ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED EXPANSION AND RENOVATION OF MABOGO SISAL ESTATES (FARM NO. 4155 AND 4156) LOCATED AT MABOGO VILLAGE, MAZINDE WARD, KOROGWE DISTRICT IN TANGA REGION.

Proponent:	**Submitted To**
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January, 2025	

EXECUTIVE SUMMARY

E1.0 PROJECT DETAILS

Environmental Impact Assessment for the Proposed Expansion, Renovation of Mabogo Sisal Estates Located at Mabogo Village, Mazinde Ward, Korogwe District in Tanga Region.

E1.1 NAME AND ADDRESS OF THE PROPONENT

Mohammed Enterprises Tanzania Limited

Golden Jubilee Towers, Ohio Street, 20th Floor P.O. Box 20660, Dar-Es-Salaam,

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E1.2 NAME AND ADDRESS OF THE LEAD CONSULTANT

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E2.0 INTRODUCTION

Sisal is an endemic tropical crop whose leaves provide the world's most important hard natural fibre used in the production of twines, ropes, sacks and carpets. Currently, the sisal industry in Tanzania employs over 100,000 people, with a total production of 33,766 tonnes in 2018. The country ranked second in the world for sisal production in 2018 only after Brazil with 80,042 tonnes. In 1964, Tanzania produced 240,000 tons from 487,000 hectares (ha). The crop was the major foreign exchange earner for the economy; it was the largest single employer. In the 1970's the major sisal products consuming countries in Europe and North America introduced a number of highly subsidized synthetic substitutes, which took over 60% of the sisal products markets in less than 16 years. However, presently synthetic fibres are no more a threat to sisal fibre. The increased global environmental awareness for the use of environmentally friendly biodegradable products has resulted into sisal fibre and products replacing the synthetic products thus resulting into increased demand of sisal fibre.

Under this proposed project, Mabogo Sisal Estate is set to increase sisal fibre production through expansion and rotational of sisal planted area by 1,409 Ha within 5-years period, and additional investment in the sisal fibre processing machines and other infrastructure.

METL is intending to increase sisal fibre production through investment in its existing sisal plantations. This will necessarily result in increased quantities and qualities of sisal products, and hence the need for

more investment in sisal estates infrastructure to meet the growing demand for sisal products. In this endeavour, the company is planning to increase area under sisal plantation, undertake crop rotation, improve on the sisal processing machineries and other support facilities.

The Legislation in Tanzania requires project Proponents to carry out an Environmental Impact Assessment (EIA) for the undertaking prior to implementation. Being aware of the aforementioned legal requirement, the proponent (Mohammed Enterprises Tanzania Limited) commissioned ARMS on Environment Limited to conduct Environmental Impact Assessment for the Proposed Expansion, Rotation and Modernization of Mabogo Sisal Estates Located at Mabogo Village, Mazinde Ward, Korogwe District in Tanga Region.

In this regard, the EIA study is conducted in accordance with the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulation of 2018.), formulated after the Environmental Management Act No. 20 of 2004. The Regulation gives mandate to NEMC to oversee the EIA process, which culminates with an award of the Environmental Permit (EP) by the Ministry responsible for Environment.

E3.0 OBJECTIVE OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

The objective of the ESIA study was to ensure that environmental concerns are integrated in all project activities in order to contribute to sustainable development. The specific objectives of conducting the Environment and Social Impact Assessment study with respect to the project was:

i. To identify and evaluate the significant environmental impacts of the project
ii. To evaluate the impacts of the various alternatives on the project
iii. To propose mitigation measures for the significant negative impacts of the project on the environment.
iv. To generate baseline data for monitoring and evaluating impacts, including mitigation measures during the project cycle.
v. To seek the views and concerns of all stakeholders in regards to the proposed project.
vi. Develop an Environmental and Social Management Plan with mechanisms for monitoring and evaluating compliance and environmental performance.

E4.0 BRIEF DESCRIPTION OF THE PROJECT SITE

Project location

Mabogo Sisal Estates Located at Mabogo Village, Mazinde Ward, Korogwe District in Tanga Region. The estate is located on the West about 12km from Arusha – Dar es Salaam road close to Kwalukonge Sisal Estate. On the North the project is bordered by Mabogo Village, on the South the Estate is bordered by Mabogo Village, on the West its bordered by Toronto farm and on the East its bordered by Mabogo Village

Existing Situation

The Mabogo Sisal Estate land covers the total area of 2995 ha., where by 152 ha is for new plants, 650.1 ha for immature plants, 555.8 ha for mature plants, 588 for old plants and land for expansion is 1049 ha. The estate has decortications plant for processing sisal to produce sisal fibre. In addition to decortication plants, the estate has residential and factory buildings, motor vehicles, farm equipment and tools including tractors, and other physical assets.

E5.0 POLICY, ADMINISTRATIVE AND LEGAL FRAMEWORK

Policies, legislation and regulations that apply and are relevant to the establishment and operations of the proposed project are discussed. They cover both the National and International aspects. For each policy, legal and regulatory guideline, the levels of compliance by the proponent based on ESIA study findings are recommended. This has been done to ensure that adequate measures are taken by the proponent to conform to the existing policies, laws, and regulations, and international best practices.

E6.0 STAKEHOLDER CONSULTATION

Various stakeholders were consulted on the process of this EIA study at various levels to obtain their views and concerns. The information from the stakeholders was obtained through interviews, questionnaires and observation. The stakeholders identified included;

- Ministry of Industry and Trade
- Tanzania Sisal Board
- OSHA
- Fire and rescue force
- Pangani Basin Authority
- Korogwe District Council
- Mabogo Village,
- Mazinde Ward
- Workers and
- Project Proponent.

Most of the consulted stakeholders were aware of the project. In general terms, all the stakeholders view the project as a positive initiative. Some of the noted underlying issues are related to the;

- ✓ Improvement in Occupational health and Safety
- ✓ Waste management
- ✓ Potential for Infrastructure upgrades
- ✓ Salary review

E7.0 PROJECT ALTERNATIVES

The project alternative is defined as a possible course of action, in place of another that will meet the same purpose and needs. The role of project alternatives is to find the most effective way of meeting the need and purpose of the project, either through enhancing environmental benefits of the proposed activity, and or through reducing or avoiding potentially significant negative impacts. The assessment has therefore analyzed the following alternatives:

i. No project alternative
ii. Different Site Selection/ Location.
iii. Alternative Source of Water
iv. Alternative Source of Power
v. Solid Waste Management Alternatives
vi. Waste Water Management Alternatives

E8.0 IMPACT IDENTIFICATION AND ASSESSMENT

Impact identification was through the knowledge of activities involved, literature, consultations, observations and experience of the experts in similar projects. The assessment and evaluation of impacts for different project components is characterized based on the following parameters: likelihood, extent of impact, nature of impact, magnitude, and intensity, degree of significance, reversibility and time or duration of the impact**.**

E9.0 POTENTIAL IMPACTS

There is no any development without having potential impacts during construction, operation and decommissioning.

Summary of key positive impacts

i. Creation of employment;
ii. Increase in market for local construction materials;
iii. Increase in economic activities;
iv. Increase in revenue by government through taxes; and

Summary of Key Negative Impacts

The following is a summary of the main negative impacts and recommended measures to minimize or eliminated the impacts:

i. Disruption of vegetation
ii. Dust generation;
iii. Soil erosion and sedimentation;

iv. Generation of waste;
v. Increased Noise Levels;
vi. Pollution of the environment from engine oils;
vii. Increased water and energy demand
viii. Room of improvement in Occupational safety and health risks;
ix. Risk of fire outbreak
x. Increased incidences of Sexually Transmitted Infections (STIs) and HIV and AIDS.

E10.0 IMPACT MANAGEMENT AND MITIGATION

Many of the mitigation measures put forward are nothing more than good engineering practice that shall be adhered to during all the project phases. The major mitigation measures to be observed include;

i. The project developer employed local consultants who carried out some of the works during the planning and design phase.
ii. Employing more people as much as possible from communities surrounding the project area; and
iii. Giving women equal employment opportunities as men.
iv. Purchasing materials from as many local suppliers; and
v. Construction activities must be undertaken only during the day i.e. between 7:30 am – 6:00 pm to minimize disturbance to the general public within the proximity of the site/project;
vi. Traffic along the access/connecting roads should be controlled during construction and especially when heavy trucks are turning in and out of the site to ensure that no accidents are caused by the site's activities
vii. Ensure proper water usage during construction and operational phases.
viii. Sewerage system must be properly designed within the site /house. Design specifications must be followed during installation. Standard cleanliness of sanitary and waste disposal facilities at construction site must be maintained;
ix. The contractor must provide adequate security during the construction period and especially during the night when there are no construction activities;
x. A complete firefighting system must be provided after completion of the project. The equipment is clearly provided in the design plan, and in the report. This must be installed or provided at strategic points.

E11.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The options to minimize or prevent the identified social and environmental impacts as well as a monitoring plan have been suggested in this report and are contained in the ESMP. Many of them are based on good

environmental and engineering practices. The Environmental and Social Management Plan (ESMP) presents the implementation schedule for the proposed mitigation measures to both environmental and social impacts as well as planning for long-term monitoring activities. The ESMP also includes the associated environmental costs needed to implement the recommended mitigation measures. The engineering designs have already included some of the mitigation measures recommended in this report. Additional recommendations are provided in the ESMP to enable the proposed project become more environmentally friendly. The implementation steps will involve the proponent, including the local government offices, Contractor, NEMC, OSHA, FIRE and Rescue force and some utilities provider, and the local communities at large.

E12.0 PROPOSED MONITORING AND AUDITING

Recommendations for monitoring have been included in the report. The Monitoring Plan also assigns responsibilities for monitoring activities. However, the proponent in collaboration with Local Government Environmental Committees and District Environmental Committee will participate in the long-term daily monitoring of the project. It is recommended that environmental audits be carried out on the project as part of the on-going maintenance programme. The audits will unveil the actual performance of mitigation measures and will allow effective measures to be included in future projects based on the legislation in force. As per operative EIA documents in Tanzania, Environmental Audits would be a responsibility of the Proponent and the National Environment Management Council (NEMC).

E13.0 COST BENEFIT ANALYSIS OF THE PROJECT

The estimated cost for implementing impact management as well as monitoring process is outlined in Chapters 8 and 9. Also, the estimated costs for mitigation or enhancement measures do not include the environmental costs, which could not be accurately calculated. Since some of the impacts will only to be realized during construction phase, the costs for these will also be short term, especially if mitigation measures are fully implemented.

E14.0 DECOMMISSIONING

A decommissioning plan that takes environmental issues into consideration shall be prepared by the developer prior to decommissioning works. Should it be done, decommissioning may entail change of use (functioning change) or demolition triggered by change of land use. The product of this project will have a long-life span of more than fifty years.

E15.0 CONCLUSION

From the ESIA study that has been conducted, it has been concluded that construction of the proposed project will generate significant socio-economic benefits to the Proponent, people in the project area and

the country. The study has also identified a number of negative environmental and social impacts that will arise as a result of the project. However, if the mitigation measures that have been proposed in this ESIA report will be properly implemented, the negative impacts will be mitigated by avoiding, minimizing or even eliminating some of the negative impacts completely. It is therefore recommended that METL should implement the project and should adopt the recommendations suggested in this report.

ACKNOWLEDGEMENT

This Report has been prepared by ARMS on Environment Limited of Dar es Salaam on behalf of Mohammed Enterprises Tanzania Limited. The Proponent wishes to thank all stakeholders and the Regulatory institution i.e., National Environment Management Council (NEMC) and individuals who have contributed views and ideas that form part of this report.

In particular, we wish to thank the Korogwe District Council officers, leadership at the local community level (ward and villages), and all other stakeholders for their valuable views and comments.

STUDY TEAM

This Environmental Impact Statement report has been prepared by ARMS ON ENVIRONMENT LTD under the leadership of Dr. Abubakar S. Rajabu (Team Leader and an Environmental Scientist responsible for the characterization of biophysical environment of the study area. He was supported by other experts. These are comprised of; - Mary Ngajilo (Sociologist was responsible for conducting socio-economic baseline survey and organizing stakeholder consultations), Paulina Simon – Environmental Scientist (responsible for the characterization of biophysical environment of the study area).

Table 1; Lead consultant information (Team leader)

Name	Title	Qualification & Experiences	Signature
Dr. Abubakar S Rajabu	Lead Consultant (Team Leader)	Registered EIA/EA Expert (Reg. No. NEMC EIA/0048 and NEMC/EA/0021)	
Mary Ngajilo	Sociologist	Registered EIA Expert NEMC/EC/EE-EIA/2021/0113	
Paulina Simon	Environmental Scientist	Registered EIA Expert	

LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immunity Deficiency Syndrome
C:	Degrees Centigrade
dB	Decibel
DOE	Division of Environment
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMA	Environmental Management Act
EMP	Environmental Management Plan
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessment
ESA	Environmental and Social Assessment
ESMP	Environmental and Social Plan
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
GBV	Gender-Based Violence
GCF	Green Climate Fund
GHG	Greenhouse Gas
HIV	Human Immune Virus
ILO	International Labour Organization
IPM	Integrated Pest Management
KVA	Kilo Volt Amperes
NEMC	National Environment Management Council
NEP	National Environment Policy
NGOs	Non-Governmental Organizations
OHS:	Occupational Health and Safety
OSHA	Occupational Safety and Health Authority
PMP	Pest Management Plan
PPE	Personal Protective Equipment
PPP	Public-Private Partnership
RHA	Risk Hazard Assessment
SDGs	Sustainable Development Goals

TANESCO	Tanzania Electricity Supply Company
TBS	Tanzania Bureau of Standards
TSB	Tanzania Sisal Board
METL	Mohammed Enterprises (Tanzania) Ltd
TIN	Taxpayer Identification Number
TOR	Terms of Reference
URT	United Republic of Tanzania
VAT	Value Added Tax

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CHAPTER ONE

1.0 Introduction

1.1 Project Background

Sisal is an endemic tropical crop whose leaves provide the world's most important hard natural fibre used in the production of twines, ropes, sacks and carpets. Currently, the sisal industry in Tanzania employs over 100,000 people, with a total production of 33,766 tonnes in 2018. The country ranked second in the world for sisal production in 2018 only after Brazil with 80,042 tonnes. In 1964, Tanzania produced 240,000 tons from 487,000 hectares (ha). The crop was the major foreign exchange earner for the economy; it was the largest single employer. In the 1970's the major sisal products consuming countries in Europe and North America introduced a number of highly subsidized synthetic substitutes, which took over 60% of the sisal products markets in less than 16 years. However, presently synthetic fibres are no more a threat to sisal fibre. The increased global environmental awareness for the use of environmentally friendly biodegradable products has resulted into sisal fibre and products replacing the synthetic products thus resulting into increased demand of sisal fibre.

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EIA process, which culminates with an award of the Environmental Permit (EP) by the Ministry responsible for Environment.

1.2 Project Proponent profile

METL is one of the associate companies of METL Group of companies. The Group of companies have major investments and successful operations in most key sectors of the economy in East and central African counties. METL's Agriculture Division comprises of sisal and tea commercial farming. The company owns and manages 10-Sisal Plantations located in the different regions of the country.

METL Group operates 10 sisal plantations, spanning over 34,500 hectares in four Tanzanian regions — Morogoro, Tanga, Coast and Kilimanjaro. Group farms produce approximately 10,000 metric tons of sisal fibre per annum, contributing 35% to Tanzania's total sisal production. We aim to double land capacity and produce between 18,000 – 20,000 metric tons of sisal fibre per annum to meet growing domestic and export demands.

1.3 Project Consultant Profile

ARMS ON ENVIRONMENT LTD is a registered Company with certificates of incorporation No. 63081 since 6 November 2007 with TIN number 106-824-495 and business license be 01384953. The company has been registered with the National Environment Management Council (NEMC) allowed to undertake Environmental Impact Assessment (EIA) and Environmental Audit (EA) with registration number NEMC/EIA/0013 and EA registration Number NEMC/EA/0011 of 2002.

1.4 Project Rationale

With intent to increase productivity in the sisal sub-sector, METL is intending to increase sisal production through improvement in Mabogo Sisal Estate infrastructure and increase the land under sisal plantation to support the potential growth in sisal production while checking environmental degradation.

The company aims to double its sisal production in the next 10-years. The project aims to capture the ever-increasing demand for sisal products, and hence generate income with a view of providing profitable returns to the shareholders, increase the national outputs and provide rural employment to over 6,000 people.

1.5 Objective of Environmental and Social Impact Assessment Study

The objective of the ESIA study was to ensure that environmental concerns are integrated in all project activities in order to contribute to sustainable development. The specific objectives of conducting the Environment and Social Impact Assessment study with respect to the project was:

i. To identify and evaluate the significant environmental impacts of the project

ii. To evaluate the impacts of the various alternatives on the project

iii. To propose mitigation measures for the significant negative impacts of the project on the environment.

iv. To generate baseline data for monitoring and evaluating impacts, including mitigation measures during the project cycle.

v. To seek the views and concerns of all stakeholders in regards to the proposed project.

vi. Develop an Environmental and Social Management Plan with mechanisms for monitoring and evaluating compliance and environmental performance.

1.6 Scope of work

This study entailed the following: -

i. To provide description of the relevant parts of the project including project location, design, components and activities;

ii. To review of policies, legislation, standards and regulations governing Environment at International, Regional and Local levels;

iii. To assemble, evaluate, and present baseline data on the relevant environmental and social characteristics of the project area;

iv. To make consultation with Government agencies, local communities and the private sector operating near the project area;

v. To assess and quantify the potential environmental impacts resulting from the building development, especially within the zone of influence of the project;

vi. Describe alternatives that were examined in the course of developing the proposed project and identify other alternatives, which would achieve the same objectives;

vii. To develop an Environmental Management Plan (EMP) detailing actions and responsibilities for impacts mitigation and monitoring.

1.7 ESIA Approach and Methodology

1.7.1 Approach

Several approaches and study methods to be used in carrying out this assignment with the view of obtaining quantitative and qualitative data (baseline data) in order to prepare the report. Main approaches used were;

i. Follow Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulation of 2018.)

ii. Follow broad ecological examinations such as transect walk and detail analysis of the project area.
iii. The scoping is being undertaken as initial stakeholder identification through identification of issues, problems and concerns, summary of results and ToR for EIA.

1.7.2 Methodology

The ESIA study for the project was carried out in accordance with the approved Terms of Reference. The study included the following methodologies:

i. Meeting and Interview;
ii. Review of Documents;
iii. Transect Walk
iv. Site visits;
v. Measurement of environmental parameters

- ***Meeting and Interview***

Key stakeholders were identified and specific meetings and interviews schedules to gather their views and perceptions on the project. The stakeholders identified included; Korogwe District Council staff; (Environmental Management Officer (EMO), District Agriculture, Irrigation and Cooperative Officer (DAICO), Mabogo Village, and Project Proponent. Specific results of the interview and meeting is presented in subsequent chapters in this report.

- ***Review of Document***

Reviews involved acquisition and review of project documents, reports, maps and drawings relevant to the project. Other documents reviewed included different pieces of national legislation, policies, guidelines and regulations as well as international policies and guidelines and procedures.

