ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT FOR KHOWARIB GREEN SCHEME REHABILITATION PROJECT

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Acronyms

Term	Definition
EIA	Environmental Impact Assessment
EIF	Environmental Investment Fund of Namibia
ECC	Environmental Clearance Certificate
EMA	Environmental Management Act
EMP	Environmental Management Plan
ESA	Environmental Scoping Assessment
ESS	Environmental and Social Safeguards
DAPEES	Directorate of Agricultural Production, Engineering and Extension Services
DEA	Directorate of Environmental Affairs
GCF	Green Climate Fund
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
PMU	Project Management Unit

EXECUTIVE SUMMARY

Improving rangeland and ecosystem management practices of smallholder farmers under conditions of climate change in Sesfontein, Fransfontein, and Warmquelle areas in the Kunene region of the Republic of Namibia Project is funded by the Green Climate Fund (GCF) through the Environmental Investment Fund (EIF) and is executed by the Ministry of Agriculture, Water and Land Reform through the Directorate of Agricultural Extension and Engineering Services (DAPEES). The project addresses the vulnerability of smallholders farmers from prolonged droughts periods through floodwater harvesting and groundwater recharge; promote a range of climate-resilient technologies for enhanced agricultural and livestock production; improve the dissemination of climate risk information among community, introduction of fuel efficient stoves; improve fodder management practices, support backyard gardening activities, promotion of drought tolerant breeds and small stock farming practices; civil society and government stakeholders through an early warning system; and capture and disseminate lessons learned through programme activities, and to influence policy through advocacy activities. Rangeland management systems will be enhanced. Improved information on climate change risks will be generated and integrated into farmer and pastoralist practices. The project will improve knowledge and understanding of climate change impacts among stakeholders, develop a community-based early warning system to reduce climate risks, and an action research approach linking traditional and scientific knowledge using seasonal forecasts. Green Schemes in the Kunene region will be supported to incorporate sustainable agricultural practices with a strong focus on learning and knowledge management component to capture and disseminate lessons learned.

As part of the environmental clearance certificate application, an environmental scoping assessment has been undertaken to satisfy the requirements of the Environmental Management Act 7 of 2007. These environmental scoping report and environmental management plan (EMP) will be submitted as part of the application for the environmental clearance certificate.

The Scoping Assessment shows that project activities are likely to cause, albeit on a very small scale, concerns related to social, economic development as well as environmental conservation. It is for this reason that an Environmental Management Plan was developed as a necessity for the project implementation. The purpose of the EMP is to define mitigation measures to be undertaken during project implementation and operation phases. The EMP provides the key Environmental and Social concerns, appropriate mitigation measures and responsibilities during project implementation. Some of the Environmental and Social Impacts

identified for mitigation and management during the project implementation include, noise and dust, pollution of water resources, health and safety risks.

The proposed project will entail various types of activities such as rehabilitation of the fence, rehabilitation of the bulk water pipeline, installation of the Centre Pivot and Solar plant (PV). These activities are envisaged to take place within six months.

1. CHAPTER ONE: BACKGROUND

1. 1 Introduction

The Environmental Investment Fund (EIF) of Namibia is a state-owned enterprise comprised of personnel from various areas of expertise and amongst others this includes environmentalist, agriculture, finance and risk management, climate finance, environment social safeguard and Others. The entity is mandated to mobilise funds for environmental protection projects while promoting the building of the green economy at national and regional level. As part of its activities among others, to implement sustainable agricultural projects for the climate change vulnerable in Namibia, the entity is rehabilitating the Khowarib Green Scheme through the IREMA project in the Kunene region, Khowarib area under the NAMI-DAMAN Traditional Authority's jurisdiction.

The proposed project triggers listed activities in terms of the Environmental Management Act (EMA) 7 of 2007, therefore, an environmental clearance certificate is required. As part of the environmental clearance certificate application, a desktop study on the envisaged environmental impact and filed work have been conducted as well as consultation with affected and interested parties to satisfy the requirements of the Environmental Management Act 7 of 2007. An environmental scoping report and environmental management plan (EMP) will be submitted as part of the application requirement for the environmental clearance certificate.

Since the proposed project site is already cleared, within a demarcated area with less than a kilometre from the main road, main activities will be more of rehabilitation of the main water pipe from the fountain, rehabilitation of the fence, installation of solar plant and installation of the Centre Pivot. These activities are envisaged to take place within six months.

Through the scoping process, the surrounding environmental assessment was completed both by a desktop review and on-ground assessment. Despite noise and air pollution which are likely to be experienced during the activities and could be a disturbance to immediate neighbours, these will be minimal and will be at a short duration. Additionally, disturbance of the ground is also being anticipated as the main water pipe must be dug out but that can be fixed after rehabilitation activities are completed.

