

---

Reg. No: 20125862, Tax No: 5845770-01-1, VAT No: 5845770-01-5, P.O. Box 27457, Windhoek

---

## **ENVIRONMENTAL SCOPING ASSESSMENT REPORT FOR KOROKOKO INVESTMENT IRRIGATION SCHEME (23 Ha) AT KOROKOKO VILLAGE IN THE NDIYONA CONSTITUENCY, KAVANGO-EAST REGION**

**Prepared by**

**Institute for Socio-Economic and Natural Resources Management (ISN-Namibia)**

**For  
Korokoko Investment cc**

REPORT NO. KI/2020-0019  
13 October 2020

**(APP-002115)**

## DOCUMENT INFORMATION

Title	Environmental scoping assessment report for Korokoko Investment Irrigation Scheme (23 ha) at Korokoko Village in the Ndiyona Constituency, Kavango-East Region
Author	Institute for Socio-Economic and Natural Resources Management (ISN-Namibia)
Project Manager	Kuniberth Shamathe
Client	Korokoko Investment CC
Date last printed	October 2020
Date last saved	13 October 2020
Project Number	ELC- KI/2020-0019
Report Number	KWA/2020-0019
Status	Draft report for comment
Issue Date	13 October 2020

# INSTITUTE FOR SOCIO-ECONOMIC DEVELOPMENT AND NATURAL RESOURCES MANAGEMENT (ISN-NAMIBIA CC)

## Our consultancy Portfolio / Specialization is composed of:

- STRATEGIC ENVIRONMENTAL IMPACT ASSESSMENTS
- ENVIRONMENTAL AUDITING AND MONITORING
- WATER QUALITY MONITORING AND MANAGEMENT
- WATER PROSPECTING
- WASTE MANAGEMENT
- ENVIRONMENTAL POLICY REVIEWS
- ENVIRONMENTAL AWARENESS AND TRAINING
- ENVIRONMENTAL MANAGEMENT SYSTEM (ISO14001) IMPLEMENTATION
- ENVIRONMENTAL CONSULTATION
- ECOSYSTEM EVALUATION
- ENVIRONMENTAL SAFETY, HEALTH AND MANAGEMENT
- FLORA IDENTIFICATION
- BIOHAZARD MONITORING (AIR AND RADIATION POLLUTION MONITORING)
- DATA COLLECTION AND ANALYSIS
- TRAIN AND MENTOR FARMERS IN PRODUCTION (LIVESTOCK AND CROP), MARKETING, FINANCIAL MANAGEMENT AND RECORD KEEPING
- BUSINESS ENTERPRISE ASSESSMENT, PLANNING AND DESIGNING
- PARTICIPATORY PLANNING FOR PROJECT PLANNING
- HOLISTIC RANGELAND MANAGEMENT AND ASSESSMENT
- ENVIRONMENTAL AWARENESS AND TRAINING
- FACILITATE ADAPTATION TO CLIMATE CHANGE IN COMMUNITY BASED PROGRAMS
- BUILD LOCAL SELF-RELIANCE AND COMMUNITY HARMONY
- PROJECT MANAGEMENT IN THE FIELD OF AGRICULTURE AND NRM
- CONTRACT MANAGEMENT IN THE FIELD OF AGRICULTURE AND NRM
- FEASIBILITY STUDIES IN THE FIELD OF AGRICULTURE AND NRM
- PROJECT PLANNING, MONITORING AND EVALUATIONS
- INSTITUTIONAL CAPACITY BUILDING DEVELOPMENT AND COMMUNICATIONS

## TABLE OF CONTENT

TABLE OF CONTENT.....	iv
LIST OF FIGURES.....	v
LIST OF FIGURES.....	v
LIST OF TABLES.....	vi
ACRONYMSANDABBREVIATIONS .....	vii
GENERAL INTRODUCTION .....	9
NEED AND DESIRABILITY ASSESSMENT .....	10
SITE SELECTION PROCESS AND ALTERNATIVE SITES .....	11
SUMMARY OF THE IMPACT ASSESSMENT RESULTS.....	11
CONCLUSION AND RECOMMENDATIONS.....	11
1.1 INTRODUCTION TO THE PROPOSED PROJECT .....	12
1.1.1 PROJECT RATIONALE .....	12
1.1.2 PROPOSED PROJECT LOCATION .....	13
1.2 PROPOSED PROJECT ACTIVITIES .....	14
1.2.4 Harvesting, Storage and Marketing .....	18
Harvesting.....	18
Marketing .....	18
<b>2 ENVIRONMENTAL LAWS AND POLICIES</b>	
.....	20
<b>2 ENVIRONMENTALLAWSANDPOLICIES</b> .....	20
<b>2.1 APPLICABLE LAWS AND POLICIES</b> .....	20
2.1.1 ENVIRONMENTAL MANAGEMENT ACT No. 7 of 2007 and its regulations of 2012 .....	20
2.1.2 THE ENVIRONMENTAL INVESTMENT FUND OF NAMIBIA.....	20
2.1.3 THE WATER ACT No. 11 OF 2013 .....	20
2.1.4 THE FOREST ACT.....	20
2.1.5 PARKS AND WILDLIFE MANAGEMENT BILL.....	21
2.1.6 NATURE CONSERVATION ORDINANCE.....	21
2.1.7NATIONAL HERITAGE .....	21
2.1.8 LABOR ACT, 2007 ACT 11 OF 2007 .....	21
<b>2.2 THE UNITED NATIONS CONVENTION ON BIOLOGICAL DIVERSITY</b> .....	21
2.2.1 PUBLIC AND ENVIRONMENTAL HEALTH ACT OF 2015.....	21
<b>3.1 AUTHORITIES AND INTERESTED AND AFFECTED PARTIES (IA&amp;Ps)</b> .....	22
<b>3.2 STEPS IN THE CONSULTATION PROCESS</b> .....	22
<b>4 DESCRIPTIONOF THE CURRENT ENVIRONMENT</b> .....	23
<b>4.1 CLIMATE BASELINE</b> .....	23
<b>4.3 SOIL AND GEOLOGY BASELINE</b> .....	26
<b>4.4 BIODIVERSITY BASELINE</b> .....	27
<b>4.5 LAND USE PATTERNS AND IMPACT ON VEGETATION</b> .....	28
<b>4.6 LAND CAPABILITY BASELINE</b> .....	28
<b>4.6 ARCHAEOLOGY BASELINE</b> .....	29
<b>4.7 SOCIO-ECONOMIC</b> .....	29
<b>5.1 CURRENT AND FUTURE LAND USE ALTERNATIVES</b> .....	30
<b>5.2 THE “NO PROJECT” OPTION LINKED TO NEED AND DESIRABILITY</b> .....	31
<b>6 PROJECT DESCRIPTION</b> .....	32
<b>6.1 CONSTRUCTION PHASE</b> .....	32
<b>6.2 OPERATIONAL PHASE</b> .....	32
<b>6.3 DECOMMISSIONING AND CLOSURE PHASE</b> .....	32
<b>7 7 ENVIRONMENTAL IMPACT ASSESSMENT</b> .....	34
<b>7.1 INTRODUCTIONS TO THE ASSESSMENT APPROACH</b> .....	34
<b>7.2 TOPOGRAPHY AND VISUAL IMPACTS</b> .....	35
7.2.1 ISSUE: HAZARDOUS EXCAVATIONS AND INFRASTRUCTURE .....	35
7.2.2 ASSESSMENT OF IMPACT .....	36
7.2.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES.....	36

<b>7.3 SOILS AND LAND CAPABILITY .....</b>	<b>36</b>
7.3.1 ISSUE: LOSS OF SOIL RESOURCES FROM POLLUTION AND PHYSICAL DISTURBANCE .....	36
7.3.2 ASSESSMENT OF IMPACT .....	37
7.3.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES.....	37
<b>7.4 BIODIVERSITY.....</b>	<b>37</b>
7.4.1 ISSUE: GENERAL PHYSICALDISTURBANCE OF BIODIVERSITY .....	37
7.4.2 ASSESSMENT OF IMPACT .....	38
7.4.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES.....	38
<b>7.5 WATER RESOURCES.....</b>	<b>39</b>
7.5.1 ISSUE: ALTERING AND POLLUTION OF SURFACE AND GROUNDWATER .....	39
7.5.2 ASSESSMENT OF IMPACT .....	40
7.5.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES.....	40
<b>7.6 AIR .....</b>	<b>41</b>
7.6.1ISSUE: AIR POLLUTION .....	41
7.6.2 ASSESSMENT OF IMPACT .....	41
7.6.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES.....	41
<b>7.7 ARCHAEOLOGY.....</b>	<b>42</b>
7.7.1 ISSUE: DAMAGE TO ARCHAEOLOGICAL SITES AND LANDSCAPES .....	42
7.7.2 ASSESSMENT OF IMPACT .....	42
7.7.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES.....	42
<b>7.8 SOCIO-ECONOMIC – HEALTH AND SAFETY .....</b>	<b>43</b>
7.8.1 ISSUE: HEALTH AND SAFETY IMPACT .....	43
7.8.2ASSESSMENT OF IMPACT .....	43
7.8.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES.....	43
<b>REFERENCES.....</b>	<b>45</b>
<b>APPENDIX A – INTERESTED AND AFFECTED PARTIES MEETING ATTENDANCE LIST .....</b>	<b>46</b>
<b>APPENDIX B-1 – PROOF OF PUBLIC CONSULTATION (28 AUGUST 2020).....</b>	<b>49</b>
<b>APPENDIX B-2 – PROOF OF PUBLIC CONSULTATION (Minutes of the first meeting) .....</b>	<b>49</b>
<b>APPENDIX C – CONSENT LETTER FROM TRADITIONAL AUTHORITY AS AGREED DURING CONSULTATION MEETING. ..</b>	<b>64</b>
<b>APPENDIX D – LIST OF OBSERVED PLANT SPECIES WITH THE PROJECT AREA (including protected species) .....</b>	<b>65</b>
<b>APPENDIX E – ENVIRONMENTAL MANAGEMENT PLAN .....</b>	<b>67</b>

## LIST OF FIGURES

Figure 1: KI-Scheme showing its distance to water and gravel road.....	9
Figure 2: Image showing the proposed area for KI-Scheme. ....	12
Figure 3: Google map showing the location of KI-Scheme. ....	13
Figure 4: KI-Scheme showing its distance to water and gravel road.....	14
Figure 5: Shows temperature variation and annual average rainfall along an east-to-west gradient, with minimum temperature variation and high annual rainfall observed in the east were the project is proposed. ...	23
Figure 6: Andara annual rainfall from Kavango East region. ....	24
Figure 7: Mashare annual rainfall from Kavango East region.....	24
Figure 8: Rundu annual rainfall from Kavango East region. ....	24
Figure 9: Combined graph of annual average minimum and maximum temperature, precipitation and number rainy days in proximity of the project site (Rundu Town). ....	25
Figure 10: Map of Wind-Rise Direction and Speed (at Rundu Town), about 134 km east of the proposed projects site at Korokoko Village.....	25
Figure 11: Borehole location map overview of Kavango East areas where the KI-Scheme is located (Extract from Department of Water Affairs and Forestry, 2019).....	27
Figure 12: About 50 percent of the proposed KI-Scheme is already cleared and been used as crop fields.....	28
Figure 13: The un-cleared parts is characterized by sparsely bushes and trees mainly dominated by <i>Terminalia sericea</i> .....	28
Figure 14: KI-Scheme showing spots for old two graves circled in red. ....	29
Figure 15: Kavango Region Poverty Headcount Rate in 2011 (upper bound poverty line) indicating Ndiyona constituency as well. ....	30

## LIST OF TABLES

Table 1: List of activities identified in the EIA Regulations that may not be undertaken without environmental clearance certificate which apply to the proposed KI-Scheme. ....	13
Table 2: GPS coordinates of the proposed project's boundaries (in decimal degrees).....	14
Table 3: Current Main Cereal Producers in Namibia.....	18
Table 4: Consultation Process with I& APs and Authorities .....	22
Table 5: Criteria for Assessing Impacts.....	34
Table 6: Hazardous excavations & infrastructure impacts – linked to phases & activities. ....	35
Table 7: Tabulated summary of the assessed impacts–hazardous excavations and infrastructure .....	36
Table 8: Soil pollution impacts–linked to phases and activities .....	36
Table 9: Tabulated summary of the assessed cumulative impacts – soil pollution.....	37
Table 10: Physical destruction of biodiversity – linked to phases and activities.....	38
Table 11: Tabulated summary of the assessed impacts–destruction of biodiversity .....	38
Table 12: Altering surface drainage patterns –linked to operation phases and activities.....	39
Table 13: Tabulated summary of the assessed cumulative impacts – surface water pollution.....	40
Table 14: Air pollution–linked to phases and activities.....	41
Table 15: Tabulated summary of the assessed cumulative impacts – air pollution. ....	41
Table 16: Archaeology impacts–linked to phases and activities/infrastructure.....	42
Table 17: Tabulated summary of the assessed cumulative impacts – archaeology impacts.....	42
Table 18: Health and safety impacts –linked to phases and activities/infrastructure.....	43
Table 19: Tabulated summary of the assessed cumulative impacts–traffic impacts .....	43
Table 20: Summary of potential cumulative impacts associated with the proposed project.....	44

## ACRONYMS AND ABBREVIATIONS

Included below is a list of acronyms and abbreviations relevant to this report.

Acronyms	Description
<b>AIDS</b>	Acquired Immuno Deficiency Syndrome
<b>AMTA</b>	Agro Marketing and Trade Agency
<b>BID</b>	Background Information Document
<b>BRAHMS</b>	Botanical Research and Herbarium Management Systems
<b>CBNRM</b>	Community Based Natural Resource Management
<b>CC</b>	Close Corporations
<b>DEA</b>	Directorate of Environmental Affair
<b>DSR</b>	Draft Scoping Report
<b>DWA</b>	Directorate of Water Affair
<b>EA</b>	Environmental Assessment
<b>ECC</b>	Environmental Clearance Certificate
<b>EIA</b>	Environmental Impact Assessment
<b>EMA</b>	Environmental Management Act
<b>EMP</b>	Environmental Management Plan
<b>FP</b>	Forestry Protected
<b>GPS</b>	Global Positioning System
<b>GTZ</b>	Gesellschaft für Technische Zusammenarbeit
<b>Ha</b>	Hectares
<b>HIV</b>	Human Immuno Virus
<b>I &amp; APs</b>	Interested and Affected Parties
<b>KI-Scheme</b>	Korokoko Investment Irrigation Scheme
<b>Kg</b>	Kilograms
<b>Km</b>	Kilometers
<b>Kv</b>	Kilovolts
<b>LAC</b>	Legal Assistance Center
<b>LC</b>	Least Concern
<b>LTD</b>	Limited
<b>MAWLR</b>	Ministry of Agriculture, Water and Land Reform
<b>MEFT</b>	Ministry of Environment, Forestry and Tourism
<b>MM</b>	Millimeters
<b>NamPower</b>	Namibia Power Corporations
<b>NamWater</b>	Namibia Water Corporations
<b>NBRI</b>	National Botanical Research Institute
<b>NCA</b>	Northern Communal Areas
<b>NDP</b>	National Development Plan
<b>NHC</b>	National Heritage Council
<b>NORED</b>	Northern Electricity Distributors
<b>NPC</b>	National Planning Commission
<b>NUST</b>	Namibia University of Science and Technology

---

**PAGE  
DELIBERATELY  
LEFT BLANK**



## EXECUTIVESUMMARY

### GENERAL INTRODUCTION

Korokoko Investment Irrigation Scheme (KI-Scheme) is a proposed on a 23-hectare (Ha) land area, and shall be located in the Ndiyona constituency at Korokoko village situated about 150km east of Rundu along B8 (Rundu-to-Divundu) road. The proposed project's implementing institution constitutes / is composed of four (4) partners who are all from Kavango East region.

The key supporting infrastructure for the proposed KI-scheme is 23 Hectare (Ha) land area, which in close proximity (about 3.7 km) to the Okavango River and is accessible via a 1.2 km off-road track connecting to the D 3402 gravel road. There is an existing powerline that runs along the D 3402 gravel road. This shows that the project is located at a strategic position in terms of infrastructure and source of water.

The project will have access to the road and powerline for electricity hence the products from the scheme can be transported easily while electricity will be accessed at a reasonable cost. Water supply for the project will be extracted from the Okavango river and delivered through 50 mm (in diameter) pipeline to be installed as part of the linear infrastructures proposed. Abstracting water from the river is sustainable for the project although it's a bit expensive compared to drilling borehole. The surrounding communities and their leadership at the project site have given their consent regarding the go-head for the project as per the attached minutes of the meeting during EIA consultation meetings.



**Figure 1:** KI-Scheme showing its distance to water and gravel road.

## SCOPE OF THIS WORK AND ASSESSMENT APPROACH

In line with the environmental regulatory requirements and project registration, ISN-Namibia was appointed by Korokoko Investment Irrigation Scheme (KI-Scheme) to conduct an environmental scoping assessment for the proposed crop irrigation activities. The following is the summary of the activities associated with the preconstruction, construction, operational and decommissioning stages of the proposed KI-Scheme that have been considered in the impact assessment as potential sources of impacts (impact factors):

- Existing and new access roads grading;
- Bush clearing and ground preparation (stumping trees and leveling)
- Fencing around the scheme
- Irrigation pipeline (galvanized) for water abstraction and irrigation network
- Storage facilities and housing
- Farm operations and Maintenance (for 25 Years)
- Decommissioning (After 25 Years) / Upgrade of Facility

The primary objective of the scoping is to identify potential impacts associated with the different development phases of this project. The assessment consisted of a site visit to the project location and public consultation meetings with the Interested and Affected Parties (I&APs). Comments, suggestions and inputs received during the initial consultation process have been addressed in this Scoping report; see the original stakeholder attendance register in **Appendix A**.

## NEED AND DESIRABILITY ASSESSMENT

The proposed project presents benefits to the Kavango East Region's population offering direct and indirect employment opportunities and capacity building in the receiving communities. The following is a summary of the likely positive impacts that have been assessed for the different phases of the formalization of the proposed KI-Scheme agricultural project:

- Reduce the impacts and vulnerability of community to the effects of climate change (**Likely impacts are low**)
- Raising awareness about the benefits of self-sustainable agriculture (**Likely impacts are high**)
- Supplement the provision of government drought relief efforts and contribute to food security in the Kavango-East region and Namibia as a whole (**Likely impacts are high** for Kavango-East region and high for Namibia)
- Improved agricultural infrastructure (**Likely impacts are high**)
- Socio-economic development and capacity building through agricultural skills transfer and training (**Likely impacts are high**)

The proponent also acknowledges that potential negative impacts in the form of visual intrusion, dust and noise pollution especially during the preconstruction, construction, operation might be incurred. These impacts can be avoided and mitigated with proper implementation of the environmental management plan **Appendix E**.

## SITE SELECTION PROCESS AND ALTERNATIVE SITES

The proposed KI-Scheme site was selected in consultation with the Korokoko community members and their leadership (see Appendix B2, for minutes of the meeting held). The proposed site was selected as most suitable in terms of minimal distance from the Kavango River from which the water for supply to the site is earmarked and its close proximity (about 3.7 km) from the B8 road from Rundu to Divundu. The portion of the allocated area where the proposed KI-Scheme will be formally setup has been used to support rain-fed cultivation of maize and mahangu, and partly been used as a grazing area for livestock.

