much needed employment opportunities
- Facilitation of local and national economic growth
- Utilisation of an energy source (solar) is renewable and low emission. This contrasts with conventional fossil fuels that contribute to pollution and climate change.
- Reduction in foreign energy expenditures.
- An EMP has been developed to mitigate any anticipated possible impacts of the project to the environment.

Public Participation Process

Interested and Affected Parties were notified of the project through site notices and newspaper adverts. All relevant information regarding consultation is covered in Chapter 4 of this document and attached in Appendix A.

Recommendation

Based on the Environmental Assessment it is concluded that most of the impacts identified can be addressed through the recommended mitigation and management actions for both the construction and operation phases of the solar plant. Should the recommendations included in this report and the EMP be implemented the significance of the impacts can be reduced to reasonably acceptable standards and duration. All developments could proceed provided that general mitigation measures as set out are implemented at a minimum.

In this respect it is recommended that the proposed solar plant receives an Environmental Clearance Certificate, provided that the recommendations described in this report and the EMP are implemented.

1 CHAPTER ONE: BACKGROUND

1.1 INTRODUCTION

The University of Namibia (UNAM) has taken an initiative to establish solar plants for its campuses. The Ogongo campus is one of the university's campuses where a 410 kWp solar plant will be established. The campus is strategically located in Omusati Region, the famous Cuvelai-Etoshia Basin of north-central Namibia. It is on a 4,350-ha farm. This large land area offers a unique opportunity to establish the solar plant and allows the university to conduct almost all student field practicals on campus as well as a further opportunity for research and community engagements in agriculture production and the management of natural resources.

The solar energy project will be developed using PV technology to generate electricity to augment the Ogongo campus electrical energy needs. The project will help to decrease the university's dependency on traditional forms of energy by increasing the availability and use of solar energy.

UNAM aims to play its part in supporting the country in meeting its renewable energy target. Namibia is poised to tackle climate change, by establishing a green economy that will drive economic recovery as envisioned for African countries in the African Union Continental Green Recovery Action Plan. In this context, the country has ambitious plans to develop green and blue economies as articulated under the economic advancement pillar of the Harambee Prosperity Plan (HPPII).

The feasibility of these plans is underscored by the abundant availability of sunlight throughout the year and proximity to billions of cubic meters of seawater and vast marine resources in the Atlantic Ocean. Namibia has the potential to capture around 10 hours of strong sunlight per day for 300 days per year. As a result, Namibia has some of the highest solar irradiance potential of any country in Africa, which is sufficient to provide power for the nation and its neighbours (WFC, 2021).

UNAM has engaged Inceptus Energy (Pty) Ltd to undertake the building work of the 410 PV solar plant at the Ogongo campus. The Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012) echoes the need of an Environmental Impact

Assessment (EIA) for new projects (such as the proposed development) that are specified by the Act.

Non-compliance to legal obligations presents liabilities and it is in the wake of the need to attain sustainability that Inceptus Energy (Pty) Ltd has opted to undertake an EIA for the UNAM Ogongo campus proposed solar power plant. EIA is required to obtain an Environmental Clearance Certificate (ECC) from the Ministry of Environment and Tourism (MET) before the project can proceed. In this context the company has set out to conduct the Environmental Impact Assessment (EIA) for its upgrade activities.

The EIA is the official appraisal process to identify, predict, evaluate and justify the ecological, social and related biophysical impacts of the project on both the environment and, affected and interested stakeholders. It provides insight on alternatives and measures to be adopted to prevent or mitigate any impacts/risks that may ensue from the project and its associated activities.

As per the requirements of the Environmental Management Act No. 7 of 2007, Inceptus Energy (Pty) Ltd has appointed JBIC to conduct the EIA and develop an Environmental Management Plan (EMP) for the proposed project. In this respect, this document forms part of the application to be made to the DEA's office for an ECC for the proposed project, in accordance with the guidelines and statutes of the Environmental Management Act No.7 of 2007 and the environmental impacts regulations (GN 30 in GG 4878 of 6 February 2012).

1.2 PROJECT LOCATION

The project site is located on UNAM Ogongo Campus, Omusati Region, Namibia. It is approximately 800 km from the City of Windhoek and mid-way between Oshikuku and Outapi Townships along the C46 highway and roughly 50 kilometers from Oshakati. The GPS coordinates and locality map are shown below.

-17.678432208453902

15.29485706330848

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A 410 KWP SOLAR PV PLANT AT THE UNAM OGONGO CAMPUS, OMUSATI REGION, NAMIBIA

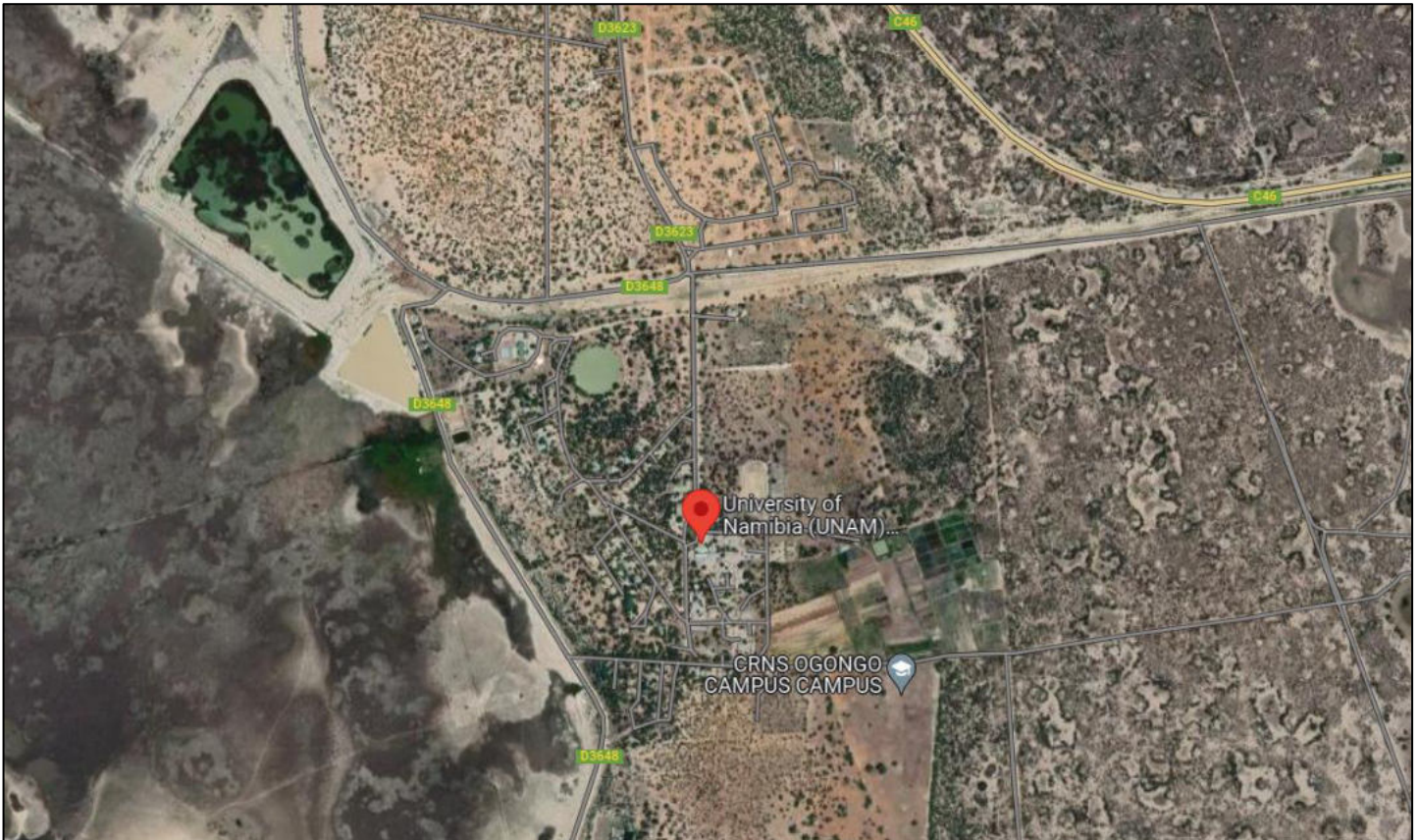




Figure 1-1:Locality map and layout

1.3 PROJECT OVERVIEW

This project entails clearing of about 4600m² of land to accommodate the proposed Solar Power plant, associated infrastructure and services. The proponent intends to install a 410 kWp Solar Plant including a Single Axis Tracker system. It is anticipated that this solar plant will produce approximately 410 kWp which will augment the UNAM Ogongo campus electrical energy needs. Approximately, 230 x 1.2-meter-deep holes will be drilled and they are to be filled with concrete for the foundation work of the tracker system. Trench work is to be done for cables and a security will also be put in place.