Water is a scarce commodity in Namibia and, as such, it must always be treated with caution. The hydrology of the area is limited to ephemeral streams and groundwater and the potential for contamination from the proposed activities is regarded as very minimal. Protection of water

quality is addressed in the EMP. The only potential environmental risk that may require further assessment will be related to extraction of water from the fountain for irrigation activities which is of moderate significance. However, with proposed mitigation measures, the impact can be reduced using sustainable irrigation methods.

To ensure environmental and social risks are controlled during rehabilitation of the Green Scheme and fodder production activities, the contractor will be requested to adhere to the EMP and where possible, all equipment to be used on site will be kept within the fenced boundaries. Residents shall be provided with notice prior to commencement of activities and continual engagement with residents shall be undertaken by the proponent to identify any issues of concerns, and appropriate mitigation and management measures will be agreed upon.

The assessment was sufficient to identify impacts, and it is concluded that no further assessment may be required. On this basis, it is the opinion of the EIF that an environmental clearance certificate could be issued, on conditions that the management and mitigation measures specified in the EMP are implemented and adhered to effectively.

1.2 Main objective

The main objective of this environmental scoping assessment is to determine and assess the potential environmental impacts that are likely to result from rehabilitation of the Green Scheme and production of fodder thereafter at Khowarib site of the IREMA Project in Kunene region.

1.3 Specific objectives

- ✓ To establish baseline environmental conditions so that relevant impacts could be projected, and sufficient mitigation measures could be designed.
- ✓ Ensure that the impacts identified are adequately addressed.
- ✓ To facilitate an informed, transparent, and accountable decision-making process by consulting with key, interested, and affected stakeholders so that their concerns are considered in the formulation and implementation of the environment management plan.
- ✓ To comply with Namibia's Environmental Impact Assessment Regulation (2012), Environmental Management Act (No. 7 of 2007) and other relevant laws and regulations.
- ✓ To propose alternative measures where it is noticed that adverse effects may occur.
- ✓ To set up an environmental management plan that will govern all activities of the project for the better protection of the environment.

1.4 Impact assessment methodology

In compliance with the EMA No.7 of 2007 and its Regulations (2012), this report has addressed environmental, social, economic issues and concerns associated with the proposed project. The general steps followed during the assessment were as follows:

1.4.1 Field Observations

The Environmental and Social Safeguards (ESS) team from the Environmental Investment Fund of Namibia (EIF) visited the site from the 6th-11th of August 2023 to collect the required qualitative and quantitative data. During the site visit, an observation of the following attributes was made namely, vegetation, the current state of the site, and surrounding land use. Images were taken and all the observed information was recorded.

1.4.2 Desktop Research

Desktop research was used to establish an environmental information database for the EIA. Materials such as books, articles, maps, internet, photographs, GIS datasets, past EIA reports, and baseline reports of the area were consulted. Documentation on policies, laws, regulations, and guidelines related to environmental management at the national level as well as the international level were also consulted.

1.4.3 Public participation

Different stakeholders and community members were invited to a public meeting through the office of the project Regional Technical Officer to give their views on the proposed project.

1.5 Scope of work

The EIF-Environmental and Social Safeguard team's responsibility was to undertake the scoping assessment process which is inclusive of the associated work of detailed description of the project, investigate legislative requirements for the type of project, identify activities and assess their impacts both positive and negative as well as coming up with mitigation measures. Moreover, the team was further required to undertake a public consultation process and address concern issues. Finally, the team will compile a report and apply for an ECC for the proposed project from the competent authority i.e., Directorate of Environmental Affairs (DEA) in the Ministry of Environment, Forestry and Tourism (MEFT).

1.6 Environmental Impact Assessment

An Environmental Impact Assessment (EIA) is a tool to manage negative environmental impacts that may arise from the proposed development and guides the project design to be more environmentally friendly. The aim of the EIA is to reduce negative impacts (effects) and maximize positive impacts, through the adoption of best environmental practices and application of the precautionary principle.

1.7 Project description

1.7.1 Project Location

Khowarib Settlement is situated (S: 19°15´ and E: 13°15´) on the southern bank of the ephemeral and westward-flowing Hoanib River, in west-central Kunene region, formerly northern Damaraland. The project is implemented on a 30 hectares existing Green Scheme within Khowarib Settlement in Sesfontein Constituency, Kunene region. Please refer to the map below (Fig 1) giving the location of the project site.