Other considerations taken into account are; that the area is sparsely inhabited, easily accessible, and suitable for agriculture activities where the soil is fertile enough to support the proposed agricultural activities. According to the proponent, any other location is deemed not viable in terms of costs in establishing and operating the KI-Scheme.

Because of the close proximity to the Kavango River, the owner of the project resolved to pump water from the river for irrigation. It's planned that a pump station will be installed at identified appropriate site at the bank of the river. This will cater for irrigation and supply for other operational activities.

## SUMMARY OF THE IMPACT ASSESSMENT RESULTS

The following is a summary of the likely negative impacts that have been assessed for the different phases of the KI-scheme:

- Air (Likely impacts are **high but localized** and can employ dust suppressing measures)
- Land use (Likely impacts are **negligible**)
- Visual impact (Likely impacts are **low**; infrastructure complements the surrounding land)
- Ecological and biodiversity loss (Likely impacts are **localized** and **low**)
- Health and safety (Overall likely impacts are **low with correct PPE**)
- Solid and hazardous waste management (Likely impacts are **low with a solid waste management plan and minimal synthetic fertilizer use**)
- Socioeconomic (Likely negative impacts are **low**)

## CONCLUSION AND RECOMMENDATIONS

Based on the environmental scoping, and the identified positive and negative impacts associated with the KI-Scheme, positive effects of this project significantly outweigh the negative ones. Most of the negative impacts are localized especially in terms of biodiversity loss, dust and noise pollution, mitigation measures as detailed in the Environment Management Plan should be adhered to, so as to minimize these effects as much as possible.

It is hereby recommended that the establishment of KI-Scheme goes ahead and that the project should be issued with an Environmental Clearance Certificate for the development of the proposed agricultural project. The Environment Management Plan and the proposed mitigation measures must be adhered to and it is the responsibility of the proponent to implement them so as to enhance the positive impacts and reduce the negative effects to a minimal. ISN-Namibia cc will periodically carry out environmental audits to assure adherence to the EMP of the proposed project.

# 1 INTRODUCTION

## 1.1 INTRODUCTION TO THE PROPOSED PROJECT

### 1.1.1 PROJECT RATIONALE

Korokoko Investment cc proposes to undertake commercial irrigation scheme activities on entailing 23 Ha, herein referred to as Korokoko Investment Irrigation Scheme (KI-Scheme). The project site is located in the Ndiyona constituency at Korokoko village which is 150km east of Rundu on B8 road of Rundu-Divundu. The proposed project's implementing institution constitutes / is composed of four (4) partners who are also members of the local community.

The project will have access to the road and power-line for electricity hence the products from the scheme can be transported easily while electricity will be accessed at a reasonable cost. Water to supply the project will be extracted from the river and delivered through 50 mm (in diameter) pipeline to be installed as part of the linear infrastructures proposed. Abstracting water from the river is sustainable for the project although it's a bit expensive compared to drilling borehole. The surrounding communities and their leadership at the project site have given their consent regarding the go-head for the project as per the attached minutes of the meeting during EIA consultation meetings.

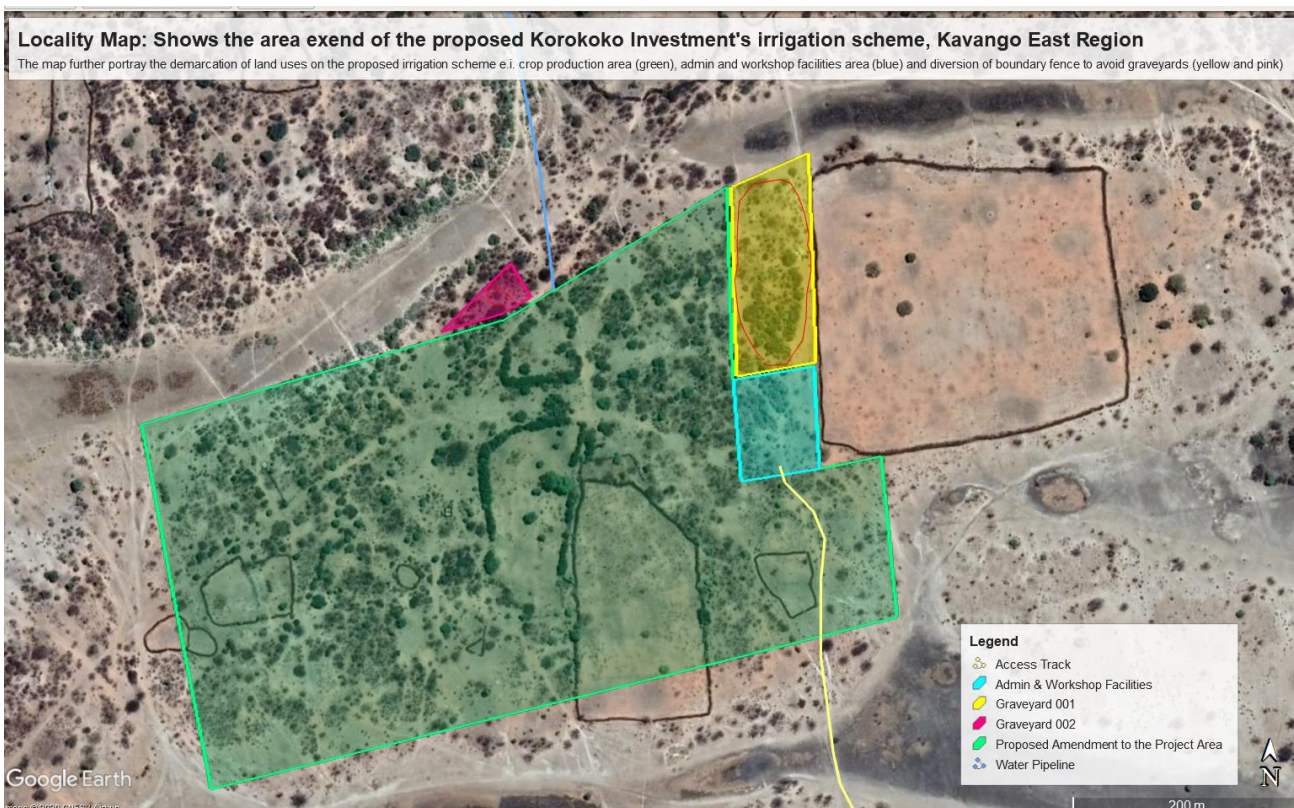


Figure 2: Image showing the proposed area for KI-Scheme.

The proposed irrigation project shall entail the production of cereal crops, vegetables and citrus i.e. Maize, wheat, onions, carrots, green peppers, watermelon, potatoes, cabbages, tomatoes and orange. The comparable benefits of the project ranges from local cereal, vegetables and fruit supply in the local markets, skills transfer for local communities and job creation in crop sector. The produce from this scheme will be sold to both the local and international markets. The produce from this project will be sold at an outlet owned by the proponent in Rundu Town which is the nearest town to the project site, but also seek international markets.

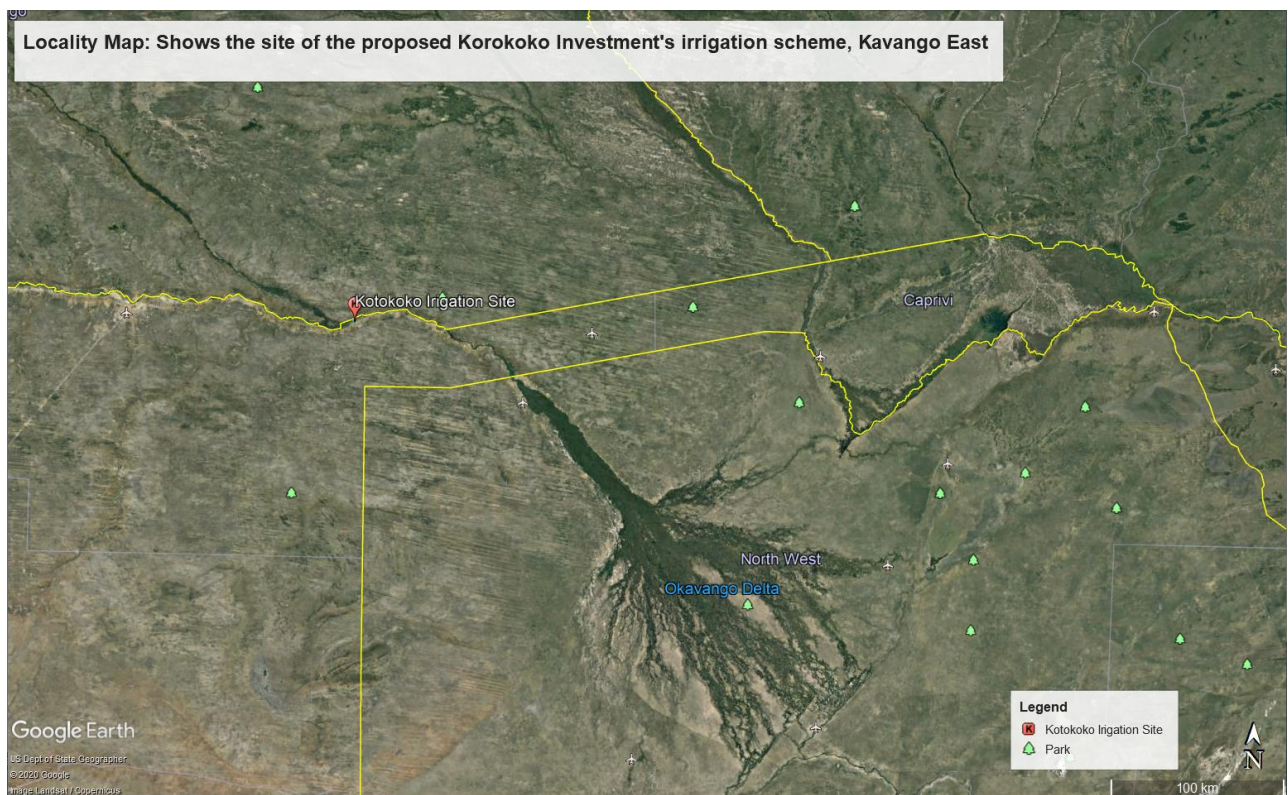
In accordance with the provisions of the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007), some of the farming activities proposed by KI-Scheme's activities may not be undertaken without an Environmental Clearance Certificate (see Table 1). In line with the national environmental assessment process (encompassing) the required Environmental Scoping Report and Environmental Management Plan (EMP) for the propose KI-Scheme undertaken in order to apply for Environmental Clearance Certificate (ECC), triggered by the proposed project:

**Table 1:** List of activities identified in the EIA Regulations that may not be undertaken without environmental clearance certificate which apply to the proposed KI-Scheme.

EMA 2007 Legislation	Description of activity	Relevance to KI-Scheme project
Activity 4 (Forestry activities)	The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorization in terms of the Forest Act, 2001 (Act No. 12 of 2001) or any other law.	The proposed project entails clearing land to make it arable and accessible for agricultural purposes. But this is at small scale since most part of the area is already cleared.
Activity 7.5 (Agriculture activities)	7.5 Pest control.	The proposed project intends to control crop pest to make sustainable profits in agriculture.
Activity 8.3 (Water resource developments)	Any water abstraction from a river that forms an international boundary.	The proposed project intends to obtain irrigation water from the bordering river.
Activity 8.7 (Water resource developments)	Irrigation schemes for agriculture excluding domestic irrigation	The proposed project entails the irrigation of 23 ha of land.

### 1.1.2 PROPOSED PROJECT LOCATION

Korokoko Investment cc proposes to undertake commercial irrigation scheme activities on 23 Ha, herein referred to as Korokoko Investment Irrigation Scheme (KI-Scheme). The project site is located in the Ndiyona constituency at Korokoko village which is 150km east of Rundu on B8 (**Trans-Zambezi**) road of Rundu-Divundu (Figure 3).



**Figure 3:** Google map showing the location of KI-Scheme.

The key supporting infrastructure for the proposed KI-scheme is 23 Hectare (Ha) land area, which in close proximity (about 3.7 km) to the Okavango River and is accessible via a 1.2 km off-road track connecting to the D 3402 gravel road (see Figure 4). There is an existing powerline that runs along the D 3402 gravel road. This shows that the project is located at a strategic position in terms of infrastructure and source of water.

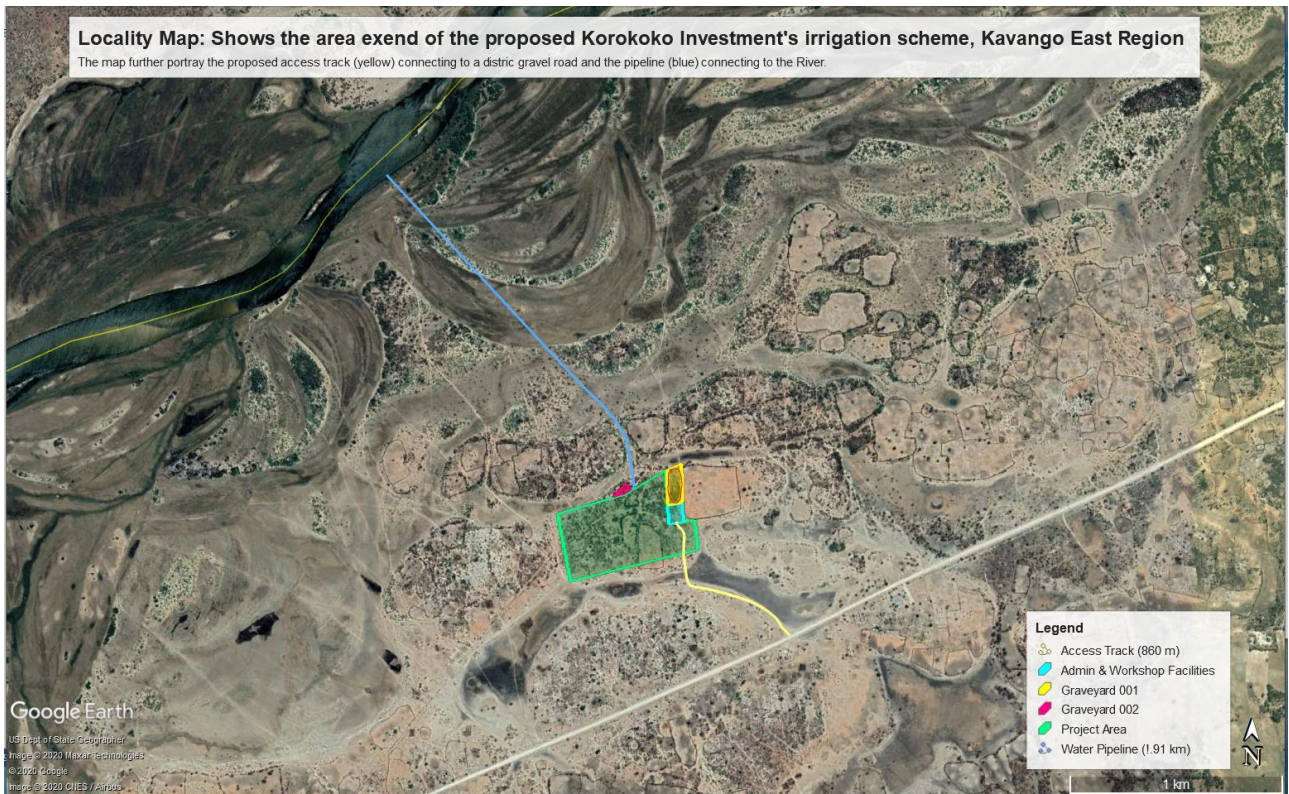


Figure 4: KI-Scheme showing its distance to water and gravel road.

Table 2: GPS coordinates of the proposed project's boundaries (in decimal degrees).

GPS POINT	LATITUDE	LONGITUDE
South-east Corner	-17.9972	20.94352
South-west Corner	-17.9986	20.9379
North-west Corner	-17.9958	20.93728
North-east Corner	-17.9937	20.94258
River Point	-17.9819	20.92934

## 1.2 PROPOSED PROJECT ACTIVITIES

### 1.2.1 Pre/construction

Pre/construction activities for KI Project will include land preparation, clearing and installation of infrastructures including the construction of Office, Ablution facilities, Staff housing, both fuel and produce storage facilities. The land preparation will include preparation of site such as fencing and bush clearing, which will utilize wooden droppers and steel posts. The clearing will be done manual with manpower. Bigger trees and protected species will be left standing unattached.

KI Project intend to construct an ablution facility, staff housing, and secure fuel and produce storage. All these facilities will be constructed based on prescribed local and international standard to avoid possible pollution and risk of contamination or hazard to livelihood.

## **1.2.2 Cultivation**

### **Land Preparation**

Cultivation will include land preparation will include the use tractor implements such moldboard plough and rippers. Minimum tillage will be practiced to reduce soil damage. As indicated under figure 12, most of the field part is already cleared hence there will be minimum clearing activities to be conducted.

### **Irrigation Systems**

Many ways to irrigate fields have been developed and there is no “best” method for all soils, field sizes and crops. The best system at any location will be the one that: can adequately irrigate the fields without wasting water; the farmer can understand and use effectively; is reliable and can be rectified easily if something goes wrong; and Environmentally friendly.

Furthermore, there many irrigation systems. These include manual, flood, basins or beds, furrows, sprinklers, drip irrigation and centre pivot. KI Project plan to use drip and centre pivot irrigation. Drip irrigation is one of the most advanced irrigation methods. Several different systems are available on the market. They are made up of various thin plastic pipes with extremely small holes, spaced at prescribed distances from each other over the length of the pipe. These holes can be 30 cm to 1 m apart. Water drips from each hole at pre-calculated rates to irrigate one or two individual plants at a time. Drip irrigation systems can easily save up to 30 % water. KI will utilise drip irrigation for smaller plots that will be located for vegetable production such as cabbage and tomatoes. The larger part of the scheme will be utilised with centre pivot. One (1) centre pivot covering 14ha each will be utilised. Centre pivot is costly but well suited for larger scale production as it can cover larger area and provide sufficient water to the crops. In this case, cereal crops such as Maize and Wheat will be produced on larger scale hence requiring centre pivot.

### **Crop Water Requirements**

The amount of water that a plant needs is dependent on many factors: type of crop, age of crop, temperature, humidity, amount of direct sunlight and speed of wind. The amount is normally expressed as depth of water in units of mm/day and includes the amount used by the plant and that which evaporates from the soil around the plant. KI will use the following water requirement from the Kavango River for irrigation purpose. The estimated water usage will be 10m<sup>3</sup> (cubic metre) per ha per year which will translate to 2,760m<sup>3</sup> per year. Since Kavango East receives sufficient rainfall for about 4 months (December – March), it is unlikely that not all the required water will be utilized from the river. The following situations, however, will be taken into consideration: If the weather is unusually hot, windy or dry, the crop will use more water; if the weather is unusually cool, damp or cloudy, the crop will use less water; and a young crop may use only half this amount of water.

## **1.2.3 Fertilization (Mechanical Application), Pest and Weed Control (Chemical Application)**

### **Fertilizer Application and Mitigation Consideration**

Despite being sand and slightly high PH, KI soil shows well suited for cereal, fruits and horticultural crops. Furthermore, the current and future analysis will inform soil correction where required such as N, P, K. Additionally, the trial planting of Maize, Mahangu and Watermelons was done which showed good yield. There

are also subsistence farming happening in the surrounding area for over 30 years but the harvest was always good. The farm is also in next to Mashare, Ngonga Linena and Shadikongoro irrigation schemes and poses similar soil texture. The analysis will then determine the rate of fertiliser requirement and application. The approach for KI will be to use organic fertilizer such as manure and compost as much as possible. Since the soil is sand, there is risk for leaching but minimal for erosion since the area is flat and sand. Therefore, careful irrigation (not over-irrigate) and incorporation of organic matter will be practiced to avoid leaching. Furthermore, regular soil sample analysis and plant nutrient content analysis will be done to determine how much to apply. The aspects that will be consideration in fertilizer application include: availability of nutrients in manures and fertilizers; nutrient requirements of crops at different stages of crop growth; time of application; methods of application, placement of fertilizers; foliar application; crop response to fertilizers application and interaction of N, P, and K; residual effect of manures and fertilizers; crop response to different nutrient carrier; and unit cost of nutrients and economics of manuring.