The project works involve the construction and operation of a solar PV plant which includes:

- Planning and Design of Project Work – this compasses preliminary site investigations e.g. geotechnical assessments and topographical surveys; permit applications; preparation of site plans/drawings and application of the appropriate approvals from the relevant regulatory authorities; assessment of baseline conditions to determine supply and demand for required project services; carry out EIA and obtain the appropriate approvals; etc.
- Site Preparation – this entails grading, landscaping, building roads and siding of project areas in order to make the sites free of obstruction prior to construction. It may also involve utilization of heavy machinery/equipment to fully prepare the landscape. This includes physically removing vegetation, any pre-existing concrete foundations, etc. By doing this, the sites are prepared for new concrete foundations and other needed site work.
- Building Foundation - once the site landscaping is fully prepared, getting the project areas mapped out for the foundation is the next critical phase before items can be delivered. The breakdown of the foundation process encompasses location of conduits into concrete shelters, placing rock in foundation bed to provide a firm surface for concrete, placing of rebar in framed areas to add extra strength for poured concrete; etc.
- Transportation, Logistics and Construction - site preparation complete and foundation in place, the next important step is preparing for transportation, logistics and construction of the solar plant, transmission lines and other associated infrastructure. This takes into account evaluating all site conditions to make sure they are conducive for the weight of cranes and trucks; planning for transporting very heavy pieces of

equipment; execution and control of the procurement; movement and stationing of personnel, material and other resources; etc.

- Electrical and Grounding - it is necessary to determine and install all necessary electrical and grounding materials needed to power the project areas.
- Operation of the solar power plant.

1.4 ACCESSIBILITY

The site is served by a well-developed road network as shown in the figure below.

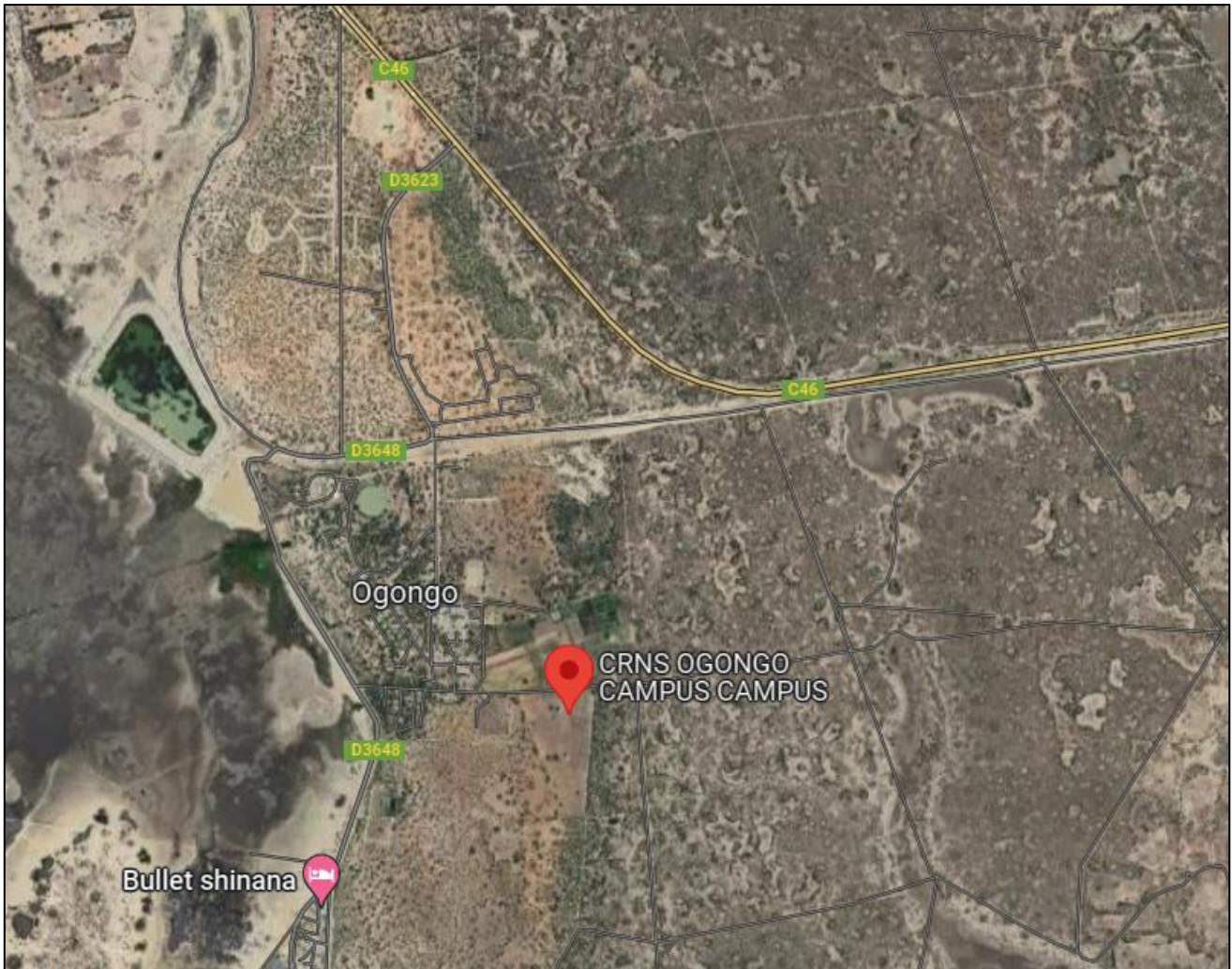


Figure 1-2: Road network in and around the project site

1.5 INFRASTRUCTURE AND SERVICES

The project will make the use of the university's existing domestic water and sewer facilities.

1.6 NEED AND DESIRABILITY

With an average of ten hours of sunshine per day, Namibia is one of the world's sunniest countries. As shown in the graph below, it has enormous potential for solar energy yet, 60% of the country's energy is imported from neighboring countries and 40% of its population is disconnected from the grid (Climate Partner, 2022).