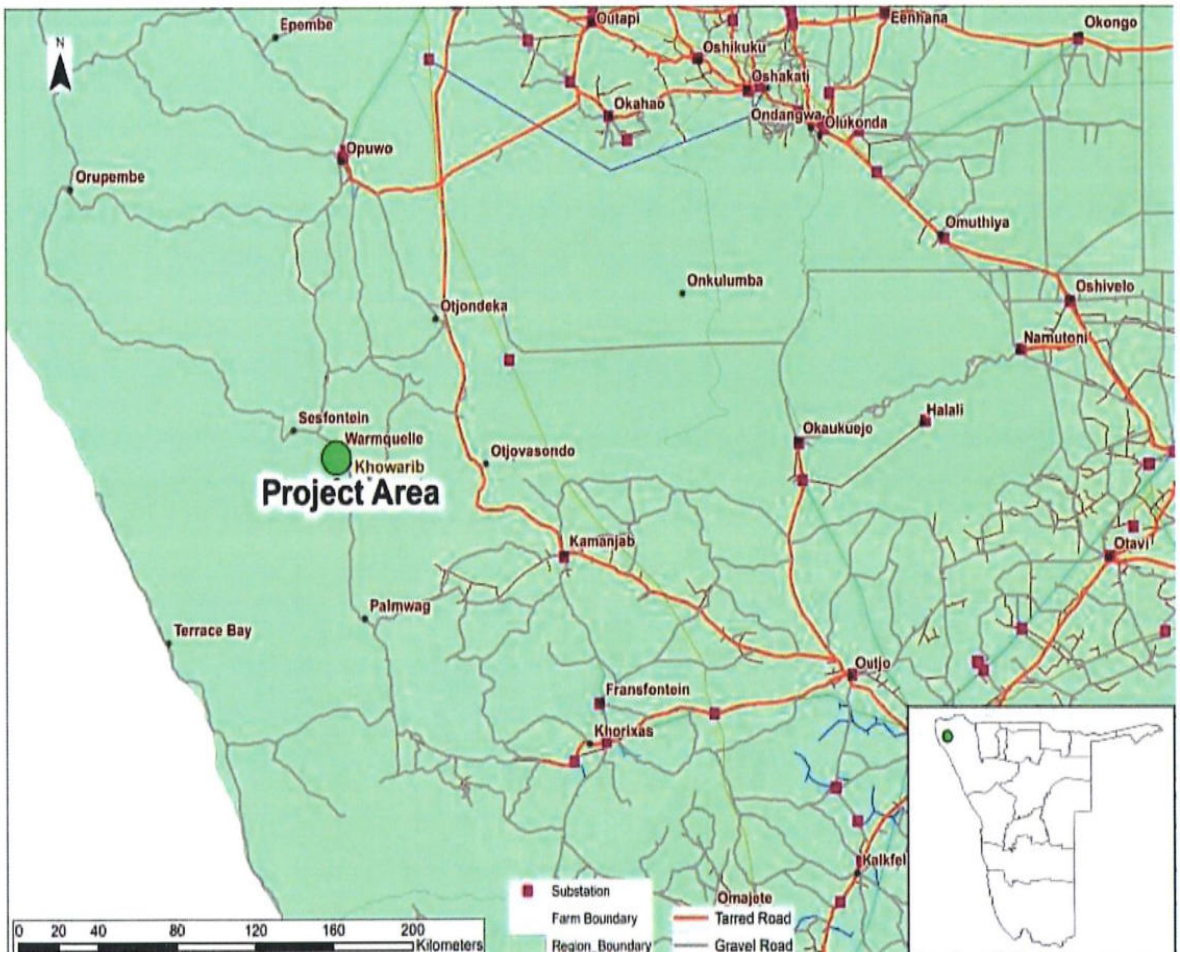


Figure 1 Khowarib Green Scheme site

1.7.2. Project Activities

Through the division of Geo-hydrology within the MAWLR, the IREMA Project conducted an assessment to determine if there is sufficient and quality water for irrigation purposes. The assessment concluded that there is sufficient water for the proposed activities. It is foreseen that the prospecting activity will include rehabilitation of the main water pipeline from the fountain, rehabilitation of the Green Scheme fence, installation of the centre pivot and solar plant.

1.7.3 Project Justification

The Green Scheme is currently not utilized due to lack of infrastructure needed for irrigation purposes, but the land is highly suitable for sustainable agriculture production that can transform the livelihood of the rural community in this area. The proposed project would make the Green Scheme more productive to the beneficiaries and the entire small-scale farming community in the Khowarib area and Kunene region at large.

Hence, there is a need to rehabilitate the Green Scheme to enable agricultural activities (fodder production and vegetable) under the IREMA Project to run smoothly in order to enable livestock farmers in the area to have fodder for their livestock and manage their rangeland sustainably thereby reducing their vulnerability to climate risks and threats while increasing the adaptive capacity, well-being and resilience.

