

**ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT FOR WINI
AGRICULTURAL DEMONSTRATION PLOT**

PROJECT TITLE: DRILLING OF A BOREHOLE FOR IRRIGATION PURPOSES



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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
CASO	Chief Agricultural Scientific Officer
CRAVE	Climate Resilient Agriculture in three of the Vulnerable Extreme northern crop-growing regions
DAPEES	Directorate of Agricultural Production, Engineering and Extension Services
DEA	Directorate of Environmental Affairs
DRWSS	Directorate of Rural Water Supply and Sanitation
GBV	Gender Based Violence
GCF	Green Climate Fund
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
NSA	Namibia Statistics Agency
PMU	Project Management Unit

EXECUTIVE SUMMARY

The Climate Resilient Agriculture in three of the Vulnerable Extreme northern crop-growing regions (CRAVE) Project is funded by the Green Climate Fund 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) and the Directorate of Agricultural Research and Development (DARD). The CRAVE Project identified and established demonstration sites in three of its target Regions of Kavango East, Kavango West and Zambezi. The demonstration sites are production areas that demonstrates Conservation Agriculture and Climate Resilient Agriculture Practices and technologies under horticulture and rain-fed production.

The Wini demonstration site in Kavango West Region was established in June 2020. As part of the demonstration site's model, the project includes the horticultural production that had the existing boreholes as source of water for irrigation. During consultations with the Directorate of Rural Water Supply and Sanitation (DRWSS) within MAWLR, a borehole groundwater siting was done. However, the infrastructure of the existing borehole is old and will require major rehabilitation costs. Recommending for a new borehole should be done according to drilling standards and specifications for the Ministry of Agriculture, Water and Land Reform. Hence, there was no objection for drilling a borehole for irrigation purposes.

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. The 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 (EMP) 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 drilling and installation of a solarised water pump. Although the lifespan of the project will be determined by the

underground discharge and other environmental, social and economic defects, the drilling and installation activities are envisaged to take place within a month.

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 vulnerability in Namibia, the entity is developing an agricultural demonstration project in the Kavango West region, Wini area under the Uukwangali traditional Authority's jurisdiction.

The proposed project triggers a listed activity 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 field work have been conducted. Furthermore, consultations were held with affected and interested parties to satisfy the requirements of the Environmental Management Act 7 of 2007. To this effect, an Environmental Scoping Report and Environmental Management Plan (EMP) were prepared 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 shallow drilling and installation of a solarised water pump. Although the lifespan of the project will be determined by the underground discharge and other environmental, social, and economic defects, the drilling and installation activities are envisaged to take place within a month.

Through the scoping process, the surrounding environmental assessment was completed both by a desktop review and on-ground assessment. The activities that will cause immediate impacts are those that relate to drilling, and they will have temporally negative impacts. Hence, clear steps and recommendations are identified in the EMP to minimise these effects. Despite noise and air pollution which are normally associated with drilling and could be a disturbance to immediate neighbours, these will be more minimal and will be at a short duration. Additionally, disturbance of the ground is also being anticipated, that can be fixed after the drilling activities are completed.

The minimal impacts identified are temporal and will most definitely be outweighed by the positive impacts after drilling and once the production commenced. It is envisaged that the

demonstration activities will benefit over 2000 indirect beneficiaries and 50 direct beneficiaries that are linked to the demonstration site.

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 irrigation activities which is of moderate significance, however with proposed mitigation measures, the impact can be reduced through the use of sustainable irrigation methods like drip irrigation, and environmentally friendly chemicals as recommended in the CRAVE Project proposal.

To ensure environmental and social risks are controlled throughout the drilling period, contractors will be requested to adhere to the EMP and where possible, all drilling equipment will be kept within the fenced boundaries. Residents shall be provided with at least two weeks' notice of drilling operations and continual engagement with residents shall be undertaken by the proponent to identify any concerns or issues, and appropriate mitigation and management measures agreed upon.

The assessment was partial but 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 and social impacts that are likely to result from the drilling a borehole at Wini demonstration site of the CRAVE project in Kavango West 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 develop an environmental management plan that will govern all activities of the project for the better protection of the environment.