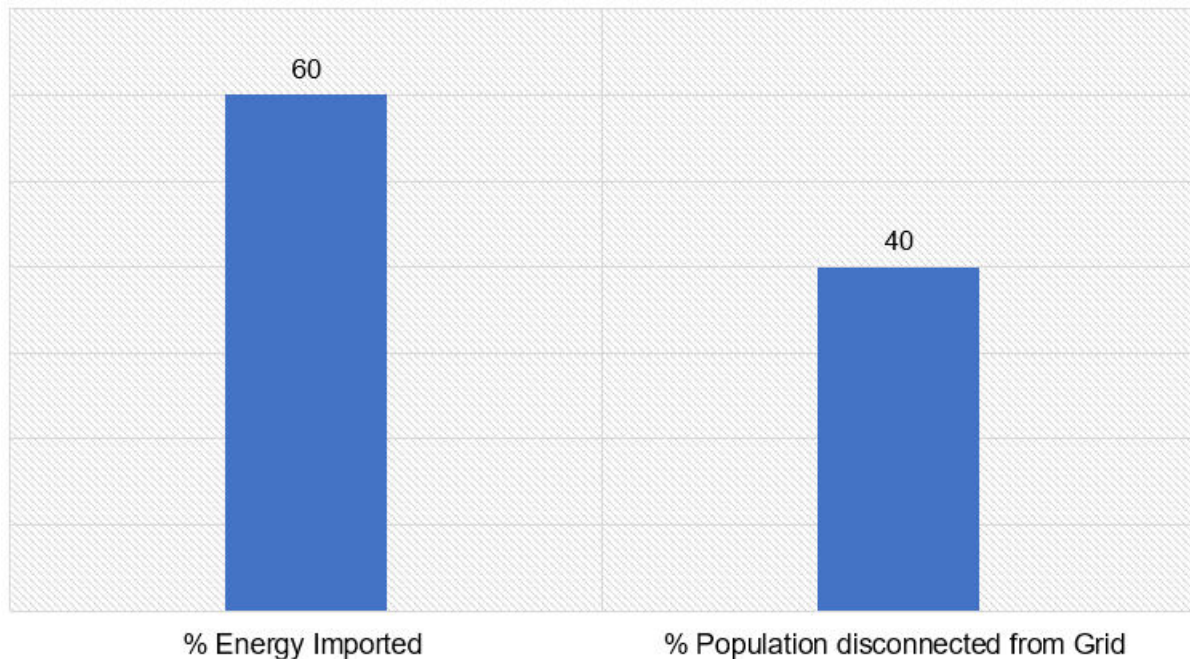


Figure 1-3: % of Energy Import and Disconnected Population

Nonetheless, Namibia has ambitious goals. The Harambee Prosperity Plan (HPPII) articulates ambitious plans to develop green and blue economies in the country. Namibia is uniquely positioned to become the renewable energy hub of the continent and is determined to play a leading role in illustrating how environmentally sustainable business practices can be profitable and transformative undertakings. By 2030, Namibia aims to produce 70% of its energy from renewable energy sources, with independent energy producers feeding renewable energy into its national grid (WEF, 2021).

The Solar PV Plant, is thus a major step in addressing the objectives of the developmental plans and targets of the Namibian government. The project will helping increase the proportion of renewable energy sources in Namibia's energy mix and improve regional and national supply.

1.7 PROJECT ALTERNATIVES

The project will not be implemented if the No-Go option is selected. The no-project alternative would mean that the various potential impacts/risks emanating from the proposed project would not be experienced. Thus the current uses and value and other potential land uses of the site are likely to be retained.

In addition there would no increased pressure on resources such as water which are already under strain. There also would be no increased chances of pollution and other potential negative impacts that would emanate from project activities.

If the project is implemented, it is anticipated that the project will have the following benefits

- Improved energy supply
- Creation of much needed employment opportunities
- Facilitation of local and national economic growth
- Utilization of an energy source (solar) is renewable and low emission. This contrasts with conventional fossil fuels that contribute to pollution and climate change.
- Reduction in foreign energy expenditures.

These benefits will not be realised if the project does not take place. With the current needs in green energy in the region and nation, it is imperative that the solar plant be established. The non-development of the proposed project will furthermore impede economic development and socio-economic progress.

Due to the project's numerous environmental and socio-economic benefits, and that the identified environmental impacts can be suitably mitigated it has been determined that the No Go option can be eliminated. Should the Competent Authorities (CA) refuse the authorisation of the proposed project, the 'No Go' option will be "implemented" and the status quo of the site will remain intact - leaving the site in its present state.

Table 1-1: Other Alternative Considerations

| Item | Description | Alternatives | Comments |
|------|----------------|--|---|
| 1. | Siting | <ul style="list-style-type: none"> • Current site | The only area accessible and authorized for the project is at the UNAM Ogongo Campus. |
| 2. | Transportation | <ul style="list-style-type: none"> • Road • Rail | Given the location of the project road is the most cost-effective means of transport. |

| Item | Description | Alternatives | Comments |
|------|----------------------|--|--|
| 3. | Solid Waste Disposal | <ul style="list-style-type: none"> Construction of a solid waste disposal site at the project site Use of waste disposal site that is being by the university. | The project will make use of the waste disposal site that is being used by the university. |
| 4. | Water and Sanitation | <ul style="list-style-type: none"> University facilities Drilling a Borehole on site Soakaway system | The project will be connected to the campus domestic water and sewer system. |
| 5. | Energy | <ul style="list-style-type: none"> Electricity Solar | Considering investment costs it is cost effective to use electrical energy as an energy source in the initial stages of the project. Solar energy will be used when the project is in its operational phase. |

1.7.1 Conclusion

It is recommended that the project goes ahead, with the construction and operation of a 410 kWp Solar PV Plant at the UNAM Ogongo Campus , Omusati Region, Namibia as a viable option as it is a cost effective and sustainable land use option.

2 CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 INTRODUCTION

This EIA Report for the solar plant has been prepared in reference to identified Namibian laws and regulations that impinge on the project throughout all its phases. Legislation is one of the most important instruments of government that ensures the following:

- Acceptable pollution control and waste management
- Conservation and utilisation of resources
- Sustainable land-use planning and regulation
- Safe and healthy workplace environments
- Determination amongst others things of the rights and responsibilities of individuals and authorities to whom the legislation applies.

The international and national laws, agreements and treaties that govern the social and environmental issues of the project are outlined in the following sub-section. The sub-section take into account brief summarises of selected legislation; it do not seek to provide comprehensive details of all legal obligations that apply to the project but rather an overview.

2.2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The pursuit of sustainability is guided by a sound legislative framework. In this section, relevant legal instruments as well as their relevant provisions have been surveyed. An explanation is provided regarding how these provisions apply to this project.