- ***Site visits***

The objectives of site visits were to observe and capture baseline data on the existing biophysical and socio-economic environment of the project area. In addition, the visits provided an opportunity to consult stakeholders and senior government officials on their views regarding the project and its potential impacts.

- ***Transect Walk***

The EIA team undertook a transect walk around the project site. This exercise was carried out in order to observe physical features existing in the project site to establish relationships with the project building that pose environmental and social issues worth noting for studies and identify the major environmental and socially sensitive receptors. The transect walk was undertaken in sub wards in the vicinity of the project to consult members living near the project site.

- ***Measurement of environmental parameters***

The ESIA team collected and analyzed baseline air quality and noise level at the proposed project site. Five (4) sampling locations were selected based on relative distance to the proposed project sites, and existing multiple sources of air pollution in the campus. The ESIA team considered the four corners of the project site and the standby generator to be the main sources of air pollution at the area.

The collection of data was done around 1420hrs to 1800hrs) so as to predict the level of air quality during the renovation phase.

- ***Measurement of ambient dust levels (PM2.5 and PM10)***

Dust levels from the sampling points were determined using the Air quality detector (HT-9600). The equipment is capable to sample dust in the range from 0.01 to 2500 mg/m^3 with a resolution of 0.001 mg/m^3 or (1$\mu g/m^3$). The Air quality detector (HT-9600) measures particulate concentrations using a near forward angle light scattering technique. Infrared light of 880 nm wavelength is projected through the sampling volume where contact with particles causes the light to scatter. The amount of scatter is proportional to the mass concentration and is measured by the photo detector. Samples were collected at a breathing height of approximately 1.5 meters above the ground.

- ***Ambient Gaseous Assessment***

The ambient air quality (gases emission) to the sampling locations was assessed using Portable Multi Gas Detector BH-4S model. The instrument operates using a heated metal oxide semiconductor. The gas molecules adsorb onto the heated surface where an oxidation-reduction reaction occurs causing a change in the electrical conductivity of the metal oxide. This change is proportional to the concentration of the gas of interest.

The gas detectors established the air composition characteristics by recording the proportions of Oxygen (O2) [%], Methane (CH4) [%], Carbon monoxide (CO) [mg/m^3], Carbon dioxide (CO2) [%], Nitrogen oxide (NO) [mg/m^3], Nitrogen dioxides (NO2) [mg/m^3], Sulphur dioxide (SO2) [mg/m^3], and Hydrogen sulphide (H2S) [%]. At the sites, the equipment was mounted at 1.5m above the ground. Three reading were collected at each sampling point, and the mean value was used as a representative value of that particular point. Results were compared with local and international standards.

- ***Ambient Noise Levels***

Noise levels assessment was carried out using a Digital Sound Level Meter at a range of 30dB – 180dB (A). On taking measurement, the meter was set to the "A" weighed measurement scale, which enables the meter to respond in the same manner as the human ear. The "A" scale is applicable for workplace compliance testing, environmental measurement, and workplace design and law enforcement. The meter

was held approximately 1.5 m above the floor and at least 0.5 m away from hard reflecting surfaces such as walls.

1.8 Report Structure

The ESIA study was prepared as per the guidelines provided under the Environmental Management Act No. 20 of 2004 (Cap 191) (Amendment 2018) and its subsequent EIA and Audits Regulations GN 349 of 2005. Thus, EIS is comprised of the following;

i. Executive Summary
ii. Introduction, objectives, rationale and methodology
iii. Project description, location and relevant components of the project and project activities
iv. Policy, Legal and Administrative Framework
v. Baseline Information
vi. Public Participation and Stakeholder's Consultations
vii. Assessment of Impacts and Identification of Alternatives
viii. Environmental Mitigation measures
ix. Environmental and Social Management Plan
x. Environmental and Social Monitoring Plan
xi. Cost Benefit Analysis
xii. Decommissioning
xiii. Summary and Conclusions

CHAPTER TWO

2.0 Project Description

2.1 Introduction

In this chapter an attempt has been made to describe the location and accessibility of the project site, project boundaries, existing situation, project components, project utilities, and project activities to be undertaken.

2.2 Project Location, Accessibility and size

Mabogo Sisal Estates Located at Mabogo Village, Mazinde Ward, Korogwe District in Tanga Region. The estate is located on the West about 12km from Arusha – Dar es Salaam road close to Kwalukonge Sisal Estate. On the North the project is bordered by Mabogo Village, on the South the Estate is bordered by Mabogo Village, on the West it's bordered by Toronto farm and on the East it's bordered by Mabogo Village

2.3 Land Tenure, Use, Ownership and Management

The parcel of land is legally owned by METL with the certificate of Occupancy No.64249. The land shall be used for agriculture purposes. Use Group 'R' use class (a) and (c) as defined in the Urban Planning (Use Group and Use Classes) Regulations, 2018.

Table 2; Coordinates for the Proposed Area

GPS Coordinates of the proposed site		
	Longitude	Latitude
Point A	38.179371	-4.847880
Point B	38.180223	-4.847319
Point C	38.180275	-4.848246
Point D	38.180860	-4.847577

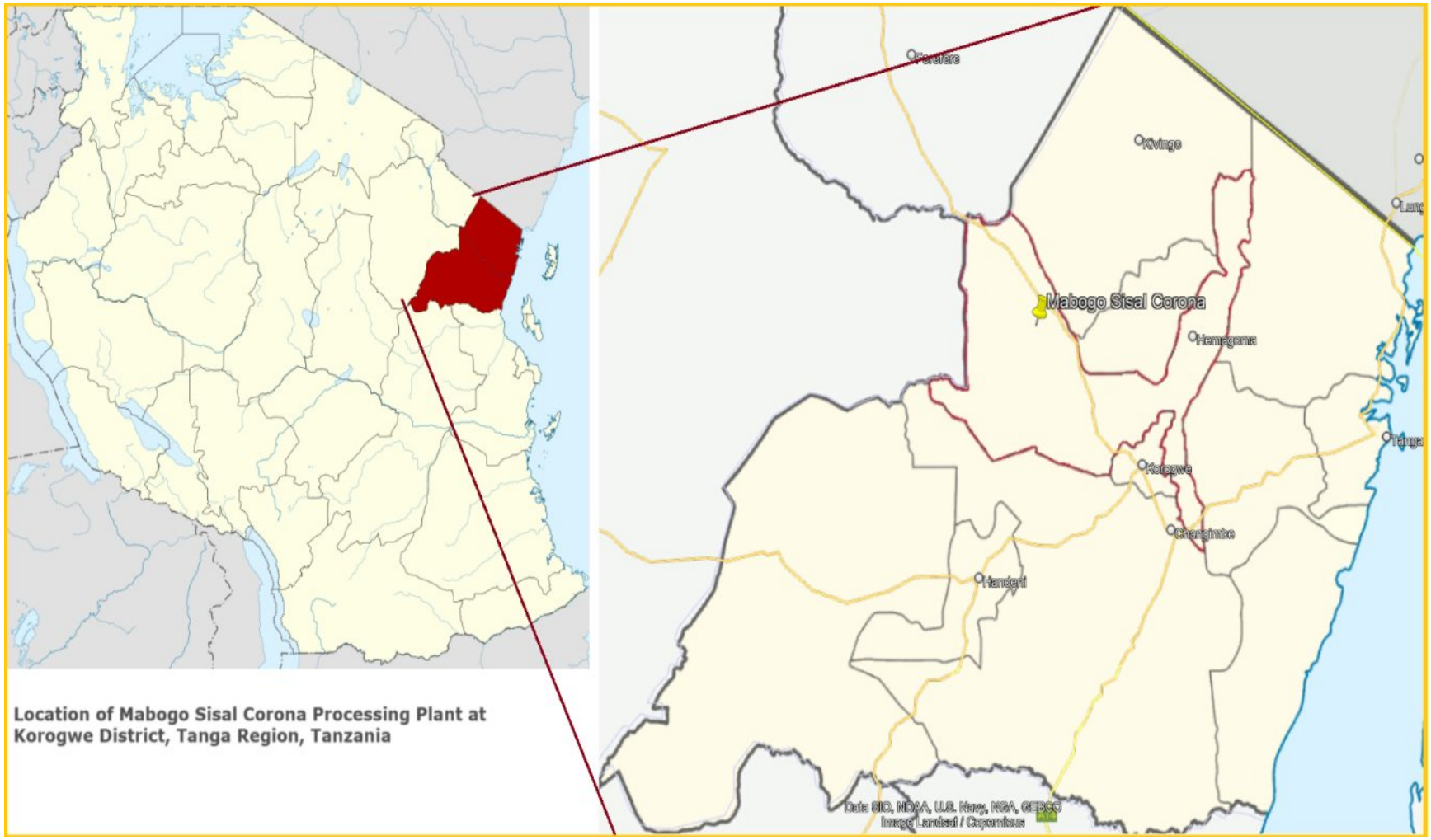

Figure 1: Location of Mabogo Estate at Korogwe District, Tanga Region, Tanzania

Source: EIA team on 6th October, 2023

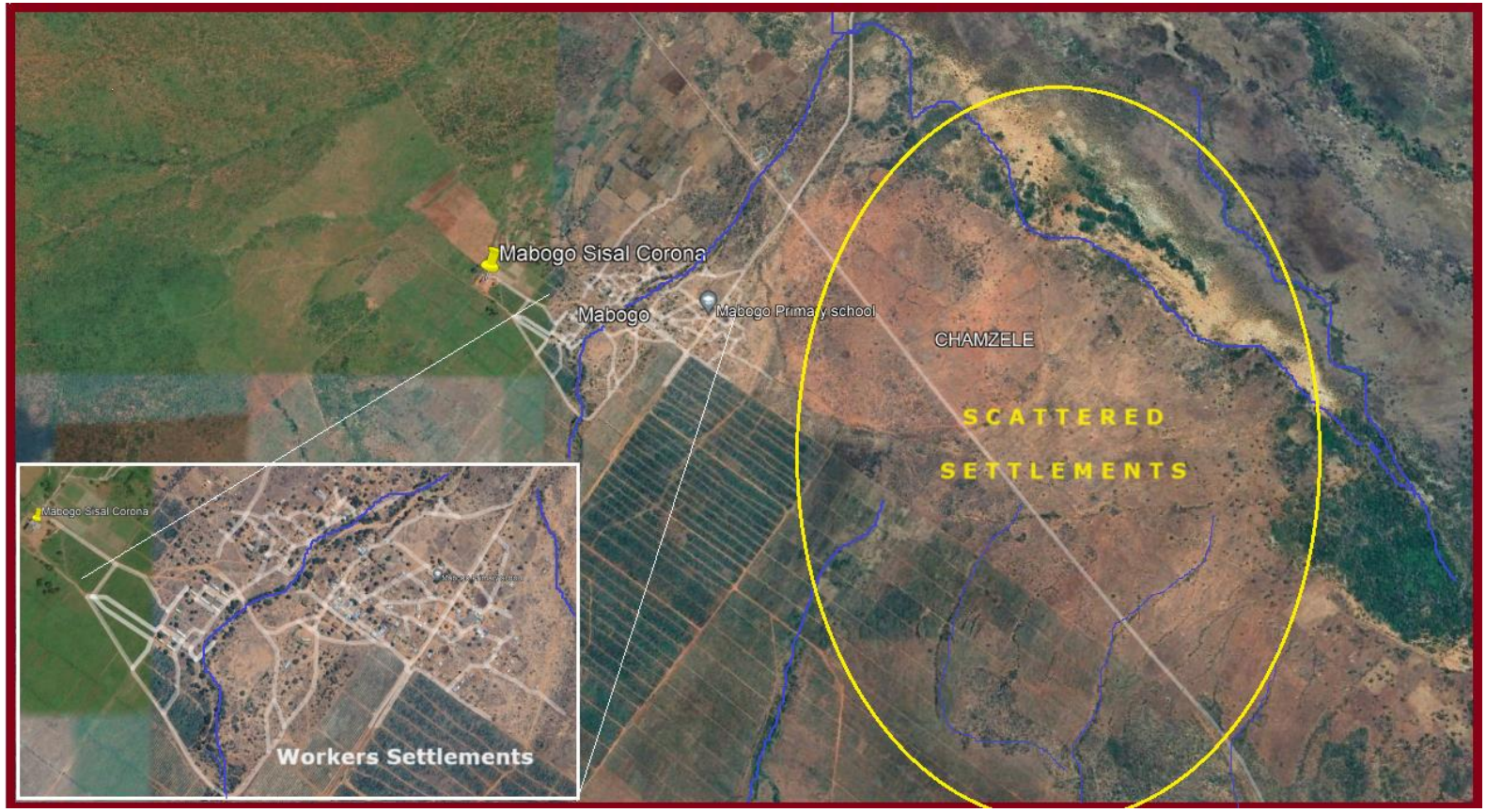

Figure 2; Settlements around Mabogo Sisal Estate

Source: EIA team on 6th October, 2023

The vulnerable aspects associated with the location include: frequent tractors within estate roads, presence of transiting communities. The highway, swampy areas and rivers, dust during dry seasons, snakes, etc. Note that the villagers benefit from the farm operations through social programs such as controlled permitted farming in the plantation, harvesting of decomissioned stumps for firewood and work opportunities among others. Thus the close proximity presents both risks and benefits to the crop cycle ecology.

2.4 Existing situation and surrounding

The Mabogo Sisal Estate land covers the total area of 2995 ha, where by 152 ha is for new plants, 650.1 ha for immature plants, 555.8 ha for mature plants, 588 for old plants and land for expansion is 1049 ha. The estate has decortications plant for processing sisal to produce sisal fibre. In addition to decortication plants, the estate has residential and factory buildings, motor vehicles, farm equipment and tools including tractors, and other physical assets.

Other infrastructure and utilities

a) **Buildings and civil works** – The estate has office blocks, residential houses for management staff, worker's quarters, factory buildings and stores buildings. The estate has well maintained access roads linking the estates and surrounding villages and farm roads for transporting sisal.

b) **Plant and Machinery -** The estate has plant and machinery and farm equipment. The plant and machinery include coronas, press and brush equipment, water pumps and other equipment. Farm equipment includes crawler tractors, harrows, agro-tractors, rotary slashes and other equipment.

c) **Motor vehicles** – The estate has motor vehicles which include tractors, trucks, pick-ups and motorcycles. The motor vehicles are used for farm operation such as transport of sisal leaf and fibre, workers and other services.

d) **Utilities** – The factory has water infrastructure including water tanks and water pipes connected to the factory sites. Some of the worker's houses are not connected to the water infrastructure and they fetch water via a water centers at different point within the worker's camps. The factory site is connected to power supply using high-capacity electric generator and/or electricity from the national grid supplied by the Tanzania Electric Supply Company (TANESCO). Most of the workers' camps inside estate have reasonable electricity supply while the village houses around the estate fall under REA Project.

Farm Services/inputs

- **Extension services –** The estate enjoy the services of qualified sisal extension officers employed by the company.
- **Farm inputs –** These include herbicides, insecticides, fungicides and fertilisers. The estates procure these inputs from various wholesalers.

2.5 Current Waste Management

Solid waste – Waste generated from processing include; sisal leaf decortications waste (SLDW) and short fibre (flume tow). Other waste includes food waste, paper, glass, ropes, dried leaves etc.

- Flume tow generated are collected, dried and later used for making sacks.
- Sisal leaf decortications waste (SLDW) is later used as fertilizer in the nearby village farms.
- Paper, ropes, dried leaves are collected in the dustbins positioned in different location and then decomposed.

Liquid waste - Waste water is from decortication process, kitchen and other sanitary facilities. Sisal is harvested, processed and reused through the decorticator machine which crushes sisal leaves into fibre, resulting in generation of sisal juice or liquid waste.

- Liquid waste from decortication is channeled into the waste water stabilization ponds, with plans to improve the water treatment by introducing the water recycling process in the near future.
- Liquid waste from kitchen and sanitary facilities are managed by using septic tanks and soak away pits.

Hazardous wastes - Hazardous wastes are mainly due to used oil from servicing of vehicles and generators, scrap metal from used and worn – out production machines, un used/or damaged vehicles and plastics.

- The plastic wastes are collected and given to the plastic recyclers.
- Fuel, oil, and lubricants will be collected and disposed of in accordance with environmental regulations.
- Scrap metal is given to scrap metal collectors.

2.6 Project components

The project will have the following components;

a) **Farm Expansion** – Mabogo Estate is intending to consistently plant a total of 1,409 ha within a period of five consecutive years. This will entail clearing of new farms, infilling of existing plantations as well as undertake crop rotation. The project is set to take five consecutive years of sisal planting and field maintenance.

b) **Modernization of Production Equipment** - The project will involve purchase of sisal fibre production equipment such as corona, brush machines and press machines and accessories**.** The project will procure land preparation machines and equipment including motor graders, crawlers,

harrow tractors. The project will procure field maintenance equipment including tractors, disc harrows, disc ploughs, manure/fertilizer spreaders, bucket tractors, boom sprayers, waste water treatment plant and other equipment.

c) **Buildings and Civil Works** – This will involve renovation of old staff houses, construction of additional houses and rehabilitation of sisal estates buildings to accommodate corona, brush machine, workers house, farm roads and bridges, and other civil works.

d) **Improvement of infrastructures** such as transport, electricity and water infrastructure of the estate. This will include buying of new generator, drilling of boreholes and water storage tanks, Procuring of motor vehicles and tractors

2.6.1 Expected Output

The proposed projects aim to strategically position METL in the competitive environment in the sisal sub-sector in Tanzania by increasing sisal outputs to meet the growing demand for sisal products both in the local and international market.

Sisal fibres shall be harvested from mature plants which are 5 to 14-years since planted. Immature sisal of between 1 and 4-years as well as old plants of 15-years and above are not for harvest. An increase in the mature crop reflects on increased sisal fibre production. Presently, the Mabogo sisal estate has a total of 556-Ha of mature sisal for harvest

Upon implementation of the proposed project, the Mabogo Sisal Estate will substantially increase the area under mature sisal up to 1850 Ha in the 10^{th} year of the project.

The projected increase in mature sisal will reflect in the increased sisal fibre produced from the current 540MT to over about 2,100MT per annum in the next 10-years period

2.7 Project Activities

The project activities are as follows;

2.7.1 Planning Phase

The activities to be involved are as follows;

- Land preparation
- Planning and seeking of the appropriate approvals from the relevant authorities
- EIA Project Report preparation

2.7.2 Construction / Modernization/ Expansion Phase

The activities to be involved are as follows;

1) **Expansion of Sisal Plantation**

The sisal planting and maintenance entail seedling preparation including nursery preparation, new farm preparation, uprooting of old sisal plants, new sisal planting, weeding, de-suckering and de-bushing. These will entail the following activities;

- Land Clearance: use of heavy-duty crawler tractors with suitable equipment such as dozer blades and Marden rollers used to clear bush and old sisal plants. The brush cut area is usually given rest of about two months to allow rotting of the brush cut plant materials. Also involves heaping, stumping and allowing decomposition of the dead vegetative materials in order to prepare the land for ploughing.
- Land Cultivation: The use of heavy-duty crawler tractors with appropriate rome harrows / ploughs are required for carrying out first and second ploughing
- Planting & Maintenance: Include measuring, holing, digging planting materials from mature nurseries, transport of the planting materials, actual planting, infilling of dead planted crop and application of fertilizers.
- Growing and fertilization, weeding, irrigation, mulching: The crop is planted using well-established nursery materials. Sisal fibre production cycle involves leaf cutting, bundling and transport of cut/bundled leaf to factory, decortications, drying, brushing grading and baling.
- Pest and Herb Control: Involved the use of designated pesticides and herbicides.
- Harvesting: Entails sisal leaves cutting, bundling, transportation and decortications. Processing involves drying of decorticated fibre and brushing, grading, baling, staking and storing.