The methods of fertilizer applications will include broadcasting, placements, localized placements, foliar feed and fertigation. Both inorganic and organic solid fertilizers will be applied using broadcasting, placements and localized Placements while fertigation and foliar feed is mainly for inorganic fertilizer (trace element). KI will use both solid and liquid application, but care will be taken to avoid environmental harm. To achieve this, the solid application will be applied in small quantities since sand soil at KI might have low Cation Exchange Capacity. This will be done by applying broadcasting during planting and top dressing after plants at different plant growth stages instead of applying all required fertilizers at once. Splitting required fertilizers into two phases will reduce the chances of fertilizers remaining on top to be washed away. The fertilizer that will be applied during planting will be incorporated into the soil while top dressing will be minimal mainly for cereal crops. For example, incorporating P fertilizer with some type of tillage significantly reduces DP concentrations in surface runoff. Incorporating fertilizer also means more of the root zone will become enriched with available P, which may increase plant uptake. Moreover, more P will move from the DP form to the reactive form with incorporation. Since placement is labour intensive, this will be applied for horticultural crops. Placement is safe compared to broadcasting since its only right amount is placed around the plants. KI will avoid using fertigation and foliar feeds during rainy season since fertilizer can be washed away to unintended places. Fertigation and foliar feed will be done when it is not rainy season so that irrigation is well controlled to avoid overflow which can transport fertilizers. Application before heavy rainfall will be avoided for both organic and inorganic fertilizers since this can promote leaching and washing away fertilizer to unintended places.

### **The soil Potential of Hydrogen (pH)**

Soils can be acid or alkaline. Soils in the higher rainfall areas (above 600 mm per year) would rather develop acid characteristics, while alkaline soils occur largely in the lower rainfall areas. This would be the common tendency, but it is not always the case as more factors, other than rainfall, might determine soil pH. The soil pH expresses the degree of soil acidity on a scale from 1 (highest acidity) through 7 (neutrality) to 14 (highest alkalinity). KI area receives about 500mm per year while the analysis results shows the PH is between 7.7 and 7.8. Soil pH is of utmost importance in plant growth as it influences nutrient availability, toxicities and the activity of soil organisms. Acidification of soils results in a gradual decline in yields. Some plants are tolerant to acidic soils, but most of them grow better in neutral or slightly alkaline soils. The level of acidity that plants can tolerate



is influenced by the supply of available nutrients and moisture. If the pH is too low, i.e. the soil is too acidic, lime could be applied under irrigation circumstances. Although soil pH is a critical factor in determining response of crops to fertilizers, pH per se is not the factor that adversely affects plant growth. Since KI soil is alkaline (7.7pH) hence the soil will be acidified with fertilizers such as ammonium sulphate, ammonium nitrate, MAP or acidifying improvers such as compost made of pine needles will be applied. Carefully application for all fertilizer materials should be considered not just to maximize plant nutrient uptake and crop yield, but also to reduce nutrient losses to the environment. Phosphorus (P) fertilizers pose particularly complex and acute environmental risks. Generally, P is immobile in the soil, but under some conditions P can leave the field and enter waterways with eroded soil particles or with runoff and subsurface drainage waters. P can build up in waterways and freshwater lakes, which can harm wildlife, human health, and businesses.

### **Pesticide use and Weed Control**

At start, most of the weeding will be done by hand or by mechanical means. However, when KI agri-business grows bigger, other methods will be used, of which chemical control will be the last choice. Chemical control is expensive and if not applied properly can place a threat on people and on the environment as well as on animals that might feed on plant residues.

### **Pest Management**

Good pest management practices will be aimed at reducing risks related to both pest and pesticide damage for pesticide users, foodstuffs, consumers and the environment. This will be done to try to manage pests in order to keep them from reaching damaging levels, instead of killing pests as well as natural enemies. Secondly, we will try to apply pesticides in a way that will avoid pesticide resistance developing in the pest population. This will be achieved by changing between pesticide products of different groups or combining biological control methods with chemical control methods. We will avoid overdosing. We will calculate the recommended doses for the specific spraying technique. Finally, improving the production methods using what is known as integrated Pest Management (IPM). IPM is the integration of available techniques to reduce pest populations and maintain them below the levels that cause economic injury in a way that will avoid harmful side effect.

### **Intercropping and Crop Rotation**

The cropping of KI will focus on intercropping and crop rotation since this important strategy to reduce the use of inorganic fertilizer which is risk for environment. For both cereal, fruits and horticultural production, crop rotation is important. This will entail growing different crops on a certain piece of land every season. Different crops are hosts to different insect pests, diseases and weeds. By changing crops every season, there is a lower risk of a build-up of insect pests, diseases and weeds on a particular piece of land. Different crops use different nutrients, by changing crops every season, depletion of certain nutrients from the soil will be avoided. This is especially important where soil fertility is low; and little or no fertilizer is used. KI is not exceptional for this situation since sand soil can be very poor in nutrient if not managed well. Crops belong to a certain group (4 groups), therefore, crops from the same group cannot be grown on the same rotation group on the same piece of land the following season. KI will use this grouping system. It will be done by choosing a crop from the next group. Once group 4 is reached, the system will go back to group 1 and start again.

## 1.2.4 Harvesting, Storage and Marketing

### Harvesting

Harvesting will be done to create employment to the surrounding community. That will be done directly harvest needed crop leaving residue in the field to contribute to fertilization of the crop field. The transportation of harvested crops will be done to avoid any leakage and pollution.

### Storage

KI intend to build two storages, one for liquids while the other one for solid products. Both storages will be strategical located western part of the sites to avoid smells as the direction of the wind is most cases from East to West. Liquid storage will be protected to avoid an access surrounding domestic and wild animals that could be harmed.

### Marketing

The current stock in the silos countrywide is about 6 360 tonnes and the expected yield only from Green Scheme projects is about 13 500 tonnes. Other state-owned farms such as those of the National Youth Service have also indicated that there are reasonable amounts of hectares planted with maize. About 2 000 hectares are cultivated at the Green Schemes which include Shadikongoro, Ndonga Linena, Mashare, Uvungu-Vungu, Sikondo, Musese and Etunda (Table 3). The release of maize from the Katima Mulilo food reserve facility is needed to create capacity for the 2018/2019 crop season. The silo at Katima Mulilo have undergone major upgrading as two more silos were to be added. The competition for KI-Scheme is mainly the Green Scheme Irrigation Farms that produce maize and horticultural products in and around the Kavango East and Kavango West Regions. The shortage of local production, however, translates to very little concern about the competitors. The other producers who are producing the same grains under the different government projects have the following market shares with regards to the specific crops:

Table 3: Current Main Cereal Producers in Namibia

Producer (Project)	Area/Locality	Tons per annum	
		Maize	Wheat
Etunda (600ha)	Omusati Region	5 500	850
Shitemo (360ha)	Kavango East Region	3 000	200
Shadikongoro (300ha)	Kavango West Region	2 800	1200
Musese (150ha)	Kavango West Region	1 500	800
Vhungu Vhungu(160ha)	Kavango East Region	1 800	300

KI-Scheme need 23 hectares of land to successfully penetrate the world market. The scheme intent to start with a smaller area then acquire the other land to extend in future. KI-Scheme plan to start with Maize, wheat, onions, carrots, green peppers, watermelon, potatoes, cabbages, tomatoes and orange.

The project would need directly four workers per hectare and indirectly one worker per hectare. That associate at least 92 work opportunities. KI-Scheme want to re-infest as long as there is land and opportunities is available. Soil observation show its sandy hence management to optimize the potential of the soil is required. All produces would be provided in the local need before to look at foreign markets.

The competitors to the market in terms of cereal crop production include other producers in other areas. Maize and wheat are also produced by farmers in the Maize Triangle in the north and north-eastern, irrigation schemes at Naute and Hardap, and from several government supported projects in the north-eastern parts of Namibia such as Shadikongoro. Mostly the crop producers supply their produce to milling companies in Namibia, after which it is milled, marketed and distributed to the various outlets in the country.

KI-Scheme will captivate the market in Northern and North Eastern Namibia. The main target client for the cereal crops which will be produced under irrigation will be the Government of the Republic of Namibia which is currently taking up 100% of the grain produced at all Namibian Green Scheme Farms. Cereal produce will also be sold directly to millers like Namib Mills in Otavi, Goal Maize Mills in Tsumeb and Onawa Mills in Outapi. The management of KI-Scheme has developed comprehensive marketing and sales strategies for the maize. The farm has also activated a distribution network for its horticultural products with a number of reputable retail chains like OK, Spar, Shoprite, Pick & Pay. Other markets include correctional services and police services such as Mukwe, Ndiyona, and Kahenge. There is a ready market for the farm's produce. Horticultural produce will be sold through the retail system (shop like Fruit and Veggie City, Shoprite, OK, Spar, Pick 'n Pay), companies that have tasked to procure food for schools and hospitals e.g. Xantium in Rundu, informal traders, wholesalers (Stampriet Produce Market, Fruit and Veggie wholesalers), hotels and lodges like Mashare Lodge and the general public.

## 2 ENVIRONMENTAL LAWS AND POLICIES

This section draws information from the legal sources in Namibia. The Republic of Namibia has five tiers of law and a number of policies relevant to agricultural activities and these include:

- The Constitution.
- Statutory law.
- Common law.
- Customary law.
- International law.

As the main source of legislation, the Namibian constitution makes provision for the creation and enforcement of applicable legislation. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and to mitigate adverse environmental impacts.

Namibia's policies provide the framework to the applicable legislation. Whilst policies do not often carry the same legal recognition as official statutes, policies can be and are used in providing support to legal interpretation when deciding cases.

### 2.1 APPLICABLE LAWS AND POLICIES

In the context of agriculture and related infrastructure in Namibia, there are several laws and policies currently applicable. Each of these is discussed in detail below.

#### 2.1.1 ENVIRONMENTAL MANAGEMENT ACT No. 7 of 2007 and its regulations of 2012

To enforce the policy on EIAs, the Environmental Management Act (EMA) No. 7 of 2007 aims to promote the sustainable management of the environment and the use of natural resources by establishing principles for decision making on matters affecting the environment; to establish the Sustainable Development Advisory Council; to provide for the appointment of the Environmental Commissioner and environmental officers; to provide for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.

#### 2.1.2 THE ENVIRONMENTAL INVESTMENT FUND OF NAMIBIA

The Environmental Investment Fund of Namibia Act (13 of 2001) provides for the creation of a fund that will be used to support sustainable environmental and natural resource management. The source of the funds will include penalties/fines paid and/or property forfeited in terms of non-compliance and/or crimes as set out in EMA.

#### 2.1.3 THE WATER ACT No. 11 OF 2013

Aims to 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.

#### **2.1.4 THE FOREST ACT**

The Forest Act (12 of 2001) allows for the declaration of protected areas in terms of soils, water resources, plants and other elements of biodiversity. This includes the proclamation of protected species of plants and the conditions under which these plants can be disturbed, conserved, or cultivated.

#### **2.1.5 PARKS AND WILDLIFE MANAGEMENT BILL**

The Parks and Wildlife Management Bill (2009) aims to provide a legal framework for the sustainable use and maintenance of Namibia's ecosystems, biological diversity and ecological processes; and repeals the Nature Conservation Ordinance (4 of 1975). This Bill allows the Namibian Ministries of Environment and Tourism, and Minerals and Energy, to allow mining to take place within parks subject to the relevant assessments and authorizations.

#### **2.1.6 NATURE CONSERVATION ORDINANCE**

The Nature Conservation Ordinance (4 of 1975) provides for the declaration of protected areas and protected species.

#### **2.1.7 NATIONAL HERITAGE**

The National Heritage Act (27 of 2004) provides protection and conservation of places and objectives of significance, as all archaeological and paleontological objects belong to the state.

#### **2.1.8 LABOR ACT, 2007 ACT 11 OF 2007**

Construction safety is regulated under the Health and Safety Regulations under the Labour Act. The health and safety framework in Namibia regulate the following aspects:

- Construction safety;
- Electrical safety;
- Machinery safety;
- Hazardous substances;
- Physical hazards and general provisions;
- Medical examinations and emergency arrangements;
- Rights and duties of employees.

### **2.2 THE UNITED NATIONS CONVENTION ON BIOLOGICAL DIVERSITY**

This over-arching international convention is relevant to biodiversity conservation and management.

#### **2.2.1 PUBLIC AND ENVIRONMENTAL HEALTH ACT OF 2015**

This Act (GG 5740) provides a framework for a structured uniform public and environmental health system in Namibia. It covers notification, prevention and control of diseases and sexually transmitted infections; maternal, ante-natal and neo-natal care; water and food supplies; infant nutrition; waste management; health nuisances; public and environmental health planning and reporting. It repeals the Public Health Act 36 of 1919 (SA GG 979).

### 3 PUBLIC CONSULTATION

The range of environmental issues to be considered in the EIA has been given specific context and focus through consultation with authorities and IA&Ps. Included below is a summary of the people consulted, the process that was followed, and the issues that have been identified.

#### 3.1 AUTHORITIES AND INTERESTED AND AFFECTED PARTIES (IA&Ps)

The following authorities and I&APs are involved in the EIA process:

- National authorities:
  - Ministry of Environment and Tourism, Ministry of Agriculture, Water and Forestry, and Ministry of Land Reform.
- I&APs:
  - Traditional Authority Kavango East, Residents of Korokoko village, and adjacent villages (**Appendix B2**).
  - Wider stakeholders' consultation through media such as newspapers (**Appendix B1 and B2**)

#### 3.2 STEPS IN THE CONSULTATION PROCESS

Table 4 below sets out the steps in the consultation process that has been conducted to date. The public consultation process entailed the submission of the Project Information Document to the Competent Authority (in this case the Ministry of Agriculture, Water and Land Reform). This was then followed by publication of adverts in local newspapers aimed at both inviting for the registration of Interested and Affected Parties and notification of consultation meetings.

Table 4: Consultation Process with I& APs and Authorities

TASK	DESCRIPTION	DATE
<b>Notification of regulatory authorities and I&amp;APs</b>		
Written notification to MET	Registration of Proposed Project	
I & AP identification	Notice for Environmental Impact Assessment	1 AUGUST 2019
Distribution of BID	Background Information Document (Bid) for Agricultural Activities with Korokoko Communities	15 AUGUST 2019
Site notices	Notice for Environmental Impact Assessment	15 AUGUST 2019
Newspaper advertisements	Notice for Environmental Impact Assessment	17 AUGUST 2019
<b>Scoping stage meetings and submission of comments</b>		
Scoping meetings	First Meeting with Korokoko community: 2nd Meeting with Korokoko community:	31 AUGUST 2019 26 OCTOBER 2019
<b>Review of scoping report</b>		
I & APs and authorities (excluding MET) review of scoping report		
MET review of scoping report		

## 4 DESCRIPTION OF THE CURRENT ENVIRONMENT

### 4 DESCRIPTION OF THE CURRENT ENVIRONMENT

#### 4.1 CLIMATE BASELINE

The KI-Scheme is situated 135km east of Rundu on Rundu - Divundu road (B8), in Korokoko village, Ndiyona district and constituency in the Kavango-east region of northern Namibia. Therefore, Korokoko is under the same geological and climatic conditions as Rundu urban of which much weather data is readily available. The KI-Scheme has a humid subtropical climate with hot summers and relatively mild winters (with warm days and chilly to cool nights). It borders on a semi-arid climate. The average maximum temperature as indicated in Figure 5 below varies between 22 and 36°C.

Rainfall is usually expected during the summer months as indicated in Figure 5 below and on average 95% of this rainfall is experienced from November to April. Rundu receives an annual precipitation of 571 mm. No rain of any significance falls from May to September, and the chance of rain increases progressively from October until January, the month with the highest total on average, and then decreases again until April.

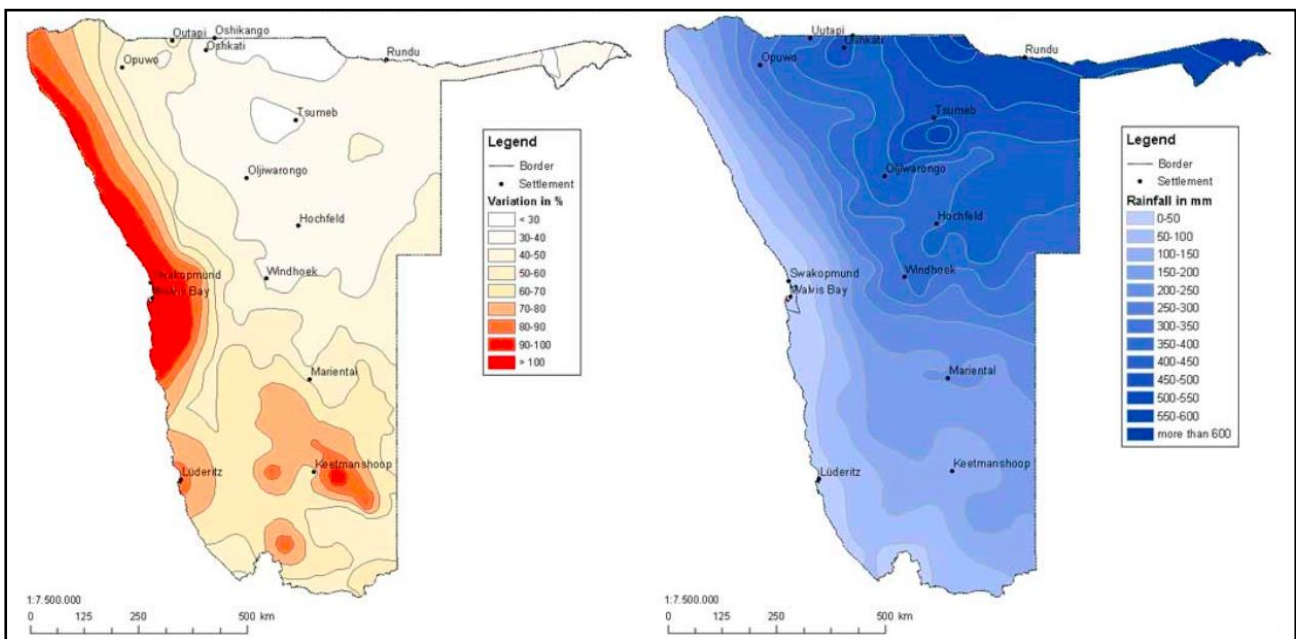


Figure 5: Shows temperature variation and annual average rainfall along an east-to-west gradient, with minimum temperature variation and high annual rainfall observed in the east where the project is proposed.

Over 30 years average rainfall data from Namibia Meteorological Services (METSU, 2019) show rainfall trend for 3 stations in Kavango East closest to Korokoko village. Kavango East is one of the regions considered to receive higher rainfall in Namibia. Rainfall variability is presented by large deviations with high degree of variability between years. Despite the challenge of climate change, there is clear trend that rainfall received over 30 years ranges between an average of 400-500 mm with Rundu being the highest. Reasonable rainfall is favorable for KI-Scheme as it will utilize less river water and electricity during rainfall season.