Table 2-1: Legal Compliance

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|---|---|--|
| The Constitution of the Republic of Namibia (1990) | <p>The articles 91(c) and 95(i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalizing policies to accomplish the sustainable objectives which include:</p> <ul style="list-style-type: none"> • Guarding against overutilization of biological natural resources, • Limiting over-exploitation of non-renewable resources, • Ensuring ecosystem functionality, • Maintain biological diversity. | <p>Through implementation of the environmental management plan the proposed development will be in conformant to the constitution in terms of environmental management and sustainability, through bringing development in an environmentally sensitive way.</p> |
| Vision 2030 and National Development Plans | <p>Namibia’s overall Development ambitions are articulated in the Nations Vision 2030. At the operational level, five-yearly national development plans (NDP’s) are prepared</p> | <p>The proposed energy generation project, is an important element in the</p> |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|---|--|---|
| | <p>in extensive consultations led by the National Planning Commission in the Office of the President. Currently the Government has so far launched a 4th NDP which pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.</p> | <p>industrialisation of the country as well as FDIs in Namibia.</p> |
| <p>Environmental Assessment Policy of Namibia 1994</p> | <p>The Environmental Assessment Policy of Namibia requires that all projects, policies, Programmes, and plans that have detrimental effect on the environment must be accompanied by an EIA. The policy provides a definition to the term “Environment” broadly interpreted to include biophysical, social, economic, cultural, historical and political components and provides reference to the inclusion of alternatives in all projects, policies, programmes and plans.</p> | <p>The construction and operation of the solar farm and transmission line will only commence after being awarded an environmental clearance certificate, thus by abiding to the requirements of the Environmental Assessment Policy of Namibia. The EIA and EMP will cater for the sustainable management of biophysical environment.</p> |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|---|---|---|
| <p>Environmental Management Act No. 07 of 2007</p> | <p>The Act aims at</p> <ul style="list-style-type: none"> • Promoting the sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment; • To provide for a process of assessment and control of projects which may have significant effects on the environment; <p>The Act gives legislative effect to the Environmental Impact Assessment Policy. Moreover, the act also provides procedure for adequate public participation during the environmental assessment process.</p> | <p>This document is compiled in a nature that project implementation is in line with the objectives of the EMA. EIA guiding procedures developed by MET were also used in the course of this project.</p> |
| <p>Electricity Act 4 of 2007</p> | <p>Requires that any generation and or distribution complies with laws relating to health, safety and environmental standards (s 18(4)(b))</p> | <p>Obliges UNAM/Inceptus Energy (Pty) Ltd to comply with all relevant provisions of the EMA and its regulations.</p> |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|--|---|--|
| | In the event that exemption from acquiring a license is granted, the Minister may impose conditions relating to public health safety or the protection of the environment. | |
| The Atomic Energy and Radiation Protection Act, Act 5 of 2005: | Provides for the adequate protection of the environment and of people against the harmful effects of radiation by controlling and regulating the production, processing, handling, use, holding, storage, transport and disposal of radiation sources and radioactive materials, and controlling and regulating prescribed non-ionising radiation sources according to the standards set out by the ICNIRP. | Justifies the need for assessing the impact of electromagnetic radiation from the power line, on the nearby settlements. |
| “Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300GHz)” (April 1998 developed by the | Provides international standards and guidelines for limiting the adverse effects of non-ionising radiation on human health and well-being, and, where appropriate, provides scientifically based advice on non-ionising radiation protection including the provision of guidelines on limiting exposure. | Justifies the need for assessing the impact of electromagnetic radiation from the power line, on the nearby residents. |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|--|---|---|
| <p>International Commission on Non-Ionizing Radiation Protection (ICNIRP)</p> | | |
| <p>Public Health Act (No. 36 of 1919)</p> | <p>Under this act, in section 119: “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.”</p> | <ul style="list-style-type: none"> • The project proponent will ensure that all legal requirements of the project in relation to protection of the health of their employees and surrounding residents is protected. • Personal protective equipment shall be provided for employees in construction. • The development shall follow requirements and specification in relation to water supply and sewerage handling so as not to threaten public health of future residents on this piece of land. |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|---|---|--|
| Soil Conservation Act 76 of 1969 | <p>The objectives of this Act are to:</p> <ul style="list-style-type: none"> • Make provisions for the combating and prevention of soil erosion, • Promote the conservation, protection and improvement of the soil, vegetation, sources and resources of the Republic. | <p>The project will have a rather localized impact on soils and on the soil through clearance for PV panel stands and powerline poles. Soil protection measures will be employed and preservation of trees as much as possible.</p> |
| Nature Conservation Ordinance 1996 | <p>To consolidate and amend the laws relating to the conservation of nature; the establishment of game parks and nature reserves; the control of problem animals; and to provide for matters incidental thereto.</p> | <p>The proposed project implementation is not located in any known or demarcated conservation area, national park or unique environments. The project site was selected with this ordinance in mind to ensure that Namibian nature is conserved.</p> |
| Protected Areas and Wildlife Management Bill | <p>This bill, when it comes into force, will replace the Nature Conservation Ordinance 4 of 1975. The bill recognizes that biological diversity must be maintained, and where</p> | <p>Environmental recommendations and considerations on this project has ensured that the proposed activities will</p> |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|---|---|---|
| | <p>necessary, rehabilitated and that essential ecological processes and life support systems be maintained. It protects all indigenous species and control the exploitation of all plants and wildlife.</p> | <p>not fall within the boundaries of any protected area and that the project will not affect heavily endangered vegetation and animals on its site.</p> |
| <p>Forest Act, 2001 (Act No. 12 of 2001)</p> | <p>The Act gives provision for the protection of various plant species through the Ministry of Agriculture, Water and Forestry (MAWF), Directorate of Forestry).</p> | <ul style="list-style-type: none"> • Land clearing of an extensive piece of land will be done upon approval from the Directorate of Forestry. • The proponent will also have to ensure that there is no indiscriminate cutting down of trees during construction and operation • The proposed site is sparsely vegetated with white thorn tree species, which are not threatened or protected. |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|--|---|---|
| National Rangeland Policy and Strategy, 2012 | The policy aims at enabling resource users (farmers and managers) to manage their rangeland resources in a sustainable manner and sustainable in that they are economically viable, socially acceptable, environmentally friendly and politically conducive. | This proposed project will ensure that the local community benefits both economically and socially from the project, this in line with the recently declared Harambee Prosperity Plan and NDP 4&5. |
| National Biodiversity Strategy and Action Plan (NBSAP2) | The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia putting together management of matters to do with ecosystems protection, biosafety, biosystematics protection on both terrestrial and aquatic systems. | <ul style="list-style-type: none"> • The project proponent has been advised by JBIC and recognises the need for ecosystems protection to manage the changing climatic environment. • This project is one of the drivers to reduce the rate of global environmental change given its contribution, to decreased use of burning fossil fuels for energy generation. |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|--|---|--|
| National Policy on Climate Change for Namibia, 2010 | In harmony with the findings of the IPCC over time and the Earth Summits held annually, the policy seeks to outline a coherent, transparent and inclusive framework on climate risk management in accordance with Namibia’s national development agenda, legal framework, and in recognition of environmental constraints and vulnerability. Furthermore, the policy pursues the strengthening of national capacities to reduce climate change risk and build resilience for any climate change shocks. | Solar energy harnessing technologies are a positive impact to fighting climate change, thus this development is a positive step towards climate smart energy generation and environmental sustainability. |
| Wetland Policy, 2004 | The policy provides a platform for the conservation and wise use of wetlands, thus promoting inter-generational equity regarding wetland resource utilization. Furthermore, it facilitates the Nation’s efforts to meet its commitments as a signatory to the International Convention on Wetlands (Ramsar) and other Multinational Environmental Agreements (MEA’s). | <ul style="list-style-type: none"> • In compliance to this Policy, the development will ensure a standard environmental planning such that it does not affect any wetlands within its locale through recognition of wetlands to promote the |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|---|--|---|
| | | <p>conservation and wise utilization of wetlands resources.</p> <ul style="list-style-type: none"> • Runoff from the project site is to be controlled so as to prevent pollution of surrounding water bodies. |
| <p>Water Resources Management Act, 2013 (Act No. 11 of 2013)</p> | <p>This Act provides for the management, protection, development, use and conservation of water resources. This also forms the regulation and monitoring of water resources.</p> | <p>Water supply will be obtained from either boreholes or the nearby . Appropriate water abstraction permits are to be obtained before is drawn from either of the two water sources.</p> |
| <p>National Heritage Act 27 of 2004</p> | <p>Heritage resources to be conserved in development.</p> | <ul style="list-style-type: none"> • Any graves or areas of natural/cultural heritage significance that are close to the project site are to be fenced off so that they are not disturbed by the project operations. |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|--|--|--|
| | | <ul style="list-style-type: none"> • During the project implementation as soon as objects of cultural and heritage interests are observed such as graves, artefacts and any other object believed to be older than 50 years, all measures will be taken to protect these objects until the National Heritage Council of Namibia have been informed, and approval to proceed with the operations granted accordingly by the Council. |
| <p>National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979</p> | <p>“No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia:</p> <p>(a) any meteorite or fossil; or</p> <p>(b) any drawing or painting on stone or a petroglyph known or commonly believed to have been</p> | <p>The proposed site of development is not within any known monument site both movable or immovable as specified in the Act, however in such an instance that any material or sites or archeologic</p> |

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|---|---|--|
| | <p>executed by any people who inhabited or visited Namibia before the year 1900 AD; or</p> <p>(c) any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph (b); or</p> <p>(d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or</p> <p>(e) any other archaeological or palaeontological finds, material or object; except under the authority of and in accordance with a permit issued under this section.</p> | <p>importance are identified, it will be the responsibility of the developer to take the required route and notify the relevant commission.</p> |
| <p>Pollution Control and Waste Management Bill</p> | <p>This bill has not come into force. Amongst others, the bill aims to “prevent and regulate the discharge of pollutants to the air, water and land” Of particular reference to the Project is: Section 21 “(1) Subject to sub-section (4) and</p> | <p>To control air, water and land pollution as agitated by the Act the proponent will ensure that the project site will have approved drainage on site as well as standard conservancy tanks that do not</p> |

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A 410 KWP SOLAR PV PLANT AT THE UNAM OGONGO CAMPUS, OMUSATI REGION, NAMIBIA

| LEGISLATION/POLICY/ GUIDING DOCUMENT | PROVISION | PROJECT IMPLICATION |
|---|--|--|
| | <p>section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse.”</p> <p>Section 55 “(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment.”</p> | <p>threaten public health, adding on an integrated pollution management strategy following the EMP provided herein.</p> |
| <p>Convention on Biological Diversity (CBD)</p> | <p>Namibia is a signatory of the Convention on Biological Diversity and thus is obliged to conserve its biodiversity.</p> | <p>The project will preserve flora and fauna species as part of the project plans.</p> |
| <p>United Nations Convention to combat Desertification</p> | <p>Namibia is bound to prevent excessive land degradation that may threaten livelihoods.</p> | <p>It will be the responsibility of the proponent to conserve vegetation on and around the area, to avoid encroachment of the desert environs in the area.</p> |

3 CHAPTER THREE: RECEIVING ENVIRONMENT

3.1 SOCIO-ECONOMIC

The project is located in Ogongo constituency in the Omusati region (see Figure below). According to Namibia Statistics Agency (2011), the population of the constituency has a population of approximately 19,000 people.