2) **Procurement of Land preparation machines and equipment**

The project will procure land preparation machines and equipment. The machine and equipment include motor graders, crawlers, harrow tractors.

3) **Procurement of Field maintenance and leaf transport equipment**

The project will procure field maintenance equipment including tractors, disc harrows, disc ploughs, manure/fertilizer spreaders, bucket tractors, boom sprayers and other equipment.

4) **Procurement Production Equipment**

The project will involve purchase of sisal fibre production equipment including corona, brush machines and press machines and accessories

5) **Buildings and Civil Works**

This will involve construction and rehabilitation of sisal estates buildings to accommodate corona, brush machine, workers house, farm roads and bridges, waste water treatment plant and other civil works

PROJECTS RESOURCES;

During this phase the project resources to be used are;

- **Water –** During this phase will be sourced from the borehole and rain harvesting whereby there are water reservoirs located on site.
- **Energy –** Source of energy to be used during this phase will be from the Tanzania Electric Supply Company (TANESCO). There is also one standby generator (Type - CUMMINS) with the capacity of 550 KVA.
- **Raw materials –** Building materials will be sourced locally and transported to the project site from their extraction, manufacture, or storage sites using transport trucks. Raw materials during this phase will be Aggregates, Sand, Cement, Reinforcement bars, Timber and machines. The machines to be installed in the factory shall be procured from outside Tanzania.
- **Manpower –** The management will hire approximately 100 workers in total to work on construction and renovation sites and on the plantations.
- **Different machinery will be used to construct the additional project facilities.** These will include: Bulldozers for clearing the site, removal of topsoil and vegetation materials, and pushing out stumps; Graders for grading and levelling land for buildings and access road formation; Tippers/lorries for transporting construction materials and workers; Heavy rollers for access roads compaction; Front-end loader for loading materials onto tippers and lorries; equipment like wheel burrows, shovels, picks; Concrete mixers; Earthmover; Compactor; Wheelbarrow; and Hammers and bolt and nut fasteners, hand saw, electric and gas welders, electric saws and grinders, load roller, trucks, hand drills and drill bits, wire cutters, concrete mixer trucks, wheel loader, forklift etc.

Table 3; Workers Quarters Construction specification/ materials

Component for Workers Quarters Housing	Description	Responsibility
Substructures	Excavations for the basement, construction of foundations. Excavated soils will be spread within the facility as there is adequate space.	Main contractor
Reinforced concrete frame	Construction of columns beams and slabs that make up the building's framed structure. Associated waste will constitute cement bags and some polythene	

External and internal walling	Missionary walling in the building exterior and walling used as partitioning internally. Associated waste will constitute cement bags and some polythene.	
Curtain walling	A form of external lightweight cladding attached to the framed structure to form complete envelops around the structural frame and shall mainly comprise an aluminium structure clad with glass.	
Roofing	Roofing structure will include timber, iron sheets and ceiling boards. Associated waste will include end cuts of iron sheets, timber and some paper materials	
Windows	Framed in aluminium and in filled with glass.	
Doors	Timber aluminium and steel.	
External finishes	Applies finishes to the exterior fabric of the building.	
Internal floor finishes	Concrete with red oxide.	
Internal wall finishes	Plastering and painting	
Fittings and fixtures	Joinery fittings, i.e., vanity units, closets, reception counters, shelving, wine racks, kitchen cabinetry, e.t.c.	Furniture specialist
Land Scape	Levelling ground and paving walkways and wash areas	Main contractor
Equipment's	Excavator, Bulldozer, Motor grader, Plate compactor, Trucks, Construction Crane	Contractor

a) Project Construction / Modernization / Expansion Wastes

It is anticipated that the project will generate a variety of wastes during its construction / renovation phase. The characteristics of the wastes are discussed in this section.

- **Soil:** The soil generated during excavation will be stockpiled along the foundation trenches and used for re-establishment of the site at the end of the project.
- **Pieces of timber/wood, empty cement bags and pieces of iron steel:** Large pieces of timber/wood generated during the construction phase will be transported back to the contractor's yard for reuse in future while the small pieces of timber/wood will be disposed-off. Empty cement bags will be collected and disposed to the dumpsite/ sold to local vendors.

- **Empty paint buckets:** The empty paint buckets will be disposed-off to registered plastic waste dealers.
- **Excess sand and stockpiles:** These can be used for future construction activities e.g. renovations. Upon completion of the project, these will be moved by the contractor to a suitable yard.
- **Domestic wastes such as Food remains etc.:** The proponent will provide dust bins for temporary storage of waste within the premises before final disposal to the designated dumping site.
- **Uprooted old sisal –** These are collected at a specific place and left to decompose.

Table 4; Types, amounts and treatment/disposal of wastes during the construction phase

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	Vegetation	Considerable waste is expected based on the total area to be planted and constructed	These will be collected in one place and left to decompose.
	Garbage waste (like papers, food remains)	30 kg/day (based on generation rate of 0.3kg/day/ person and 100 people)	The proponent will provide dust bins for temporary storage of waste within the premises before final disposal to the designated dumping site.
Solid Waste (Non-Degradable)	Soil	Considerable amount is estimated based on the area to be excavated	This will be stockpiled along the foundation trenches and used for re-establishment of the site at the end of the project.
Liquid waste	Sewage	Considerable amount	To be directed to the Septic Tank-Soak away System that is present at the site
Hazardous wastes	Oils and greases	None	This will be collected and stored within the project site waiting to be given licensed dealers.
	Scrap metals, plastics	5 – 10 kg	Scrap metal is given to scrap metal collectors Plastics are disposed in the designated landfill

Waste	Types	Amount	Treatment/ Disposal
	Waste tires	-	Waste tires will be used for decorations across Estate also some tires will be stored in various designated locations across the Estate

2.7.3 Operational Phase

Sisal farming and sisal fibre production starts with nursey preparation to obtain the seedlings. Sisal field maintenance include sisal planting, weeding, de-suckering, de-bushing, sisal harvest and soil preparation. Sisal fibre production entails decortication, drying of sisal fibre from the corona, fibre brushing, pressing and balling.

a) Sisal Processing entails the following;

- **Feeding**: This is the preliminary stage for fibre processing soon after cutting of sisal leaf and transporting from the farms by the use of trailers. It is always achieved by unloading the trailers and loading feeding table directly by throwing the bundles of sisal leaf where the bundles are untied ready for the next stage.
- **Shaking:** After feeding the sisal leaf is then allowed to pass on the shaker wheel specifically for removing the dust on the leaf and separating the leaf from them being bundled to an arrangement that will allow the next stage to be possible and simple.
- **Decortications**: Decorticators (corona) are used to extract sisal fibre. Lead is crushed and beaten by a rotating wheel set with blunt knives, so that the pulp is removed while only fibre remain. The other parts of the leaf are washed away by water. Decorticated fibre is washed before drying by sun or alternatively wet fibre may be dried by hot air. This wet process requires water (about 40,000 litres per shift). No chemical substances are applied at this stage. Before squeezing, sisal fibres are rinsed to ensure the requisite quality is achieved (about 20,000 litres of water per day). Wastewater is produced and discharged through designated channels. From the drums the sisal fibre is conveyed to a squeezing part ready for transportation to drying lines.
- **Drying:** The fibre quality depends upon moisture content so proper drying is important. Artificial drying has been innovated in place of sun drying.
- **Brushing**: Before baling sisal must be brushed to remove pieces of bark which had not been removed after decortication and drying. -Brushing also frees individual fibre from each other and removes the

short fibre, which is called tow. -Brushing machine contain of revolving metal beaters; hanks of fibre is fed into them by hand, one end first and then the other.

- **Grading**: Sisal fibre is always graded according to quality for marketing purposes following the recommended sisal grades by the Tanzania Sisal Board.
- **Baling and packaging**: Aimed at achieving the lowest possible volume, in order to realize savings on freight charges, while facilitating ease of handling. Sisal fibre is therefore baled under great pressure to achieve high density (1.7m3/T). In the baling process, bales are labeled indicating the grades, origin, date, and mark of the producer. The standard bales are normally in units of 100kg, 200kg and 250kg.
- **Storage**: This is to store fibre waiting for brushing, already brushed fibre, and bales waiting for transportation to port of export. The storage facility has adequate ventilation and is stored properly to avoid direct contact with walls, bare floor, and any other contamination.
- **Transportation**: Sisal fibre is transported to ports and to local consumption (local and international markets). There is a sisal bag manufacturing plant located in Morogoro with a sisal spinning plant. Transportation department include plant operators, small vehicle drivers and heavy truck drivers.

b) <u>Project Operation Materials / Resources</u>

- **Farm Equipment and tools** – The equipment to be used includes boom sprayers, and farm gears – gloves, boots, aprons and hats.
- **Production machineries** - The project will use sisal fibre production equipment including corona, brush machines and press machines and accessories
- **Motor vehicles** –METL uses tractors to collect Sisal leaf from the estate's farms to the main roads for offloading to the trucks which transport the sisal leaf to the factory.
- **Office Furniture and Equipment** - The project will use office furniture and equipment to replace the existing worn-out assets.
- **Water** – water during this phase will be sourced from the borehole and rain water reservoir. The factory has water infrastructure including water tanks and water pipes connected to the factory sites.
- **Energy** – source of energy to be used during this phase will be from the Tanzania Electric Supply Company (TANESCO). There is also one standby generator (Type - CUMMINS) with the capacity of 550 KVA

- **Manpower** – Currently the project employs over 600 workers who are divided as follows; Seasonal farm workers and permanent workers). After expansion the number of workers will increase.
- **Infrastructure** - The project site can be accessed by earth roads which are in good condition throughout the seasons, more access roads are still being constructed for easily transportation of goods and services. The estate uses tractors and motorcycles as their means of transport within the farms and factory.

c) Project Operation Wastes

It is anticipated that the project will generate a variety of wastes during operation phase. These are;

- **Solid waste –** These are mainly domestic waste (like papers, food remains) and flume tow products. The flume tow products are dried and used to make sacks.
- **Liquid waste -** Sisal estate process sisal leaves which undergo decortication, for fibre production, water is an essential input for washing, resulting in generation of liquid waste. Currently the waste water produced is directed to waste water stabilization ponds. Also, other sanitary liquid wastes are managed through septic tank and soak away pits.
- **Hazardous wastes -** Hazardous wastes are mainly due to used oil from servicing of vehicles, generators scrap metal from used and worn – out production machines, un used/or damaged vehicles and plastics. The plastic wastes are collected and given to the plastic recyclers. Used oil is collected in special containers and stored within the project site waiting to be given licensed dealers and Scrap metal is given to scrap metal collectors.

Table 5; Types, amounts and treatment/ disposal of operational wastes

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	Garbage waste (like papers, food remains)	Considerable amount (based on generation rate of 0.3kg/day/ person and 600 people)	The proponent will provide dust bins for storage of waste within the premises before final disposal to the designated dumping site.
Liquid waste	Sewage	Considerable amount (Based on 600 people, water consumption rate of 40L/capita/day and	To be directed to the Septic Tank-Soak away System that is present at the site

Waste	Types	Amount	Treatment/ Disposal
		wastewater discharge factor of 80%,	
Hazardous wastes	Oils and greases	None	This will be collected and stored within the project site waiting to be given licensed dealers.
	Scrap metals, plastics	5 – 10 kg	Scrap metal is given to scrap metal collectors Plastics are disposed in the designated landfill
	Waste tires	-	Waste tires will be used for decorations across Estate also some tires will be stored in various designated locations across the Estate

2.7.4 Decommissioning Phase

Decommissioning is the last phase in the lifetime of such facilities, following their design, construction, operation and permanent shutdown. It comprises different administrative and technical activities whose purpose is to remove or to minimize the residual hazards in the facility after it is shut down.

a) Decommissioning activities

These will involve;

i. Removal of structures on or beneath the ground;
ii. Disposal or secure isolation and/or treatment of contaminated equipment in-situ or offsite
iii. Remediation of aesthetics (back-fillings, stained soil removal, waste disposals, etc.) and containment control of contaminant and general site clean-up.
iv. Access controls for physical structures remaining on- site that are unsafe or hazardous to humans or animals
v. Remediation of aesthetically unacceptable portions of the site (filling of pits, removal of stained soil and odorous material, levelling of mounds, disposal of waste rock) etc.
vi. Clean-up of the site to a level which will provide long-term environmental protection and will be safe for the intended future use

vii. Re-vegetation

b) Project demolition wastes

Demolition waste is waste debris from destruction of buildings, roads, bridges, or other structures.

i. Concrete and Brick: Concrete and brick can be recycled by crushing it into rubble. Once sorted, screened and contaminants are removed, reclaimed concrete or brick can be used in concrete aggregate, fill, road base, or riprap. Mobile concrete crushers also allow for recycling of concrete on-site.

ii. Wood: Wood can be reused or repurposed, recycled. Reused wood can eliminate the need for full-size new lumber if used for smaller building components. Repurposed wood can be used in pathways, coverings, mulches, compost, animal bedding, or particleboard.

iii. Drywall: Drywall is made primarily of gypsum. Once the gypsum is depapered, it can be added in cement production, as a soil amendment, used in aerated composting, or recycled into new drywall. Gypsum recycling can be particularly beneficial because in landfill conditions gypsum will release hydrogen sulfide.

iv. Asphalt: Asphalt, from shingles or asphalt concrete, is typically recycled and used in pavement.

v. Metal: Scrap metal is an established industry focused on the collection, buying, selling, and recycling of salvaged materials.

vi. Sisal Waste: Will be collected in one place and left to decompose.

2.8 Project Utilities

Some of the major utilities for the project include energy, waste management, water supply, fuel and raw materials.

- **Energy**

The factory site is connected to power supply using high-capacity electricity from the national grid supplied by the Tanzania Electric Supply Company (TANESCO). There are also two standby generators with the capacity of 550 KVA and 350 KVA.

Generator specification;

- ✓ Enclosed exhaust system for safety - Available
- ✓ Recessed, lockable door - Available
- ✓ Fully weather protected - Yes
- ✓ External emergency button for operator safety – Not Available
- ✓ Durable steel construction - Yes

- **Water**

The estate is well supplied with natural spring water and borehole The factory has water infrastructure including water reservoir tanks and water pipes connected to the factory sites. Also, Pangani Basin Water Board has granted a water use permit no. 11102714 to the Mabogo Sisal Estate to abstract 4.0 litres of water per second by pipe from the borehole.

- **Raw materials**

The raw materials used in the Mabogo sisal estate factory are mainly sisal leaf.

- **Manpower**

Currently the project employs over 600 whereby there 550 field maintenance workers, 40 security workers and 10 skilled workers. At the factory workers are working in eight hours' time and are provided with PPEs depending on their line of duty. After expansion the number of workers will increase.

- **Sanitary facilities**

At the Mabogo factory, there are two sanitary facilities (one for male and another for female) which are used by the management. Also, there are six worker's sanitary facilities (toilets and bathrooms and changing rooms).

- **Infrastructure**

The project site can be accessed by tarmac and earth roads which are in good condition throughout the seasons for transportation of goods and services.

2.9 Project Boundaries

We can identify three types of boundaries that are considered in conducting EIA. The boundaries are Institutional, Temporal and Spatial boundaries.

2.9.1 Institutional Boundaries

Institutional boundaries refer to those institutions and sectoral boundaries in which the project lies or interacts. These can be determined from political boundaries, Acts, regulations and institutional mandates and administrative structures. This proposed development touches the interest of a number of people and administrative units in relation to several policies, laws and plans, and the overall land and settlements acts. The institutional framework includes; Minister responsible for environment in the Vice President's office, Division of Environment NEMC, District Council and Ward and sub-ward (with committees for environment).

2.9.2 Temporal Boundaries

Temporal boundaries refer to the lifespan and reversibility of impacts. The impact of the proposed project will have implications that stretch very far into the future until when decommissioning is undertaken. Also, consideration needs to be given to what happens when the project ends, where there is need for site restoration and decommissioning of the project.

2.9.3 Spatial Boundaries

Spatial boundaries are crucial to decide on whether impacts are likely to occur at Local, Regional, National or International Level. The proposed project will have wide ranging implications that could be felt Locally, Regionally, Nationally and probably outside the country thus, causing impacts as far as those areas. In this study, spatial impacts will be determined from the core project area (the area within the proposed project development). The Area of Impact and Area of Influence.

a) Core Project Area

In determining the spatial dimension of the project, it is important to consider impact in a contour layout, starting with the Core Project Area (CPA). This is the area where the project is located and, which will bear most impacts than the rest. In this case the Mabogo village is the Core Project Area (CPA).

b) Area of Impact (AoI)

This is the area which surrounds the Core Project Area (CPA). This is an area that borders the proposed project area. This area plays an important role and bears some positive or negative impacts. The area of Impact in the case of the proposed project would include Korogwe, Lushoto, Handeni etc. These areas will be linked with the proposed development through road transport, supply of services and goods as well as labor force.

c) Area of Influence (AoI)

The area beyond the area of impact is further away from the proposed project. It consists of the centers of decision making that can influence the development of the industry. This center of decision making includes National Environment Management Council and the Ministry responsible for Environment. The proposed project may attract contractors and consultants beyond Tanzania.

CHAPTER THREE

3.0 Policy, Administrative and Legal Framework

3.1 Overview

This project needs to comply with the Tanzania's national environmental policy and legislation because it is going to be implemented in Tanzania. Tanzania currently aims at achieving sustainable development through rational use of natural resources and incorporating measures in any development activities in order to safeguard the environment. The main legal document which drives towards achieving this goal is the National Environmental Policy (NEP), which was approved by the GOT in 1997. The NEP advocates the adoption of Environmental Impact Assessment (EIA) tool for screening development projects, which are likely to cause adverse environmental impacts.

3.2 National Policies Framework

Relevant policies and legislation pertaining to ground water and surface water pollution, pollution of soil, land and land use, air pollution health and safety were examined, among others in order to ensure that the proposed expansion and renovation of sisal plantation and factory meets and abide to the existing regulations. These are described below.

Various national policies relevant to this project have been considered. The summary of policies reviewed and their relevance is provided below.

1) National Environmental Policy2021

The Policy highlights sustainable development as its core concept. It states that Tanzania is committed to sustainable development in the short, medium and long-term and adopts key principles of sustainable development. It is the main policy document governing environmental management in Tanzania by addressing environmental issues as both natural and social concerns. The policy has also proposed framework environmental legislation to take account of the numerous agencies of Government involved in regulating various sectors. Thus, the NEP defines strategic plans for environmental management at various levels and provides approach for mainstreaming environmental issues for decision-making and defining sector policy action plans. In regards to environmental management and protection the policy identifies six key problem areas as; Land degradation; Lack of access to good quality water; Environmental pollution; Loss of wildlife habitat and biodiversity; Deterioration of aquatic ecosystems; and Deforestation.