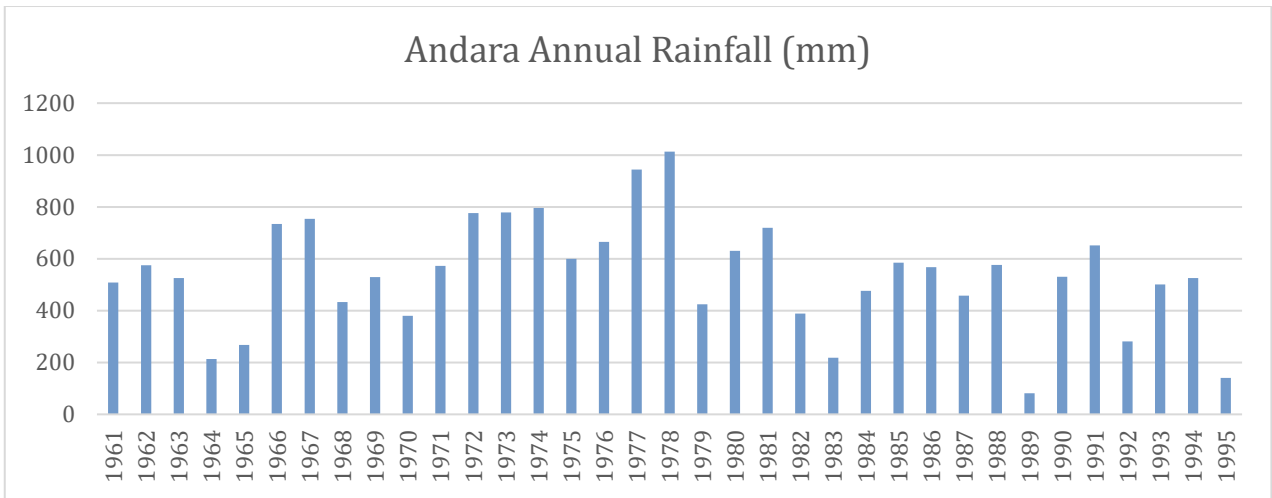


Figure 6: Andara annual rainfall from Kavango East region.

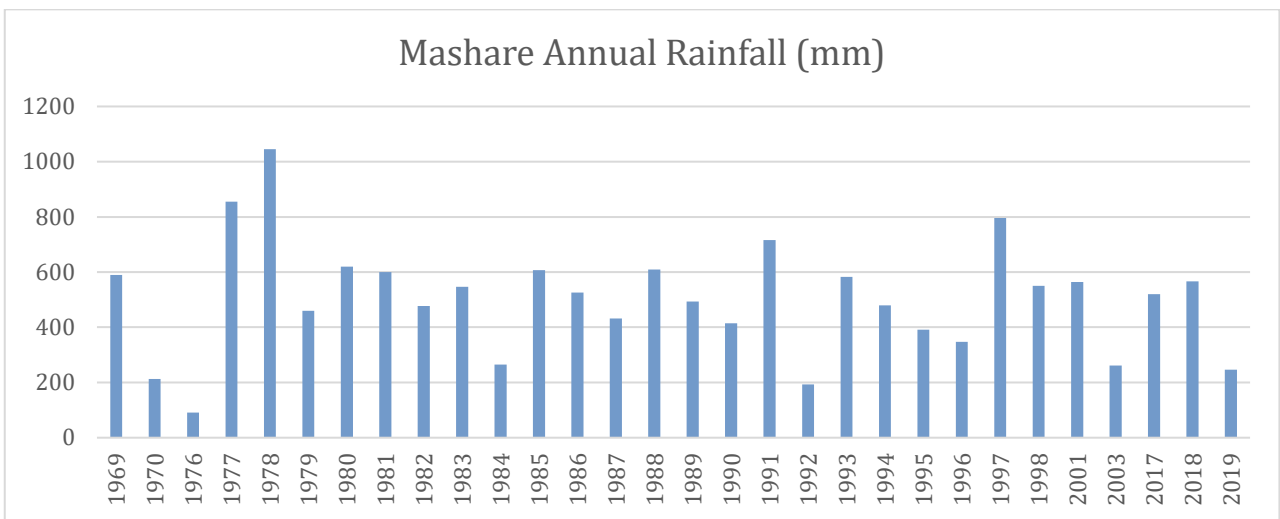


Figure 7: Mashare annual rainfall from Kavango East region.

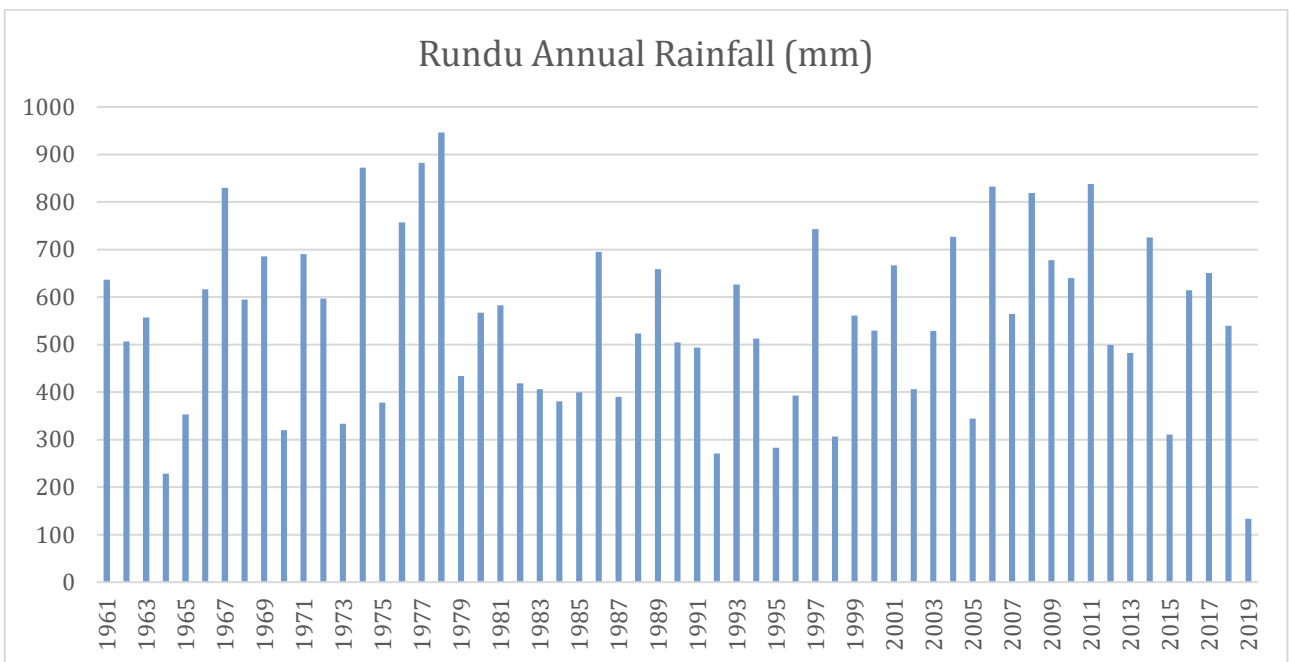


Figure 8: Rundu annual rainfall from Kavango East region.



The prominent wind rises from the south-easterly direction reaching average speed of between 5 km/h and 25 km/h (Figure 9).

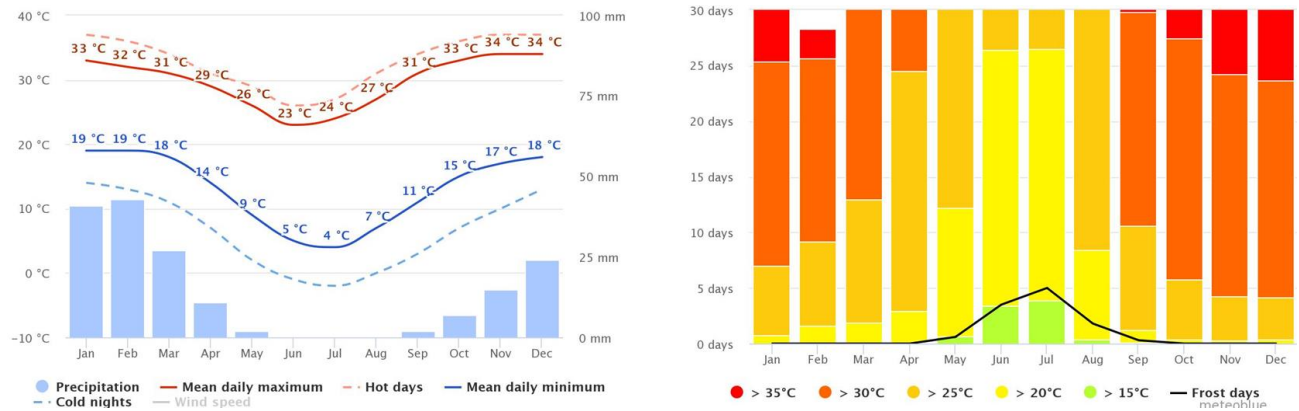


Figure 9: Combined graph of annual average minimum and maximum temperature, precipitation and number rainy days in proximity of the project site (Rundu Town).

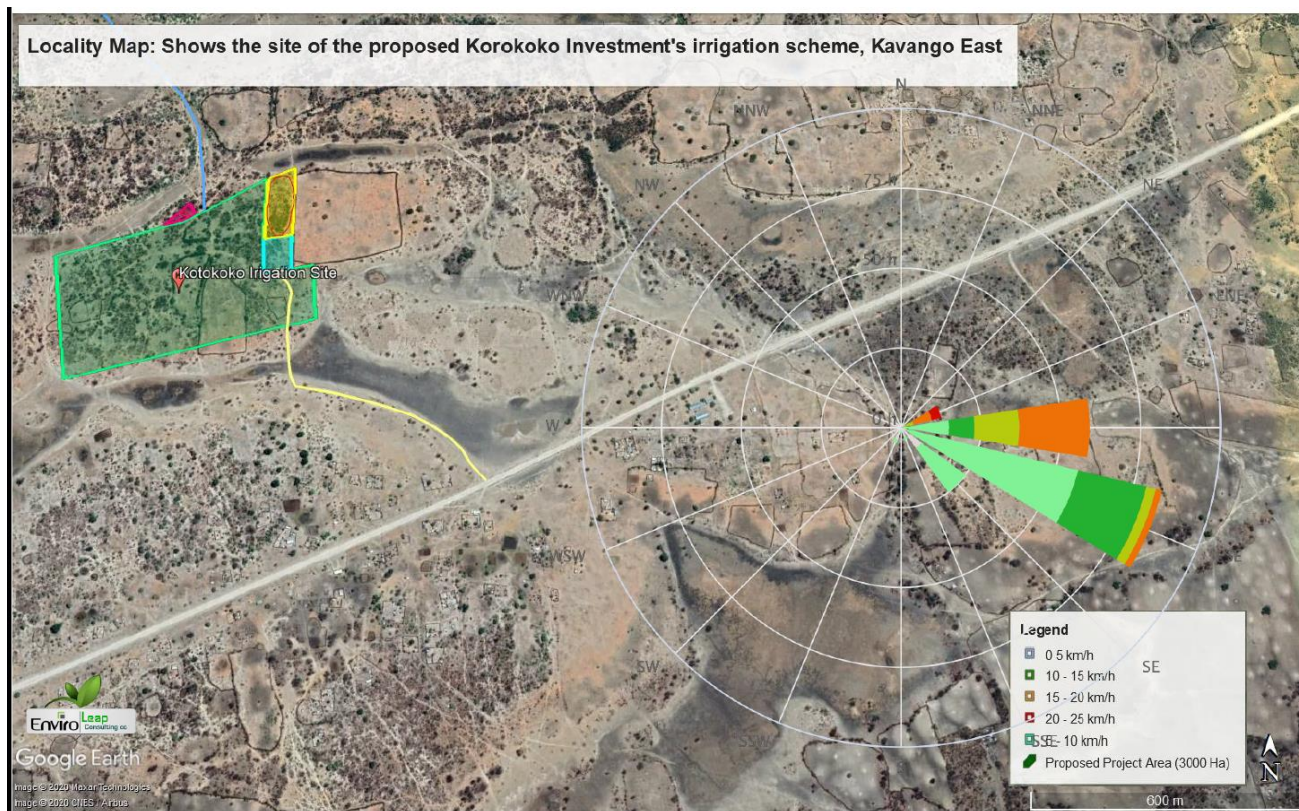


Figure 10: Map of Wind-Rise Direction and Speed (at Rundu Town), about 134 km east of the proposed projects site at Korokoko Village.

## 4.2 TOPOGRAPHY BASELINE

Due to the high drainage capacity of the sandy soils, the scheme operations must be cognizant of the potential risks of over-irrigation which may contribute significantly to leaching of nutrients out of the soil. In seasons with abnormal rainfall, this will happen naturally in the sandy soils and therefore, the essential application of organic matter cannot be over emphasized. To manage the scheduling of the irrigation correctly, the scheme is advised to gauge soil moisture regularly to indicate when and how much to irrigate. Continued over-irrigation will also lead to contamination of groundwater and high return-flows to the river. The danger for this can however be

reduced dramatically if the scheme applies only the right amount of water when it is needed.

In such flat and sandy area, it is not foreseen that irrigation will pose a problem regarding erosion as such, but the fact that an irrigation project is at a certain place, may attract more people to the surrounding area. Their land-use practices can lead to erosion during heavy rainfall or even wind-erosion because of over-grazing and deforestation. This can be mitigated by good Agricultural Extension work and awareness campaigns, to show farmers the results of such unsustainable land-uses practices and to teach ways to prevent it. It will also be good practice to prevent any land clearing within 150m from the riverbank for cultivation purposes. This will ensure that if erosion does start, soil and nutrients will not wash into the river with subsequent detrimental results to the ecology downstream. However, since KI-scheme is far away (about 3.5km), this is not a major concern.

Another good practice will be for the scheme to incorporate all organic material harvested on the land back into the soil, instead of burning it or using it as fodder for their livestock. (This also applies to the initial land clearing operation). In this way, they will enhance the water holding capacity of the soil and the soil will not be prone to wind or water- erosion. A better practice still will be to manufacture compost from this material and the manure from cattle. This will also lead to higher crop yields due to the higher nutrient content and better water holding capacity of the soils which will be an added benefit for subsistence farmers.

### **4.3 SOIL AND GEOLOGY BASELINE**

Due to the sandy nature of the soils and low clay and organic matter content, the soils are well drained, have a high infiltration rate and a low water retention capability. This can be mitigated by incorporating a good deal of compost and other organic material into the soil. Typically, this soil has a useful water retention capability of  $\pm 30\text{mm}$  which is just enough water for three to four days during the peak demand periods. The scheme and irrigation designer therefore have to take this into account when designing the irrigation systems and irrigation scheduling. On the other hand, this also makes it a very easy soil to manage because drainage is not a problem and the right amount of water and fertilizer can be applied when needed. A good deal of initial fertilizer however is needed to bring the soil fertility a good level after which only regular maintenance fertilizer application is needed. Geologically most of the Kavango East soils comprise Cenozoic deposits of the Kalahari Group that overlay extensive basalt sheets of the Stormberg Series. The deposits of the Kalahari Group consist mostly of light coloured sands, chalcedonic limestones, silicified sandstones and ochreous sands. The last mentioned forming the Kalahari Sandveld in Namibia.

The Okavango River area consists out of two distinguishable landforms namely, the inland sand plateau and, the river terrace system. The riverine landform consists out of a floodplain that is partially under water during the rainy season and therefore not considered suitable for intensive irrigation purposes. The terrace is situated  $\pm 6$  to 7 metres above the riverbed. The parent material of the inland sand plateau is composed predominantly of infertile aeolian sands of the Kalahari Group with low organic matter content. Along the terraces the sandy soil is enriched with clay and silt deposits by seasonal floods.

The main source of water supplies in the project area is boreholes from Directorate of Water Supply and Sanitation Coordination and Okavango Rivers as sources. But for KI-Scheme, the water supply will be from the Okavango River which is about 3.7km to the River, as shown in Figure 4. As shown in borehole location map in Figure 11, it is noted that the proposed scheme site is not affecting any underground water sources as there is none sited in the immediate vicinity. Therefore, this scheme poses no threat to the potential abstraction of ground water.

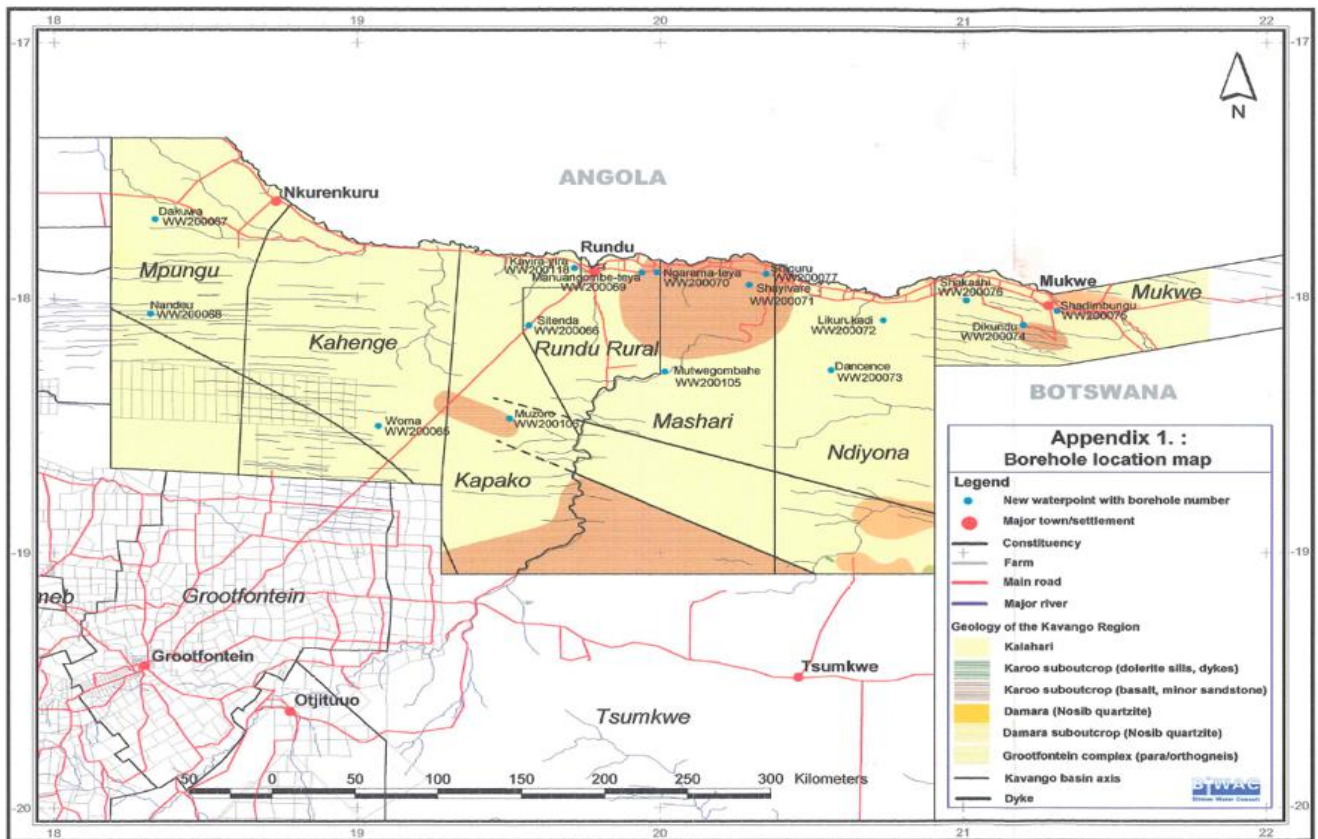


Figure 11: Borehole location map overview of Kavango East areas where the KI-Scheme is located (Extract from Department of Water Affairs and Forestry, 2019)

#### 4.4 BIODIVERSITY BASELINE

The birds were observed or encountered in the area during the field visit and this was augmented with the use of Kenneth Newman, 2000. Newmans Birds By colour, Southern Africa Common Birds Arranged by Colour, Struik New Holland Publishing (Pty) Ltd 2000. Since birds have no trans-boundaries this list does not restrict the occurrence of other birds not appearing in the list below:

Black Chested Prinia

Pied Crow

Red –Eyed Bulbul

Social Weaver

Southern Yellow Billed Hornbill

Namaqua Dove

Yellow Canary

Palm Swift

Grey – Backed Finchlark

Laughing Dove

Monteiro Hornbill

Streaky – Headed Canary

Namaqua Sandgrouse

#### 4.5 LAND USE PATTERNS AND IMPACT ON VEGETATION

KI-Scheme occupies the communal farming land which has been used for growing crops such as maize, mahangu and melons. Most of the vegetation in the ear-marked area has been cleared with the exemption of some pocket areas still having bushes.