1.4 Impact assessment methodology

The methodology used to carry out the scoping assessment focused on field observations and desk reviews data collection methods. This was followed by data analysis, identification of impacts and mitigations measures compiled in the EMP. 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 on the 16 September 2021 to collect the required qualitative and quantitative data. Data collected through field visits observations that focused on key attribute such as vegetation, the status of the site and surrounding land use.

1.4.2 Desktop Research

The desk study was carried out prior to mobilization for fieldwork. It involved reviewing previous aeromagnetic, geological, and hydrogeological investigations of the Kavango West Region, to aid in understanding the geological and hydrogeological settings of the region. The previous boreholes drilled in the area were also studied, to better understand the target depths of the primary aquifers which are the target aquifers within the Region.

1.4.3 Public participation

Different stakeholders and community members were invited to a public meeting to give their views on the proposed project. During the meeting discussions provided information from beneficiaries, Traditional Authorities, DAPEES and DRWSSC



Figure 1 Stakeholders engagement meeting at Wini demonstration plot

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, compile reports and submit an ECC application to the 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

The Wini site is in Kavango West Region. The area is in Kakua Village, under Mpungu constituency. The Area is about 35Km Southwest of Nkurenkuru Town from the B1 road from Nkurenkuru to Mpungu. The site is governed under the Uukwangali Traditional Authority.