In order to achieve the above policy objectives; the following measures shall be put in place; Planning and implementation of water resources and other development programmes in an integrated manner and in

ways that protect water catchment areas and their vegetation cover; and improved management and conservation of wetlands.

Relevance to the Project: The project will be required to address policy objectives by ensuring that damage to the biophysical and social environment is avoided or minimized during implementation of the project activities which are expected to have impacts.

2) National Land Policy 1995

The National Land Policy of 1995 (Revised in 1997) recognizes the need for protecting environmentally sensitive area such as catchment areas, rivers, fragile waterways, game reserves, etc. The policy stresses that these sensitive areas should not be allocated to individuals. Additionally, the policy promotes land tenure system to encourage the optimal use of land resources, and to facilitate transport-based social-economic development. The Land Policy provides for "full fair and prompt compensation" when land is acquired. Similarly, the project implementation will keenly observe the policy requirements.

The National Land Policy set in motion a land reform giving respect to customary and common rights. In addition, roles of government in land tenure and management have been devolved to the local level and establishment of supporting systems for land registration and entitlement to the sub ward level.

Furthermore, the policy emphasizes on the protection of environment and natural ecosystems from pollution, degradation and physical destruction. In addition, the policy recognizes the importance of social services such as water, roads, energy and solid waste management for environmental protection. It also identifies the need for conservation and preservation of prehistoric/historic sites and buildings.

Relevance to the Project: This policy is relevant to the proposed project and the project design will ensure protection of existing land ownership patterns, social services, proper disposal of solid wastes and suitable landscape works to protect sensitive areas in the project area.

3) The National Water Policy 2021

NAWAPO's objective is to develop a comprehensive framework for sustainable management of the national water resources. In this case the policy recognizes the need to protect water sources against pollution and environmental degradation. The Water Policy reflects the shift in approach towards comprehensiveness and economics. In addition, the Policy aims at ensuring that beneficiaries participate fully in all states of water resource developments and recognizes the fundamental but intricate linkages between water and socio-economic development, including environmental requirements. The Policy expounds on the importance of water for domestic use, agriculture, livestock keeping, mining energy, fisheries, environment, human health, wildlife and tourism, forestry, navigation and trans-boundary requirements. The policy states that "a holistic water (river) basin approach, integrating multi-sector and

multi-objective planning and management, should be taken in order to ensure sustainability and protection of the resource."

With these basic shifts in approach and the attempt to co-ordinate and harmonize the sectoral policies, it is in line with though guidance from the Convention of Wetlands and the vision of the National Environmental Policy.

Relevance to the Project - The proposed project could result into pollution for ground and surface water in the area. In this case project designs will ensure water sources (including streams which ultimately flow into the water sources) are suitably protected to minimize impacts during the renovation and operational phases of the project.

4) National Gender Development Policy 2000

Main objective of this policy is to provide guidelines to ensure gender sensitive plans, programs and strategies in all sectors and institutions. The policy gives emphasis on gender equality with it aims at establishing strategies on poverty eradication through ensuring that both women and men get access to existing resources for their development. It values the role played by women in bringing about development in the society. Construction sector is also committed to ensuring gender mainstreaming at all levels, through provision of equal opportunities to both men and women in road works and related activities.

Relevance to the Project: The policy requires the project management ensure that gender issues are given emphasis. It also requires that women and men are given equal employment opportunities in the project, whenever possible. Therefore, this project will ensure that women, will be adequately involved at all levels of the project planning to implementation.

5) The National Employment Policy, 2008:

The major aim of this policy is to promote mainly of Tanzania Nationals. Relevant sections of this policy are (i) Section 10, which lays down strategies for promoting employment and section 10.1 is particularly focusing on industry and trade sectors (ii) Section 10.6 which deals with employment of special groups. It identifies women, youth, and persons with disabilities and (iii) Section 10.8 which deals with the tendencies of private industries to employ expatriates even where there are equally competent nationals. It therefore aims at preparing conducive environment for the unemployed to employ themselves by directing more resources to the self-employment sector, identifying potential areas for employment and lay down strategies of how to utilize areas in promoting employment industry, identify and elaborate on the status and roles of various stakeholders in promoting and sustaining employment, and to develop the self-employment sector in the rural areas as to reduce the rate of migration to urban areas.

Relevance to the Project: The EIA study will fully abide by the provisions of this policy. The Management will abide to the relevant provisions of the policy to ensure that local residents, especially the youth, women and other vulnerable groups, are given priority in all employment opportunities that will arise during the renovation and operational phases of the project.

6) The National Health Policy 2017

The health Policy is a vital guide towards health development of any country. It is particularly, important in a country like ours where resources and technology are more limited than in other countries, which are relatively better off in both technology and resources The National Health Policy is aimed at providing direction towards improvement and sustainability of the health status of all the people, by reducing disability, morbidity and mortality, improving nutritional status and raising life expectancy. The policy recognizes that, good health is a major resource essential for poverty eradication and economic development. The main objectives of the policy are:

- Sensitize the community on common preventable health problems, and improve the capabilities at all levels of society to assess and analyse problems and design appropriate action through genuine community involvement.
- Promote awareness among Government employees and the community at large that, health problems can only be adequately solved through multi sectoral cooperation involving such sectors as Education, Agriculture, Water, Private Sector including Non-Governmental Organization, Civil Society and Central Ministries, as Regional Administration and Local Government, and Community Development, Gender and Children.
- Promote and sustain public-private partnership in the delivery of health services.

Relevance to the Project: The implementation of this project will ensure that all the staff, workers at the project site will have necessary personal protective equipment, such as gloves, dust mask and the local communities will be informed and protected against all health risks, including awareness on health problem so as to attain poverty reduction hence to achieve economic development.

7) National Policy on HIV/AIDS 2003

The policy provides a framework, direction and general principles in the national response to interventions in the prevention, care and support of the infected and affected by the HIV/AIDS epidemics and mitigation of its impacts. Tanzania is facing major threats to the survival of its people and the development chances of the nation from a concentrated and a generalized HIV /AIDS epidemic. The National Multi-Sectoral Strategic Framework (NMSF) on HIV / AIDS will translate the National Policy of HIV/AIDS by providing strategic guidance to the planning of programmes, projects and interventions by various stakeholders in

the fight against HIV/AIDS. In order to make sure that NMSF meets its objectives, the following goals were set

GOAL 1: Reduce the spread of HIV in the country.

GOAL 2: Reduce HIV transmission to infants.

GOAL 3: Political and government leaders consistently give high visibility to HIV /AIDS in their proceedings and public appearances.

GOAL 4: Political leaders, public and private programmes, projects and interventions address stigma and discrimination and take Human Rights of persons living with HIV /AIDS into account.

GOAL 5: HIV /AIDS concerns are fully integrated and prioritized in the National Poverty Reduction Strategy and Tanzania Assistance Strategy.

GOAL 6: Reduce the prevalence of STIs in the population.

GOAL 7: Increase the knowledge of HIV transmission in the population.

GOAL 8: Increase the number of Persons living with HIV /AIDS who have access to a continuum of Care and Support from Home / Community to Hospital levels.

GOAL 9: Reduce the adverse effects of HIV /AIDS on orphans

Relevance to the Project*:* The Management and the District Council are required to make sure that there are no any discrimination and stigma and also take Human rights of person living with HIV/AIDS into account.

8) **The National Investment Promotion Policy, 1996**

The Policy is promoting investment opportunities that private sector can take up and increase economic growth. The Investment Promotion Policy outlines areas and conditions for investment and comes as a result of the economic liberalization program that promotes the role of the private sector in economic activities in Tanzania. The Policy encourages private sector investments whilst also taking into accounts environmental consideration so as to ensure investments yield the expected benefits.

Relevance to project: The proposed project came into being as a result of this policy that promotes the role of the private sector in economic development. This Environmental Impact Statement will assess the contribution of the proposed development to improvement of social welfare through employment and economic growth.

9) The Tanzania Development Vision 2025

Composite Development Goal for the Tanzania Development Vision 2025 (URT, 2000) foresees the alleviation of poverty through improved socio-economic opportunities, good governance, transparency and improved public sector performance. These objectives, not only deal with economic issues, but also

include social challenges such as education, health, the environment and increasing involvement of the people in working for their own development. The thrust of these objectives is to attain a sustainable development of the people. The Vision 2025 seeks to mobilize the people, the private sector and public resources towards achieving shared goals and achieve sustainable semi-industrialized middle market economy by year 2025.

Relevance to the Project: The establishment of the Factory aims at improved commercial and business status for development and improvement of livelihoods of the people in the region and national wide.

10) The National Strategy for Growth and Reduction of Poverty (NSGRP/ MKUKUTA)

The National Strategy for Growth and Reduction of Poverty (NSGRP) or Mkakati wa Kukuza Uchumi na Kuondoa Umaskini Tanzania (MKUKUTA) is focusing on promoting economic growth and reducing poverty in Tanzania. The NSGRP is a five years' program from 2005/06 to 2009/10, which addresses the Tanzania Development Vision 2025 for high and shared growth, high quality livelihoods, peace, stability and unity, good governance, high quality education and international competitiveness. In addition, NSGRP is contributing to implementation of the Millennium Development Goals.

The main objective of the NSGRP is to stimulate economic growth and reduce poverty, improve quality of life and social well-being and improve good governance and accountability. The strategy recognizes the close linkages between economic growth, good governance and improved quality of life and social well-being, and poverty reduction. Among the various factors that have been identified to stimulate growth is the improvement of industrial sector in order to stimulate economic growth.

Relevance to the Project: Project implementation is consistent with the relevant provisions of the NSGRP, as it seeks to improve living standard of people.

11) The Construction Industry Policy (2013)

Among the major objectives of the policy, which supports a sustainable block development sector, include the promotion and application of cost effective and innovative technologies and practices to support socio-economic development activities such as blocks, road-works, water supply, sanitation, shelter delivery and income generating activities and to ensure application of practices, technologies and products which are not harmful to either the environment or human health.

Relevance to the Project: This project is in-line with this policy as ultra-modern technology shall be used during construction and its operation. Implementation of the proposed project will as much as possible make use of cost effective and environmentally friendly technologies to minimise wastage of resources especially building materials, water and energy.

12) The National Energy Policy, 2015

The policy among others focuses on utilization of energy resources in a suitable and environmentally friendly manner. The policy recognizes that; energy is a prerequisite for the proper function of all subsectors of the economy. It is an essential service whose availability, quantity and quality determine the success or failures of development endeavours. The policy stresses the use of renewable and alternative energy sources such as wind, solar, hydro, liquefied petroleum gas (LPG) and natural gas. The policy promotes energy efficiency and conservation as a means towards cleaner production and pollution control measures.

Relevance to the Project: The proposed project will use electricity from TANESCO also energy efficiency bulbs and appliances which are energy savers. Also, there will be a backup diesel generator.

13) The National Economic Empowerment Policy, 2004

(i) The National Economic Empowerment Policy takes into account the private sector development policy objectives, the need to create more opportunities for the private sector as well as setting out rules and regulations on competition and fair economic participation in a market-oriented economy. Measures and strategies to be adopted will also recognise the contribution of the informal sector and undertake to improve it; (ii) The Policy focuses on areas that have high potential to generate quick results especially those which directly impact on the lives of individuals with entrepreneurial capability in agriculture, livestock keeping, fishing, forestry, building and construction, trade, tourism, mining, manufacturing, and transportation. It will also devise deliberate strategies to empower players who are already on the ground to improve their performance. Furthermore, it will specify economic activities which are reserved for the citizens and those which may be owned jointly by foreigners and Tanzanians; and (iii) The Policy will enhance Tanzania's capacity to compete in the local market, the East African Community, SADC, and other economic groupings as well as in the world market. Furthermore, it will facilitate the improvement of the quality of locally made products, reduce the cost of production and raise the skills level used in productive activities. Where large investment projects are established opportunity for spin off activities will be created. The responsibility of implementing the Policy will involve all the stakeholders including the private sector and the Government. Its success will require observance of principles of good governance, efficiency in public service delivery, as well as a proper mindset towards empowerment.

Relevance to the Project: Project implementation is consistent with the relevant provisions of this policy.

14) The National Agriculture Policy 2013

The NAP 2013 therefore, aims at addressing challenges that continue to hinder the development of the agricultural sector; these include low productivity; over dependence on rain-fed agriculture; inadequate

agriculture support services; poor infrastructure; weak agro industries; low quality of agricultural produce; inadequate participation of the country's private sector in agriculture; environmental degradation and crop pests and diseases. A more conducive policy environment than the current one is required for effective participation of all actors in the sector in order to tap existing capabilities and potentialities so as to revitalize the development of the sector. There shall, therefore, be a policy shift towards increased investment in agriculture and greater involvement of the private sector in the production and provision of support services to the farming community.

Relevance to project; the proponent shall observe the provision of this Act by participating in the sector and cooperating with the major actors and the Government in the development of the agricultural sector as well as to tap existing capabilities and potentialities so as to revitalize the development of the sector.

3.3 National Legal Framework

This section addresses the legal (Laws, Regulation and Guidelines) and regulatory framework, which is relevant to the proposed project. The legal and regulatory framework provides the various legal aspects that must be adhered to as the project in designed, implemented and later when it is decommissioned.

1) The Environmental Management Act Cap 191

Environmental Management Act No.20 of 2004 is the principle legislation governing environmental management in the country. The Act recognizes the right of every citizen to clean, safe and heath environment, and the right of access to environmental resources for recreational, educational, health, spiritual, cultural and economic purposes. Part IX provides for Waste Management. The section makes separate provisions on governing the management of solid waste; litter; disposal and transportation of liquid waste and sewerage; management of gaseous waste and management of hazardous waste. Local government authorities are given specific obligation to minimize solid, liquid, gaseous and hazardous wastes falling under their respective jurisdictions. The proponent has to observe environmental quality standards in respect of air water and soil as stated in 2007 Regulation. Also Carrying out self-Monitoring and environmental Audit and submit the reports to NEMC.

In order to ensure there is effective implementation of national environmental policy objectives, the Act has identified and outlined specific roles, responsibilities and functions of various key players and provides a comprehensive administrative and institutional arrangement which consists of: National Advisory committee; Minister responsible for environment; Director of environment; National Environmental Management Council (NEMC); Sector ministries; Regional secretariat; and Local government authorities (City, Municipal, District and Town Councils).

Relevance to the Project: The Act is relevant because the project is expected to have some adverse impacts to the environment (such as noise, vibration, and dust during renovation stage). Thus, monitoring of the mentioned parameters would require adherence to the developed environmental standards (international and national) and Environmental Management Plan (EMP) and Monitoring Plan (MP) to be prepared as part of design for the proposed project.

2) Occupational Health and Safety Act No. 5 of 2003

Part IV of this Act make provisions for safety, health and welfare for persons at work in factories and other places of work; to provide for the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with activities for persons at work. Proposed Sisal plantation and factory will entail the employment of both skilled and unskilled laborers, and as such will comply with this Act. Part 111 of the Act calls for the registration of the market or workplaces to obtain compliance certificate as well as submission of drawings in blue prints which depict vital sections to the OSHA's Chief Inspector for approval. Occupational health and safety are key aspects in the operations. First aid equipment, sanitary facilities and effective Personal Protective gears will be provided to employees and maintained by the contractor during the period of renovation.

Relevance to the Project: EIA study and project management will be required to fully abide by the provisions of this Act to make sure that the safety of contractor's staff and people living along the project's corridor is effectively protected.

3) Local Government Act (District and Urban Authorities) of 1982

This Act provides for detailed responsibility for Urban and District Councils in the administration of their day-to-day activities. EIA and waste management are pointed out as one of the activities to be managed by both district and urban authorities.

Relevance to the Project: The project activities including this EIA study will seek to liaise closely with Korogwe District Council and other stakeholders in the project area will be required to fully abide the provisions of this law in order to ensure effective management of wastes to be generated.

4) The Land Act, 2019

The Land Act seeks to control land use and clarify issues pertaining to ownership of land and land-based resources, transactions on land and land administration. This Act identifies three categories of land – village, public and general, and distinguishes protected or restricted land (e.g. National parks, forest reserves, etc.) and ensures that tenure and rights of legitimate land users are considered and respected. Land sensitivity and potential environment impact of the proposed expansion of Sisal plantation and

factory shall be considered in order to ensure that the land is not polluted and to allow for natural and rapid restoration of cleared vegetation or disturbed land.

Relevance to the Project: The design and implementation of this EIA process is consistent with this legislation. The proposed project will be carried out within the limits of the site earmarked for the activity.

5) The Fire and Rescue Army Act 2007

The Fire Fighting and Rescue Act of 2007 stipulate that every building with more than one storey should be installed with a number of facilities for firefighting. Buildings have to be provided with adequate means of escape and firefighting facilities. Also, buildings as infrastructure require fire protection to facilitate their regular functioning and service delivery. Protection of buildings is not only necessary for such purposes, but also for the safety of the users.

Relevance to the project: The proposed development under the Act requires the installation of firefighting equipment's. Also, the proponent will employ skilled and knowledgeable personal to use the equipment and means against fire hazards could render attempts to contain fire outbreaks.

6) Water Resource Management Act 2009

The water resources management Act of 2009 principally seeks to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways that take into account ten (10) fundamental principles including:

Protecting biological diversity especially the aquatic ecosystems;

- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Providing for systems for managing the growing demand for water use through integrated planning and management of surface and groundwater resources, in ways that incorporate economic, environmental and social dimension in the planning process;
- Proving implementation of international obligations stipulated under international legal instruments to which Tanzania is party and
- Facilitating social economic development.

Apart from incorporating sustainable water use principles and having pollution prevention conditionality in the water permits, the Act goes a step further by putting in place a regime for water resource protection, abstraction (surface and groundwater) and use. Under Section 33(1) of the Act, for the whole or part of a water source, a determination of the ecological reserve shall ensure that adequate allowance is made for each aspect of a reserve.

Relevance to the Project: This EIA study will ensure that all relevant potential impacts from the proposed project is properly mitigated to avoid any potential social and environmental problems. The discharge of waste water will be restricted as stated in the law, that waste water should be treated before discharged to the environment. renovation of the Factory will ensure sustainable and efficient use of water.

7) The Water Supply and Sanitation Act No. 12 of 2019

This legislation provides for sustainable management and adequate operation and transparent regulation of water supply and sanitation services; provides for establishment of water supply and sanitation authorities as well as community owned water supply organizations; and provides for appointment for service providers. The main aim of this law is to ensure the right of every Tanzanian to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by taking into account among others protection and conservation of water resources and development and promotion of public health and sanitation; and protection of the interest of customers.

Under this law, the Minister responsible for water affairs shall establish water authority and cluster water authorities in order to achieve commercial viabilities.

Relevance to the Project: The project proponent will ensure that no any kind of waste to be discharged in water sources so as to ensure water conservation and protection is well managed.