#### 4.6 LAND CAPABILITY BASELINE

The proposed land on which the KI-Scheme will be situated had sparsely distributed vegetation which includes trees, shrubs, herbs, and grasses. The notably tree species in the areas are; *Terminalia sericea*, *Acacia erioloba*, *Acacia hebeclada* supsb. *hebeclada*, *Combretum imberbe*, *Schinziophyton rautanenii*, *Strychnos spinosa*, *Hyphaene petersiana*, shrub such as *Dichrostachys cinerea*, and *Gymnosporia maranguensis* were encountered during the botanical assessment. Herbs such as *Acrotome inflata*, and *Asparagus spp.* are quite common in the proposed area.



Figure 12: About 50 percent of the proposed KI-Scheme is already cleared and been used as crop fields.



Figure 13: The un-cleared parts is characterized by sparsely bushes and trees mainly dominated by *Terminalia sericea*.

The alien plants were taken into consideration during the botanical assessment. It was found that there were no records or observation of alien plants in the proposed area for the activities of the KI-Scheme.

#### 4.6 ARCHAEOLOGY BASELINE

The proposed site for the KI-Scheme is within an already developed communal area and therefore because of prior land developments, no major artifacts of historical or cultural significance were found on site. However, there are two old existing graves. The zoomed-out map below showing detail inside of proposed Korokoko Investment Irrigation Project. The red circles indicate the two grave spots while existing gardens within the project are clearly visible. It was agreed the project can proceed since there area has been used for cultivation and livestock grazing without protecting these two old graves. However, it was resolved the graves to be protected by fencing them. The cultivation of activities will start 5 metre away from the fenced off graveyards.

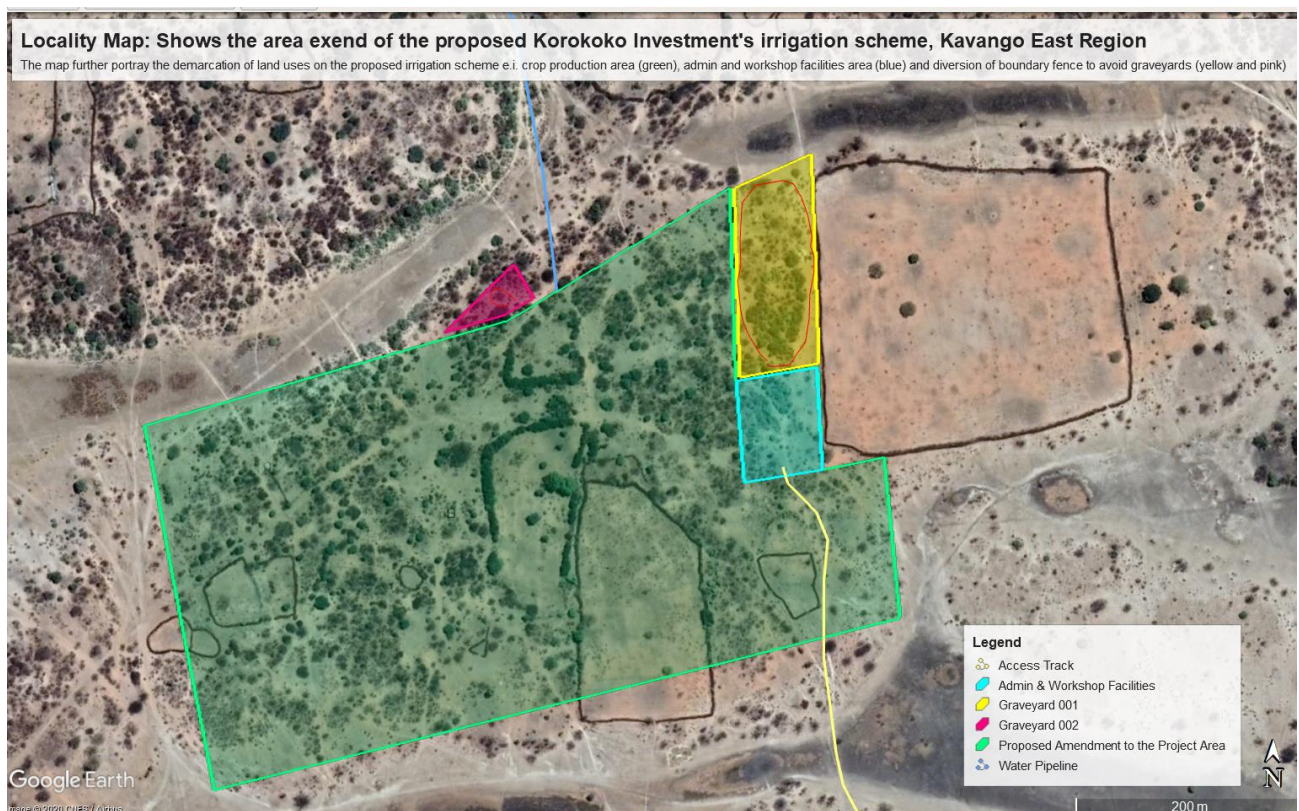


Figure 14: KI-Scheme showing spots for old two graves circled in red.

#### 4.7 SOCIO-ECONOMIC

Korokoko village is a typical rural area village with most of the residents depending on mixed subsistence livestock and crop farming and seasonal fishing. It is further characterized by poor sanitation and drinking water supply. Household structure is dominated by hut structure with thatch roof and mud/clay wall. There is one school (combined) in the vicinity area. Korokoko village is located within Ndiyona constituency, therefore Ndiyona constituency socioeconomic information is the most relevant information that helps to provide insight socioeconomic status of Korokoko since the socioeconomic information for Korokoko is not properly documented. Ndiyona constituency has about 20,633 population with an average of 6 household size. Household income is mainly from farming with 48 percent of the population receiving income from farming.

About 60.9% households in the constituency are involved in crop and livestock farming. Most of the properties are occupied without mortgage. On the other hand, wood poles/sticks or grass/ reeds houses are common in this constituency which Korokoko is not exceptional. Moreover, wood /charcoal is the common source of energy for cooking with 92% of households utilizing such while 78% of the households uses candles as the means of lighting during night. Various method used in abstracting water including piped water within the house, piped water outside the house, public pipe, borehole with tank, protected well, borehole with open tank, river /dam /stream and unprotected hand dug well. About 80% of the household have no toilet facilities.

In terms of changes in the incidence of poverty over time between 2001 to 2011, Ndiyona was one of the constituencies with greatest decline which recorded reductions of 12.8 percentage points. Furthermore, this constituency (Ndiyona) has poverty incidence above the national average of 27 percent. Figure 15 indicates a reduction in poverty levels over the period of ten years (from 2001 to 2011). The map indicates the greatest decline in poverty occurred in Mashare, Ndiyona and Mukwe constituencies.

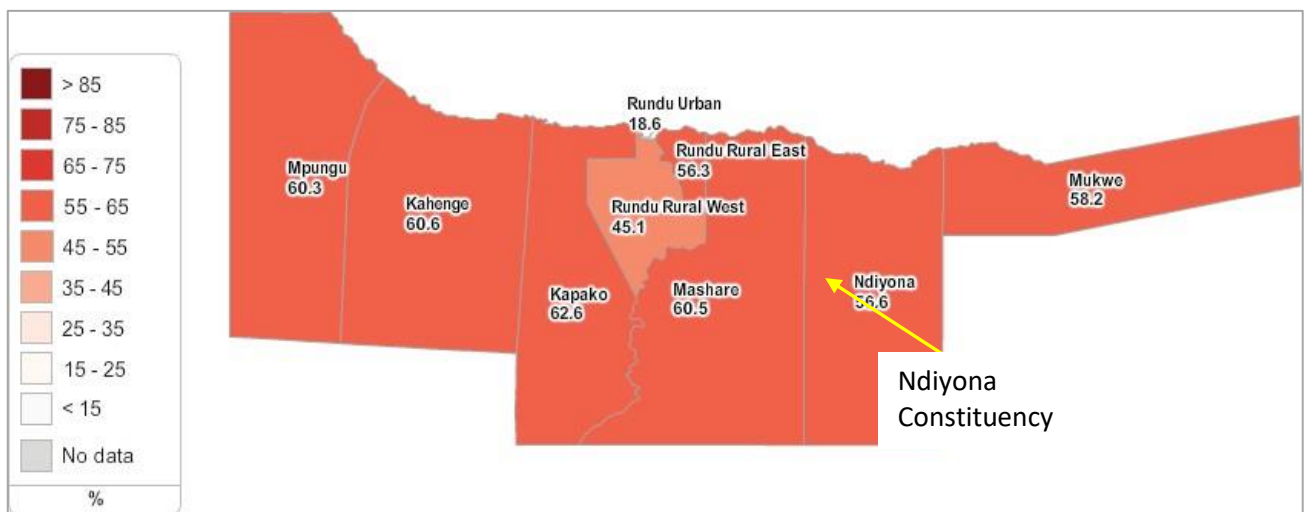


Figure 15: Kavango Region Poverty Headcount Rate in 2011 (upper bound poverty line) indicating Ndiyona constituency as well.

Based on the 2011 Namibian Index of Multiple Deprivation (NIMD), Ndiyona constituency was the 6th overall deprived constituency in Namibia. When segregated by variables, Ndiyona was number 5 and 6 on health and education deprivation accordingly. Among the twenty most living environment deprived constituencies in 2011, Ndiyona constituency was one of the largest declines in living environment deprivation with 2 percentage points. Constituency figures show that Mashare and Ndiyona had the highest proportion of disabled people, with about 8 percent each.

## **5.1 CURRENT AND FUTURE LAND USE ALTERNATIVES**

The existing site for the establishment of the KI-Scheme was selected by the project proponent in consultation with the Korokoko community members with its leadership for the purpose of agricultural activities. The proposed KI-Scheme occupies 23 ha of communal land. Other considerations made during the selection process were that;

- The area is sparsely inhabited, easily accessible,
- The project site is not in an area prone to flooding (therefore the food crops are not at risk) and
- The aquifers are not too deep to be used for water abstraction (boreholes) to augment the surface water from the river ensuring sustainable water harvesting for horticultural irrigation.
- According to the proponent any other location is deemed not viable in terms of costs in establishing and operating the mixed-use farm.

This was the most favorable site in terms of minimal distance between the connection points of the Kavango River and the farm to support crop on 23ha of land on the farm.

## **5.2 THE “NO PROJECT” OPTION LINKED TO NEED AND DESIRABILITY**

The assessment of this option requires a comparison between the alternatives of proceeding with the proposed agricultural development with that of not proceeding. Proceeding with the agricultural project will enable the enhancement of the Namibian quest for food self-sufficiency and thus the contribution to food security and the project will therefore result in significant positive economic and social impacts. However, proceeding with the proposed project will also result in negative environmental impacts as described and assessed in other section of this scoping report. Not proceeding with the proposed project will prevent KI-Scheme from producing the envisaged cereals, vegetables and citrus, and will leave the current land use unchanged or developed.

## 6 PROJECT DESCRIPTION

### 6.1 CONSTRUCTION PHASE

The pre-construction and construction activities i.e. preparations of land for the proposed project will only commence once the Environmental Clearance Certificate (ECC) has been obtained. This is a preceding legal requirement enabling other approvals and permits such as consent letter and Land Lease Agreement from Gciriku Traditional Authority and Ministry of Land Reform respectively. The local community members have consented to the project as detailed in the minutes to the public stakeholder (Appendix B4) who occupy the surrounding area to the proposed KI-Scheme site. KI-Scheme will employ the specialties of a local agricultural engineering company to implement the green house design, civil, structural and health and safety plan. Activities of the preconstruction and construction phases are summarized as follows:

Access road grading: To facilitate the ease of circulation for vehicles transporting employees, construction material, equipment and farm implements, the existing road that was created by the community will be upgraded by means of upgrading it and compacting to be able to support the movement of farm vehicles to the site;

- Site clearing and ground preparation /Foundation: The necessary land clearing will be undertaken as per design of greenhouse, cultivation and scheme infrastructures.
- Fencing: A fence will be erected during the preconstruction phase and this will remain in place after commission in order to regulate access to the KI-Scheme and for health, safety/security purposes
- Overhead cable
- A single power line servitude of the appropriate voltage as determined by NamPower engineers will link the proposed KI-Scheme to the NamPower substation will be installed.
- Commissioning

### 6.2 OPERATIONAL PHASE

As soon as the KI-Scheme has been commissioned, the farm will be self-sustaining and start to produce agricultural cereal, vegetables and citrus to supply the consumers. Permanent and casual staff will be employed to ensure consistency of yields and proper running of farm operations.

All strategic decisions at the farm will be done by the Executive Director of the scheme who has vast experience in both cereal, vegetation and citrus production. All tactical and operational decisions will be the responsibility of the Farm Manager. Continuous Stakeholder Engagements: At all stages of the project phases (preconstruction, construction, operation and maintenance) there will be continuous consultations following the prescribed communication channels through the Gciriku Traditional Authority with the stakeholders if any concerns arise. The issues affecting the local community in the immediate vicinity of the KI-Scheme will be received and resolved as soon as possible.



### **6.3 DECOMMISSIONING AND CLOSURE PHASE**

The proposed operational lifespan of the leasehold agreement is twenty-five (25) years, as per the application to be made to Gciriku Traditional Authority and Ministry of Land Reform in Rundu. Consistent agriculture output is guaranteed by the secured personal and loan funds to realize the fruits of the dedication to this KI-Scheme. The KI-Scheme is expected to be operational for a 25 years period; thereafter the farm can then be upgraded by adding extra farming activities and diversifying agricultural uses depending on long term feasibility or completely decommissioned. The provisions of the Environmental Management Act, 2007 it is necessary to take into account the impacts on the environment during the decommissioning phase of the project. Namibian legislation considers decommissioning as a separate activity and an EIA should therefore be carried out prior to its decommissioning.

Recommendations to be considered prior to decommissioning: A closure plan should be developed by the proponent at least 10 years prior to the expected date of decommissioning. This closure plan must identify the targets and objectives for decommissioning and the operations working towards this end. Consultations from specialists must be conducted by the proponent in order to ensure that the decommissioning phase is in line with the prevailing best practice trends, to reduce the potential risks and economic costs to carry out this process. Stakeholder engagement is vital at this phase to ensure that the communities' interests are known and their obligations from the beginning of the project are addressed.

## 7 ENVIRONMENTAL IMPACT ASSESSMENT

### 7.1 INTRODUCTIONS TO THE ASSESSMENT APPROACH

Potential environmental impacts were identified by ISN-Namibia in consultation with I&APs, regulatory authorities, specialist and KI-Scheme. In case of social impacts, the assessment focused on third parties only (third parties include members of the public and other local and regional institutions) and did not assess health and safety impacts on workers because the assumption was made that these aspects are separately regulated by health and safety legislation, policies and standards.

The impacts are discussed under issue headings in this section. The discussion and impact assessment for each sub-section covers the construction, operational, decommissioning and closure phases where relevant. This is indicated in the table at the beginning of each sub-section. Included in the table is a list of project activities/infrastructures that could cause the potential impact per farming phase. The activities/infrastructure that are summarized in this chapter, link to the description of the proposed project (see Section 6 of the EIA report).

Both the criteria used to assess the impacts and the method of determining the significance of the impacts is outlined in Table 5. This method complies with the method provided in the Namibian EIA Policy document and the draft EIA regulations. Part A provides the approach for determining impact consequence (combining severity, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D. Both mitigated and unmitigated scenarios are considered for each impact.

Table 5: Criteria for Assessing Impacts.

PART A: DEFINITION AND CRITERIA		
Definition of SIGNIFICANCE	Significance = consequence probability	
Definition of CONSEQUENCE	Consequence is a function of severity, spatial extent and duration	
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action. Irreplaceable loss of resources.
	M	Moderate/measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints. Noticeable loss of resources.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/will remain in the current range. Recommended level will never be violated. Sporadic complaints. Limited loss of resources.
	L+	Minor improvement. Change not measurable/will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favorable publicity.
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short-term
	M	Reversible overtime. Life of the project. Medium-term
		Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of Impacts	L	Localized-Within the site boundary.
	M	Fairly widespread-Beyond the site boundary. Local
		-Far beyond site boundary. Regional/national

PARTB: DETERMINING CONSEQUENCE					
SEVERITY=L					
DURATION	Long-term	H	Medium	Medium	Medium
	Medium term	M	Low	Low	Medium
	Short-term	L	Low	Low	Medium
SEVERITY=M					
DURATION	Long-term	H	Medium	High	High
	Medium term	M	Medium	Medium	High
	Short-term	L	Low	Medium	Medium
SEVERITY=H					
DURATION	Long-term	H	High	High	High
	Medium term	M	Medium	Medium	High
	Short-term	L	Medium	Medium	High
			L	M	H
			Localized Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/national
SPATIALSCALE					

PARTC: DETERMINING SIGNIFICANCE					
PROBABILITY (of exposure to impacts)	Definite/Continuous	H	Medium	Medium	High
	Possible/frequent	M	Medium	Medium	High
	Unlikely/seldom	L	Low	Low	Medium
			L	M	H
CONSEQUENCE					

PARTD: INTERPRETATION OF SIGNIFICANCE	
Significance	Decision guideline
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

\*H = high, M = medium and L = low and + denotes a positive impact.

Mitigation measures to address the identified impacts are discussed in this section and included in more detail in the EMP report that is attached in Appendix E. In most cases (unless otherwise stated), these mitigation measures have been taken into account in the assessment of the significance of the mitigated impacts only.

## 7.2 TOPOGRAPHY AND VISUAL IMPACTS

### 7.2.1 ISSUE: HAZARDOUS EXCAVATIONS AND INFRASTRUCTURE

Hazardous excavations and infrastructure include all structures into, or off which third parties and animals can collide, fall and be harmed. In the construction and decommissioning phases these hazardous excavations and infrastructure are usually temporary in nature, usually existing for a few weeks to a few months. The operational phase will present more long-term hazardous infrastructure.

Table 6: Hazardous excavations & infrastructure impacts – linked to phases & activities.