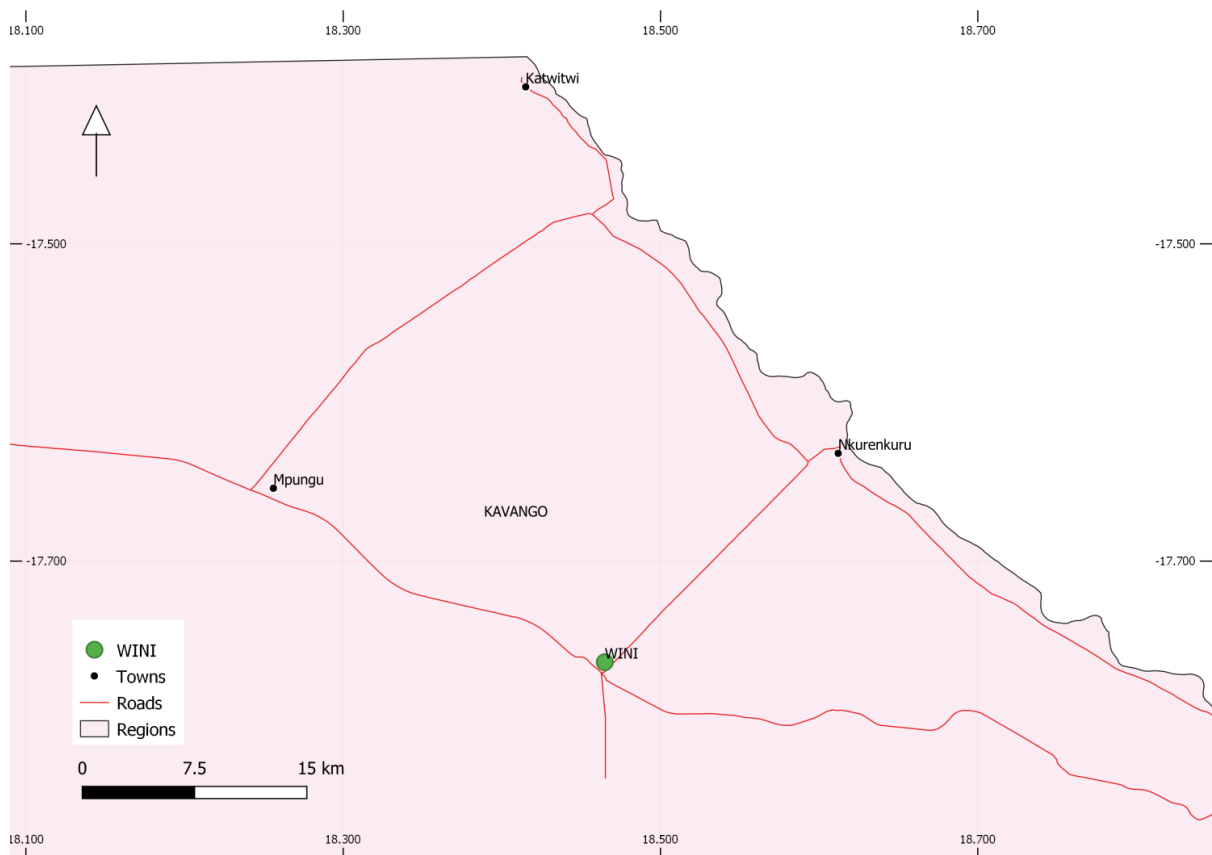


Figure 2 Wini demonstration plot

1.7.2. Project Activities

Through the division of Geo-hydrology within the MAWLR, the CRAVE Project surveyed the envisaged area to determine if there is sufficient and quality water for irrigation purposes. It was confirmed that there is sufficient water in the area and therefore it was recommended that a borehole should be drilled. Hence, the project will drill a borehole and install a solarised water pump at the site to support the horticulture production activities.

1.7.3 Project Justification

The Demonstration site is currently underutilized due to lack of water 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 demonstration site more productive and will benefit small-scale farmers linked to the demonstration site.

Regionally, the geohydrology of the area is distinguished between two major aquifer systems namely, the fractured bedrock and the Kalahari aquifers. The Kalahari aquifer is generally non-

saturated i.e., a dry system, but should it receive good recharge from rainfall, ephemeral runoff it can create shallow superficial flows within the non-saturated aquifers, resulting in water levels less than twenty meters. According to the Groundwater Database of Namibia (GROWAS) there exists at least 7 boreholes within a 6km radius of the proposed drill site. The average depth of the boreholes is 76.5mbgl with a minimum depth of 54mbgl (WW4378) and a maximum depth of 94mbgl (WW26631 and WW26630). The nearest borehole to the proposed drill site is approximately 3.9km away and is 94m deep (WW26630).

Hence, there is a need to drill a borehole to enable agricultural demonstration activities to run smoothly. This will reduce food insecurity and rural human population’s vulnerability to climate risks and threats while increasing the adaptive capacity, well-being, and resilience of the vulnerable small-scale farming communities in crop production landscapes that are threatened by climate variability and change.

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 legislations

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	Through implementation of the environmental management plan, the proposed project activities will ensure conformity to the

	<p>the welfare of the people by adopting policies that are aimed at maintaining 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)).</p>	<p>constitution in terms of environmental management and sustainability.</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>-Drilling of borehole requires environmental approval before it is undertaken.</p> <p>-By abiding by the requirements of the Environmental Assessment Policy of Namibia, the EMP will cater for the sustainable management of biophysical environment.</p>
<p>Environmental Management Act No. 7 Of 2007</p>	<p>Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27).</p> <p>Requires adequate public participation during the environmental assessment process for interested and affected parties to</p>	<p>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.</p>

	<p>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 declared by the Minister of Environment and Tourism or in a manner prescribed by the Minister. Details principles which are to guide all EIA</p>	
<p>EIA Regulations GN 2007 (no.30 of 2012)</p>	<p>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</p>	<p>This Act and its regulations will inform and guide this process</p>
<p>Soil Conservation, 1969 (Act 76 of 1969) and the Soil Conservation Amendment Act (Act 38 of 1971)</p>	<p>Makes provision for the prevention and control of soil erosion</p>	<p>The proposed project will monitor and apply the soil conservation mechanisms.</p>
<p>Forest Act 12 of 2001 Forest Act Regulations 2015</p>	<p>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,</p>	<p>The species on site are not protected thus no permit is acquired</p>

	<p>Subsection 1(b)).</p> <p>Tree species and any vegetation within 100m from a watercourse may not be removed without a permit</p> <p>(Section 22, subsection 1 (b))</p>	
<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: Meteorites, fossils, petroglyphs, ornamental infrastructure graves, caves, rock shelters, middens, shells that came into existence before the year 1900 AD: or any other archaeological or paleontological finds.</p>	<p>The proposed site of development houses one archaeological site (grave) that was established in the 1960s according to the information obtained during the public meeting.</p>
<p>The Occupational Safety and Health Act No. 11 of 2007</p>	<p>Advocates for employee and public safety, health</p>	<p>The project will ensure compliance with the terms of the Act.</p>
<p>National Heritage Act, No. 27 of 2004</p>	<p>The Act provides for the protection and conservation of places and objects with heritage significance</p>	<p>The proposed site has an archaeological site (grave) that was established in the 1960s according to the information obtained during the public meeting. The site will be fenced off.</p>
<p>Pollution and Waste Management Bill (draft)</p>	<p>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</p>	<p>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</p>

	describes how waste should be managed to reduce environmental pollution. Failure to comply with the requirements is considered an offense and is punishable.	exploration activities. A waste management strategy that follows recycling, reuse and reducing will be commissioned throughout the 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 THREE: THE RECEIVING ENVIRONMENT