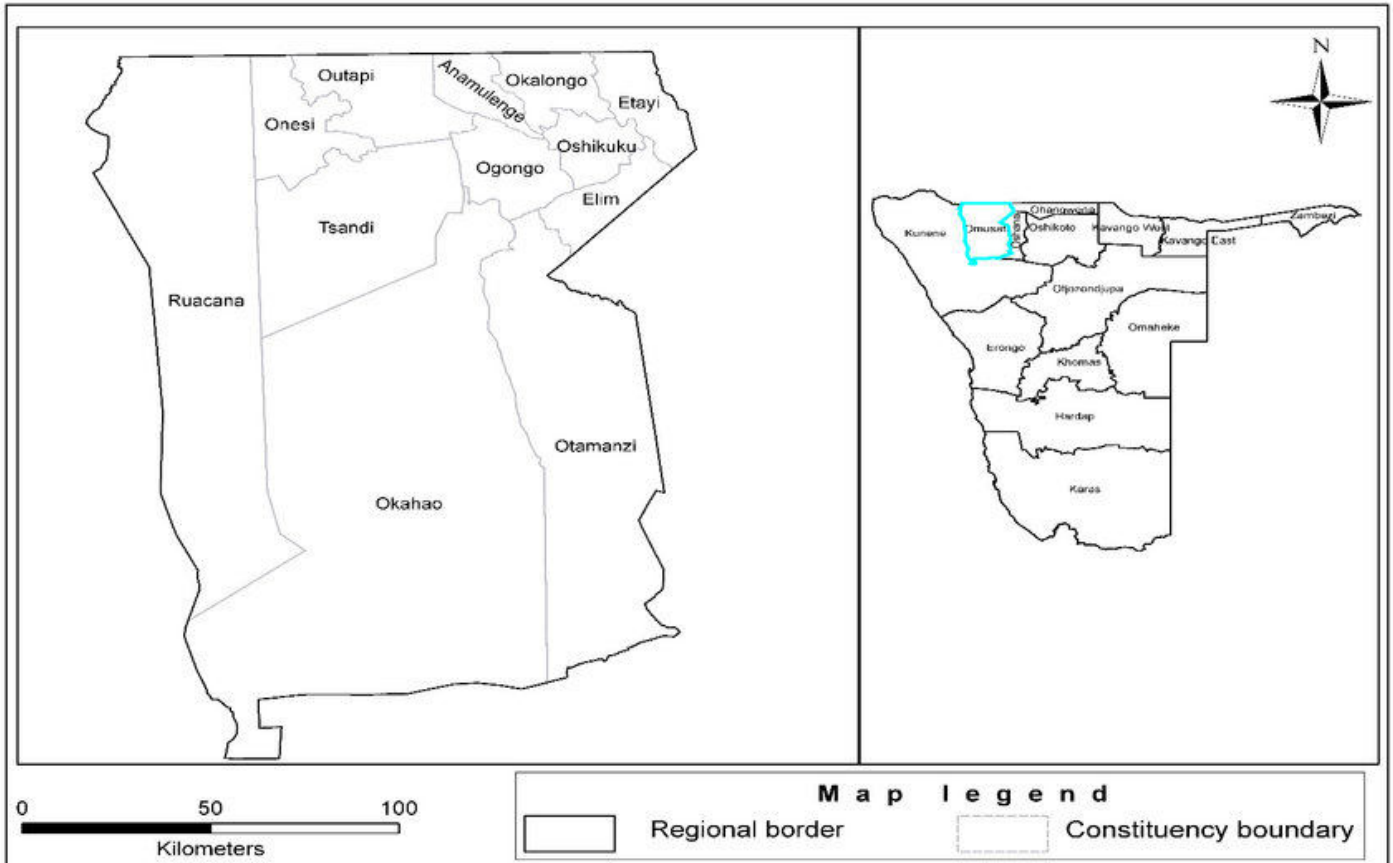


Figure 3-1: Region

The northern part of Omusati is far more densely populated than the south, where the grazing is of poor quality and the water is generally saline. This is predominantly an agricultural region in which mahangu is cultivated successfully. A canal carries water from the Ruacana river to Oshakati, passing through Outapi. Water from this canal has been used to irrigate a large, government-run farm at Etunda where crops from maize, vegetables and fruits are grown. The electrical network covers towns including Outapi, Ruacana, Tsandi, Oshikuku, and Okahao. The region is traversed by a high standard trunk road which provides a direct link to adjacent regions and the rest of the country. Although passenger and freight transport along this route is easy, the rest of this road network, in common with all the communal areas of northern Namibia, is of poor quality. Okahao and Outapi both have District hospitals, and a network of clinics provides basic services. Only 17% of households

in Omusati have access to improved sanitation (toilet facilities). According to the 2012 Namibia Labour Force Survey, unemployment in the Region is 28.9%. Omusati has 274 schools with a total of 86,365 pupils. Common sources of income include sale of livestock, weaving traditional handcrafts, selling grass, roots, tubers and fruits from the veldt, sale of amarula oils, brewing local beer, and trading. Pensions, salaries, and government grants are also sources of incomes for some categories of people. Most of the population in the Ogongo Constituency are engaging in livestock farming, especially cattle, goats, and sheep. This is attributable to the fact that the area consists of forestry. However, most of the people are involved in crop farming, particularly producing mahangu. Most parts of the Constituency are covered by trees which are usually used for constructing cultural household infrastructure.

There are few shops and cuca shops which provide essential goods and services to residents. About 50 percent of the Constituency is electrified, mostly at schools and health facilities as well as private facilities. The NamWater and Rural Water Supply pipelines supply water in the Constituency. The public institutions and households in the radius of 10 km are connected to these pipes. Other inhabitants are using wells and earth dams as the only sources of potable water. The water canal is available for livestock and irrigation, especially for small gardening. There is a District Hospital and 5 clinics which serve the communities within and around the Constituency. There are 9 combined schools and 1 primary school, as well as 2 tertiary institutions, namely the University of Namibia Ogongo Campus and Marcopolo Vocational Training. There is 1 sub-Police Station and a MTC's network coverage in the Constituency. There are two gravel roads in the Constituency, namely the Outapi-Okahao and Ogongo Olundjinda roads. The only financial services available are those rendered by Nampost. Hence, residents travel to neighboring Constituencies to get access to financial services from the First National Bank (FNB), Bank Windhoek and Standard Bank. There is also an Ogongo Game Park, which is part of Ogongo Campus of the University of Namibia. It consists of 1000 hectares. The Camp has variety of bird species, including ostriches and other games such as zebras, giraffes, springboks and oryx etc.

Unemployment in Omusati was estimated at 35.6 %, which implies that the dependency ratio is relatively high. Extrapolating from the national unemployment statistics, the constituency has an unemployment rate of 33.40% and youth unemployment rate of 46.10% (Namibia Central Bureau of Statistics, 2019). This shown in the figure below.