8) The Public Health Act 2009

Part IV of the Act provides for need to maintain cleanness and hygiene and prevent nuisance during renovation works. It calls for effective management of solid, liquid, gaseous, and hazardous wastes. Section 76 of the Act specifically requires every authority to undertake periodic studies to determine the type of solid and liquid wastes generated from markets, institutions and industries; and determine appropriate methods for sorting and storage of the wastes.

Relevance to the Project*:* This project will involve a level of waste generation and therefore the EIA study will design waste management activities to be implemented during the implementation of the project.

9) HIV and AIDS (prevention and Control) Act No. 28 of 2008

The Act provides for prevention, treatment, care, support and control of HIV and AIDS, for promotion of public health in relation to HIV and AIDS. HIV and AIDS education in workplace, the Act requires that every employer in consultation with the ministry shall establish and coordinate a workplace programme on HIV and AIDS for employee under his control and such a program shall include provision of gender response HIV and AIDS education, distribution of condoms and support to people living with HIV and AIDS.

Relevance to the Project: The project Proponent will observe the requirement of this Act during project implementation by promoting awareness and education concerning the prevention and control of the spread of the disease.

10) The workers Compensation Act 2015

The law provides for compensation to employees for disablement of death caused by or resulting from injuries or diseases sustained or contracted in the course of employment to establish the Fund for administration and regulation of works compensation and to provide for related matter.

Relevance to the Project: This Act is very relevant to this project as workers will be exposed to various hazards during renovation and operation of the Factory. The Proponent and the contractor will have to ensure safety and health of workers at the project environment.

11) The Urban Planning Act No. 8 of 2007

The law provides for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters. Expropriation of land for water infrastructure development and associated activities in urban areas shall comply with the provisions for this law. Under Section 3 among other things the law seeks to improve level of the provision of infrastructure and social services for sustainable human settlement development.

Relevance to the Project*:* The provision of the requirement by this project is in full compliance with the Urban Planning Act.

12) The Engineers Registration Act, 1997

There is hereby established Board known as the Engineers Registration Board which has responsibility of regulating the activities and conduct of engineers and of engineering consulting firms in accordance with the functions and powers conferred upon it by this Act. Qualification for registration of Engineers as stated in part iii section 10(1) of this act that "subject to the provisions of this Act, a person shall be entitled, on making an application to the Board in the prescribed manner and on payment to the Board of the prescribed fee, to be registered under this Act and to have his name entered in the register as a registered engineer".

Relevance to the project: This project has an engineering works which involves various designs for the renovation of the Factory. Example design for Building, Installation facilities such electricity, sewerage systems, waste management (waste water treatment plant, solid waste management system). All required engineering part will be done by a registered engineer to ensure compliances of the Act.

13) The Contractors Registration Act, 1997

There is hereby established Board known as the Contractors Registration Board. The purpose of contractor's registration Board is stated under this act in part ii section 3(2a-d). As explained in this act a contractor is "any person who himself as a developer or investor, undertakes the renovation, erection, installation or alteration of any structure, for public use or otherwise, situate below, on or above the ground or other work connected therewith or the execution of any alteration or otherwise to any structure, for public use or otherwise, or other work connected therewith, where such person undertaking to do any such work."

Part iii section 7(1) of this act states the registration of the contractors. "The Registrar shall keep and maintain registers of contractors of different types, categories and classes, in which the name of every person entitled to have his name in them as a registered contractor, shall be entered as soon as it is practicable after being accepted by the Board for registration".

Relevance to project: The proposed project contractors to be involved will be a registered member of the board as already being explained in part iii section 7(1) of the contractor's registration Act of 1997.

14) Environmental Impact Assessment and Audit Regulations as amended on 2018

The Environmental Impact Assessment and Audit regulations are made under Environmental Management Act. No 20 of 2004. The regulations provide basis for undertaking Environmental Impact Assessment and Environmental Audit for various development projects with significant environmental impacts in the country. This section gives a brief description of some provisions in the regulations that are relevant to this study.

Part 111 of the Environmental Impact Assessment and Audit Regulation, formed under G.N. No. 349 of 2005 deals with project registration and screening procedures. Section 5 requires the registration applicant for Environmental Impact Assessment Certificate to submit a project brief report in the format shown in the THIRD SCHEDULE of the EMA (2005) and FIRST SCHEDULE of the regulation. According to the provision, the applicant is required to submit a project brief report to the National Environmental Management Council (NEMC). Section 6 (1) requires a Proponent to register the project in accordance with format specified in the THIRD SCHEDULE of the regulations. The section also, specifies issues to be covered by the proponent in the project brief report. Section 6 (3) requires a project brief to be prepared by a registered environmental impact assessment expert.

According to Section 11 (1) project proponent is required to undertake an environmental impact assessment especially if the project brief has no sufficient mitigation measures, or undertake a preliminary assessment if more information is required to determine a screening decision.

Further details and guidance for the conducting of EIA is provided; these include relevant steps for undertaking Preliminary Environmental Assessment (PEA -Section 11 (2)). Part IV Section 13(1) requires the proponent to conduct EIA in accordance with general environmental impact assessment guidelines and in accordance with the steps outlined in the FOURTH SCHEDULE of the regulations. Whereas Section 16 specifies EIA study should examine environmental, social, cultural economic and legal issues, The FIRST SCHEDULE gives list of projects subjected to EIA and those that do not requiring EIA and it categorizes the projects into two types namely: Type A (projects requiring a mandatory EIA) and Type B (project requiring PEA).

According to the schedule, Type B Projects are those projects that are likely to have some significant adverse impacts but the magnitude of impacts is not well known. Thus, a PEA is required to determine whether the project should proceed without a full EIA.

Part X Section 44 (1 and 2) outlines the objectives of Environmental Audits and its principal functions. Section 45 outlines the basic principles under which the environmental audit is conducted and Section 46 (1) specifies the type of projects requiring environmental audits as specified in the THIRD SCHEDULE to EMA (2005) and FIRST SCHEDULE of the regulations.

Relevance to the Project: A project of this categorization is likely to have some social and environmental impacts. Following the review of the project brief submitted to NEMC, the decision was made to undertake Environmental Impact Assessment. Based on this, all phases of the EIA study will abide by the provisions of this Act.

15) Environmental Management (Air Quality Standards) Regulation, 2007.

The object of these regulations is to set baseline parameters on air quality and emissions and enforce minimum air quality standards. They are also meant to help developers including industrialists to keep abreast with environmentally friendly technologies and ensure that the public health as well as the environment is protected from various air pollution emissions sources. These Regulations stipulates the role and powers of the National Environmental Standards Committee. According to the regulations, the approval of a permit for emission of air pollutants shall be guided by ambient, receptor, emission and specification standards approved by the Minister. Offences and penalties for contraveners are also provided for in the regulations.

Emission and emission limits of sulphur and nitrogen dioxides, carbon monoxide, lead, ozone, black smoke and suspended particulate matter together with their test methods are specified. Tolerance limits and test methods for dust, sulphur dioxide and nitrogen oxides from cement factories into the air as well as

from motor vehicles are also given. These pollutants are not expected to be generated from the project activities in significant amounts since special measures will be implemented to avoid emissions during operation.

Relevance to project: The proponent will ensure that mitigation measures on dust and gaseous emission are enforced on implementation of the project throughout the life cycle.

16) Environmental Management (Soil Quality Standards) Regulation, 2007

These regulations set limits for soil contaminants in agriculture and habitat, enforce minimum soil quality standards, prescribe measures designated to maintain, restore and enhance the sustainable productivity of the soil and prescribe minimum soil quality standards for sustaining ecological integrity and productivity of the soil. According to the regulations, among others, the National Environmental Standards Committee has the powers to set pollutant limits and specify procedures for determination of the quality of soil for protection of the soil from degradation as a result of anthropogenic activities such as agricultural and mining activities and waste disposal. Owners and operators of a main polluting activity are required to voluntarily register with NEMC and obtain a soil pollutants discharge permit. Obligations of polluters are also given. According to the regulations, the NEMC plays a crucial role in soil quality compliance and enforcement. Recording and reporting requirements, Offences and penalties for non-compliance as well as how appeals against aggrieved decisions should be handled are stipulated. Contaminant limits for selected soil pollutants mainly halogenated hydrocarbons (example, trichloethylene, dichloromethane, tetrachloroethylene, carbon tetrachloride, etc.), fuel hydrocarbons (benzene, ethylbenzene, total xylenes, toluene, etc.), organic and inorganic pesticides (lindane, Atrazine, DDT, sulphur, Hexachlorobenzene, Aldrin, etc.) and their respective test methods are specified. The Regulations also cover contaminant limits for some heavy metals (e.g. arsenic, cadmium, nickel, copper, zinc, etc.) together with their test methods. Most of the pollutants covered in these regulations will not be produced from the project activities in appreciable concentrations. However, there is a potential for soil pollution from petroleum hydrocarbons due to the use of fossil fuels for running machineries, plants and vehicles during the renovation phase. Fossil fuels will be applied in a rational manner to minimize residues and consequently soil and water pollution.

Relevance to project: The proponent will manage well all solid and liquid wastes to be generated and oil spills at each project phase to avoid the soil contamination.

17) Environmental Management (Water Quality Standard) Regulation, 2007

Among others, the object of the regulations is to enforce minimum water quality standards prescribed by the National Environmental Standards Committee, enable the National Environmental Standards

Committee to determine water usages for purposes of establishing environmental quality standards and values for each usage and ensure all discharges of pollutants take into considerations the ability of the receiving water to accommodate contaminants for protection of human health and conservation of marine and aquatic environments. The Regulations elucidate the role of the National Environmental Standards Committee of Tanzania Bureau of Standards in setting minimum quality standards for water, sewerage, etc. They also give prohibitions and prescribed minimum water quality standards. The applicant of water right is obliged to indicate the likely impact on the environment and comply with prescribed effluent or receiving water standards, which are not below the standards specified in these regulations if the water right or permit is granted. The regulations give NEMC the power to designate main water polluting activities for which prior grant of permit must be obtain from the Council. It can be observed from the regulations that, the NEMC plays a crucial role in water quality compliance and enforcement. Recording and reporting requirements, Offences and penalties for non-compliance as well as how appeals against aggrieved decisions should be handled are stipulated.

The Regulations specify permissible limits for selected physical, inorganic, organic and microbiological components of Municipal and industrial effluents and the respective test methods of the pollutants. Specific tolerances and methods of testing for effluents of chrome and vegetable tanning industries and fertilizer industries are given. Regarding drinking water, the regulations specify microbiological requirements and classification of non-chlorinated piped water sources, chemical and physical limits as well as radioactive materials limits for quality of drinking water supplies. Also specified in the regulations are minimum distances from sources of water contamination and sampling frequency for water quality monitoring of various sources.

Relevance to project: The Proponent will minimize the impacts of the project activities to groundwater and nearby surface water sources and marine ecosystems.

18) The Local Government (Urban Development Control) Regulations, 2008, (GN No. 242/2008)

These regulations were made by the Prime Minister under powers conferred upon him by the Local Government (Urban Authorities) Act Cap 288. The Regulations provide for a mechanism for control of insanitary premises, management of night soil including its disposal. It prohibits depositing refuse on streets, pollution of water, fire in buildings or houses, straying animals, and construction of drainage.

19) The Environment (Registration of Environment Experts) Regulations 2021

These Regulations make provision with respect to Environmental Experts and establish the Environmental Expert Committee. The Regulations provide for the certification and registration of Environmental Experts

and contain rules relative to the practice and discipline of Environmental Experts and define functions, powers and internal organization of the Committee.

Relevance to project; The proponent complies with the requirements of this Act as it has engaged a registered and experienced Firm to conduct the Environmental Impact Assessment for the proposed project.

20) The urban planning (Use Group and Use Classes) Regulations. 2018:

The law provides for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters. Expropriation of land for water infrastructure development and associated activities in urban areas shall comply with the provisions for this law. Under Section 3 among other things the law seeks to improve level of the provision of infrastructure and social services for sustainable human settlement development.

Relevance to project*:* The proponent shall abide to the requirements of this Act by promoting proper use of land and protecting land.

21) The environment management (Hazardous Waste Control and Management) Regulation, 2021.

These Regulations may be cited as the Environmental Management (Hazardous Waste Control and Management) Regulations, 2021. These Regulations shall apply to all categories of hazardous waste and to the generation, collection, storage, transportation, treatment, recycling, reuse, recovery and disposal of hazardous waste and their movements in, into and out of Mainland Tanzania. The regulation requires that any person dealing with hazardous waste in Tanzania be guided by following principles of environment and sustainable development:

i. The precautionary principle
ii. Polluter pays principle, and
iii. The producer extended responsibility

Relevance to project: The management shall abide by the provision of this regulation through proper management of hazardous waste.

22) The Environment Management (Quality Standard for Control of Noise and Vibration pollution) Regulations, 2015

These Regulations shall apply to the control of noise and environmental vibrations in Mainland Tanzania. The objectives of these Regulations shall be to- (a) ensure the maintenance of a healthy environment for all the people in Mainland Tanzania, the tranquillity of their surrounding and their psychological wellbeing by regulating noise and vibration levels; (b) prescribe the maximum permissible noise and vibration levels

from a facility or activity to which a person may be exposed; (c) provide for the control of noise and vibration and mitigating measures for the reduction of noise and vibration; (d) set baseline parameters on noise and vibration permissible levels based on a number of practical considerations and acceptable limits; (e) enforce minimum noise and vibration limits prescribed by the National Environmental Standards Committee; (f) help developers such as industrialists to keep abreast with environmentally friendly technologies; and (g) ensure protection of human health and the environment from various sources of noise and vibration pollution.

Relevance to project: the management shall abide by this regulation and shall not make or cause to excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; also the workers within the plant shall be provided with protective equipment's such as ear plugs to prevent the noises from the machines from affecting them.

23) The Environmental (Solid Waste Management) Regulations. 2009 as amended in 2016.

The regulation has been made under section 114, 115, 116,117, 118, 119, 120,121, 122 and 230 of Environmental Management Act, 2004. These regulations apply to all matter pertaining to solid waste management. They aimed among other things at setting standard for permit to operate solid waste disposal sites, permit to transport solid waste, permit to dispose solid waste and license to own or operate solid waste disposal site.

Relevance to project: The Expected solid wastes to be generated will properly be managed in all project phases.

24) The Fire rescue force (safety inspection and certificates) regulation, 2012.

The Act stipulate that the Certificate issued shall be valid for a period of one year from the date of issue, there after the property owner shall apply for it to be renewed. Any owner of the property, premises, vehicle, vessel who fails to renew his Fire Safety Certificate within one month after its expiry will be required to pay the principal amount payable in respect of that property plus penalty of twenty-five per centum (25%) for late payment.

Relevance to project: The contractor shall by the provision of this Act by consulting fire and rescue force for inspection and renewal of certificate annually.

25) Fire and rescue force (precautions in building) regulation,2015

The provisions of this Part shall apply in determining the design, renovation, protection, location, arrangement and maintenance of exit facilities to provide safe means of escape for occupants from all buildings hereafter erected, altered or changed in occupancy.

4.-(1) The areas which are designated as means of escape shall include- (a) exit staircase; (b) firefighting

lobby; (c) smoke stop lobby; (d) exit passageway; and (e) escape corridors. (2) The areas which are designated as means of escape shall not be turned into other usage.

Relevance to project: The contractor shall abide by the provision of this Act by designating proper exit routes to be used during fire emergency.

26) The Companies Act, [CAP 212 R.E 2019].

An Act to repeal and replace a law relating to companies and other associations, to provide for more comprehensive provisions for regulation and control of companies, associations and related matters. 3.-(I) Any two or more persons, associated for any lawful purpose may, by subscribing their names to a memorandum of association and otherwise complying with the requirements of this Act in respect of registration, form an incorporated company, with or without limited liability. 15.-(I) On the registration of the memorandum of a company the Registrar shall certify under his hand that the company is incorporated and, in the case of a limited company, that the company is limited, and, in the case of a public company, that the company is a public company. Effect of registration (2) From the date of incorporation mentioned in the certificate of incorporation, the subscribers to the memorandum, together with such other persons as may from time to time become members of the company, shall be a body corporate by the name contained in the memorandum, capable of exercising all the functions of an incorporated company, but with such liability on the part of the members to contribute to the assets of the company in the event of its being wound up as provided for in this Act. 16.-(I) A certificate of incorporation given by the Registrar in respect of any association shall be conclusive evidence that all the requirements of this Act in respect of registration and of matters precedent and incidental thereto have been complied with and that the association. is a company authorised to be registered and duly registered un-Conclusiveness of certificate of incorporation der this Act.

Relevance to project: the proponent complies by the provision of this Act and the company is incorporated on the 18th day of January 2007.

27) The Investment Act (CAP 38 R.E 2022)

An Act to make provision for investment in Tanzania, to provide for more favorable conditions for investors, and for related matters. All investors whether or not this Act applies to them to obtain necessary permits, authorizations, approvals, registrations, consents, licenses and any other matter required by law for a person to set up and operate an investment.

Relevance to project: The proponent shall abide by the provision of this Act by seeking proper permits, authorizations, approvals, registrations, consents required by law to operate the sisal Estate.

28) The Income Tax Act R.E 2019

An Act to make provisions for the charge, assessment and collection of Income Tax, for the ascertainment of the income to be charged and for matters incidental thereto. 4.-(1) Income tax shall be charged and is payable for each year of income in accordance with the procedure in Part VII by every person - (a) who has total income for the year of income or is a corporation which has a perpetual unrelieved loss determined under section 19 for the year of income and the previous two consecutive years of income; (b) who has a domestic permanent establishment that has repatriated income for the year of income; or (c) who receives a final withholding payment during the year of income. (2) The amount of income tax payable by a person for a year of income shall be equal to the sum of the income tax payable with respect to subsection (1).

Relevance to project: The Act is relevant because the project is expected to have income due to the operations of sisal estate and factory. The proponent shall adhere to the provision of the Act and pay the required tax imposed by the Government.

29) The village land Act cap114 R E 2019

An Act to provide for the management and administration of land in villages, and for related matters. The village council shall, subject to the provisions of this Act, be responsible for the management of all village land. (2) The village council shall exercise the functions of management in accordance with the principles applicable to a trustee managing property on behalf of a beneficiary as if the council were a trustee of, and the villagers and other persons resident in the village were beneficiaries under a trust of the village land. (3) In the management of village land, a village council shall have regard to— (a) the principle of sustainable development in the management of village land and the relationship between land use, other natural resources and the environment in and contiguous to the village and village land; (b) the need to consult with and take account of the views and, where it is so provided, comply with any decisions or orders, any public officer or public authority having jurisdiction over any matter in the area where the village land is; (c) the need to consult with and take account of the views of other local authorities having jurisdiction in the area where the village land is. (4) A village council may establish a committee to advise and make recommendations to it on the exercise of any of the functions of the management of village land but, notwithstanding the provisions of section 110 of the Local Government (District Authorities) Act such committee shall have no power to take any decisions concerning the management of village land.

Relevance to project: The proponent shall abide by the provision of this Act by cooperating with the village council on different matters.