2.CHAPTER TWO: LEGISLATIVE REQUIREMENTS

2.1 Introduction

An important part of the EIA is identifying and reviewing the administrative, policy and legislative frameworks concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in undertaking the proposed project (Ruppel & Ruppel-Schlichting, 2011). This section looks at the legislative framework within which the proposed development will conform to; the focus is on the compliance with the legislation during the planning, construction, and operational phases. All relevant legislations, policies and international statutes applying to the project are highlighted in the table below as specified in 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).

Table 1 Policies, legal and administrative regulations

Law/Ordinance	Provision	Applicability to the project
The constitution of Namibia (1990) First Amendment Act 34 of 1998	Article 16(1) guarantees all persons the right to property, to acquire, own and dispose of property, alone or in association with others and to bequeath such property. “The State shall actively promote and maintain the welfare of the people by adopting policies that are aimed at maintaining	Through implementation of the environmental management plan, the proposed project activities will ensure conformity to the constitution in terms of

	ecosystems, essential ecological processes, and the biological diversity of Namibia. It further promotes the sustainable utilisation of living natural resources basis for the benefit of all Namibians, both present and future." (Article 95(I)).	environmental management and sustainability.
Environmental Assessment Policy of Namibia 1994	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.	-Rehabilitation of the Green Scheme and fodder production requires environmental approval before it is undertaken. -By abiding by the requirements of the Environmental Assessment Policy of Namibia, the EMP will cater for the sustainable management of biophysical environment.
Environmental Management Act No. 7 Of 2007	Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27). Requires adequate public participation during the environmental assessment process for interested and affected parties to voice their opinions about a project (Section 2(b-c)). According to Section 5(4) a person may not discard waste as defined in Section 5(1)(b) in any way other than at a disposal site	This Act and its regulations will inform and guide this process. The project will ensure that all provisions of the EMP are implemented, and regular environmental compliance auditing is conducted.

	declared by the Minister of Environment and Tourism or in a manner prescribed by the Minister. Details principles which are to guide all EIA	
EIA Regulations GN 2007 (no.30 of 2012)	Details requirements for public consultation within a given environmental assessment process (GN No 30 S21). Details the requirements for what should be included in a Scoping Report	This Act and its regulations will inform and guide this process
Soil Conservation, 1969 (Act 76 of 1969) and the Soil Conservation Amendment Act (Act 38 of 1971)	Makes provision for the prevention and control of soil erosion	The proposed project will monitor and apply the soil conservation mechanisms.
Forest Act 12 of 2001 Forest Act Regulations 2015	To provide for the protection of the environment and the control and management of forest. Relevant sections: Approval required for the clearance of vegetation on more than 15 hectares (Section 23, subsection 1(b)). Tree species and any vegetation within 100m from a watercourse may not be removed without a permit (Section 22, subsection 1 (b))	The site is already cleared, there will be no clearance of vegetation at this stage, thus no permit is acquired
National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979	"No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: Meteorites, fossils, petroglyphs, ornamental infrastructure graves,	The proposed site of development is not within any known monument site, both movable and

	caves, rock shelters, middens, shells that came into existence before the year 1900 AD: or Any other archaeological or paleontological finds.	immovable as specified in the Act.
The Occupational Safety and Health Act No. 11 of 2007	Advocates for employee and public safety, health	The project will ensure compliance with the terms of the Act.
National Act, No. 2004. Heritage 27 of 2004	The Act provides for the protection and conservation of places and objects with heritage significance	The proposed site of development is not within any known cultural heritage site.
Pollution and Waste Management Bill (draft)	This bill defines pollution and the different types of pollution. It also points out how the Government intends to regulate the different types of pollution to maintain a clean and safe environment. The bill also describes how waste should be managed to reduce environmental pollution. Failure to comply with the requirements is considered an offense and is punishable.	The proposed project shall be executed in harmony with the requirements of the act to reduce negative impacts on the surrounding environs from waste during rehabilitation activities. A waste management strategy that follows recycling, reuse and reducing will be commissioned throughout project activities.
Nature Conservation Ordinance 4 of 1975 with amendments and special regulations	This ordinance prohibits "picking of indigenous plants in private nature reserves 24. (1) No person shall without the written approval of the Minister pick any indigenous plant, or any portion of an indigenous plant, in a private nature reserve: Provided that the owner of the land concerned may at any time pick any indigenous plant, other than a protected plant, on such land.	The project will not remove any protected species because the site has already been cleared for agricultural purposes.