Construction	Operational	Decommissioning	Closure
Site preparation activities: <ul style="list-style-type: none"> <li>• Land clearing</li> <li>• Leveling, grading</li> <li>• Fencing, water supply infrastructure</li> </ul>	Maintenance of infrastructure: <ul style="list-style-type: none"> <li>• Fences</li> <li>• Water infrastructure</li> </ul>	Site preparation activities: <ul style="list-style-type: none"> <li>• Land clearing</li> <li>• Leveling, re-grading</li> </ul>	N/A

## 7.2.2 ASSESSMENT OF IMPACT

Temporary to long-term impact on the landscape and visual quality of the site would be created during the project activities. The project will be visible within the immediate vicinity and up to some kilometers around the project site only, and thus is likely to create visual impacts.

Table 7: Tabulated summary of the assessed impacts–hazardous excavations and infrastructure

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	H	L	H	H	H
Mitigated	L	H	L	H	M-L	M-L

## 7.2.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Conceptual discussion of the mitigation measures is provided below and detailed in the EMP (Appendix E).

Measures to limit access to the hazardous infrastructures by unauthorized persons and or wildlife / livestock must be employed to prevent fatalities. Construction machinery, equipment and vehicles not currently in use should always be removed in a timely manner.

## 7.3 SOILS AND LAND CAPABILITY

### 7.3.1 ISSUE: LOSS OF SOIL RESOURCES FROM POLLUTION AND PHYSICAL DISTURBANCE

Soils are a significant component of most ecosystems. As an ecological driver, soil is the medium in which most vegetation grows and a range of vertebrates and invertebrates exist. In the context of farming and related infrastructure, soil is even more significant if considering that farming is a long-term land use where the soil is exposed to continuous cultivation and use of agricultural chemicals.

There are a number of sources in all phases that could pollute soils particularly in the unmitigated scenario. In the construction and decommissioning phases these potential pollution sources are temporary in nature, usually existing for a few weeks to a few months. Although the sources are temporary in nature, the potential related pollution can have long term effects. The operational phase will present more long-term potential sources.

Table 8: Soil pollution impacts–linked to phases and activities

Construction	Operational	Decommissioning	Closure
Site preparation activities: <ul style="list-style-type: none"> <li>• Land clearing</li> <li>• Leveling, grading</li> <li>• Fuel and Lubricants</li> </ul> Waste Management Equipment maintenance	Handling, Storage and Application of fertilizer, Pesticides, Fuels / Oil and lubricants.  Equipment maintenance  Use of vehicles and equipment that may leak lubricants and fuel	Site preparation activities: <ul style="list-style-type: none"> <li>• Land clearing</li> <li>• Leveling, grading</li> <li>• Fuel and Lubricants</li> </ul> Waste Management Equipment maintenance	N/A

### 7.3.2 ASSESSMENT OF IMPACT

In the unmitigated scenario, pollution of soils from numerous incidents can result in a loss of soil functionality as an ecological driver because it can create a toxic environment for vegetation, vertebrates and invertebrates that rely on the soil. It could also negatively impact on the chemistry of the soils such that current growth conditions are impaired. Excess manure piled at one place to be used as fertilizer can be toxic to soil as soil become compacted and deformity. In the mitigated scenario, the number of pollution events should be significantly less which reduces the potential severity to medium.

Table 9: Tabulated summary of the assessed cumulative impacts – soil pollution.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H	H	L	H	H	H
Mitigated	M	L	L	M	M	M-L

### 7.3.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Conceptual discussion of the mitigation measures is provided below and detailed in the EMP (Appendix E).

In the construction, operation and decommissioning phases all hazardous chemicals and materials (new and used), dirty water and non-mineralized wastes should be handled in a manner that they do not pollute soils. The proponent must adopt best pollution prevention practice through basic infrastructure design, proper disposing and through education and training of workers and the required steps to enable fast reaction to contain and remediate pollution incidents should be employed on-site.

## 7.4 BIODIVERSITY

### 7.4.1 ISSUE: GENERAL PHYSICALDISTURBANCE OF BIODIVERSITY

The section is a high-level assessment of biodiversity impacts in line with the content of the baseline description (Section 4), and the content of the EMP (Appendix E). The assessment covers the following broad topics: physical destruction of biodiversity and related functions, impacts on surface water resources as an ecological driver, and general disturbances to biodiversity.

Table 10: Physical destruction of biodiversity – linked to phases and activities

Construction	Operational	Decommissioning	Closure
Site preparation activities: <ul style="list-style-type: none"> <li>• Land clearing</li> <li>• Leveling, grading</li> <li>• Fuel and Lubricants</li> </ul> Waste Management Equipment maintenance	Handling, Storage and Application of fertilizer, Pesticides, Fuels / Oil and lubricants  Equipment maintenance and equipment that may leak lubricants and fuel	Site preparation activities: <ul style="list-style-type: none"> <li>• Land clearing</li> <li>• Leveling, grading</li> <li>• Fuel and Lubricants</li> </ul> Waste Management Equipment maintenance	N/A

### 7.4.2 ASSESSMENT OF IMPACT

In the unmanaged scenario, biodiversity will be disturbed in the following ways:

- Illegally collection and removal of vegetation, vertebrate and invertebrate species
- River sand may be collected from the Okavango River for building purposes
- Dust fallout from various dust sources may have adverse effects on the growth of some vegetation and it may cause varying stress on the teeth of vertebrates that have to graze soiled vegetation
- Open reservoirs may lead to drowning of fauna; and pollution emissions and general litter may directly impact on the survival of individual plants, vertebrates and invertebrates.

Taken together, the disturbances will have a high severity in the unmitigated scenario. In the mitigated scenario, many of these disturbances can be prevented or mitigated to acceptable levels, which reduces the severity to low.

Table 11: Tabulated summary of the assessed impacts–destruction of biodiversity

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H	H	M	H	H	H
Mitigated	L	L	M	L	L	M

### 7.4.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Conceptual discussion of the mitigation measures is provided below and detailed in the EMP (Appendix E).

Detail discussion to agree on linear infrastructures such as roads and pipelines was discussed and agreed with community members. It is recommended to avoid unnecessary clearing of vegetation. The lay down areas will be placed within the site boundary, not affecting adjacent land uses. A fauna and flora survey was conducted to identify the presence of any key flora and fauna species of importance onsite and along the proposed transmission line route.

In the construction, operation and decommissioning phases a biodiversity management plan will be implemented. The key components are:

- To generally limit construction and operation activities and related disturbance to the area specifically identified footprint area and described in this EIA report. As part of this commitment the size of development areas should be kept to an absolute minimum
- To audit the activities of construction and operation teams in the footprint area on a routine basis. Where the construction teams have not complied with the relevant plans contractual penalty clauses will apply
- Implementation of an alien/invasive/weed management programme to control the spread of these plants onto and from disturbed areas
- If irreplaceable biodiversity will be permanently lost and restoration is not possible, a biodiversity offset will be investigated. The modified approach is considered justified on the basis that should all the mitigation measures be successfully implemented then the level of impact should be acceptable (reducing to medium significance in the range of medium to high).

With regard to dust impacts, dust suppression techniques should be employed if the specific activity is likely to create dusty atmospheric conditions in excess of the periodic extremes. Avoid activities that create excessive dust on extremely windy days. Personnel are required to wear personal protection equipment (PPE) such as dust masks if excessive dust is created for prolonged working periods. Using water to suppress dust is not an option since the country is experiencing a severe drought.

## **7.5 WATER RESOURCES**

### **7.5.1 ISSUE: ALTERING AND POLLUTION OF SURFACE AND GROUNDWATER**

The altering and obstructing of surface water drainage (change in water flow and gully erosion of the riverbeds from channeling of water) is identified as a potential impact associated with the proposed activities, as well as water pollution i.e. through the change to surface water and nutrient flow. Because of the close proximity to the Okavango River, KI-Scheme resolved to pump water from the river for irrigation purpose. It's planned that a pump station will be installed at identified appropriate site at the bank of the river. This will cater for irrigation and supply for other operational activities.

There are a number of pollution sources in all project phases that have the potential to pollute surface and groundwater, particularly in the unmitigated scenario. In the construction and decommissioning phases these potential pollution sources are temporary in nature, usually existing for a few weeks to a few months. Although these sources may be temporary, the potential pollution may be long term. The operational phase will present more long-term potential sources.

Table 12: Altering surface drainage patterns –linked to operation phases and activities.

Construction	Operational	Decommissioning	Closure
Abstraction of surface water from the Okavango River	Storage and handling of new and used materials and chemicals (including hydrocarbons)	Abstraction of surface water from the Okavango River	N/A
Storage and handling of new and used materials and chemicals (including hydrocarbons)	Waste management	Management of Farm Chemicals (fertilizers and Pesticides)	
Waste management	Transportation, Use and Management of product and input chemicals	Storage and handling of new and used materials and chemicals (including hydrocarbons)	
Equipment that may leak lubricants and fuel	Maintenance of equipment that may leak lubricants and fuel	Waste management	

### 7.5.2 ASSESSMENT OF IMPACT

In the unmitigated scenario, surface water may collect contaminants from numerous diffuse sources. At elevated pollution concentrations these contaminants can result in water concentrations that are above recommended drinking water guidelines and on biodiversity. The dilution effect of the floodwater has not been studied in detail since the area is not flood prone but in the event of occurrence it will reduce the concentration of any contaminants.

In the mitigated scenario, most surface water run-off should be relatively clean, and the severity reduces to low because systems and procedures can be implemented to contain pollution at source and isolate it from potential water resources.

Table 13: Tabulated summary of the assessed cumulative impacts – surface water pollution.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H	H	M	H	L	H
Mitigated	L	M-L	L	L	L	L

### 7.5.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Conceptual discussion of the mitigation measures is provided below and detailed in the EMP (Appendix E).

In the construction, operation and decommissioning phases the farm manager will ensure that all hazardous chemicals (new and used), dirty water, non-mineralized wastes, and product are handled and transported in a manner that they do not contaminate surface water run-off or near surface water flow. The underneath store place for manure should be covered with impermeable cover to avoid excess leakage of manure element that can contaminate underground water.

On-going water quality monitoring in the Okavango River will be done to track pollution trends and related risks. If pollution is detected, remediation steps will be implemented with the input of a groundwater specialist and the relevant government departments.



## 7.6 AIR

### 7.6.1 ISSUE: AIR POLLUTION

Clearing work, cultivation (soil tillage) and herbicides / parasites spraying on site is likely to create very little dust and other possible pollutants that may contribute although little to air pollution. This may be an unwanted change to the community of the area.

Table 14: Air pollution–linked to phases and activities.

Construction	Operational	Decommissioning	Closure
Preparation of the arable land and general building activities	Vehicle movement and diesel generator exhaust fumes	Removal of infrastructure	Wind erosion of rehabilitated areas
Opening borrow pits and ponds	Soil management activities	Vehicle movement and diesel generators exhaust fumes	
Vehicle movement and diesel generators exhaust fumes	Excess manure handling	General material handling Soil management activities	

### 7.6.2 ASSESSMENT OF IMPACT

There are a number of activities in the pre- construction, construction and operation such as land clearing and cultivation that have the potential to pollute the air. In the construction and decommissioning phases, these activities are temporary in nature. The operational phase will present more long-term activities and the closure phase will present final landforms that may have the potential to pollute the air through long-term wind erosion. Given that the activities during decommissioning are similar to construction, the assessment findings for construction are considered applicable to decommissioning. Detailed assessment of the closure phase is only possible when the final closure plan is documented, but it is expected that impacts at closure will not be worse than the operational phase.

Air pollution related impacts on biodiversity have been discussed in Section 4 and therefore this section focuses on the potential for human health impacts.

Table 15: Tabulated summary of the assessed cumulative impacts – air pollution.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	M	M	M-L	M	H
Mitigated	M-L	L	L	L	L	L

### 7.6.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

Conceptual discussion of the mitigation measures is provided below and detailed in the EMP (Appendix E).

In the construction, operational and decommissioning phases, mitigation measures will be implemented for the main dust emission sources. The recommended methods to achieve this are:

- Dust suppression on the temporary gravel road through chemical binding agents combined with vehicle speed controls. The alternative dust suppression means is water but preferably not

Okavango River water;

- Dust controls at the crushing and screening operation (for road building) by water sprays; and
- Dust controls at excavation, scraping, and material handling points (loading and offloading) by water sprays where practical.
- Placing an impermeable cover over the surface of the manure to avoid being blown by wind.

If used, diesel generators will be operated and maintained according to supplier specifications and the IFC emission limits.

## 7.7 ARCHAEOLOGY

### 7.7.1 ISSUE: DAMAGE TO ARCHAEOLOGICAL SITES AND LANDSCAPES

The assessment focuses on the specific archaeological resource level; the impact depends on the physical disturbance of individual sites. On the landscape level there are important archaeological areas that will be compromised by the placement of farm infrastructure in general. Two old graves have been identified.

Table 16: Archaeology impacts–linked to phases and activities/infrastructure.

Construction	Operational	Decommissioning	Closure
Preparation of the arable land and general building activities	Soil management and cultivation activities	Preparation of the arable land and general building activities	N/A
Opening borrow pits and ponds		Opening borrow pits and ponds	

### 7.7.2 ASSESSMENT OF IMPACT

The assessment focuses on the specific archaeological resource level; the impact depends on the physical disturbance of individual sites. On the landscape level there are important archaeological areas that will be compromised by the placement of farm infrastructure in general.

Table 17: Tabulated summary of the assessed cumulative impacts – archaeology impacts

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M-H	M	L	M-L	M	M
Mitigated	L	L	L	L	L	L

### 7.7.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

KI-Scheme will ensure that archaeological sightings observed at any phase of the project duration are reported to the relevant authority for further verification and assessment for potential impacts. In so doing landscapes and finds of archaeological importance can be avoided in most cases. Two identified old graves will be protected by fencing the specific area and the cultivation to start 5 meter away.

Where any archaeological sites will be disturbed and/or destroyed they will be subjected to detailed survey. This information will be used to apply for the necessary permits that are required in terms of the National

Heritage Act 2004. All workers (temporary and permanent) will be educated about the importance of preserving archaeological sites. During all phases prior to closure, the farm manager will ensure that it limits infrastructure development, operations and related disturbance to the approved footprint area.

## 7.8 SOCIO-ECONOMIC – HEALTH AND SAFETY

### 7.8.1 ISSUE: HEALTH AND SAFETY IMPACT

Impacts relating to the welfare, health and safety of the local communities may arise as a result of traffic, noise, air quality, pollution issues, etc. During the construction phase KI-Scheme may at a minimal provide job opportunities to the local community.

Table 18: Health and safety impacts –linked to phases and activities/infrastructure

### 7.8.2ASSESSMENT OF IMPACT

Impacts relating to the welfare, health and safety of the local communities may arise as a result of traffic, noise,

Construction	Operational	Decommissioning	Closure
Preparation of the arable land and general building activities	General material handling Soil cultivation and management activities	Removal of infrastructure  Vehicle movement and diesel generators exhaust fumes	N/A
Opening borrow pits and ponds	Infrastructure maintenance and servicing	General material handling Soil management activities	

air quality, pollution issues, etc. During the construction phase KI-Scheme may at a minimal provide job opportunities to the local community. The leasing of land for the project has resulted in the availability of financial resources to the local community.

Table 19: Tabulated summary of the assessed cumulative impacts–traffic impacts

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	H	M-L	M	L	M
Mitigated	L	M-L	L	L	L	L

### 7.8.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

No strict mitigation measures have been identified. However, it is critical that KI-Scheme should timely and continuously communicate and disseminate information with the local community to alleviate potential sense of social marginalization, drive gender quality and enhance their understanding and perception of the benefits associated with the project.

## 8 KEY ASSUMPTIONS, UNCERTAINTIES AND LIMITATIONS

Assumptions, uncertainties and limitations have been discussed throughout the EIA report and in the various specialist studies. The more significant of these included.

The EIA focused on third parties only and did not assess health and safety impacts on workers because the assumption was made that these aspects are separately regulated by health and safety legislation, policies and standards, and that KI-Scheme will adhere to these.

## 9 ENVIRONMENTAL IMPACT STATEMENT & CONCLUSION

The vegetation in the proposed area ear-marked for KI-Scheme is sparsely distributed with a few forest-protected trees distributed within the vicinity. The impact of the project to the vegetation in the area can be rated moderate since the area is moderate vegetated. The only concern with regards to vegetation is the possible chopping down of some protected species found in the area. In order to mitigate this impact a replacement approach should be taken into consideration by planting the same number or more of the chopped down trees to act as a windbreaker and fence around the KI-Scheme. A local nursery in the region should be approached for the acquisition of indigenous trees for replacement.

Table 20: Summary of potential cumulative impacts associated with the proposed project.

Section	Potential impact	Significance of the impact (the ratings are negative unless otherwise specified)	
		Unmitigated	Mitigated
<b>Topography</b>	Injury to people, birds and animals from hazardous excavations and infrastructure.	H	M-L
<b>Soils and land capability</b>	Loss of soil resources from cultivation, contamination and erosion	H	M-L
	Loss of soil resources from physical disturbance	H	M
<b>Biodiversity</b>	Physical destruction of biodiversity from clearing land and placing infrastructure	H	M-L
	Loss of biodiversity from the disruption of migratory corridor and access to resources (water, grazing / browsing)	H	H
	General disturbance of biodiversity	H	L
<b>Water resources</b>	Pollution of surface and groundwater	H	L
<b>Air quality</b>	Air pollution from dust and use of vehicle and diesel generator	H	H
<b>Archaeology</b>	Damage to archaeological sites and landscapes	M	L
<b>Socio-economic impacts</b>	Injury to third parties, risk of HIV/AIDS and Gender issues	M	L

## REFERENCES

- Coats Palgrave, K. 1983. Trees of Southern Africa. Struik Publishers, Cape Town, RSA.
- Curtis, B. and Mannheimer, C. 2005. Tree Atlas of Namibia. National Botanical Research Institute, Windhoek, Namibia.
- Department of Water Affairs and Forestry, 2001. Groundwater in Namibia: An explanation to the hydrogeological map. MAWRD, Windhoek, 1, 128 pp.
- Geological Survey of Namibia, 1999. Regional geological map of Namibia. Ministry of Mines and Energy, Windhoek, Namibia.
- Government Gazette, 27 December 2007. No. 3966, Act No. 7, 2007 Environmental Management Act 2007.
- Henderson, L. 2001. Alien Weeds and Invasive Plants: A Complete Guide to Declare Weeds and Invaders in South Africa. Plant Protection Research Institute: Agricultural Research Council.
- Herbarium of Namibia (WIND). 2015. BRAHMS Database. National Herbarium of Namibia (WIND), National Botanical Research Institute, MAWF, Windhoek, Namibia.
- Klaassen, E. & Kwembeya, E. 2013. A Checklist of Namibian Indigenous and Naturalised Plants. National Botanical Research Institute: Windhoek.
- Mannheimer, C. & Curtis, B. A. (Eds) 2009. Le Roux and Müller's Field Guide to the Trees and Shrubs of Namibia. Windhoek: Macmillan Education Namibia.
- Mendelsohn, J., Jarvis, A., Roberts, C. & Robertson, T. 2003. Atlas of Namibia. David Phillips Publisher. Cape Town.
- Ministry of Environment and Tourism, 2002. Atlas of Namibia. Comp. J. Mendelsohn, A. Jarvis, T. Roberts and C. Roberts, David Phillip Publishers, Cape Town.
- Müller, M.A.N. 1984. Grasses of South West Africa/Namibia. John Meinert Publishers (Pty) Ltd, Windhoek, Namibia.
- Newmans, K. Birds By Colour, Southern Africa Common Birds Arranged by Colour, Struik New Holland Publishing (Pty) Ltd 2000.
- Van Wyk, B. and Van Wyk, P. 1997. Field guide to trees of Southern Africa. Cape Town: Struik Publishers.
- Van Oudtshoorn, F. 1999. Guide to grasses of southern Africa. Briza Publications, Pretoria, South Africa.
- <http://www.udel.edu/iec/Resumes/Birkmire/Pubs/RWB78.pdf>. Accessed on Tuesday 16 February 2016, 2227hrs.