30) The Business Licensing Act, 1972

An Act to repeal and re-enact Trades Licensing Ordinance. (5) Any building or part of a building (including any out-house, shed or other structure, and also any part of land enclosed by a fence, howsoever constructed), which is used as an office, Shop, godown, store or warehouse or otherwise as a place where any business is normally carried on, or which is normally used by a person carrying on business for any purpose connected with his business shall, for the purposes of this Act be deemed to be a place where such business is being carried on: Provided that- (a) any place only temporarily used by a person carrying on business for any specific purpose connected with the business shall be deemed not to be a place where such business is normally carried on; (b) where two or more separate portions of a building or two or more separate Places on the land comprised in the same right of occupancy granted, or deemed by any written law to have been granted, under the Land ordinance, are used by the same person for the purpose of, or -in connection with, the business carried on by him, such portions or, as the case May be, places shall, in relation to such business, be deemed to be One Place of business.

3..-(l) No person shall carry on m Tanganyika, whether as a principal or agent, any business unless- (a) he is the holder of a valid business license issued to him In relation to such business; and (b) such business is being carried on at the place specified m the licence. (2) No person shall carry on business at two or more places, unless he is the holder of a separate business licence issued to him M' relation to such business for each of such place: provided that, m any such case, if a valid business licence exists m respect of any of the places of business (hereinafter referred to as -the principal place of business'') the holder shall be deemed not to have contravened the provisions of this subsection-

Relevance to project: the proponent abides by the provisions of this Act and has a valid business license for the proposed project.

31) HIV and AIDS (prevention and Control) Act No. 28 of 2008

The Act provides for prevention, treatment, care, support and control of HIV and AIDS, for promotion of public health in relation to HIV and AIDS. HIV and AIDS education in workplace, the Act requires that every employer in consultation with the ministry shall establish and coordinate a workplace programme on HIV and AIDS for employee under his control and such a program shall include provision of gender response HIV and AIDS education, distribution of condoms and support to people living with HIV and AIDS.

Relevance to project: The project Proponent will highly observe the requirement of this Act during project implementation by promoting awareness and education concerning the prevention and control of the spread of the disease.

32) The Workers Compensation CAP 263 R.E 2015

The law provides for compensation to employees for disablement of death caused by or resulting from injuries or diseases sustained or contracted in the course of employment to establish the Fund for administration and regulation of works compensation and to provide for related matter.

Relevance to project: This Act is very relevant to this project as workers will be exposed to various hazards during renovation and operation of the estate. The Proponent and the contractor will ensure safety and health of workers at the project environment through provision of compensation to employees for disablement of death caused by or resulting from injuries or diseases sustained or contracted in the course of employment.

33) The urban planning Act, 2007

An Act to provide for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters.

Relevance to project*:* The proponent shall abide to the requirements of this Act by promoting proper use of land and protecting land.

34) The urban planning(building) regulations,2018;

Use Class: Individual dwelling houses designed for use as dwellings by single families, together with such outbuildings as are normally used therewith, but not including dwelling houses designed for occupation by more than one family, and not including dwelling accommodation built over or attached to commercial, office or industrial buildings of Groups E to M inclusive. Terraced dwelling houses (in blocks of two or more) each dwelling designed for use by a single family, together with such outbuildings as are normally used therewith, but not including dwelling accommodation attached to commercial, industrial or office buildings of Groups E to M inclusive. Dwelling houses occupied principally as dwellings, but also used by the occupiers or tenants for professions and occupations and not used in any way as industrial buildings or for the public display or sale of goods or for the storage of bulky equipment or materials used in the occupier's profession or occupation.

Relevance to project*:* The proponent shall abide to the requirements of this Act by adhering to the use as designated by the law.

35) The Government Chemist Laboratory Authority Act no 8 of 2016

This Act establishes the Government Chemistry Laboratory Authority and provides with respect to its functions, powers and administration. The authority shall be the supreme and referral laboratory of the Government of Tanzania. It shall carry out, among other things, testing of food and drugs. it shall also

carry out functions under the Environmental Management Act. The Act also requires other laboratories to register with the Chief Government Chemist. The authority shall conduct research activities, laboratory analysis and advise the Government on matters relating to forensic toxicology, forensic biology, DNA, illicit drugs, forensic chemistry, food, drugs, occupational health, industrial and consumer chemicals and products and environmental samples for executing health, legal, social wellbeing and environmental interventions.

Relevance to project*:* The proponent shall abide to the requirements of this Act by adhering to standards in the products they produce.

36) The industries and consumer chemicals (management and control) regulations,2020

5.-(1) Any person who imports or exports a chemical shall- (a) be registered and be issued a certificate; (b) register the premises and chemicals; (c) create awareness to the public on the inherent risks of indiscriminate use and misuse of chemicals; (d) set and adhere to the code of practice and guidelines on the safe use and handling of chemicals; (e) apply for chemical importation or exportation permit for every chemical consignment prior to importation or exportation; and (f) submit to the Registrar, in writing, the name of an authorized agent.

Relevance to project*:* The proponent shall abide to the requirements of this Act by registering as the importer and user of chemicals, as well as proper usage of chemicals to control risks.

37) The industrial and consumer's chemicals (management and control) Act, 2003

An Act to provide for the management and control of the production, importation, transportation, exportation, storage, dealing, and disposal of chemicals and for matters connected therewith. This Act introduces measures for the control of production, importation, exportation, transportation, storage, handling and placing on the market of industrial or consumer chemicals or chemical products and provides for the carrying out of such control.

Sections 3 to 10 provide for administration of this Act and establish for this purpose a Technical Committee and define the functions of the Government Chemist Laboratory Agency, the Chief Government Chemist, the Ministerial Advisory Board for the Government Chemist Laboratory Agency and the Emergency Response Committee. The Chief Government Chemist shall act as the Registrar of Chemicals, the functions of which are set out in section 10. Sections 11 to 47 contain provisions relative to the control of the production, importation, transportation, exportation, storage, handling, placing on the market and disposal of chemicals. Measures of control include registration of chemicals, certification, use restrictions, inspection, packing labelling requirements and precautionary measures. Other provisions of this Act

concern financial arrangements, liability and regulation making powers of the Minister. Offences are defining and penalties prescribed.

Relevance to project*:* The proponent shall abide to the requirements of this Act by providing proper management and control of the production, importation, transportation, exportation, storage, dealing, and disposal of chemicals to be used in the project.

38) The Employment and Labour Relations Act Cap 366 RE 2019

An Act to make provisions for core labour rights, to establish basic employment standards, to provide a framework for collective bargaining, to provide for the prevention and settlement of disputes, and to provide for related matters. 5.-(1) No person shall employ a child under the age of fourteen years. (2) A child of fourteen years of age may only be employed to do light work, which is not likely to be harmful to the child's health and development; and does not prejudice the child's attendance at school, participation in vocational orientation or training programmes approved by the competent authority or the child's capacity to benefit from the instruction received. (3) A child under eighteen years of age shall not be employed in a mine, factory or as crew on a ship or in any other worksite including non-formal settings and agriculture, where work conditions may be considered hazardous by the Minister.

Relevance to project; The proponent shall abide to the requirements of this Act by not employing a child below 18 years old in factory site.

39) The Tanzania Meteorological Authority Act, 2019

This Act establishes the Tanzania Meteorological Authority as a body corporate, for the purpose of collaborating and cooperating with international organizations relating to meteorological issues. The Authority has the mandate to exchange meteorological and related data and products at national, regional and global level for the safety of life and property and to enhance understanding of the global atmosphere. Some functions of the Authority include to; implement the National climate related policies in relation to weather and climate matters; regulate and coordinate meteorological activities in the country; organize and administer efficient networks of surface and upper air stations necessary to establish accurate records of the weather and climatic conditions; and provide weather and climate services for the safety of life and property and to various users of meteorological services. The Act provides that any person who intends to engage in any meteorological observations, weather forecasting activities or weather modification activities shall apply for a permit to the authority. The Act provides extensively for the manner and conditions of application and issuance of meteorological permits. Essentially, the Act repeals the Meteorology Act, Cap. 157.

Relevance to project; the proponent shall abide to the requirements of this Act by requesting meteorological data for the safety of life and property and to enhance understanding of the atmosphere of the related project site.

40) Customs (Management and Tariff) Act [CAP 403 R.E 2019]

An Act to provide for the management and administration of customs, transfer tax and related matters. (2) For the purposes of this Act— (a) goods shall be deemed to be entered when the entry, made and signed by the owner in the prescribed manner, is accepted and signed by the proper officer and when any duty due or deposit required under this Act in respect of the goods has been paid, or security has been given for compliance with this Act; (b) the time of importation of any goods shall be deemed to be the time at which such goods come within the boundaries of Tanzania;

Relevance to project; the proponent shall abide to the requirements of this Act as designated by the law.

41) National Social Security Fund (NSSF) Act, 2022

6.-(1) This Act shall apply in Mainland Tanzania in relation to a person who is- (a) employed in the private sector; (b) self-employed; (c) a foreigner employed in Mainland Tanzania; (d) employed in the international organization operating in Mainland Tanzania; and (e) any other category of persons as may be specified by the Minister upon recommendation of the Authority. (2) Every insured person shall be issued with a registration number upon registration.

Relevance to project; the proponent shall observe the provision of this Act by registering all the workers in the NSSF and submit their contributions as required by the Law.

42) The Environmental Management (Prohibition of Plastic Carrier Bags and plastic bottles cap seals) Regulations, 2022

These Regulations shall apply to- (a) the import, export, manufacturing, sale, supply, storage and use of plastic carrier bags within Mainland Tanzania; and (b)the import, export, manufacturing, sale and use beverages with plastic bottle cap seal. 4. The objectives of these Regulations are to- (a) impose a total ban on the import, export, manufacturing, sell or offer for sale and use of plastic carrier bags regardless of their thickness; (b) impose a total ban on the import, export, manufacturing, sale and use beverages with plastic bottle cap seal; (c) protect human and animal health as well as the environment from likely adverse effects of utilization of plastic carrier bags, or plastic bottle cap seals; and (d) provide economic and financial incentives for the production and importation of alternative carrier bags.

Relevance to project; The proponent will abide by these regulations and shall not import, export, manufacturing, sale, supply, storage and use of plastic carrier bags or plastic bottle cap seals instead they shall use alternative carrier bags.

43) National Economic Empowerment Act, 2004 (No. 16 of 2004).

An Act to establish the National Economic Empowerment Council for the promotion and facilitation of ownership of income generating activities and assets by Tanzanians to provide legal and institutional framework for the Council; to establish the National Economic Empowerment Fund and to provide for the control of the financial affairs of the Council and the Fund, and to provide for other incidental matter. This Act established the National Economic Empowerment Council as a body corporate under section 3. The Council shall implement the National Economic Empowerment Policy as promulgated by the Government and shall develop a strategic institutional framework and national guidelines to support planning and coordination of a specific sector and multi-sector response to the proposed policy. A National Economic Empowerment Fund is established under section 16. A Register of institutions and organizations engaging in economic activities established under section 25. Registration with the Register shall be compulsory.

Relevance to the Project: Project implementation is consistent with the relevant provisions of this Act.

3.4 Relevant International Agreements, Conventions and Treaties

Tanzania is signatory to a number of international agreements and conventions relating to environmental management, community rights and Indigenous Peoples. The international conventions are not always translated into national legislation. Some of the key agreements are listed in in the table below.

Table 6; Relevant International Agreements, Conventions and Treaties

CLIMATE CHANGE/AIR QUALITY		
Agreement/ Convention	**Notes/Comments**	**Relevance**
Vienna Convention forthe Protection of the Ozone Layer, 1985	Protection of the ozone layer, came into force in1988,	Sets international standards for protection of the ozone layer; emissions from project potential to harm ozone layer
Montreal Protocol on Substances that Deplete Ozone Layer,1989	Protection of the ozonelayer.	As above
United Nations Framework Conventionon Climate Change (UNFCC), 1994	Control of greenhouse gas emissions. Tanzania signed the	Sets international guidelines on restrictions of GHG emissions in order to prevent climate change; Project will emit greenhouse

	Convention on 12 June, 1992 and ratified it on 17 April, 1996	gases from power generation through heavy fuel combustion
Kyoto Protocol, 1997	Greenhouse gas emissions targets.	As above
BIODIVERSITY/PROTECTED AREAS		
Agreement/ Convention	**Notes/Comments**	**Relevance**
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), 1971	The conservation and sustainable utilization of wetlands, i.e., to stem progressive encroachment on and loss of wetlands now and in the future, recognizing the fundamental ecological functions of wetlands, their economic, cultural, value.	Sets international requirements for the protection of wetlands; project has potential to impact local wetland area
Convention on the International Trade of Endangered Species of Wild Fauna and Flora (CITES), 1973	To ensure that international trade in specimens of wild animals and plants does not threaten their survival and it accords varying degrees of protection to more than 33,000 species of animals and plants.	Sets international restrictions/bans on trade of certain wild animals/plants. Project takes place in high biodiversity area
United Nations Convention on Biological Diversity, 1992	Promotes development of national strategies for the conservation and sustainable use of biological diversity. Often seen as the key document regarding sustainable development.	Sets guidelines for protection and promotion of biological diversity. Project takes place in high biodiversity area.
United Nations	To combat desertification and	Sets guidelines to combat

Convention to Combat Desertification, 1994	mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.	desertification. Project has potential to impact local water resources and quality and land use
LABOR/HEALTH/SAFETY		
Agreement/ Convention	**Notes/Comments**	**Relevance**
Constitution of the International Labor Organization	Promotes opportunities for women and men to obtain decent and productive work, in conditions of freedom, equity, security and human dignity in a safe and healthy environment.	Sets international labour standards; project will employ large workforce
Forced Labour Convention, 1930	Tanzania ratified this Convention and thus undertakes to suppress the use of forced or compulsory labour in all its forms within the shortest possible period.	Although not likely to occur, this risk should not be underrated as the vast extent of secondary or tertiary associations may trigger this impact accidentally.
The Workmen's Compensation (Accidents) Convention	This is the 17th convention of the International Labour Organization, adopted in 1925.	It sets out the requirement that workers or their dependents must be compensated for injury as a result of accidents in the workplace.
World Health Organization	To improve health and Living standards of the people in the World	Sets guidelines to improve health and living standards; project has potential to

		impact local health/living Standards.
PESTCIDES USE		
Agreement/ Convention	**Notes/Comments**	**Relevance**
Rotterdam convention	The objectives are to promote shared responsibility and cooperative efforts among parties in the international trade of certain hazardous chemicals to protect human health and the environment from potential harm, and to contribute to the environmentally sound use of those hazardous chemicals by: facilitating information exchange about their characteristics; providing for a national decision-making process on their import and export; and disseminating these decisions to parties.	To set guidelines for protection of human health and the environment from potential harm

3.5 Administrative Framework / Institutional Arrangement

The administrative and institutional arrangements for environmental management for all sectors in Tanzania are stipulated in the environmental Management Act No. 20 of 2004 (Cap 191). The Act mentions the Minister Responsible for Environment as the overall in-charge for the administration of all matters related to the environment. Part 111 of EMA, 2004 provides details of administrative and institutional framework for environmental management in Tanzania. The Act also mentions seven (7) institutions which are involved in environmental management in Tanzania. The administrative authority for environmental assessment and monitoring at national level is vested in the office of the Vice-President, where the Minister Responsible for Environment is seated. Other legal institutions for environmental

management in the country include: National Environmental Advisory Committee, Director of Environment, National Environment Management Council (NEMC), Sector Ministries, Regional Secretariat and Local Government Authorities (Township, Ward, Sub wars "Mtaa and Kitongoji").

The Minister Responsible for Environment - has overall responsibility of matters related to environment, including the approval of the EIA reports.

The National Environmental Advisory Committee (NEAC) - is comprised of members with experience in various fields of environmental management in the public and private sector and in civil society. The committee advises the Minister on any matter related to environmental management.

The Division of Environment (DoE) - headed by the Director of Environment deals with the development of Environmental policy and co-ordination of its implementation. It's also plays an advisory role to the Government on all matters pertaining to environmental management including overarching mandate on the functions of the National Environmental Management Council (NEMC).

National Environmental Management Council (NEMC) – headed by the Director General has the overall responsibility of undertaking enforcement, compliance, review and monitoring of Environmental Impact Assessment, and in this regard facilitates public participation in environmental decision making. Other functions of NEMC include recommendations to the Minister to approve, reject or approve with conditions, specific EIS and to make recommendations on whether to revoke EIA Certificates in cases of non-compliance.

The Sector Ministries- are required to establish Sector Environmental Sections headed by the Sector Environmental Coordinator which, among other things, have the responsibility to ensure environmental compliance by the Sector Ministry and to oversee the preparation of, and implementation of, all EIA's required for investments in the sector.

The Regional Secretariat -headed by the Regional Environmental Management Expert (REME), is responsible for the co-ordination of all environmental management programs in their respective regions. The regional administrative Act No. 9 of 1997 provide for Regional Commissioners to oversee regional secretariat Councils, with district commissioner directly supervising the district councils.

Table 7; Institutional framework

Level	Institution	Roles
National	The Vice President's Office (Division of Environment, NEMC)	- Co-ordinate Environmental Management Policy, Environmental Management Act and EIA guidelines - Approval of ToR, Review of EIA - Issuing an Environmental Certificate

		- Environmental Monitoring and Compliance Auditing - Advise Government on all environmental matters
	Ministry of Land, Housing and Human Settlements development	- Land use planning, - Issuing of Right of Occupancy, - Valuation and compensation.
Regional	Regional commissioner's Office	- Oversee and advice on implementation of national policies at regional level - Oversee enforcement of laws & regulations - Advice on implementation of development projects and activities at regional level
District	Kibaha District Commissioner's Office	- Oversee and advice on implementation of national policies at District level - Oversee enforcement of laws & regulations - Advice on implementation of development projects and activities at District level
	Kibaha District Council (District Executive Director Office)	- Overseeing all development activities in the district
Ward	Ward Development Committees (Ward Executive Officer, Ward Extension officers), Ward Environment committee	- Oversee general development plans for the Ward - Provide information on local situation and Extension services - Technical support & advice - Project Monitoring
Village (community)	Councils (Chairman /VEO, Environment Committee): and other leaders	- View on socio-economic and cultural value of the sites and project operations. - Rendering assistance and advice on the implementation of the project

		- Project Monitoring (watchdog for the environment, ensure wellbeing of residents and participate in project activities
Project proponent	Mohammed Enterprises Tanzania Limited	- Project design and planning and facilities renovation - EIA study - Project implementation (operation) - Project monitoring and internal auditing - Project decommissioning

CHAPTER FOUR

4.0 Environmental and Social Baseline Conditions

4.1 Introduction

This section describes the baseline condition as they relate to physical environment, biological environment, the socio-economic environment within the core project area and the marginal zones. The sub sections of physical, economic, social characteristics and Infrastructure and demographic characteristics are based on secondary data observation, while the last sub section including biological environment are based on the primary survey obtained during field work.