Water Resources Management Act, 2013.	Provide for the management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters.	This Act and its regulations will inform and guide this process

3. CHAPTER TRHEE: THE RECEIVING ENVIRONMENT

3.1 Climate

The single most important climatic feature of this area is absolutely its low rainfall and the associated unpredictability of this rainfall through time and space. Khowarib typically receives about 53.37 millimetres (2.1 inches) of precipitation and has only 84.44 rainy days, representing 23.13% annually. Accompanying this low and variable rainfall are extremely high evapotranspiration rates, estimated as in the region of 200-300mm. This combination of factors means that as is characteristic for dryland areas, environmental productivity is primarily moist. The temperatures are characterised by high diurnal and seasonal variations. The area's yearly temperature is 26.2ºC (79.16ºF) and it is 1.74% higher than Namibia's averages.

3.2 Topography

Khowarib is situated on the eastern edge of the transitional or pro-Namib plains between the Namib Desert to the west and the interior highlands to the east. The Hoanib River is one of the several westward flowing rivers traversing these morphological regions and forms a deeply incised valley with many large tributaries. To the east of the settlement, the Hoanib river becomes constrained by the uplands of the interior plateau, and this forms the steep slopes of the Khowarib gorge. West of the Khowarib settlement, however, stretch flat semi-desert plains of fertile alluvial sands and silts.

3.3 Soils

Generally, the soils of the Kunene region are characterized by low organic matter content and a deficit of Phosphorus. Their depth varies from shallow to deep and can predominantly be described as sandy to loamy sand. The soils of the project area are characterised by low clay and organic matter, making them poor in nutrients/fertility. These soils are a combination of regosols and unconsolidated sandy soils, with poor water holding capacity. They require frequent watering depending on the temperatures.

3.4 Flora and Vegetation

The vegetation of the Khowarib area comprises mainly Mopane savanna. Some larger collections of Ana trees (*Faidherbia albida*), Leadwood (*Combretum imberbe*), Mopane

(*Colophospermum mopane*), Camel Thorn (*Acacia erioloba*), *Salvadora* and *Euclea* are found in the gallery forests. Often several meters high, sour grasses and reeds grow in the wetlands. With its gallery forests and the larger wetlands in the Khowarib gorge, in a flood area east of Sesfontein and the lower reaches and mouth area, the Hoanib is a linear oasis in the otherwise arid surroundings, providing livelihood for a rich wildlife. In addition to larger populations of many species of antelope found in the lower reaches of the Hoanib, are also many desert elephants (about 35 individuals), rhinos, giraffes, as well as several lion prides, and smaller predators.

3.5 Hydrology and Drainage

Namibia is divided into 11 water management areas referred to as "water basins" according to the common drainage flows of major water sources such as rivers, groundwater systems (aquifers), water supply canals and pipelines. The Kunene River Basin is located in the north-western part of Namibia occupying part of the Kunene region, featuring the Kunene River as its northern border, while having the Atlantic Ocean. The water from Kunene River, which originates from the Bie highlands in Angola forms the northern border of the basin and is used for water supply and power generation. Most of the water supplied in the basin comes from groundwater sources, except for the people (especially the Himba community) who live along the rivers. They collect water directly from the river or close-by through hand-dug wells and boreholes. The water comes from groundwater, ephemeral rivers and a perenial river. Three major ephemeral rivers (only flowing after heavy rains) and their tributaries (smaller rivers which flow into larger rivers), namely the Khumib, Hoarusib and Hoanib, join the westward flow towards the Atlantic Ocean.

3.6 Socio –Economic

According to NSA (2011), Sesfontein constituency had a population of 8 434. The livelihoods of the people at Khowarib are largely dependent on livestock farming, tourism and selling.

4. CHAPTER FOUR: PUBLIC CONSULTATION PROCESS

4.1 Introduction

The EIA Process is incomplete without engagement of the public mainly those affected by the proposed development but also those with keen interest in the proposed development. The public consultation process allows persons or groups that may be affected or merely interested in a project the opportunity to submit or voice their concerns or comments regarding the proposed activity. Section 21 of the Regulations prescribes the steps to meeting the requirements of the public consultation process, these were guides to conducting of this very important step in the EIA process.

4.2 Steps taken in the public consultation process.

4.2.1 Identified and consulted stakeholders.

Table 2 List of stakeholders who were consulted during the scoping assessment.