**APPENDICES**

**APPENDIX A – INTERESTED AND AFFECTED PARTIES MEETING ATTENDANCE LIST**

ATTENDANCE REGISTER FOR THE PARTICIPANTS OF THE FIRST MEETING - 31 AUGUST 2019



ENS-NAMIBIA STAKEHOLDERS MEETING FOR KOROKOKO INVESTMENT CC  
 VENUE: KOROKOKO VILLAGE, NDIYONA CONSTITUENCY, KAVANGO EAST REGION  
 31 AUGUST 2019

NAME	AREA/VILLAGE	AFFILIATION	CONTACT NUMBER	SIGNATURE
Kufuna Stephen	Korokoko	Community member	0811123110	[Signature]
Agbonel Joseph	Korokoko	Korokoko Investment	081153334	[Signature]
MUHATA ALFRED M?	KOROKOKO	KOROKOKO	0818325701	[Signature]
KAPERE LUCAS	KOROKOKO	KOROKOKO	—	[Signature]
YITUMBO JOHN	KOROKOKO	KOROKOKO	—	[Signature]
STAWA FLOR FLURON	KOROKOKO	KOROKOKO	0212151403	[Signature]
Linyendo Andrew	Korokoko	Community member	0814958679	[Signature]
Phisoa Yendira	Korokoko	Community member	0812163897	[Signature]
Mamiishi Aubrey	Korokoko	Community member	N/A	N/A
Muyonga Fehin	Korokoko	Community member	0814455677	[Signature]
Muyonga Mari	Korokoko	Community member	0818815758	[Signature]
Ndumbo Shiyango N?	Korokoko	Community member	0817678777	[Signature]
Muyonga Markiel	Korokoko	Community member	—	[Signature]
Muyonga Shumari K	Korokoko	Community member	0817086781	[Signature]
Muyonga Peter	Korokoko	Community member	0817906360	[Signature]

ATTENDANCE REGISTER FOR THE PARTICIPANTS OF THE SECOND MEETING - 26 OCTOBER 2019

26/10/2019

ATTENDANCE LIST.

VENUE: KOROKOKO

MAIN AIMS: PROPOSAL OF KOROKOKO GREEN SCHEME PROJECT

NAMES	POSITION	CELL NO.
1. STANISLAUS S.K.	VDC CHAIRPERSON	081 7086781
2. HELENDA FAUSTINUS.M	MEMBER	0817903664
3. ALEXANDER MUTERO.N	VDC	081 3266 256
4. SHIPUYA M.M.	MEMBER	0814525470
5. Munganya N.R	Member	0814542963
6. Ngumbwa K.K	MEMBER	081794501
7. KAMWANGA W.K	MEMBER	0812419641
8. Livongi Petrus	MEMBER	086102111
9 Kamukathi J.	MEMBER	0815831745
10. MUKATA ALFRED.M.	MEMBER	081 8325701
11. MUKOJA KAYOKO	MEMBER	0818034774
12. Alex Mutero	MEMBER	0813266256
13. Ndara Nicodemus	MEMBER	
14. Haimbari Applonia	MEMBER	
15. SHIYAVE Pamliana	MEMBER	
16. MUYENGA MARIA	MEMBER	
17. KIRURU ELIZABETH	MEMBER	
18. RUSICA Mpande	MEMBER	0812363079
19. VADNICA KAPANGO	MEMBER	
20. ANTON ANTONIANKA KARUMBU	MEMBER	081 2657639
21. KANUMBO AULEVIA	MEMBER	
22. Ndara Annacletta	MEMBER	0817581957
23. WANGARE MARIA	MEMBER	08174 7570709
24. MUYENGA PETRINA	MEMBER	
25. BENEDICTUS NDARA NELTO	MEMBER	
26. MWAMBU	MEMBER	
27. MUKHEMBO ANSELM	MEMBER	

		Cell Number
28. Shitarara Christophine	Member	
29. Mukishi Elizabeth	Member	
30. Kashindereki makena	Member	
31. Shikutumwa mathias Kadah	Member	
32. Shampapi Josephine	Member	
33. Shampapi Annafrieda	Member	
34. Linyanda Andreas Nyango	member	084955679
35. Shindhimba Steniskaus	Member	
36. Natumba Mushongo	Member	
37. Shindhimba Simon	MEMBER	
38. Mungamba Shikongo	MEMBER	
39. Kuyangura Motamu	MEMBER	
40. Shikutumwa Matias	MEMBER	
41. KATIYA LUCAS	MEMBER	0813212845
42. Mandala Mbombo	MEMBER	0817995449
43. Mukure Celestinus Kavito	MEMBER	0814167725
	MEMBER	
	MEMBER	
	MEMBER	
	MEMBER	
	MEMBER	
	MEMBER	
	MEMBER	
	MEMBER	

98% OF THE MEMBERS  
 OR MAJORITY SUPPORTED THE  
 PROJECT TO CONTINUE.

NO! APPROVED BY COMMUNITY MEMBERS  
 DATE: 26/10/2019  
 TIME: 12:50  
 SIGNED: *Mukure Celestinus Kavito*



APPENDIX B-1 – PROOF OF PUBLIC CONSULTATION (28 AUGUST 2020)

**NOTICE FOR ENVIRONMENTAL IMPACT ASSESSMENT**

**ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED KOROKOKO INVESTMENT CC IRRIGATION SCHEME AT KOROKOKO VILLAGE, KAVANGO EAST REGION.**

Notice is hereby given to all Interested & Affected parties (I&APs) that a community and stakeholders' meeting will be conducted at Korokoko village on 31 August 2019 for public consultation inputs. Thereafter an application will be made to the Environmental Commissioner in terms of the Environmental Management Act (No. 7 of 2007) and its Regulations of 2012 for the following:

- Project Name:** KOROKOKO IRRIGATION PROJECT.
- Project Location:** KOROKOKO VILLAGE, KAVANGO EAST REGION.
- Proponent:** KOROKOKO INVESTMENT CC
- Project Description:** ESTABLISHMENT OF AN IRRIGATION SCHEME.

KOROKOKO INVESTMENT CC has appointed ISN-NAMIBIA CONSULTANT CC to conduct Environmental Impact Assessment and Environmental Management Plan

A public consultation meeting is scheduled to take place on **31 August 2019 at Korokoko Headman gathering place**. All interested & Affected Parties (I & APs) are encouraged to register and attend the meeting, and/or raise concerns or provide comments and opinions. Background Information Document (BID) will be provided upon indication as I&AP:

Should you wish to register as an I & AP, please contact ISN NAMIBIA CONSULTANT CC at + 264 812360999. Email: [isn-namibia@gmail.com](mailto:isn-namibia@gmail.com). Deadline for comments is 14 September 2019.

**2 EWI**  
28.08.19  
**news**

**Governor wants renamed airport upgraded**

**Irrimart employs NAC**

**NOTICE FOR ENVIRONMENTAL IMPACT ASSESSMENT**  
ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED KOROKOKO INVESTMENT CC IRRIGATION SCHEME AT KOROKOKO VILLAGE, KAVANGO EAST REGION.

Notice is hereby given to all interested & affected parties (I&APs) that a community and stakeholders' meeting will be conducted at Korokoko village on 31 August 2019 for public consultation inputs. Thereafter an application will be made to the Environmental Commissioner in terms of the Environmental Management Act (No. 7 of 2007) and its Regulations of 2012 for the following:

**Project Name:** KOROKOKO IRRIGATION PROJECT.  
**Project Location:** KOROKOKO VILLAGE, KAVANGO EAST REGION.  
**Proponent:** KOROKOKO INVESTMENT CC  
**Project Description:** ESTABLISHMENT OF AN IRRIGATION SCHEME.

KOROKOKO INVESTMENT CC has appointed ISN-NAMIBIA CONSULTANT CC to conduct Environmental Impact Assessment and Environmental Management Plan.

A public consultation meeting is scheduled to take place on 31 August 2019 at Korokoko Headman gathering place. All interested & Affected Parties (I & APs) are encouraged to register and attend the meeting, and/or raise concerns or provide comments and opinions. Background Information Document (BID) will be provided upon indication as I&AP.

Should you wish to register as an I & AP, please contact ISN NAMIBIA CONSULTANT CC at + 264 812360999. Email: [isn-namibia@gmail.com](mailto:isn-namibia@gmail.com). Deadline for comments is 14 September 2019.

*“There is a capacity limit in place for irrigation projects”*

**APPENDIX B-2 – PROOF OF PUBLIC CONSULTATION (Minutes of the first meeting)**



**MINUTES OF THE PUBLIC CONSULTATION FOR THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) OF THE PROPOSED KOROKOKO IRRIGATION SCHEME.**

**1<sup>ST</sup> MEETING WITH KOROKOKO COMMUNITY MEMBERS, HEADMAN AND VILLAGE DEVELOPMENT COMMITTEES**

**Date: 31 August 2019**

**Time: 14h30 -17h00**

**Venue: Korokoko Headman Gathering tree**

**Compiled by : Kuniberth Shamathe**

## **I. Welcoming and opening**

The meeting started with a prayer by Korokoko community member. Korokoko headman Mr Faustinus Ngunda Mungomba welcomed the participants to the meeting which composed Korokoko community members, Korokoko Investment CC member and ISN-Namibia consultant. Mr Mungomba welcomed everyone to the consultative meeting and requested for all present to participate freely in the meeting. He however expressed concern that the meeting was not well represented, and the message was not delivered well on time to community including himself. He requested the consultants and project owners to provide all required information for the community members to make informed decisions since he was not well aware about the proposed project and the aspect of Environmental Impact Assessment (EIA). An attendance register was circulated to all participants to write on their names, contact details, affiliation and then sign (See Source of Verification Annex I).



Figure I: Participants during the meeting.

## **2. Purpose of the meeting and background of the project**

Mr. Gabriel Kupembona, a member of the Korokoko Investment CC introduced the consultant and gave background information regarding the proposed irrigation project by Korokoko Investment CC. He explained that their project intended to establish medium scale irrigation project. That, their project will focus on cereal, horticultural and citrus i.e. Maize, wheat, cabbages, tomatoes and orange. He further explained that the members of the project are all from Kavango East and West region. Mr Kupembona indicated that the project is constituted and composed of four (4) members

who are all local people. Moreover, Mr Kupembona alluded to the possible benefits of the project which included job creation, availability of food and infrastructure development. He concluded by indicating the proposed location and land of the project in question, which he explained that the larger part of the land belonged to one of their group member (Ms Erwina Karupu), while the remaining land belonged to some of the community members hence his team requesting the community members of Korokoko to avail the land. He then indicated that the consultant will explain in-depth the purpose of the meeting and how EIA works.

Mr Kuniberth Shamathe from ISN-Namibia, an independent entity which has been appointed to conduct an EIA for Korokoko Investment CC briefed the participants on the purpose of the meeting. He explained the purpose of the meeting was for the consultant to engage and consult with the community if they are aware of the project and their opinions and position regarding the proposed Korokoko Irrigation project. This is in line with the legal frameworks of the government regulatory policies. Mr Shamathe clarified that he had no relationship or association with the owners of the proposed project. He emphasized that the purpose of the community meeting was to consult for communities' opinions and opinion on the proposed project. He further clarified that the meeting should not be seen as an opportunity to cause conflict among themselves or against the project owners but rather to act in good faith to provide their opinions and position towards the proposed project in terms of benefits, clarity required, concerns, and possible acceptance and rejection. Possible mitigations will be discussed for raised concerns.

### **3. Questions, comments and concerns**

After discussion on the purpose of the meeting and background of the project, Mr Shamathe requested participants for questions, comments and inputs.

**In the document, the following abbreviations depict: A: Answer, C: Comment, Co: Concern, Re: Remark, Q: Question.**

**Q:** Who is the owner of the project? It was not clear who are the four people, and where they come from.

**A:** The four members are as follows:

- Ms Erwina Karupu who is local person from Korokoko village
- Mr Gabriel Kupembona from Ndonga Linena

- Ms Pauline Mavanze Kandjimi and
- Mr Augustinus Haupindi

**Q:** From which village is Ms Pauline Mavanze Kandjimi and Mr Augustinus Haupindi?

**A:** Ms Karupu would know since she brought them on board, and they are good friend to her. But they are from Kavango region.

**Q:** The benefits of the irrigation is not clear. Can you clearly summarize about the benefits of the project? How will the community benefit from the project?

**A:** Benefits include possible job creation at various stages of the project, availability of food to buy from nearby and infrastructure development. Infrastructures may include roads and boreholes. The structure is not finalized but community could benefit in many ways.

**Q:** Where exactly is the irrigation project will be located? How big the area will be? and which specific villages are included in the area of the project?

**A:** The proposed site is down on the northern side of where we are sitting. It covers the site where Ms Karupu's parent was living. The size of the area is not determined yet, it is the intention to determine the boundaries and the size of the area after consensus in this meeting. The community members, project owners and consultant will have to conduct site visit to determine the demarcation.

**Q:** Was the owners of the crop fields at the site consulted? Will there be enough space for cattle grazing areas ones the project established?

**A:** It was indicated that Ms Karupu who was absent during the meeting had conducted preliminary consultation with the people having crop fields at the site but not sure if all of them were consulted. However, the intent of this meeting is to consult the community members and discuss whether the project is accepted.

**Q:** Where are the other project members? No satisfactory answers to most of the questions asked.

**A:** Other members were willing to participate but are engaged in equally important tasks hence they only delegated one member to represent them.

**Co:** The meeting is underrepresented, while the project requires community members endorsement. Secondly, most of the questions are not given satisfactory answers. Why is Ms Karupu

not here since she is from this area to clarify to the community members?

#### **4. Way forward**

After these questions or concerns, it was discussed and agreed that another meeting to be convened. The invitation to be done on time. The Village Development Committee (VDC) to be informed on time so they will inform all community members to be present in the next meeting. It was also agreed that Ms Karupu should be part of the project owners' representative in the next meeting so she can answer questions that were not answered properly.

#### **5. Closure.**

The headman closed meeting at 17h00 emphasizing the importance of development but also highlighting the need to follow right procedures when introducing a project. He advised that the project owners should liaison with him and VDC regarding the date of the next meeting to avoid improper coordination. He thanked everybody for their time and active participation.



## **AGENDA**

**Date: 31 August 2019**

**Time: 14h30 -17h00**

**Venue: Korokoko Headman Gathering tree**

- |                                     |   |   |
|-------------------------------------|---|---|
| 1. Welcoming and opening            | - | Headman Mr Faustinus N Mungomba           |
| 2. Attendance registration          | - | Mr Kupembona (member of the project)      |
| 3. Background of the project        | - | Mr. Kumbona                               |
| 4. Purpose of the community meeting | - | Mr. Shamathe (consultant)                 |
| 5. Questions and comments           | - | Participants                              |
| 6. Way Forward                      | - | Facilitated by Mr. Shamathe (consultant). |
| 7. Closure                          | - | Headman Mr Faustinus N Mungomba           |



**MINUTES OF THE PUBLIC CONSULTATION FOR THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) OF THE PROPOSED KOROKOKO IRRIGATION SCHEME.**

**SECOND MEETING WITH KOROKOKO COMMUNITY MEMBERS, HEADMAN AND VILLAGE DEVELOPMENT COMMITTEES**

**Date: 26 October 2019**

**Time: 14h30 -16h50**

**Venue: Korokoko Headman Gathering tree**

**Compiled by : Kuniberth Shamathe**



## 6. Welcoming and opening

The Village Development Committee (VDC) chairperson of Korokoko Village Mr Stanislaus Kashindereki requested a volunteer to open the meeting with a prayer. After a prayer, Korokoko headman Mr Faustinus Ngunda Mungomba welcomed the participants to the meeting which composed Korokoko community members, Korokoko Investment CC member and ISN-Namibia consultant. Mr Mungomba welcomed everyone to the consultative meeting and requested all present to participate freely in the meeting. He indicated that he would not dwell much on the purpose of the meeting or what is to be discussed since the project owners and consultants will explain that. He indicated that he was happy with the number of representatives in the meeting compare to the previous one.

VDC chairperson Mr Kashindereki informed and reminded the participants that the meeting was a continuation of previous meeting that was conducted at the same place on 31 August 2020. That the matter under discussion could not be concluded because there was underrepresentation from the community members and the meeting was not properly organized. He informed that effort was made from both owners of the project, headman and VDC to inform the larger community for this meeting. He encouraged active participation and wished for fruitful discussion.



Figure 1: VDC chairperson addressing participants during the opening of the meeting.

## 7. Purpose of the meeting and background of the project

Ms. Erwina Mushinga Karupu, a member of the Korokoko Investment CC gave background information regarding the proposed irrigation project by Korokoko Investment CC. She explained that their project intended to establish medium scale irrigation project focusing on cereal,

horticultural and citrus i.e. Maize, wheat, cabbages, tomatoes and orange. She further explained that all the 4 members of the project are all from Kavango East and West region. Moreover, she explained that the project would have multiple benefits for the community members including job creation, availability of food to reduce transport cost and infrastructure such as transformer where community members can abstract electricity nearby. Ones the irrigation scheme established and progressing well, the community members will benefit from trainings. It is also planned that a shareholding will be considered for the community if the project succeeds. Ms Karupu indicated that she will not go into depth but rather she would give an opportunity to a consultant to explain the purpose of an EIA.



Figure 2: Ms Karupu providing the background of the project.

Mr Kuniberth Shamathe from the ISN-Namibia explained the purpose of the meeting was for the consultant to engage and consult with the community if they are aware of the project and their opinions and position regarding the proposed Korokoko Irrigation project. This is in line with the legal frameworks of the government regulatory policies. Mr Shamathe clarified that he had no relationship or association with the owner of the proposed project. He emphasized that the purpose of the community meeting was to consult communities' opinions and opinion on the proposed project. This include whether the project will affect the community negatively including interference on cultural and heritage aspects. He further clarified that the meeting should not be seen as an opportunity for conflict but rather to act in good faith and discuss in term of community opinions and position towards the proposed project in terms of benefits, clarity required, concerns, and possible acceptance and rejection. Possible mitigations will be discussed for raised concerns. Mr Shamathe cemented the headman and VDC chairperson indication that the meeting was a continuation of the previous meeting.

## 8. Questions, comments and concerns

After discussion on the purpose of the meeting and background of the project, Mr Shamathe requested participants for questions, comments and inputs.

**In the document, the following abbreviations depict: A:** Answer, **C:** Comment, **Co:** Concern, **Re:** Remark, **Q:** Question.

The start of the discussion was directed more to the questions that were not addressed in previous meetings as follows:

**Q:** Who is the owner of the project? It was not clear who are the four people, and where they come from.

**A:** The four members are as follows:

- Ms Erwina Karupu who is local person from Korokoko village
- Mr Gabriel Kupembona from Ndonga Linena
- Ms Pauline Mavanze Kandjimi from Kaisosi
- Mr Augustinus Haupindi from Kasote

Ms Karupu indicated that she has known these people for many years. She has done projects and some other business with them and she can testify they are reliable people.