4.2 Physical characteristics

- **Geographical location**

Korogwe District also known as Korogwe District Council is one of the eleven districts of Tanga Region in Tanzania. The district covers an area of 6,534 km2 (2,523 sq mi). It is bordered to the northeast by the Lushoto District and north by Bumbuli District. Korogwe District also bordered to the east by the Mkinga District and the Muheza District, to the South by the Handeni Rural District and the Korogwe Urban District, and to the West by the Kilimanjaro Region. The highest point in Korogwe District is Mafi Peak at 1,442m. (Source; https://en.wikipedia.org/wiki/Korogwe_District).

- **Climate**

Located at an elevation of 305.48 meters (1002.23 feet) above sea level, Korogwe has a Tropical wet and dry or savanna ('summer' dry season) climate (Classification: As). The district's yearly temperature is 29.08ºC (84.34ºF) and it is 4.86% higher than Tanzania's averages. Korogwe typically receives about 103.57 millimeters (4.08 inches) of precipitation and has 185.83 rainy days (50.91% of the time) annually.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	38.98 (102.16)	38.98 (102.16)	38.98 (102.16)	35.82 (96.48)	33.72 (92.7)	33.72 (92.7)	32.66 (90.79)	31.61 (88.9)	32.66 (90.79)	34.77 (94.59)	35.82 (96.48)	36.88 (98.38)	38.98 (102.16)
Average high °C (°F)	34.18 (93.52)	34.41 (93.94)	34.57 (94.23)	32.94 (91.29)	30.7 (87.26)	30.08 (86.14)	29.56 (85.21)	29.79 (85.62)	30.29 (86.52)	31.41 (88.54)	32.54 (90.57)	33.95 (93.11)	32.03 (89.65)
Daily mean °C (°F)	30.65 (87.17)	30.9 (87.62)	31.32 (88.38)	30.18 (86.32)	28.33 (82.99)	27.39 (81.3)	26.76 (80.17)	27.0 (80.6)	27.53 (81.55)	28.53 (83.35)	29.65 (85.37)	30.65 (87.17)	29.08 (84.34)
Average low °C (°F)	25.64 (78.15)	25.78 (78.4)	26.4 (79.52)	25.96 (78.73)	24.77 (76.59)	23.44 (74.19)	22.63 (72.73)	22.82 (73.08)	23.26 (73.87)	24.06 (75.31)	24.6 (76.28)	25.35 (77.63)	24.56 (76.21)
Record low °C (°F)	23.18 (73.72)	23.18 (73.72)	20.02 (68.04)	15.8 (60.44)	21.07 (69.93)	14.75 (58.55)	20.02 (68.04)	21.07 (69.93)	21.07 (69.93)	21.07 (69.93)	22.13 (71.83)	23.18 (73.72)	14.75 (58.55)
Average precipitation mm (inches)	58.17 (2.29)	42.51 (1.67)	118.13 (4.65)	242.28 (9.54)	222.43 (8.76)	39.92 (1.57)	46.31 (1.82)	52.21 (2.06)	64.78 (2.55)	141.24 (5.56)	125.38 (4.94)	89.44 (3.52)	103.57 (4.08)
Average precipitation days (≥ 1.0 mm)	10.25	7.28	19.25	25.0	21.94	10.16	10.82	11.49	14.47	15.99	20.21	18.96	15.49
Average relative humidity (%)	77.43	77.17	77.0	78.47	81.0	77.5	77.52	78.72	79.26	80.57	80.66	78.04	78.61
Mean monthly sunshine hours	11.83	11.79	11.59	11.39	11.35	11.76	11.68	11.76	11.54	11.82	12.89	11.92	11.78

Figure 3; Korogwe district weather by month

Source; https://weatherandclimate.com/tanzania/tanga/korogwe

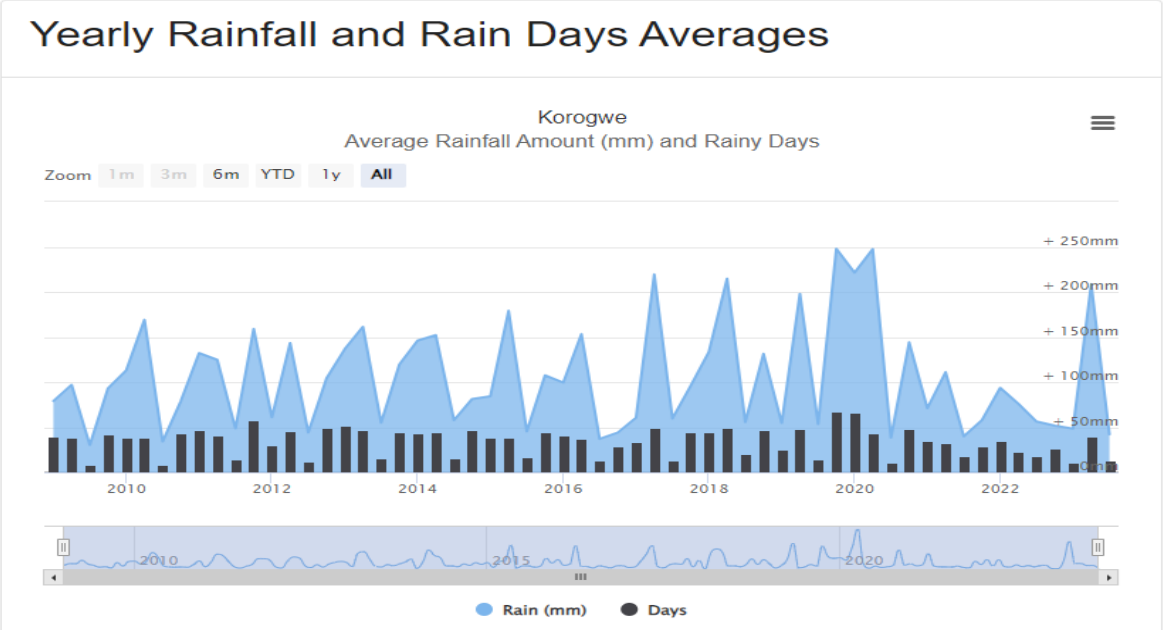

Figure 4; Yearly rainfall and rainy days averages

Source; https://weatherandclimate.com/tanzania/tanga/korogwe

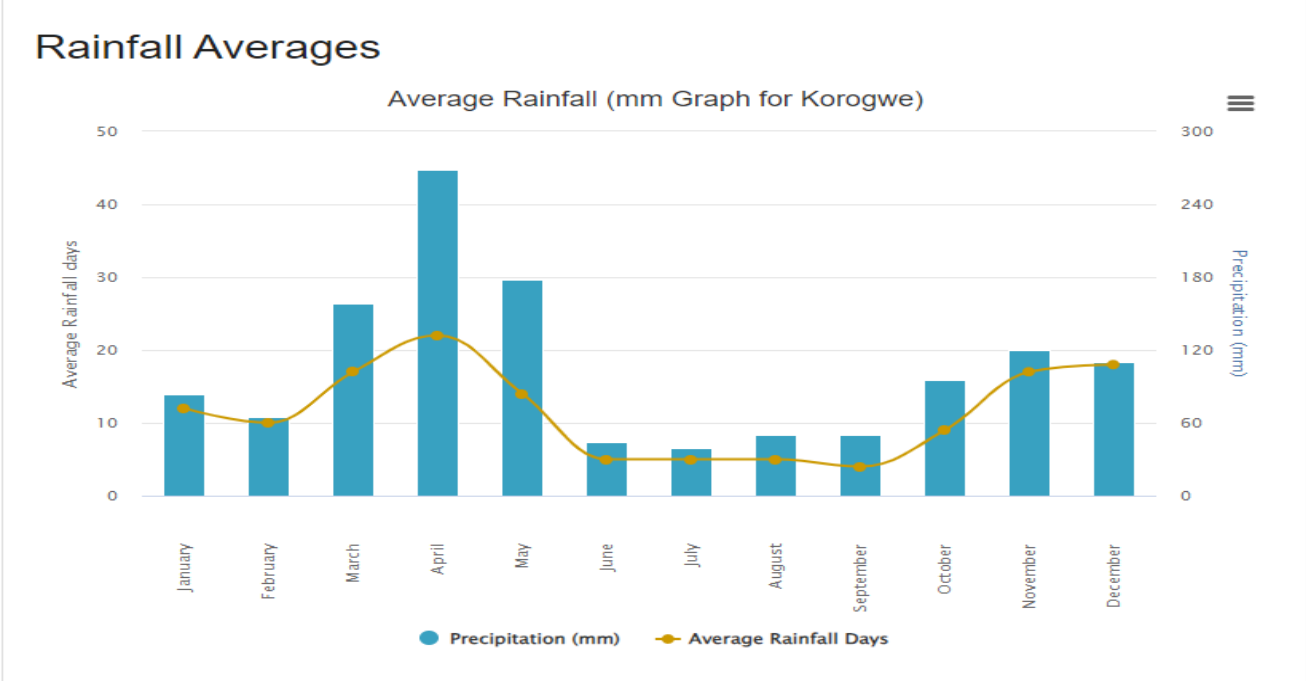

Figure 5; Rainfall averages

Source; https://weatherandclimate.com/tanzania/tanga/korogwe

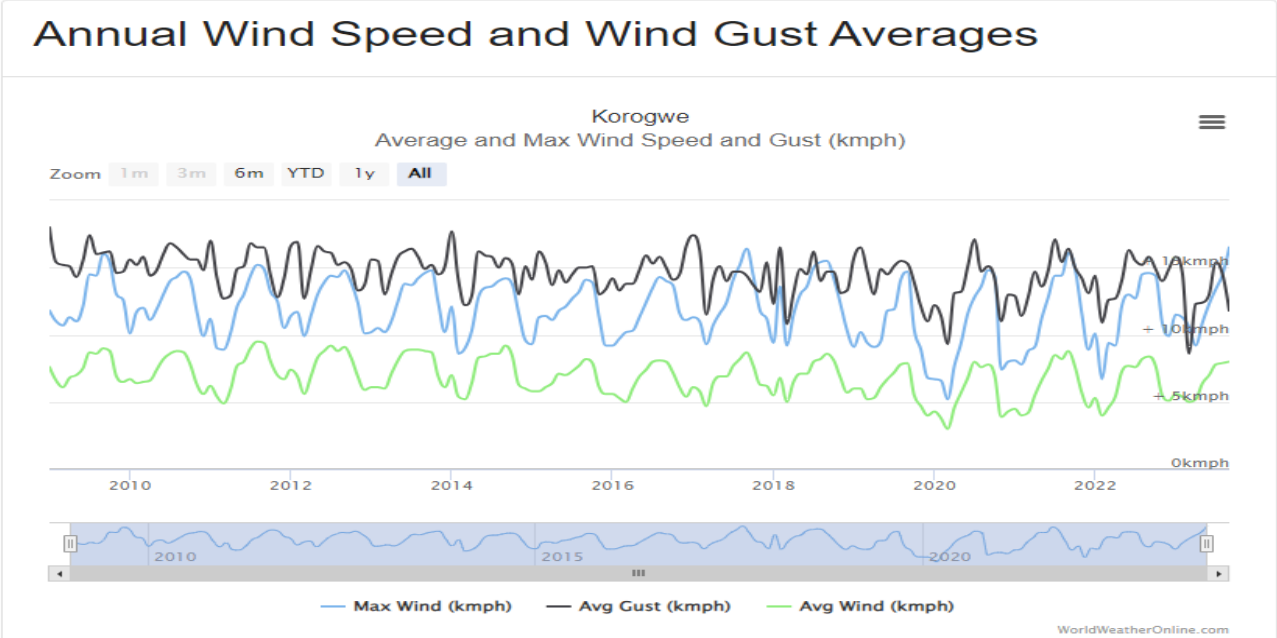

Figure 6; Annual wind speed and wind gust averages

Source; https://weatherandclimate.com/tanzania/tanga/korogwe

- **Geology and drainage**

The project area is drained by the Ruvu Hydrology Sib-Catchment Area. There are smaller streams and rivers which feed into the Ruvu River. The West and East Usambaras are large ranges of Precambrian metamorphic geologic formations of acid-gneisses, pyroxenes, and amphiboles. These mountains were formed by faulting and uplifting creating the drainage system of troughs that form many watersheds, which provide water to a majority of the population of northeast Tanzania.

The usambara mountain range was formed nearly two million years ago. Due to a lack of glaciations and a relatively consistent climate, the rainforest has gone through a long term and unique evolution resulting in an impressive amount of endemism and an old-growth cloud rainforest. The West and East Usambaras are large ranges of Precambrian metamorphic geologic formations of acid-gneisses, pyroxenes, and amphiboles. These mountains were formed by faulting and uplifting creating the drainage system of troughs that form many watersheds, which provide water to a majority of the population of northeast Tanzania. (Source; https://en.wikipedia.org/wiki/Usambara_Mountains).

- **The Agro-Ecological Zones**

The variations in the topography and climate provide different cropping possibilities which can be defined into three major agro-ecological zones. Most of the district has loamy, sandy and clay soils while the natural vegetation is predominantly of the tropical type. These zones are the Mountainous, low wetlands, and Semi-Arid Zone. An Irrigation zone can also be identified along the major rivers. Each zone, however, has similar topography, climate and cropping possibilities.

The mountainous zone occupies about 25% of the district area, lies between 900-1500 meters above sea level, has a temperate climate and between 1000-2000mm of annual rainfall. The zone is ideal for growing bananas, beans, potatoes, temperate fruits, coffee, tea and cardamom. Livestock are also reared. Since the slopes are gentle, there are few erosion problems. This zone is over part of the Western Usambara Mountains includes Bungu Division, and some of Magoma division (Kizara ward).

The Low wetland zone occupies about 35% of the district, lies between 600-800 meters, is hothumid, and has an average rainfall between 800-1000mm per year. Several rivers, including the Pangani and Lwengera, drain this area to provide irrigation potentials. The main food crops grown are maize, paddy, beans, cassava and potatoes while the cash crops cultivated include cashew nuts, cotton, sisal and tropical fruits like mangoes, oranges and tangerines. Livestock (exotic and indigenous) is also reared for milk and meat. The zone covers Korogwe (Ngombezi ward) and some of Magoma divisions, Mombo division (Makuyuni ward)

The Semi-Arid Zone occupies about 40% of the district. Lies between 400-700 meters above sea level and has less than 600 mm of mean annual rainfall. The crops grown are millet, cassava, beans, paddy, sisal, cotton, sunflower, and cashew nuts. The zone covers Mkomazi, Mazinde, Mkalamo, Mombo and parts of Mashewa wards. The Irrigation zone extends through parts of the **Low Wetland and Semi-Arid zones** which are drained by the major rivers. Paddy is the main crop in these river valleys and cultivation depends on drawing water from the rivers. Some irrigation is also found locally in depressions among the mountainous zone and is used to grow vegetables like tomatoes, onions and cabbage.

4.3 Biological Environment

This part gives details of natural biological factors (such as animals and plants) that affect human life (as in a particular place or period).

- **Flora**

The project site is composed with high diversity plant species of different life forms including grass, trees and shrubs. Also, some areas are covered with sisal plants, banana plants and some mango trees. There are no environmentally sensitive areas, either legally protected or in existence without legal measures.

- **Fauna**

The study area is devoid of visible free ranging fauna. However, there is a variety of bird species and reptiles such as lizards, snakes and a significant number of rats, bugs and flies. There are also few domestic animals such as cows and chickens, which are kept by workers and villagers.

- **Unique and Endangered Species**

There are neither unique nor endangered species of concern that were observed in the project area.

4.4 Socio Economic Activities

a) Social Services

- **Population**

According to the 2022 Tanzania National Census, the population of tanga region was 2,615,597, Korogwe Rural District was 272,870 with 3,203 km² Area 85.19/km² and Magamba – Kwalukonge was 7,108 (Source: National Bureau of Statistics Tanzania (web).

- **Education**

The awareness in education of the people in Korogwe is very high, there many primary schools, secondary schools as well as colleges. As of 2022, there were 165 Schools in Korogwe District, 138 of are primary schools and 27 are secondary schools. (Source; https://en.wikipedia.org/wiki/Korogwe_District).

- **Gender empowerment**

Gender empowerment, among others ensures that the disadvantaged sex particularly women, fully participate in policy and decision-making processes and in all aspects of economic, sociocultural and political life. Various measures have already been put in place to minimize time spent by women and girls in attending home activities to allow more time to be used in the above-mentioned activities. These measures include proper use of family planning methods, opening and operating of day care centers, establishment of women economic groups, participation in SACCOS, CBOs and other cooperative activities. These initiatives are also implemented in Korogwe District Council.

- **Water and sanitation**

Nearly a quarter (24 percent) of households has a safe source of water, whereas 28 percent of them get it from an unprotected well. Safe sources of drinking water are treated pipes, bore holes, hand pumps, and protected wells. The analysis by cluster location shows that 33 percent of households in accessible villages have a safe source of drinking water, whereas the share of households in remote villages is just 15 percent. The shares of households with unprotected wells are 19 percent for accessible and 37 percent for households in remote villages. Poverty status of the household shows important differences in access to safe source of water. 32 percent of poor households gets drinking water from unprotected well, whereas the share for non-poor households is 26 percent. Overall, 85 percent of households have safe sanitation, whereas up to7 percent use uncovered pit latrines. The breakdown by poverty status shows that 92 percent of non-poor household's report access rate to safe sanitation, while the share for poor households is 68 percent. In addition, 90 percent of nonpoor households use covered pit latrines compared to 67 percent of poor households. It is also noticeable that up to 27 percent of poor households in this district have no toilets.

- **Poverty and Livelihoods**

Today, the population of the Usambara Mountains region has one of the highest growth rates (about 4% compared to the Tanzanian national average of 2.1%), a staggering amount of poverty, and highest densities of people in all of Tanzania. Most of the inhabitants are subsistence farmers who rely heavily on the forests around them for timber, medicinal plants, clearing for agriculture, and fuelwood. 70% of the original forest cover of the West and East Usambaras has been lost. Its ecosystems were significantly disrupted by foreign-controlled logging companies that carried out large-scale deforestation from the 1950s onwards. A sawmill at Tanga processed East Usambara timber, and its output was increased in the 1970s with Finnish development funding. Major land and forest degradation remains a pressing issue.

There are still many places that attract visitors looking for experiences beyond developed tourist resorts. These include the trade town of Lushoto (German colonial era Wilhelmsthal), the once-popular German resort Amani Nature Reserve and farm, and the Mazumbai University Forest, which is considered the last example of pristine tropical forest in the East Usambaras. (Source; https://en.wikipedia.org/wiki/Usambara_Mountains)

Poverty is lowest for households where the main income earner is an employee, at 7 percent. In addition, the employees are the most likely to be located in accessible villages, at 78 percent, whereas the self-employed in agriculture and the self-employed in nonagricultural activities report the highest shares of households located in remote villages, at 49 and 46 percent, respectively.

- **Health**

In Terms of Healthcare facilities, as of 2022 Korogwe District is home to 3 health centers,1 hospital and 48 clinics (Source; https://en.wikipedia.org/wiki/Korogwe_District) nearby the project site there two health facilities built. Overall, fever or malaria is the most common sickness, affecting almost 63 percent of the total population. Coughing and breathing difficulties affected 19 percent of the ill population. Diarrhoea or abdominal pain and pain in back, joints or limbs follows, with 9 and 8 percent respectively, whereas other illnesses had minor shares. Males report being affected more often by coughing and breathing difficulties than females at 21 and 16 percent respectively. There are no sharp differences between males and females for the remainder of the sicknesses or injuries.