Stakeholders	Purpose
MEFT	Notice of intent to conduct Scoping assessment and submission of an application for the ECC
Kunene Regional Council	Pivotal to regional planning and development intervention.
DAPEES-MAWLR	Notice of intent to conduct Scoping assessment
NAMI-DAMAN Traditional Authority	Administration of land rights and public meeting arrangement
Khowarib Surrounding Communities	Affected and Interested Parties/ Beneficiaries of the project
CASO –MAWRL, Kunene	Notice of intent to conduct Scoping assessment

4.2.2 Engagement with Traditional Authority and local residents

Communication was made with the Traditional Authority (TA) of the area for information about the project and the proposed public meeting to be held. All communications to the traditional authority were made through the IREMA Regional Technical Officer in Kunene region. The meeting was held on the 8th of August 2023 at Khowarib Community Hall through a Focus Group Discussion (FGD). During these discussions, the EIF team firstly wanted to know whether the residents were aware of the proposed project. The residents indicated that they were aware of the project, and they wholeheartedly welcomed it. Further discussions were based on the question whether the proposed project will cause negative impacts on following:

- ✓ the local residents,
- ✓ natural ecology of the area,
- ✓ scenic beauty of the area,
- ✓ public health and safety,
- ✓ water resources and quality,
- ✓ the soil quality of the area, and
- ✓ drainage of the area.

Through the discussions, it came out strongly that the proposed project will not have any significant impacts on the above. *Hence, the residents pleaded with the EIF through the*

IREMA Project to speed up acquiring the Environmental Clearance Certificate from the Ministry of Environment, Forestry and Tourism to allow the production of fodder at the site commence to enable the beneficiaries to have fodder for their livestock as the drought continues to persist in the region. The attendance registers and pictures are annexed at the end of this report.

5. CHAPTER FIVE: ASSESSMENT OF IMPACTS

The EIA Policy of Namibia seeks to achieve a balance between negative and positive impacts and between biophysical impacts and social and economic gains to society. Consequently, both negative and positive impacts on the environment will be considered. Moreover, this report will recommend measures to mitigate negative impacts and optimize (or enhance) positive impacts.

5.1 Identified potential impacts

5.1.1 Positive impacts

- Employment creation
- Income Generation
- Availability of animal feed
- Sustainable rangeland management
- Economic stimulation in rural area

5.1.2 Negative impacts

- Noise and Air quality concerns
- Soil erosion
- Occupational health and safety
- Increased water demand

5.2 impact analysis and evaluation

The identified impacts were assessed in terms of probability (likelihood of occurring), extent (spatial scale), magnitude (severity) and duration (temporal scale). The following assessment methodology was used to examine each impact identified.

Table 3 Ranking matrix for environmental significance.

Score	1	2	3	4	5

Temporal scale	Short term – impact quickly reversible, (less than 1 year)	Short term impact (1-5 years)	Reversible over time; medium-term (5-15 years)	Impact is long-term (15-40 years)	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources(over 40 years)
Spatial scale	**Site only:** Impact is localized within the site boundary	**Local:** Impact is beyond the site boundary	**Regional:** Impact is felt within adjacent biophysical and social environments:	**National:** Impact widespread far beyond Regional:	**International:** Impact extend National or over international boundaries
Likelihood	**Improbable:** low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	**Low probability:** Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	**Medium Probability**: Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	**Highly probable:** Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	**Definite:** Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.
	2	**4**	**6**	**8**	**10**
Magnitude	Minor deterioration, nuisance, or irritation, minor change species habitat	Low deterioration, slight noticeable alteration in habitat and biodiversity.	Moderate deterioration, discomfort, partial loss of habitat/biodiversity or resource,	High deterioration, death, illness or injury, loss of habitat / diversity or	Extremely high deterioration, high quantity of deaths, injury or illness / total loss of

	diversity in / or resource, no or very little quality deterioration.	Little loss in species numbers.	moderate alteration.	resource, severe alteration, or disturbance of important processes.	habitat, total alteration of ecological processes, extinction of rare species.

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. Significance point = (magnitude + duration + extend) x likelihood. The maximum value per potential impact is 100 significance points (SP). Potential impacts are rated as high, moderate, and low significance, based on the following significance rating scale:

Table 4 Significance rating scale

Type of impact	Significant point	Significant rate
Positive +	>60	H
	30-60	M
	30 <	L
None	0	N
Negative -	>60	H
	30-60	M
	30<	L

Table 5 Rated negative impacts

Aspect	Type of impact	Scale	Duration	Magnitude	Likelihood	Significance Unmitigated	Mitigated
Noise and Air quality concerns	-ve	1	1	2	2	L	L
Soil erosion	-ve	1	1	2	2	L	L

Increased water demand	-ve	1	1	4	2	L	L
Safety risks	-ve	2	1	4	2	L	L

Table 6 Rated positive impacts

Aspect	Type of impact	Scale	Duration	Magnitude	Likelihood	Significant
Employment creation	+ve	3	3	8	5	H
Income generation	+ve	3	3	6	5	H
Availability of animal feed/fodder	+ve	3	3	6	5	H
Sustainable rangeland management	+ve	3	3	8	5	H
Economic stimulation in rural area	+ve	3	3	6	5	H