3.1 Rainfall and temperature

Although rainfall in Kavango is higher than in most other parts of Namibia, there are several environmental constraints to agricultural development. For example, rainfall in Kavango is variable and unpredictable, the annual average is less than 475 mm in the southernmost part of the region and more than 550 mm in the northernmost part, and annual totals vary from less than 300 mm in the driest years to more than 1 000 mm in the wettest. About 80% of the rain falls between December and March (Thiem and Jones, 2013). Kavango is classified as semi-arid. Temperatures are generally warm with average maximum temperatures above 30°

Celsius in all months except May, June and July, and frost occurs rarely in the winter months (Mendelsohn and El Obeid 2003: 43).

3.2 Geology

The geology of the area forms part of the Okavango Basin which is part of the greater Kalahari Basin, covering most of the northern and eastern parts of Namibia and extends across the Namibian border into Botswana and Angola. The bedrock underlying the basin filled with Kalahari Sequence deposits consist of basal rocks of the Damara Sequence, followed by the Karoo Sequence sediments, overlain, and intruded by volcanics of Karoo age. The unconsolidated to semi-consolidated clay, sand and gravel of the Kalahari Sequence fill the Okavango Sub-basin, which deepens from the northeast towards the northwest, from 0 to 400 m along the north-west trending basin axis. The basin axis stretches from the northwest corner of former Bushman land through the south-western Kavango Region and from there into the Ohangwena Region. Sub-outcrops of volcanic rock occur at the Okavango River near Rundu and between Mukwe and Bagani. Damara Sequence rocks crop out in the southern part of the Khaudum National Park within the Nhoma River drainage and at the border between the Kavango and Caprivi regions near Andara.

3.3 Vegetation

The area is covered by Kalahari Woodland with a dominance of Camelthorn, *Phyllanthus violacea* (Ghukororo tree), reeds and *Combretum collinum* trees. There are also small wildlife dominating the area such as birds, Squirrels, Rabbits and Hare.

3.4 Socio-economic

According to the population Census Report of 2011 conducted by the Namibia Statistics Agency (NSA), Mpungu Constituency where Wini Demonstration plot is situated had a total population of 15 018 people. Most of the inhabitants are engaged in some form of agricultural production, primarily small-scale farming of *mahangu* (pearl millet) on a few hectares, with small numbers of goats and cattle. According to Brown (2010), small-scale *mahangu* farms provide some food self-sufficiency but little food security – and no opportunities for economic development or poverty reduction. Other crops grown in medium to small quantities include groundnuts and sweet potatoes. Although, some of the crop-growing activities on these farms generate income, it is too little because fields are small, soils have limited fertility, yields are low, surplus harvests are rare, and markets are small (Brown 2010). Livelihoods are thus considerably diversified, with residents relying also on wages and salaries, pensions, and cash remittances.

Though, Livestock being a source of livelihood is only practiced on a small-scale, animals mostly reared include goats, chickens, and Pigs. In addition, livestock also provide an

important source of draught power for cultivation, meat, and milk. Perhaps more importantly, the household cattle herd is regarded as a form of savings (Thiem and Jones, 2013).

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
Kavango West Regional Council	Pivotal to regional planning and development intervention.
Village Development Committee	Notice of intent to conduct Scoping assessment
DRWSS-MAWLR	Notice of intent to conduct Scoping assessment
Uukwangali Traditional Authority	Administration of land rights and public meeting arrangements
Wini Surrounding Communities	Affected and Interested Parties/ Beneficiaries of the project
ASO-MAWRL, Kavango West	Notice of intent to conduct Scoping assessment

DAPEES/CRAVE	Notice of intent to conduct Scoping assessment
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4.2.2 Engagement with Traditional Authority and 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 CRAVE Liaison Officer in Kavango West Region. The meeting was held on the 16 September 2021 at Wini Demonstration Plot 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 and 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 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
- ✓ Archaeological sites