**Q:** What are the benefits of the project to the community of Korokoko village?

**A:** Benefits include job creation at various stages of the project, availability of food to buy from nearby and infrastructure development as indicated. Infrastructures may include roads, transformer and boreholes. The group intent to give a share to community if the project succeeds well. Agricultural trainings will be offered to selected community members.

**C:** Many project owners always promise to assist communities or given priorities to local community members when they are looking for the land, but they do not honour the promise afterwards.

**Q:** Where exactly is the irrigation project will be located? How big the area will be, and which specific villages are included in the area of the project?

**A:** The proposed site is down on the other side of where we are sitting. It covers the site where Ms Karupu's parent was living and some parts of community members crop fields.

It was discussed and agreed that the participants will go visit the area after the meeting so that the consultant can collect data according to the demarcation agreed by the communities and project owners.

***Two community members with crop fields at the site indicated they were not in agreement to avail their crop fields for the benefits of the communities or project owners. They indicated their share for the project must be clear otherwise their fields must be excluded.***

The project owner indicated that they will have separate discussion with these two people in order to agree the way forward.

**Q:** Will there be enough space for cattle grazing areas ones the project established?

**A:** Yes, the area project will not extend to the grazing areas. It will only cover the smaller area. However, we will determine that when we conduct the site visit.

## **9. Way forward**

After long discussion, the community members approved land for the project with the following conditions:

- The participants will have to go together with the consultant to show him the boundary of the approved land per the agreement in the meeting.
- The project owners to talk to two people with crop fields at the site to have an agreement. The project owners and these two people should give feedback to the headman and VDC after they agree. The consultant was given go ahead with compiling EIA report and submit but the project owner should give feedback to the consultant that they have resolved with the two people.
- It was agreed that the project owners together with headman and VDC should go to the Traditional Authority to request a consent letter. The consent letter be given to consultant to be included as part of the application.

The consensus for approving the request was reached by community members raising hand to indicate their acceptance or objection of the proposed project. Except only one individual, 42 out of 43 (98%) present

indicated supporting the project (see figure 3). The VDC Chairperson expressed dissatisfaction with some community members who always show up late to community structures to complain that they have not been consulted when decisions are taken. He requested community members to participate in consultations that affect them.



Figure 3: Show of hand by Korokoko community members as sign of accepting a project.

## **10. Closure**

The headman closed the meeting at 16h30 thanking everybody for their active participation. He requested all present to participate on the site visit to be conducted soon after adjourning from the meeting. The meeting ended with a prayer.

## **11. Site visit**

After the meeting, the participants together with the consultant visited the area for the proposed project. The participants went around covering the whole area that was agreed in a meeting to be allocated to the project. The community members confirmed that this was the area they availed in the meeting. The community members pointed out there was two graves within the area. The consultant requested to be shown the location of the graves. He asked what is the position of the community with regard to the graves? The community members indicated they had no problem provided the graves must be fenced so no cultivation to be conducted at the specific areas of the graves. They indicated cultivation and grazing was already going in the area hence cultivation should start 5 meters away from them. The consultant took GPS coordinates for the area including the position of the graveyards, two crop fields that require finale agreement and the riverside were water would be abstracted.



Figure 4: One of the crop field with reservation before finale agreement.



Figure 5: The riverside where water would be abstracted for irrigation.



## AGENDA

**Date: 26 October 2019**

**Time: 14h30 -16h50**

**Venue: Korokoko Headman Gathering tree**

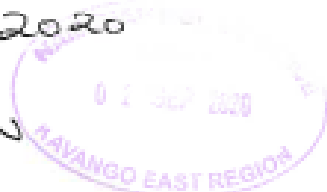
- |                                      |   |                                 |
|--------------------------------------|---|---------------------------------|
| 8. Welcoming and opening             | – | Headman Mr Faustinus N Mungomba |
| 9. Attendance registration           | - | Mr. Shamathe (consultant)       |
| 10. Background of the project        | – | Ms. Erwina Kerupu               |
| 11. Purpose of the community meeting | – | Mr. Shamathe (consultant)       |
| 12. Questions and comments           | - | Participants                    |
| 13. Way Forward                      | – | Facilitated by Mr. Shamathe.    |
| 14. Closure                          | - | Headman Mr Faustinus N Mungomba |

**APPENDIX C – CONSENT LETTER FROM TRADITIONAL AUTHORITY (TA) AS AGREED DURING CONSULTATION MEETING.** The project owners and headman went to TA after project owners agreed with two community members who were not in agreement to avail their crop fields later agreed to do so.

G CIRIKU TRADITIONAL AUTHORITY  
P. O. BOX 1648  
RUNDU

KAVANGO EAST REGION  
31 AUGUST 2020

SA FAWANGU CREST



TO WHOM IT MAY CONCERN

WE ARE THE GCIRIKU TRADITIONAL AUTHORITY.  
WE WOULD LIKE TO GIVE A WITNESS TO THE FOLLOWING  
PEOPLE NAMELY U) ERWINA MUSHINGA KARUFU WHO WAS  
BORN AT KOROKOKO VILLAGE AND HER PARENTS ARE ALSO  
RESIDENT OF KOROKOKO. SHE WOULD LIKE TO PUT A  
SMALL GREEN SCHEME PROJECT ON HER ARSA WITH  
HER COLEQUES NAMELY: SHIKERETE GABRIEL KUPEMBWA,  
PAULINE MAVANZE KANDSIMI AND AUGUSTINUS HAUPINDI.

THESE ARE THE YOUTH WILLING TO UPGRADE THEIR LIVES  
AND THOSE OF THE COMMUNITY THROUGH AGRICULTURE.  
HENCE, WE HAVE GIVEN OUR CONSENT FOR THE  
PROJECT TO PROCEED. WE HUMBLY REQUEST YOUR  
RESPECTIVE OFFICE TO HELP THEM IN THIS REGARD.

YOUR CO-OPERATION WILL BE HIGHLY APPRECIATED.  
THANK YOU.

PP. Asipayi  
LIPAYI ALBERTINA NANAO  
GCIRIKU TRADITIONAL AUTHORITY





**APPENDIX D – LIST OF OBSERVED PLANT SPECIES WITH THE PROJECT AREA (including protected species)**

The common dominating specie for the uncleared area as shown in the picture below is Terminalia sericea. However, there is also other specie shown in the table below.



Species	Occurrences	Protection Status	Conservation Status	Control status
<i>Acacia mellifera</i>	Not common	-	-	NT
<i>Baikiaea plurijuga,</i>	Not common	F	LC	C
<i>Bauhinia petersiana</i>	Common	-	-	NT
<i>Boscia albitrunca</i>	Not common	F	LC	C
<i>Burkes africana,</i>	Occasional	F	-	NT
<i>Combretum collinum,</i>	Occasional	-	-	NT
<i>Combretum imberbe,</i>	Not common	F	LC	C
<i>Dichrostachys cinerea</i>	Occasional	-	-	NT
<i>Grewia flavescens,</i>	Not Common	-	-	NT
<i>Grewia retinervis</i>	Occasional	-	-	NT
<i>Guibourtia coloesperma,</i>	Occasional	F	-	NT
<i>Gymnosporia maranguensis</i>	Not Common	-	-	NT
<i>Philenoptera nelsii,</i>	Not common	F	LC	NT
<i>Sclerocarryia birrea</i>	Not common	F	LC	C
<i>Strychnos cocculoides,</i>	Not common	F	-	C
<i>Terminalia sericea,</i>	Common	-	-	NT
<i>Ximania Americana,</i>	Occasional	-	-	NT
<i>Zizyphus mucronata</i>	Not common	F	LC	NT

**Abbreviation in column 3, 4 and 5 stands for the followings:**

F – Forestry Protected specie

LC – Least Concern

C – The protected plant species should be controlled

NT - The protected plant species should not be controlled

Forestry protected trees are as per forestry ordinance 37 of 1952 and Forestry Act no 72 of 1968.

Protected species are also as per classification under the Forest Act (2001) and Regulations (2015).

## APPENDIX E – ENVIRONMENTAL MANAGEMENT PLAN

Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Responsibilities
<b>Pre-construction (Planning/Design) Phase</b>				
Compliance with Namibian Constitution and EMA and Namibia agricultural policy of 2015 and all applicable Environment and Social Safeguards Policies	<ul style="list-style-type: none"> <li>-Identify and assess the environmental and social impacts and risks including those related to gender, climate change and vulnerability</li> <li>- Address all land acquisition, involuntary resettlement and compensation</li> <li>- Identify and address all pollution, biodiversity and occupational health and safety issues.</li> </ul>	<ul style="list-style-type: none"> <li>-ESR and EMPs prepared for the KI-Scheme</li> <li>- Resettlement screening and appropriate safeguards document developed and implemented</li> </ul>	Once	Proponent, Consultants (ISN-Namibia)
Environment and Social Safeguards Training	Safeguards training including KI-Scheme operational safeguards for all employees	All employees trained	Regularly	Proponent and farm managers
Community mobilization and consultation	Prepare and implement a stakeholder engagement plan, inform all communities affected by the project implementation schedule and their right to compensation if any	Number of farmers/community groups engaged/sensitized	Once-Before commencement of construction	Proponent, Consultants (ISN-Namibia)

Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Institutional Responsibilities
Health and Safety Issues	Preparation of a health and safety plan for workers and impacted communities addressing issues including education of workers and impacted communities on measures to prevent the spread of HIV/AIDs through awareness campaigns, provision of safety equipment for workers, child labor prohibited	-Health and Safety plan prepared - Workshop on HIV/AIDs held for workers and community	As per health officer's schedule	Proponent, health officers and farm managers
<b>Construction Phase</b>				
Loss of vegetation	-Clearing of vegetation should be done only where necessary. -At least 50% of any indigenous trees removed during clearing will be replaced. -Ensure clearing is undertaken with minimal disturbance to the	Area re-vegetated or restored. Conservation of at least 50% of Indigenous trees.	Periodically	Contractor, proponent and respective District Environmental Officers

Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures surrounding environment within the approved work Sites.	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Institutional Responsibilities
Soil Erosion	<ul style="list-style-type: none"> <li>-Prompt backfilling and refrain from trenching in rain season.</li> <li>-Progressive rehabilitation will be done so that no trenches are left uncovered for more than 48 hours.</li> <li>-Stockpiles will be made not to exceed a height 1 metre.</li> <li>-Utilize excavated material for construction and restoration works</li> </ul>	Excavated soil banked and backfilled.	Always	Contractor, proponent. Farm managers and respective District Environmental Officers
Soil Contamination	<ul style="list-style-type: none"> <li>-Machinery that will be used for the project will be properly serviced to minimize fuel leaks to the environment.</li> <li>-In cases of spillages, in-situ bio-remediation will be done.</li> </ul>	Daily and weekly Checklists completed. Machinery services as per manufacturer's specification	Always	Contractor, proponent. Farm managers and respective District Environmental Officers
Solid Wastes	<ul style="list-style-type: none"> <li>-Provide waste collection receptacles</li> </ul>	Number of waste bins at convenient sites around the farm and all organic matter should be used as fertiliser for the crops.	Always	Contractor, proponent. Farm managers and respective District Environmental Officers

Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Institutional Responsibilities
Water Pollution	Sensitization of workers on waste management practices. - Conduct waste segregation, reduce and recycle. All grey water runoff or uncontrolled discharged from farm/working areas to water courses should be contained and properly Channeled	No littering policy must be adhered to. Water pollution prevention measures in place	Always	Contractor, proponent, Farm managers, And respective District Environmental Officers)
Air pollution	- Sprinkle water in on dusty roads and soil heaps to keep down the dust produced. - The on-site burning of cleared vegetation will be mitigated by making it available to local communities for use as firewood. This will prevent burning large quantities of vegetation.	Air quality monitored. No complaints from affected parties	Regularly	Contractor, proponent. Farm managers, and respective District Environmental Officers

Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Institutional Responsibilities
Occupational Health and Safety	<ul style="list-style-type: none"> <li>- Develop, implement and disseminate occupational health and safety guidelines</li> <li>-Employ qualified fist aider and safety officer</li> <li>- First aid kits to be available on site for use by the workers,</li> <li>- Provide Personal Protective Equipment (PPE) to employees.</li> <li>- Sensitize community about ongoing works through notice boards, reflective liners and detours</li> </ul>	<ul style="list-style-type: none"> <li>-OHS guideline in place (% of contractor staff aware of OHS measures and trained</li> <li>- Documented qualifications of first aider and safety officer</li> <li>- PPE usage</li> <li>-Informed public and employees</li> <li>-Gender and HIV/AIDs mainstreamed</li> </ul>	Monthly	Contractor, proponent. Farm managers, and respective District Environmental Officers
Noise Pollution	-Installation of noise mufflers on equipment	Equipment with noise reduction provision	Always	Contractor, proponent. Farm managers, and respective District Environmental Officers
Dust	-Vehicles transporting raw materials especially soil should be covered or avoid overloading to reduce dust emissions.	Use of wet Excavations/damping of roads. No complaints from affected parties	Always	Contractor, proponent. Farm managers, and respective District Environmental Officers

Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Institutional Responsibilities
Employment Opportunities	<p>-Implementing clear and transparent procedures for recruitment of labour and sourcing of goods and services will enhance the positive impact.</p> <p>-Preference will be given to residents of local communities, in the case of unskilled labour, and preference given to local suppliers in the case of goods and services.</p>	Number of local communities' employed and/or procured as part of farm staff.	Three month interval	Contractor, proponent. Farm managers, and respective District Environmental Officers
Conflicts due to differences in social, cultural norms/values	<p>Sensitization of workers on respect for cultural norms and values</p> <p>Develop grievance mechanisms to handle related grievances</p>	Number of workers sensitized	Three month intervals	Contractor, proponent. Farm managers, and respective District Environmental Officers



Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Institutional Responsibilities
Spread of HIV/AIDS	<ul style="list-style-type: none"> <li>-To complement existing initiatives in the community, HIV/AIDS awareness and sensitization will be provided to personnel as part of other health and safety awareness.</li> <li>- Development of brochures and other materials that will convey information about diseases and infections,</li> <li>- regular provision of adequate prevention measures such as condoms;</li> <li>-provision of drugs such as anti-retroviral drugs (ARVs)</li> </ul>	HIV/AIDS is included in regular Health, Safety and Environment awareness	Consistently	Contractor, proponent. Farm managers, and respective District Environmental Officers
Increased traffic related impacts including strain on existing scheme, road infrastructure and traffic incidents (accidents and congestion)	<ul style="list-style-type: none"> <li>-Develop and implement a traffic management plan</li> <li>-Erect road safety features</li> </ul>	<ul style="list-style-type: none"> <li>-Traffic management plan prepared</li> <li>-Safety signage</li> </ul>	Quarterly	Contractor, proponent. Farm managers and respective District Environmental Officers
Temporary loss of livelihoods, social disruption of farming activities and potential	<ul style="list-style-type: none"> <li>- Assessment of the degree of loss to ascertain required compensation if any</li> <li>-Register easement with all farmers whose fields will be</li> </ul>	-Number of farmers affected, sensitized and compensated.	Monthly	Contractor, proponent. Farm managers, and respective District Environmental Officers, Farmer Groups

Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Institutional Responsibilities
Unrest amongst farming communities	<p>Traversed by equipment and temporary access roads</p> <ul style="list-style-type: none"> <li>-Sensitization of communities on how to cope with changes and ensure their awareness of the planned construction activities prior to commencement.</li> <li>Alternative access routes and water diversions will be provided where applicable.</li> <li>-Scheduling/phasing of works to minimize disruption</li> <li>-Construction of works will be phased to limit displacement of farmers at any given time 50% of the scheme.</li> </ul>	-Community members consent to construction works schedule and phasing plan.	Always	Contractor, proponent. Farm managers, and respective District Environmental Officers, Farmer Groups

Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Institutional Responsibilities
<b>Operation and Maintenance Phase</b>				
Degradation of land due to poor agronomic practices	<ul style="list-style-type: none"> <li>-Sensitize farmers on adoption of improved irrigation/agriculture technologies.</li> <li>-Promote soil conservation practices and labour saving technologies</li> </ul>	<ul style="list-style-type: none"> <li>-Number of farmers trained in improved agronomic practices</li> <li>-Soil conservation practices implemented</li> </ul>	Quarterly	Contractor, proponent. Farm managers, and respective District Environmental Officers, Local Leaders
Soil and Water Pollution	<ul style="list-style-type: none"> <li>-Encourage use of environmentally friendly pesticides and herbicides.</li> <li>-Regulate use of fertilizers, pesticides and herbicides</li> <li>-Train farmers on safe use and handling of agro-chemicals.</li> <li>-Prepare pest management plans</li> <li>-Provide water quality monitoring station to monitor water quality</li> </ul>	<ul style="list-style-type: none"> <li>Approved agrochemical used in fields</li> <li>Byelaws on Agro-chemicals documented and disseminated</li> <li>Manuals developed for farmers</li> <li>Water monitoring station in place</li> </ul>	Quarterly	Contractor, proponent. Farm managers, and respective District Environmental Officers, Local Leaders
Impact on Downstream Water Users and River reservoir	<ul style="list-style-type: none"> <li>-Sensitize farmers on land and water rights</li> <li>-Establish and strengthen Water User Associations</li> <li>-Installation of control and water metering, and establishment of payment mechanism for water served</li> </ul>	<ul style="list-style-type: none"> <li>-Number of farmers sensitized</li> <li>-Number of WUAs established and strengthened</li> <li>Water metering system in place</li> </ul>	Quarterly	Contractor, proponent. Farm managers, and respective District Environmental Officers, Local Leaders

Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Institutional Responsibilities
Accelerated or frequent breakdown of infrastructure	<ul style="list-style-type: none"> <li>-Water scheduling protocol based on irrigation policy</li> <li>-Training of farm workers on maintenance and operation of irrigation structures.</li> <li>-Provision of equipment, tools and manuals.</li> <li>-Provision of incentives to maintain infrastructures e.g. access to clean drinking water, seeds and food items</li> </ul>	<ul style="list-style-type: none"> <li>-Functional water scheduling protocol</li> <li>% Farmers trained.</li> <li>Training manuals for Irrigation management, equipment and tools maintenance.</li> </ul>	Quarterly	Contractor, proponent. Farm managers, and respective District Environmental Officers, Local Leaders
Public Health concerns: due to water-logging of irrigation facilities resulting in increased incidence of water-borne diseases such as Malaria, Typhoid, Bilharzia	<ul style="list-style-type: none"> <li>-Irrigation schemes will not be located close to homesteads. Community members will be educated on the issues of water-borne diseases.</li> <li>-Liaise with district Health officers to promote use of mosquito nets, chemically treatment, and/or boiling of water prior to drinking.</li> <li>-Technical designs of irrigation schemes will consider water flow by gravity to minimize pumping</li> </ul>	<ul style="list-style-type: none"> <li>- Health campaign promoting use of mosquito nets, and treatment of drinking water.</li> </ul>	Quarterly	Contractor, proponent. Farm managers, and respective District Environmental Officers, Local Leaders

Anticipated Environmental and Social Impacts	Proposed Action/Measures and Objective of Management Measures	Monitoring and Reporting Indicators	Frequency of Monitoring (Timing)	Implementation Plan and Institutional Responsibilities
<b>Decommissioning phase</b>				
Prepare a rehabilitation/closure plan	Minimise potential erosion Minimise long term visual impacts and ensure that it is compatible with surrounding land uses. Remove all waste and hazardous materials Re-vegetation of the area with indigenous plants Prevent noxious weed and pest	Vegetation and recovery level	At the end of the project	Contractor, proponent. Farm managers, and respective District Environmental Officers, Local Leaders