6. CHAPTER SIX: THE ENVIRONMENTAL MANAGEMENT PLAN (EMP)

6.1 Overview of the EMP

The Environmental Management Plans are used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced. A conscious decision

was made based on the recommendations and guidelines by the Directorate of Environmental Affairs-EIA division, to assess both significant and less significant environmental impacts of the proposed development and develop an EMP for the identified impacts. The EMP was developed, and it will effectively be implemented by the proponent, to ensure that the adverse impacts identified through the scoping assessment are mitigated and/or minimised

6.2 Identified potential negative impacts and proposed mitigation measures.

Table 7 Potential negative impacts and proposed mitigation measures

Potential impacts	Proposed Mitigation Measures
1. Noise and Air Quality concerns (Expected sources of noise pollution include vehicles and machinery. Air pollution is anticipated to arise from exhaust from engines	-Sprinkling water to dusty areas during site preparation and operations -Containment of noisy operations, including locating noise operations away from sensitive neighbourhoods -Limit rehabilitation works to daytime only -Selection of appropriate machinery and regular servicing of machinery and vehicles -Provision by contractor and use of masks and earmuffs by casual workers.
2. Soil Erosion	-Loose soils to be used to fill back excavated/disturbed areas. -Loose soils to be compacted with a mechanical roller so as to avoid erosion by wind or surface runoff.
3. Increased water demand	-Use high water efficient irrigation system -Monitor water extraction from the fountain.
4. Generation of Solid waste	-Provide waste collection bins/bags -Construct a pit for the biodegradable waste
5. Health and Safety Risks (Risk of accident incidents is anticipated with the rehabilitation activities. workers will be in direct contact with machinery and equipment, Health, safety and security are important aspects throughout the project implementation).	-Design and implement safety measures and emergency plans to contain accident risks, -Regular Training on health and safety to workers shall be conducted, -Provide workers with protective clothing (nose and mouth masks, earmuffs, overalls, safety boots and gloves) and helmets, -Avail first aid kits on site

The detailed EMP in terms of roles and responsibilities as well as the monitoring timeframes is annexed at the of this report.

7. CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7.1 Recommendations

- ✓ The project, overall, will have substantial significant positive social, economic and environmental benefits. It will enhance accessibility to sufficient water for irrigation purposes at the Green Scheme site.
- ✓ The project shall build the resilience of small-scale farmers to climate risks and threats in the area by enabling them to establish market opportunities for their livestock and create employment for women and youth.
- ✓ Monitoring has been identified as an important process in the protection of environment of the project site and addressing social concerns since it will reveal changes and trends brought about mainly by the fodder production and operational activities.

7.2 Conclusion

In conclusion, the economic benefits of the proposed development project outweigh its shortcomings. Although, the project activities are likely to cause, on a small scale, risk of accidents, health, and emission of dust, and increase in noise, these impacts are synonymous with the development project of this nature and will be adequately mitigated through the effective implementation of the EMP prepared. We therefore recommend that the project be cleared for commissioning.

References

Mendelson, J., Jarvis, A., Roberts, C., & Robertson, T. (2002), *Atlas of Namibia. A portrait of the land and its people.,* Windhoek: David Philip

NSA, (2011), *Kunene census regional profile*, Windhoek: NSA

Ruppel, C. O., & Ruppel-Schlichting, K. (2011). Environmental Law and Policy in Namibia (S. Van Wy). *VRÜ Verfassung und Recht in Übersee*, 446-449.

Strohbach, J. B., & Sheuyange, P. T. (2001). Vegetation survey of Namibia. *Journal of the Namibia Scientific Society*, 93-124.