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 CRAVE Project to speed up acquiring the Environmental Clearance Certificate from the Ministry of Environment, Forestry and Tourism to allow the drilling of the borehole at the demonstration site to enable the beneficiaries continue with their agricultural activities at the site. 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
- Generation of revenue through improved yields
- Diversification of livelihoods
- Year-round production
- Economic stimulation in rural area
- Improve water access
- Efficient resource use of water and SET

5.1.2 Negative impacts

- Noise and air quality concerns
- Soil erosion
- Accidents
- Water pollution
- Risk of Covid-19
- Impact on archeological site

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,	Low deterioratio	Moderate deterioration,	High deterioratio	Extremely high

	nuisance, or irritation, minor change species habitat diversity in / or resource, no or very little quality deterioration.	n, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers.	discomfort, partial loss of habitat/biodiversity or resource, moderate alteration.	n, death, illness or injury, loss of habitat / diversity or resource, severe alteration, or disturbance of important processes.	deterioration, high quantity of deaths, injury or illness / total loss of 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		
Impact on ground water	-ve	1	1	4	2	L	L
Safety risks	-ve	2	1	4	2	L	L
Increased risk of Covid-19	-ve	2	1	2	5	L	L
Impact on Archaeological site	-ve	1	1	2	1	L	L

Table 6 Rated positive impacts

Aspect	Type of impact	Scale	Duration	Magnitude	Likelihood	Significant
Employment creation	+ve	3	3	8	5	H
Generation of revenue through improved yields	+ve	3	3	6	5	H

Livelihood diversification	+ve	3	3	6	5	H
Year-round production	+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 Plan 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. The EMP is annexed at the end 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 Wini Demonstration site.
- ✓ The project shall build the resilience of small-scale farmers to climate change risks and threats in the area by enabling them to establish market opportunities, diversify livelihoods, 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 drilling 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.

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Annexures



Figure 3 Map of Wini, showing the proposed drilling sites and location of the grave within the demo plot

The EMP to be implemented at the proposed project site (WINI Plot)

Potential impacts	Proposed Mitigation Measures	Impact rating when mitigated	Monitoring Indicators	Responsible party	Monitoring timeframe
<p>1. Noise pollution (Expected sources of noise pollution include vehicles and machinery).</p>	<ul style="list-style-type: none"> -Containment of noisy operations, including locating noise operations away from sensitive neighbourhoods -Limit drilling works to daytime only -Drilling work to take shortest time possible -Selection of appropriate machinery and regular servicing of machinery and vehicles, -Provision by contractor and use of ear plugs by drilling workers. 	Low	Noise levels	Contractor /Proponent (EIF)	Daily
<p>2. Air quality concerns (Air pollution is anticipated to arise from exhaust from engines)</p>	<ul style="list-style-type: none"> -Sprinkling water to dusty areas during site preparation and drilling operations -trees planting 	Low	<ul style="list-style-type: none"> -Visual inspections -Trees layout, 	Contractor /Proponent (EIF)	Daily

			number, and height		
3. Soil Erosion (drilling and heavy machinery movement will expose topsoil to possible soil erosion).	<ul style="list-style-type: none"> -Loose soils to be used to fill back excavated/disturbed areas. -Loose soils to be compacted with a mechanical roller to avoid erosion by wind or surface runoff. - Plant trees and shrubs 	Low	<ul style="list-style-type: none"> -Trees layout, number, and height -Measure Soil erosion level 	Contractor	Once off after completion of drilling activities.
4. Impact on ground water resources (increased demand for water).	<ul style="list-style-type: none"> -Put proper measures for collection and disposal of spilled oils and lubricants - Ensure the available underground water quantity can sustain the identified activities. 	Medium	<ul style="list-style-type: none"> -Water quality tests -Amount of water being extracted 	Contractor /Proponent (EIF)	The contractor will monitor the collection and disposal of spilled oils daily, throughout the drilling exercise and the proponent will monitor water quantity after drilling on a continuous basis until the end of CRAVE project.