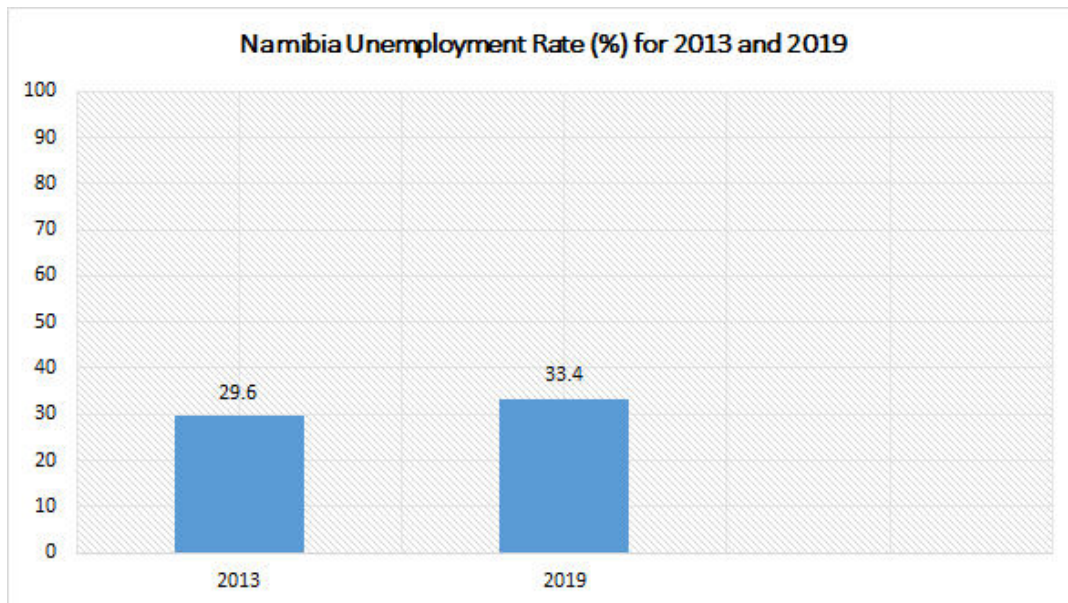


Figure 3-2: Namibia Unemployment Rate and Youth Unemployment Rate

In 2001 the employment rate for the labor force (64% of those 15+) was 66% employed and 34% unemployed. For those 15+ years old and not in the labor force (29%), 29% were students, 37% home-makers, and 33% retired, too old, etc. According to the 2012 Namibia Labour Force Survey, unemployment in the region stood at 28.8%. The two studies are methodologically not comparable.

Among households, 95% had safe water, 34% no toilet facility, 51% electricity for lighting, 77% access to radio, and 20% had wood or charcoal for cooking. In terms of household's main sources of income, 9% derived it from farming, 61% from wages and salaries, 7% cash remittances, 5% from business or non-farming, and 15% from pension.[13]

For every 1000 live births there were 62 female infant deaths and 64 male. The life expectancy at birth was 53 years for females and 51 for males. Among children younger than 15, 4% had lost a mother, 6% a father, and 1% were orphaned by both parents. 6% of the entire population had a disability, of which 19% were deaf, 47% blind, 7% had a speech disability, 10% hand disability, 28% leg disability, and 6% mental disability

The project will support the district's need for employment as well as the expansion of the local economy. Numerous employment opportunities are to be created for work personnel throughout the project phases. In addition, other forms of employment are likely to result from spillover effects, through indirect services such as supply of raw materials, equipment, machinery, etc.

3.2 CLIMATE

The Omusati Region is described as a semi-arid and characterized by the high temperature ranging between 25°C and 37°C. The average rainfall per year is about 350-500 mm between November to April. The rainfall decreases from 600 mm in the north east to 300 mm in the west. The Region falls under the very flat hydrogeological Cuvelai Basin dipping from some 1150 m above sea level (asl) in the north east to 1080 m asl in Etosha Pan. The relatively high and reliable average rainfall allows for crop farming. After rain season, innovative irrigation systems are utilized by locals to produce agricultural products. The ground water in the west and south of the Region is sweet and shallow i.e., 10-20 meters from the surface. During droughts, pits are dug and serve as reliable sources of water. The rest of water sources in the Region is predominantly saline.

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Nov | Oct | Dec | Year |
|---------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Record high °C (°F) | 38.0 (100.4) | 39.0 (102.2) | 36.0 (96.8) | 35.0 (95.0) | 36.0 (96.8) | 32.0 (89.6) | 33.0 (91.4) | 39.0 (102.2) | 42.0 (107.6) | 46.0 (114.8) | 45.0 (113.0) | 39.0 (102.2) | 46.0 (114.8) |
| Average high °C (°F) | 31.84 (89.31) | 31.59 (88.86) | 30.55 (86.99) | 30.27 (86.49) | 29.18 (84.52) | 26.92 (80.46) | 27.31 (81.16) | 31.13 (88.03) | 34.81 (94.66) | 36.11 (97.0) | 33.52 (92.34) | 32.11 (89.8) | 31.28 (88.3) |
| Daily mean °C (°F) | 28.4 (83.12) | 27.93 (82.27) | 27.2 (80.96) | 26.46 (79.63) | 24.43 (75.97) | 21.15 (70.07) | 21.09 (69.96) | 24.55 (76.19) | 28.61 (83.5) | 31.13 (88.03) | 30.08 (86.14) | 28.96 (84.13) | 26.67 (80.01) |
| Average low °C (°F) | 22.74 (72.93) | 22.06 (71.71) | 21.79 (71.22) | 20.25 (68.45) | 16.74 (62.13) | 12.19 (53.94) | 11.48 (52.66) | 14.08 (57.34) | 17.21 (62.98) | 20.87 (69.57) | 23.41 (74.14) | 23.26 (73.87) | 18.84 (65.91) |
| Record low °C (°F) | 17.0 (62.6) | 16.0 (60.8) | 17.0 (62.6) | 16.0 (60.8) | 11.0 (51.8) | 4.0 (39.2) | 5.0 (41.0) | 7.0 (44.6) | 10.0 (50.0) | 12.0 (53.6) | 15.0 (59.0) | 18.0 (64.4) | 4.0 (39.2) |
| Average precipitation mm (inches) | 172.08 (6.77) | 156.59 (6.16) | 184.55 (7.27) | 43.14 (1.7) | 0.74 (0.03) | 0.0 (0) | 0.0 (0) | 0.03 (0.0) | 1.5 (0.06) | 20.3 (0.8) | 113.47 (4.47) | 186.67 (7.35) | 73.26 (2.88) |
| Average precipitation days (≥ 1.0 mm) | 16.91 | 14.82 | 19.55 | 6.55 | 0.18 | 0.0 | 0.0 | 0.0 | 0.55 | 4.55 | 13.73 | 17.55 | 7.87 |
| Average relative humidity (%) | 46.98 | 48.81 | 55.21 | 46.15 | 32.38 | 29.99 | 27.64 | 20.55 | 17.06 | 19.59 | 33.95 | 42.21 | 35.04 |
| Mean monthly sunshine hours | 11.31 | 11.35 | 11.25 | 11.26 | 11.15 | 11.0 | 11.08 | 11.29 | 11.54 | 11.56 | 11.47 | 11.35 | 11.3 |

Figure 3-3: Ogongo Climate Data

Source: Climate-data.org, 2022

3.3 FLORA AND FAUNA

The landscape of the Region is made up of mopane trees which is a dominant species and spreads across the Region on shallow sand. The sandy parts of the Region bear abundant makalani palms 'omilunga', fig trees 'omikwiyu', baobab trees 'omikwa' and marula trees 'omigongo', especially in the eastern part. Vegetation in Omusati region is largely influenced by soils and water. However, the region has a large variety of vegetation type. Vegetation in the Cuvelai part of the region ranges from mopane (fruit tree) to mopane shrub and low trees on oshanas and limited Cuvelai palms and fruit trees on loamy sands. In the remainder of the Region, the western sand plains are found interspersed with mopane " Combretum savanna, western mopane " pan mosaic and mixed broadleaf woodlands on red dolomite

sands at the edges in the Ruacana area and at the extreme southwestern corner of the region. Omusati Region is a home to 332 584 cattle and 295 780 goats (Namibian Sun Newspaper, 2018) and different species of domestic animals. Further domestic animals kept by the locals in the area include donkeys, sheep's, and pigs. There is not much of wildlife occurring within the area as most wildlife is located within the Etosha National Park.