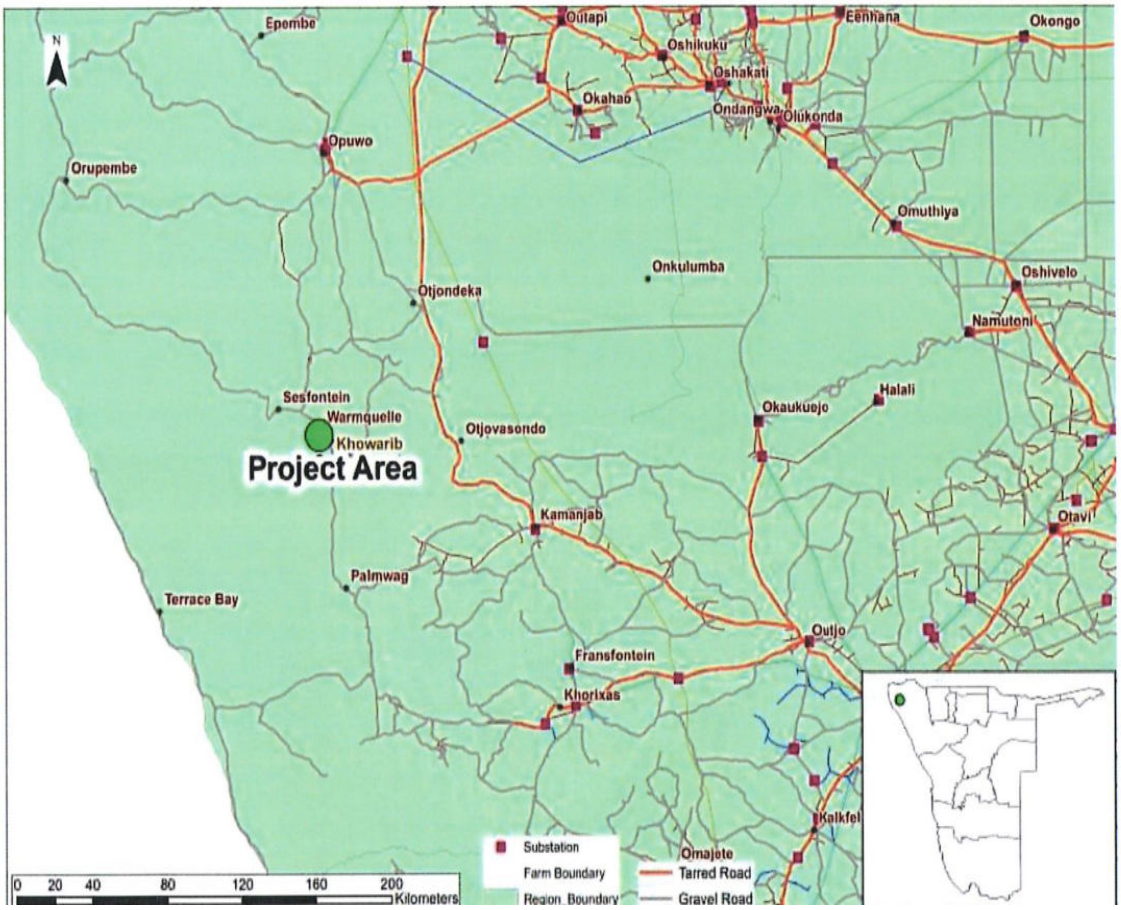
Tourism, M. O. (1994). *Environmental Assessment Policy of Namibia.* MET.

Annexures

The detailed Environmental Management Plan to be implemented on site

Potential impacts	Proposed Mitigation Measures	Impact rating when mitigated	Responsible party	Monitoring timeframe
1. **Noise and Air Quality concerns** (Expected sources of noise pollution include vehicles and machinery. Air pollution is anticipated to arise from exhaust from engines)	-Sprinkling water to dusty areas during site preparation and operations -Containment of noisy operations, including locating noise operations away from sensitive neighbourhoods -Limit rehabilitation works to daytime only -Selection of appropriate machinery and regular servicing of machinery and vehicles. -Provision by contractor and use of mouth masks and	Low	Contractor	Daily, for the duration of the rehabilitation works.

	earmuffs by the casual workers.			
2. **Soil Erosion** (heavy machinery movement will expose topsoil to possible soil erosion).	-Loose soils to be used to fill back excavated/disturbed areas. -Loose soils to be compacted with a mechanical roller so as to avoid erosion by wind or surface runoff.	Low	Contractor	Once off after completion of rehabilitation of the main water pipe and installation of the solar plant.
3. **Increased water demand**	- Use high water efficient irrigation system - Monitor water extraction from the fountain.	Low	Contractor/Proponent (EIF)	The contractor and IREMA PMU will monitor the quantities of water used for irrigation daily, throughout the duration of the IREMA project.
4. **Health and Safety Risks** (Risk of accident incidents is anticipated with the rehabilitation activities. Workers will be in direct contact with machinery and equipment Health, safety and security are important aspects throughout the project implementation).	-Design and implement safety measures and emergency plans to contain accident risks, -Regular Training on health and safety to workers shall be conducted, -Provide workers with protective clothing (nose and mouth masks, earmuffs, overalls, safety boots and gloves and helmets) -Avail first aid kits on site	Low	Contactor/Proponent (EIF)	Daily, for the duration of the rehabilitation works.



Location of Khowarib Green Scheme

Figure 2 Stakeholder consultation at Khowarib Community Hall

Figure 3 Center Pivot irrigation system at Khowarib Green Scheme

Figure 4 Solar Plant at Khowarib Green Scheme

Figure 5 Fountain where the project will draw water for irrigation