<p>5. Health and Safety Risks (Risk of accident incidents is anticipated with the drilling activities. Drilling workers will be in direct contact with heavy machinery and equipment Health, safety and security are important aspects throughout the project implementation).</p>	<ul style="list-style-type: none"> -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, industrial/safety boots, and gloves) and helmets, -Avail first aid kits on site 	<p>Low</p>	<p>Efficiency of assigned mitigation measures</p>	<p>Contractor/ Proponent (EIF)</p>	<p>Daily</p>
<p>6.Increased risk of Covid-19 (Increased risk of Covid-19 can occur due to handling of the same tools and equipment at the drilling site and social interactions between drilling workers and local people)</p>	<p>-Provide workers with face masks and hand sanitizers to reduce the risk of contracting Covid-19.</p>	<p>Low</p>	<p>Efficiency of assigned mitigation measures</p>	<p>Contractor /Proponent (EIF)</p>	<p>Daily</p>

7. Impact on archaeological site	Fence off the area within the demo plot where the grave is located.	Low	Area fenced off	Project beneficiaries/proponent (EIF)	
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Figure 4 EIF team with the participants after the meeting at Wini Demonstration site

Curriculum Vitae of:

Personal information

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Nationality Namibian
Date of birth 11 January 1983
Gender Male

Education and training

Dates November 2014
Title of qualification awarded Bachelor of Science Honours Degree in Geography and Environmental Studies
Principal subjects/occupational skills covered Environmental Assessment and Management, Environmental Pollution and Control, Environmental Planning and Project Appraisal, Safety Health and the Environment, Applications of GIS and Remote Sensing, Natural Resources and Sustainable Development, Hydrology and Water Resource Management, Landuse Planning
Name and type of organisation providing education and training Midlands State University, Zimbabwe
Level in national or international classification Level 8

Work experience

Dates 01 February 2017-Present.
Occupation or position held Environmental and Social Safeguards (ESS) Officer
Main activities and responsibilities

- Developing and overseeing ESS policies and procedures of the EIF
- Ensuring the implementation and maintenance of an ESS M&E system within EIF
- Reviewing, Revising and Updating the ESS policy and its associated instruments

- Performing ESS due diligence procedures on EIF funded projects
- Designing suitable ESS risk and impact mitigation measures for each EIF funded project
- Managing mitigation measures and actions emanating from the ESS risk identification process and provide periodic reports on such projects
- Providing training and capacity building to funded and supported partners
- Reviewing ESS monitoring reports
- Maintain ESS records on all EIF programmes and Projects

Name and address of employer

Environmental Investment Fund of Namibia

Type of business or sector

State Owned Enterprise/Public Sector

Personal skills and competences

Mother tongue(s)

Oshiwambo

Other language(s)

Skills	English	Afrikaans	Shona
Reading skills	Good	Fair	Better
Writing skills	Good	Fair	Fair
Speaking skills	Good	Better	Better

Professional Skills and Competencies

- Report Writing skills
- Research Skills
- Microsoft Programmes (word, Excel, PowerPoint)
- Data Analysing skills using software such as SPSS

Driving licence

Code B licence

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KREDULA KANGOMBE SHIMWANDI

Passionate Environmental Science graduate who is eager to contribute to the improvement and protection of the natural environment through changing from environmentally harmful human activities. Interested in learning and growing in the environmental protection and conservation.

EDUCATION

BSc (Honours) Degree in Integrated Environmental Science

University of Namibia (2017-2019)

Diploma in Natural Resource Management

University of Namibia (2014-2016)

Namibia Senior Secondary Certificate

Ipumbu Senior Secondary School (2011-2012)

WORK EXPERIENCE

Environmental Investment Fund of Namibia (Intern)

January 2021-Up to date

- Environmental monitoring and evaluation
- Environmental impact assessment
- Data management
- Gender mainstreaming

Hardap Game Park (Intern)

December 2018- January 2019

- Animal count
- GPS tracking of Rhinos
- Park patrolling
- Farm and butchery inspection
- Road blocks
- General management and maintenance of the park

Outapi Town Council (Intern)

June – July 2018

- Waste management
- Environmental education
- Environmental inspection

- Issuing and renewing of fitness certificates
- Business inspection

Eenhana Directorate of Forestry (Intern)

December- January 2015

- Office administration
- Law enforcement
- Community based forest management
- Tree planting and orchard development
- Forest conservation and protection

Mbeyo Community Forest (Intern)

June-July 2015

- Forest inventory

SKILLS

Report writing

Presentation Skills

Microsoft programmes (Word, Excel, PowerPoint, Publisher)

Software's – ArcGIS and SPSS

Research skills

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