3.4 GEOLOGY AND HYDROLOGY

3.4.1 Topography and Drainage

The Region's elevation is 1150 m above sea level (asl) in the north east to 1080 m asl in Etosha Pan. The topography of the Region is mostly flat (with the exemption of the Ruacana area towards the Angolan border that is punctuated by mountains and rolling hills). According to Omusati Regional Council (2016), the landscape of the Region is made up of a successive series of sand dunes of varying depths, separated by waterways. The topography of the area is characterized by a combination of high and low-lying areas intersected by shallow water courses. The flat shallow depressions or Oshanas fills up with surface water during the rainy season. The Oshanas also receive and keep water from heavy rainfalls that are occasionally experienced in this part of the country.

3.4.2 Geology and Soils

Namibia has a unique and ancient geological history with great rock formation. The geology of the territory is characterized by sandstone and calcrete (Mendelssohn, 2002). No hard-geological rocks are exposed at the site. The soil of the northern Namibia is dominated by deep Kalahari and Namib sand that mostly occur in the formation of sands and other sedimentary materials, while the clay sodic sands dominate in the Oshanas. The soil type classification is termed to be favorable for crop cultivation and plant growth. This is determined by its physical properties to the nature of water retention, lower salinity, and high nutrient level. In principle, the soil comprises of mosaic soil type such as clay and average salty clay. This determines that the main soil dominance is Eutric Cambisols that characterized by its definition on consistency, colour and structure. On extent, it is found in the depression of low-lying areas of the landscape, and typically contain accumulations of calcium carbonate. These soils are potentially fertile, but iron and zinc occurrence might be at lower-level concentration sometimes (Mendelssohn, 2002).

3.4.3 Surface water

The Cuvelai Basin which hosts the project area consists of thousands of drainage channels or oshanas which are filled during the rainy season. These oshanas are shallow, often

vegetated and poorly defined, interconnected flood channels and pans through which surface water flows slowly or may form pools depending on the intensity of the floods (“efundja”)” (GCS Water and Environmental Consultants, 2019). There are no natural surface water bodies on site.

3.4.4 Groundwater potential

The country has been divided into twelve hydrogeological regions based mainly on geological structure and groundwater flow and according to the national hydrogeological map, the project area is part of the Cuvelai-Etosa groundwater Basin. According to the hydrogeological map of Namibia (Christelis and Struckmeier, 2011), the regional groundwater potential is moderate. The Kalahari aquifers are subdivided into five major units and named after the region or locality where they occur or where they were first described. The Discontinuous Perched Aquifer (KDP) represents a series of shallow, only locally occurring aquifers of limited extent. This aquifer type is present mainly in the Niipele Sub-Basin where recent dune sand covers the underlying sediments of the Kalahari Sequence. The KDP is recharged by direct infiltration of rainwater and exploited by means of traditional funnel-shaped hand dug wells called omifima (perched aquifer). Although the yield is generally limited by the size of the aquifers, they provide easily accessible and good quality drinking water to the scattered villages in the northern regions.

4 CHAPTER FOUR: PUBLIC CONSULTATION

4.1 OVERVIEW

The public consultation process forms an important component of the Environmental Assessment process. It is defined in the EIA Regulations (2012), as a “*process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters*” (S1). Section 21 of the Regulations details steps to be taken during a given public consultation process and these have been used in guiding the process.

Formal public involvement has taken place via public consultations and focal meetings, newspaper announcements to inform the public that such a large-scale project is under consideration. The public consultation process has been guided by the requirements of Environmental Management Act (EMA) No. 7 of 2007 and the process has been conducted in terms of regulation 7(1) as well as in terms of the EMA Regulations of GN 30 of 6 February 2012.

Its overriding goals have been to ensure transparency in decision making and to.

- ✓ Ensure stakeholder concerns are incorporated in project design and planning;
- ✓ Increase public awareness and understanding of the project and
- ✓ Enhance positive development initiatives through the direct involvement of affected people.

The objective of the public participation is to build credibility through instilling integrity and of conducting the EIA, Educate the stakeholders on the process to be undertaken and opportunities for their involvement and build stakeholders by establishing an agreed framework accordingly. This requires accessible, fair, transparent and constructive participation at every stage of process. Inform stakeholders on the proposed project and associate issues, impacts and mitigation and using the most effective manner to disseminate information.

In this section of the report, the results of consultations with various classes of stakeholders are summarized. The results of consultations with other stakeholders and community members who took part in this EIA are attached as Appendices.

The consultation was facilitated through the following means:

- ❖ A Background Information Document (BID) containing the project description, the EIA process and an invitation to participate was shared with stakeholders and community members.
- ❖ Invitation to participate notices were published in the local newspapers (e.g. Confidante) as shown in Table 4.1 below and Appendix A of this document.
- ❖ Announcement of EIA process verbally in the common public meeting points.
- ❖ Placement of a public notice at the project site and surrounding areas.

Table 4-1: Details of public notification of the EIA study

| Method | Area of Distribution | Language | Date Placed |
|----------------|----------------------|----------|--|
| The Confidante | Country Wide | English | 24 th February and 3 rd March 2023 |
| The Villager | Country Wide | English | 24 th February and 3 rd March 2023 |
| Site notices | Ogongo | English | 01 st – 3 rd of March 2023 |
| Public Meeting | Ogongo Campus | English, | 10 th March 2023 |

The photos below show the public consultation notice that was placed for project. Also shown are photos that were taken during the site visits.



✓ *Key Stakeholder Engagement Meeting*

A public meeting was organised on 10th of March 2023 14h00pm. Proof of public consultation is given in Appendix A of this document as well the attendance register explaining the project and the EIA study. Given below are the details of the meeting which was held:

✓ *Identification of Interested and Affected Parties (I&APs)*

The EIA team identified and consulted the following I&APs & key stakeholders for the proposed project:

- ❖ NAMPOWER
- ❖ NORED
- ❖ Community Members.

Other I&APs were allowed to register to the EIA team and compiled a database containing their names and correspondence details. The registration was accomplished over a period of 14 days.

✓ *Consultation with Stakeholders*

Experts in relevant fields, leaders of thought in environmental matters, Organs of the State, local communities have been consulted for their opinions on issues relating to the potential ecological and socio-economic impacts of the proposed project. This provided an opportunity for stakeholders and the public at large to engage in the process and to make comments or express their concerns regarding the proposed development.

Table 4-2: Key findings of the public consultation process

| SUMMARY OF ISSUES | |
|--------------------------|--|
| THEME | ISSUE |
| Economic | <ul style="list-style-type: none"> ✚ Employment of general labour must consider employing local people from Ogongo. ✚ The company must take the social responsibility in Ogongo. ✚ Improve the life being of the local residents. |
| Health and Safety | <ul style="list-style-type: none"> ✚ Waste management concerns including both solid waste and wastewater. ✚ Potential air, noise and water pollution due to development. ✚ The company must provide enough health care to employees |
| Ecological | <ul style="list-style-type: none"> ✚ Concerns regarding impacts on and conservation of natural vegetation. ✚ Limited cutting down of trees should be observed by the construction company ✚ Resources such as air and water should not be polluted during operations because communities, wild animals and livestock rely on these resources. |
| Communication | <ul style="list-style-type: none"> ✚ Clear communication needs to be promoted between relevant authorities and the local community. |

5 CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1 OVERVIEW

The proponent recognizes the importance of undertaking the project operation in line with sustainable development objectives and applicable legal requirements. To this end an Environmental Management Plan (EMP) for the project is being developed in order to address negative environmental impacts and enhance positive impacts. The EMP takes into account identification of potential impacts, assessment of the significance of the risks associated with these impacts and the establishment of preventive actions as well as mitigation measures. The EMP will be monitored, reviewed, and updated as necessary with the aim of continuous improvement, taking into account various changes in project operations, the biophysical environment and socio-economic circumstances.

5.2 ASSESSMENT OF IMPACTS

This section outlines how the overall methodology to assessing the project's possible environmental and social impacts. Each potential impact must be assessed in order to properly evaluate its significance. The definitions and explanations for each criterion are set out below in Table 5-1.

Table 5-1: Assessment Criteria

| | |
|--|--|
| Duration – What is the length of the negative impact? | |
| None | No Effect |
| Short | Less than one year |
| Moderate | One to ten years |
| Permanent | Irreversible |
| Magnitude – What is the effect on the resource within the study area? | |
| None | No Effect |
| Small | Affecting less than 1% of the resource |
| Moderate | Affecting 1-10% of the resource |
| Great | Affecting greater than 10% of the resource |
| Spatial Extent – what is the scale of the impact in terms of area, considering cumulative impacts and international importance? | |
| Local | In the immediate area of the impact |
| Regional / National | Having large scale impacts |
| International | Having international importance |
| Type – What is the impact | |

| | |
|--------------------|--|
| Direct | Caused by the project and occur simultaneously with project activities |
| Indirect | Associated with the project and may occur at a later time or wider area |
| Cumulative | Combined effects of the project with other existing / planned activities |
| Probability | |
| Low | <25% |
| Medium | 25-75% |
| High | >75% |

(Adopted from ECC-Namibia, 2017)

Table 5-2: Impact Significance

| Class | Significance | Descriptions |
|--------------|---------------------|---|
| 1 | Major Impact | Impacts are expected to be permanent and non-reversible on a national scale and/or have international significance or result in a legislative non-compliance. |
| 2 | Moderate Impact | Impacts are long term, but reversible and/or have regional significance. |
| 3 | Minor | Impacts are considered short term, reversible and/or localized in extent. |
| 4 | Insignificant | No impact is expected. |
| 5 | Unknown | There are insufficient data on which to assess significance. |
| 6 | Positive | Impacts are beneficial |

(Adopted from ECC-Namibia, 2017)

Table 5-3: Environmental Impacts and Aspects Assessment

| Environmental Impact | Valued Ecosystem Component | Impact | Project Phase | Duration | Magnitude | Extent | Type | Probability | Significance | Infrastructure |
|------------------------|--|---|-----------------------------|-----------|-----------|----------|--------|-----------------|--------------|----------------|
| TOPOGRAPHY | Landscape Scenery | Visual aesthetic impact | Construction and Operation | Moderate | Moderate | Local | Direct | Medium 25 - 75% | Minor | PV Plant |
| SOIL | Soil | Contamination to soil from waste disposal | Construction and Operations | Moderate | Small | Local | Direct | Low <25% | Minor | PV Plant |
| | Soil | Spillages of fuel, oil and lubricants. | Construction | Short | Small | Local | Direct | Low <25% | Minor | PV Plant |
| | Soil | Erosion | Operations | Moderate | Small | Local | Direct | Low <25% | Minor | PV Plant |
| LAND CAPABILITY | Terrestrial ecology and aquatic ecosystems | Change in land use | Construction and Operations | Permanent | Great | Local | Direct | Low <25% | Moderate | PV Plant |
| | Carrying capacity | Increase in human activities in the environment | Construction and Operations | Moderate | Moderate | Regional | Direct | Medium 25 - 75% | Moderate | PV Plant |
| WATER | Surface water quality | Water pollution from oils and lubricants from vehicles and machinery. | Construction and Operations | Moderate | Moderate | Local | Direct | Medium 25 - 75% | Moderate | PV Plant |
| | Surface water quality | Turbidity and high sediment load | Construction | Moderate | Small | Local | Direct | Low <25% | Moderate | PV Plant |

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| Environmental Impact | Valued Ecosystem Component | Impact | Project Phase | Duration | Magnitude | Extent | Type | Probability | Significance | Infrastructure |
|----------------------|--------------------------------------|--|-----------------------------|-----------|-----------|----------|--------|-----------------|--------------|----------------|
| | Soil, Vegetation, Infrastructure | Flooding | Construction & Operation | Permanent | Moderate | Local | Direct | Medium 25 - 75% | Moderate | PV Plant |
| AIR QUALITY | Air Quality | Construction phase dust | Construction | Short | Small | Local | Direct | Low <25% | Minor | PV Plant |
| WASTE | Groundwater quality | Hazardous waste such as waste oil and lubricants. | Construction and Operations | Short | Small | Local | Direct | Low <25% | Minor | PV Plant |
| | Surface water quality | Threatened from plant stormwater discharge into the river. | Construction and operations | Moderate | Moderate | Regional | Direct | Medium 25 - 75% | Moderate | PV Plant |
| | Topography and Landscape | Visual impacts due to use of unsustainable disposal methods | Construction and Operations | Short | Small | Local | Direct | Low <25% | Minor | PV Plant |
| FAUNA | Terrestrial ecology and biodiversity | Loss of habitat and driving away of local animals and aquatic animal species | Construction and Operations | Moderate | Moderate | Local | Direct | High >75% | Minor | PV Plant |
| | Avifauna | Bird electrocution, and physical crashes | Operations | Moderate | Small | Local | Direct | Low <25% | Minor | PV Plant |

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| Environmental Impact | Valued Ecosystem Component | Impact | Project Phase | Duration | Magnitude | Extent | Type | Probability | Significance | Infrastructure |
|----------------------|--------------------------------------|--|-----------------------------|----------|-----------|--------|--------|-------------|--------------|----------------|
| | Aquatic life | Antifouling paints | Operations | Moderate | Small | local | Direct | Low <25% | Minor | PV Plant |
| | Terrestrial ecology and biodiversity | Destruction of vertebrate fauna (e.g. road kills; fence and powerline mortalities) | Construction and Operations | Long | Moderate | Local | Direct | Low <25% | Minor | PV Plant |
| FLORA | Terrestrial ecology and biodiversity | Proliferation of invasive species inland | Construction and Operations | Long | Moderate | Local | Direct | High >75% | Moderate | PV Plant |
| | Terrestrial ecology and biodiversity | Illegal collection of firewood | Construction and Operations | Long | Moderate | Local | Direct | Low <25% | Minor | PV Plant |
| | Terrestrial ecology and biodiversity | Loss of unique flora and special habitats in the local environment because of general nuisance and animal migrate. | Construction and operations | None | Small | Local | Direct | Low <25% | Moderate | PV Plant |

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A 410 KWP SOLAR PV PLANT AT THE UNAM OGONGO CAMPUS, OMUSATI REGION, NAMIBIA

| Environmental Impact | Valued Ecosystem Component | Impact | Project Phase | Duration | Magnitude | Extent | Type | Probability | Significance | Infrastructure |
|-----------------------------|---|---|-----------------------------|----------|-----------|---------------------|--------|-----------------|--------------|----------------|
| | Terrestrial ecology and biodiversity | Uncontrolled fires | Construction | Long | Great | Regional / National | Direct | Low <25% | Major | PV Plant |
| SOCIAL | Noise Pollution | Increased noise levels | Construction and operations | Moderate | Small | Local | Direct | Low <25% | Minor | PV Plant |
| | Socio Economic Activities | Temporary and permanent employment prospects. | Construction and operations | Long | Moderate | Regional | Direct | Medium 25 – 75% | Positive | PV Plant |
| | Socio Economic Activities | Climate change impacts | Operations | Long | Moderate | Regional / National | Direct | High >75% | Positive | PV Plant |
| | Contribution to National Economy | Employment, local procurement, duties and taxes. | Construction and Operations | Short | None | Regional / National | Direct | Low <25% | Positive | PV Plant |
| Heritage/Archaeology | Graves, artefacts, archaeological high value components | Destruction or affecting heritage, paleontological and archaeological artefacts | Construction and Operation | Moderate | Moderate | Local | Direct | Medium 25 – 75% | Moderate | PV Plant |

| Environmental Impact | Valued Ecosystem Component | Impact | Project Phase | Duration | Magnitude | Extent | Type | Probability | Significance | Infrastructure |
|--------------------------|----------------------------|---|----------------------------|----------|-----------|--------|--------|-----------------|--------------|----------------|
| HEALTH AND SAFETY | Health Sanitation | Poor ablution and waste management facilities may be detrimental to human health. | Construction and Operation | Moderate | Moderate | Local | Direct | Medium 25 – 75% | Moderate | PV Plant |
| | Property and human life | Electrocution, fires resulting in fatalities, damage to properties, veldt fires and power surges. | Construction and Operation | Moderate | Great | Local | Direct | Medium 25 – 75% | Major | PV Plant |