- **Employment**

The adult population of the district is categorised into two main groups: working and non-working. The working population includes all adults who had engaged in any type of work in the 4 weeks preceding the survey. Within the working population, a distinction is made between those employed to capacity and those who are underemployed. The underemployed are those individuals who report willingness to take on additional work. This category reflects the population that is not working as much as they want, so they reflect surplus in the labour supply. The non-working population consists of individuals who had not engaged in any type of work in the 4 weeks preceding the survey. This group is further subdivided into those who are unemployed and those who are economically inactive. While the economically inactive are individuals who had not engaged in any work in the 4 weeks preceding the survey due to illness, disability, age or school, unemployed individuals are those who were not working due to lack of employment opportunities but were actively looking for a job.

- **Energy**

Korogwe District Council is similar to other areas of the country, whereby TANESCO is the sole supplier of electricity in the council. Customers using electricity for institution, domestic and commercial purposers. The majority of Korogwe District Council population use firewood and charcoal for cooking it is important for the district council to continue encouraging people to use alternative sources of energy instead of fuel wood and charcoal in order to reduce the pressure being exerted on forests. Addition to that, electricity costs have to be further reduced especially in rural areas to increase number of electricity users.

- **Transport Infrastructures**

The classification of road network in Korogwe District Council has been divided into three types of road surfaces which are tarmac, gravel and earth surface.

- **Telecommunication Service**

Korogwe District Council enjoys internet and telephone services (both cellular phone and land line-based telephone services) and postal services. However, there are no television stations but famous Tanzania Local Television channels like Independent Television (ITV), Channel Ten; Tanzania National Broadcasting Television (TBC) can be accessed.

- **Commerce and industry**

General Business in Tanzania is an important sector of the country's economy, providing employment to millions of people and contributing significantly to the country's GDP. It is the backbone of the Tanzanian economy and encompasses a wide range of activities, from agriculture and manufacturing to services, retail, and tourism.

b) Economic Activities

The main economic activities of Korogwe District are industries, trade beekeeping and agriculture.
Agriculture As the main pillar of the Council's economy, it is a source of income and household economy for more than 80% of its residents. The council has 116,339 hectares (equivalent to 32.8% of the total area of the council) suitable for the cultivation of various crops. In general, residents of rural areas engage in the cultivation of commercial crops and food in small areas. On average, one farmer/household owns between 0.5 and 2 hectares of food and commercial crops. Important food crops grown in the Council include rice, maize, cassava, sweet potatoes, yams, beans and bananas. Commercial crops grown are sisal, tea, vegetables, tropical fruits, and cashews. In addition, to a small extent, crops such as coffee, cardamom and cotton are also cultivated. Korogwe District Council has an area of 142,672 hectares of the entire area of the district suitable for grazing. In addition, an area of 42,080 hectares is an area set aside by villages

for grazing and the remaining area of 100,592 hectares is for open grazing. The livestock sector takes the second place in terms of economic importance for the residents of Korogwe District Council after the agricultural sector. The important livestock in this Korogwe Council include domestic and dairy cattle, domestic goats, sheep, chickens, ducks, rabbits, pigs and dairy goats in small numbers. There are various industries such as rice husking factory

Bee keeping is the principal industrial dealing with management of bees and processing of bee products from natural forests, plantations, agricultural land and other habitants. The main bee keeping products include honey, bee wax, and royal jelly proposal and pollination services.

The National Beekeeping Policy (1998) however states clearly how bee keeping will be the key activity in improving economic situation for the rural community as well nation wise. Also, it indicates various stake holders in this activity, district council, donors as well as rural people (community). In the District almost all beekeeping is currently practiced through the traditional methods. The district has 275 modern hives and 2331 traditional hives. Harvesting is done in February/March and October/November every year. Markets are available in Dar es Salaam, Tanga, Moshi and Arusha while others are in Kenya. Most of the producers are small holders

4.5 Baseline environmental parameters for the existing Mabogo Sisal factory

The Impact Assessment focused on the estimation of atmospheric emissions and impacts associated with the factory operation activities. The findings of the Baseline and Impact Assessment components assist in creating informed recommendations for air quality, dust and noise management measures, including mitigation and monitoring. The total of 4 sampling points was established for gas emissions, noise and dust levels measurement. Measurements were taken in the afternoon at around 01:30Hours. Descriptions of the sampling points are summarized in the table below

4.5.1 Ambient Gaseous Emission

Levels of ambient gases were measured using a BH-4S Portable Multi-Gas Detector. Parameters measured include: Carbon monoxide (CO) in mg/m^3, Carbon dioxide (CO_2) in %, Oxides of nitrogen (NO) in mg/m^3, Sulphur dioxide (SO_2) in mg/m^3 in mg/m^3. All the measured parameters were found to be within stipulated local (TBS) and international guidelines i.e., WHO Ambient Air Quality Guidelines

Table 8: Average values of Measured Gaseous Emissions

UNITS	Measured Parameters			
	CO_2	CO	NO	SO_2
	%	mg/m^3	mg/m^3	mg/m^3
Decortication area	0.01	2.00	0.02	0.01
Drying yard	0.01	2.00	0.01	0.00
Brush room	0.01	1.00	0.01	0.00
Bailing room	0.00	2.00	0.02	0.00
TBS		Maximum permitted exposure of 100 mg/m^3 for the periods not exceeding 15 minutes		Daily average of hourly value not exceeding 0.15
WHO		30	0.12	0.5

4.5.2 Dust level

Dust levels from the sampling points were determined using the Air quality detector (HT-9600). The equipment is capable to sample dust in the range from 0.01 to 2500 mg/m^3 with a resolution of 0.001 mg/m^3 or (1µg/m^3). Some assessed locations had dust concentration which comply with both TBS (TZS845:2005) and WHO, 2005 guidelines except brush room and bailing room which were higher compared to the prescribed limits as depicted in the recorded data. Workers in these areas should be equipped with respiratory protective gears to ensure a safe working environment and minimizing exposure to potential airborne hazards.

Table 9: Average values of measured Dust levels

Sample collection point	**PM2.5 [µg/m^3]**	**PM10 [µg/m^3]**
Decortication area	7	18
Drying yard	13	23
Brush room	15	187
Bailing room	24	152
Local standard (TZS: 845:2005)	N.M	60-90
International standard [WHO:2005]	25	50

4.5.3 Sound level

Sound data were recorded at sampling stations established using a digital sound level meter, with measurement range of 30 to 130dB (A). In general, noise levels as baseline had low intensity which comply

with the Environmental Management (Standard for the control of Noise and Vibrations Pollution), 2015 which is 85dBA except in the brush room and decortication area which had high intensity thus may pose any effect to humans. The management should continue enforcing the use of earmuffs/earplugs to workers and consider job rotation and exposure reduction to the area. Also, the management should ensure Machinery and equipment's are well maintained and repaired so as to reduce the noise caused by faultiness, tear and wear. The following are the sound level measurements obtained.

Table 10: Onsite noise (dBA) levels

Name of Sampling Point (SP)	**Noise level (dB)**
Decortication area	92.3
Drying yard	59.3
Brush room	80.5
Bailing room	69.2
Environmental Management (Standard for the control of Noise and Vibrations Pollution), 2015	85

CHAPTER FIVE

5.0 Stakeholder Involvement

5.1 Overview

Stakeholder involvement is a cornerstone of any EIA since it ensures that all the interested and affected parties are involved in the project. It also ensures collaboration between the proponent, interested and affected parties throughout all the phases of the project.

This section outlines a range of stakeholders consulted in the EIA process for the proposed development. The chapter identifies stakeholders and synthesizes their concerns regarding the proposed development in short by highlighting the most commonly and significantly noted views. However, all the views from stakeholders have largely been reflected in the whole document as the issues, problems and concerns discussed in the document come from the stakeholders consulted as well professional observations and assessment by the EIA team.

5.2 Objectives of the Consultation Process

The involvement of the local population is essential to the success of the project(s) in order to ensure smooth collaboration between project proponent and local communities and to minimize and mitigate environmental and social risks related to the proposed project activities. The overall objective of the consultation process is to disseminate project information and to incorporate the views in the design of the mitigation measures and environmental management plan. It is done to ensure the quality, comprehensiveness and effectiveness of the impact assessment to ensure that various groups' views are adequately taken into consideration in the decision-making process so as to avoid conflict at a later stage. Consultation with the stakeholders was aimed at positively conveying information about the proposed project development, clear up misunderstandings, allow a better understanding of relevant issues and how they will be dealt with, and identify and deal with areas which are controversial so as to clarify matters and make adjustments accordingly, while the project is still in its design stage. The objectives of stakeholder's consultation are as follows:

- Define potential project stakeholders and suggest their possible project roles.
- Disseminate comprehensive information about the project to enable stakeholders to identify their concerns, needs, and recommendations.
- Listen to their comments, ideas and concerns and record the same for follow up.
- Document stakeholder feedback and enhance the ESIA accordingly

- Identify the most effective outreach channels that support continuous dialogue with the community
- Avoid any misconceptions about the project and properly manage expectations.
- Analyse gaps identified from the issues.

As a result, the key principles of effective engagement that guide stakeholder consultations include:

- Ensuring that all interactions are free of intimidation or coercion.
- Providing meaningful information in a format and language that is understandable and tailored to the needs of the target stakeholder group(s).
- Being inclusive in the representation of views, i.e., including different ages, and genders, and incorporating vulnerable and/or minority groups.
- Respecting local traditions in the decision-making processes.
- Information should be easily accessible for stakeholders and be culturally appropriate; to allow the effective participation of those identified as minorities, disadvantaged or vulnerable groups.
- Ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible, and appropriate manner and format.

5.3 Identification of Stakeholders

The study identified stakeholders to be consulted and involved throughout the project life cycle. Stakeholders' identification in this study was done through a continuous and comprehensive brainstorming process to collect an exhaustive list of people/ groups or institutions that are likely to be affected by the project/affect the project, influence the direction of the project or have those having interest over the project. In this study the following stakeholders were identified;

- Ministry of Industry and Trade
- Korogwe District Council
- Mabogo Village,
- Mazinde Ward
- OSHA
- Fire and rescue force
- Pangani Basin Authority
- Tanzania Sisal Board

- Workers and
- Project Proponent.

Table 11; Stakeholder identification and analysis

LEVEL	STAKEHOLDER	REMARKS
National	- -Tanzania Sisal Board	- Director General
District	- Korogwe District Executive Director's Office	- District Agriculture, Irrigation and Cooperative Officer (DAICO)), - District environment management
Local	- Mabogo Village, Executive Officer (VEO) - Mazinde Ward Executive Officer	- Local government authorities - Direct project beneficiaries - Communities in the project footprint - Project affected persons
Agency	- OSHA - Fire and rescue force - Pangani Basin Authority	- Inspector - Fire marshal - Basin Director

Table 12; Public participation process

Stakeholder	Date of visit	Venue	Stakeholders consulted	Methodology
Tanzania Sisal Board	2/12/2023	-	1. Director General	- Through mail
Korogwe District Council	06/10/2023	Korogwe District Council office	2. District Agriculture, Irrigation and Cooperative Officer (DAICO)), 3. District Environment Management Officer	- Interview

Mabogo Village,	06/10/2023	Mabogo Sisal Estate Meeting Room	1. Village Executive Officer (VEO) 2. Members	- Focus group discussion - Interview - Meeting
Workers	06/10/2023	By following them into their working section	1. Workers from different section	- Interview
Community of Mabogo Village	15/03/2024	Mabogo village office	3. Community	- Meeting

5.4 Engagement approach during preparation phase

During this period the consultations, presentations/interviews and discussion with the above-identified stakeholders were conducted. In the presentations, the team shared with these stakeholders timely, relevant, understandable and accessible information in a culturally appropriately manner free of manipulation, interference, coercion, discrimination and intimidation. During this stage, the team collected the views and opinions on project design, risk, and impact and mitigation measure associated with the Project.

5.5 Identification of Issues and Problems

The field visits helped to identify a number of issues, problems and challenges regarding the proposed project. These issues and problems are organized into major categories, issues and problems within this categories and possible sources of data and information.

Table 13: Categories of issues and problems

S/N	Category of issues /problems	Issues/Problems	Source of information
1	Job opportunity	➢ Job creations	METL
2	Corporate social responsibility	➢ Provision other services and amenities	METL
3	Occupational health and Safety,	➢ In availability of personal protective equipment's	METL
4	Waste management,	➢ Improper waste management	METL
5	workers salary	➢ Improvement of workers salary	METL

5.6 Stakeholders Views and Concerns

Initial consultation process focused on the Proponent. It considered various issues that may pose adverse impacts on the environment. It included issues on employments, waste management and so on. The role of the consultant was to moderate the meeting, and the team assistant took notes. The question-and-answer sessions took place until questions were exhausted and some form of consensus was reached. The main issues discussed by some stakeholders are summarized in table 14 with the list of people consulted during the consultation process.

Table 14: Stakeholders consulted and their views

SN	Name & Position	Organization	Views	Response
1	Saddy H. Kambona	Tanzania Sisal Board	- The company should consider putting up infrastructure for rainwater harvesting as sisal farming expansion will attract more decortication centers which require enough water for sisal washing and other domestic use. - The company should also consider water recycling technology in its decortication centers to minimize water usage. - Sisal waste should be used as manure to improve soil fertility and productivity - The company should consider possibility of interfering with corridors of wild animals such as elephants and wild pigs which feed on sisal. - Proper technology for expelling such animals be put in place to avoid loss to the company - The company should consider coming up with technology that allows use of sisal waste as source of energy to run various operations at the estate. this is because of recent power cut and low voltage which slow down sisal production.	- Infrastructure such as water reservoirs have been developed to harvest rain water to be used during the sisal fibre processing. - Water recycling technology shall be considered in its decortication centers to minimize water usage. - Sisal waste will be used as manure to improve soil fertility and productivity - METL will implement proper means for expelling wild animals who feed on the sisal plants.

2	Sebastian Changoma District Agriculture, Irrigation and Cooperative Officer (DAICO)	Korogwe District Council	- The proponent should take precautions on pests' control in small sisal plants. - The estate is good and there is a fallow land that can be used for future plantation.	- Application of pests control chemicals shall be used in small sisal plants. - METL will implement good farm management practices for increase yield and environmental protection.
3	Nakomolwa Makala Environmental Management Officer (EMO)	Korogwe District Council	- Extension of the sisal plantation, some trees will be cut so as to get area for planting Sisal. - Workers should be provided with PPEs when operation machines and doing other tasks. - Management of waste water from decortication process.	- The management shall plant more tree in different areas of the project site. - The management provides PPEs to the workers depending on their line of duty. - Waste water from the decortication process is directed to waste water stabilization ponds before it is released into the water bodies. Water will be recycled and reused into the decortication.
4	Mabogo factory Workers	Mabogo Sisal Estate	- The proponent should consider adding salaries to the workers	- Salaries are being paid as per national standard with performance incentives based on the output generated.

			- The proponent provides health care services to the workers especially when accidents occur. - PPEs should be provided all the time when needed.	- Provision of Safety equipment's and first aid measures are already available and this information will be disseminated by means of regular safety awareness trainings. - PPEs are being provided to the workers depending on their line of duty.
5	Village Council Meeting	Mabogo Village	- The proponent cooperates with the village office in different development projects example they provided Modernization /Renovation materials during construction of police station in Mabogo. - The youth are employed in farms and the factory. - Worker's settlement should be considered.	- The proponent will improve cooperation with the community leadership in different areas. - In employment opportunities at the factory, youth will be considered - More workers quarters will be established.
6	Community meeting and Project neighbors	Mabogo Village	- The community is of the view that there is a need to increase water availability in Mabogo area. - Contract workers further commented regarding the workers' housing, that more efforts are required to address the housing concerns. - There is a perception among workers that the workload exceeds the compensation provided feeling that they need salary raise.	• Currently, water supply is available for domestic and production use, in future additional water sources will be made available. • More worker's houses are being constructed. • Issues pertaining to METL infrastructure for a joint benefit with

			- Contract workers have identified leave allowances as an area for enhancement, presenting an opportunity to refine these benefits, ultimately leading to improved job satisfaction and well-being. - Workers further mentioned that despite contributions to the National Social Security Fund (NSSF), workers report a lack of tangible benefits from these contributions. - The contract workers have further requested that METL engages the contractor company management to ensure a uniform implementation of the safety equipment and first aid measures. • The Contract workers have highlighted an opportunity for improvement, suggesting that expanding transportation options for farm commutes would greatly benefit workers, reducing lengthy walks and enhancing their overall experience.	the surrounding villages are being assessed for implementation. • The contractor company has already been given notice and a new contractor is being engaged in its place to ensure proper operations. • Current compensation structure clearly encourages better payment to those yielding higher output while those not performing as per the workload targets go with minimum wages as per law. • Leave allowances are being given by the contractor as per operational budget. • NSSF is a government body which has visited multiple times for awareness training for the workers. • Provision of Safety equipment's and first aid measures are already available and this information will be disseminated by means of regular safety awareness trainings.

				• Transport from designated pickup points and time is available for workers.
7	Zania Msangi Technician	Pangani Basin Authority	- The management should apply for water use permit for any source they plan to use. - The management should conduct the hydrological survey. - To ensure that all existing boreholes are legally registered, all hydrogeological survey reports should be submitted to the water basin office. - The surveyor should be registered. - Conduct water quality analysis in boreholes before use.	- Currently, all boreholes are done by registered drillers and surveyors who eventually submitted all document and records to relevant authorities. - Water analysis is conducted before use. - Water demand analysis is conducted by drilling consultant.
8	Theresia Mrema, Francis Shayo and Baraka Mwasale Occupational Hygiene Inspectors	Occupation Safety and Health Authority OSHA	- Prepare risk assessment concerning expansion of the sisal farms and mitigation measures; - Implement Occupational health and policy; - Apply advanced technology for production purpose ie. New Brushing Machine that produce less dust, Air blow that remove dust and Corona Machine that produce less noise; - Provision of accurate PPE's based on type of work performed;	- HSE policy has been effectively implemented, and a comprehensive risk assessment of the facility is already available. - Research and innovation is in process to get improved machinery that are efficient, environment friendly and ergonomically complaint.

			- Increase number of sanitary facilities by considering number of workers and gender; - Provide safe drinking water to workers; - Prepare training on safety issues to workers ie First Aid training and health and safety representative trainings; - Undertake regular inspection ie electrical safety inspection by checking wires, connections and Earthing systems of the building; - Undertake regular medical examination to workers (pre – examination, periodic/annually examination and Exit examination).	- Appropriate PPEs are being provided to the workers depending on their line of duty. - Currently, sanitary facilities are sufficiently available and provision of additional facility is being considered in proportion with expansion numbers. - Safe drinking water is available and facility will be enhanced to accommodate expansion needs. - Trainings are being conducted regularly on a variety of safety topics. - Medical checkups are being conducted to workers annually. - Annual OSHA inspections are regularly conducted.

CHAPTER SIX

6.0 Identification and Assessment of Impacts

6.1 Overview

Construction and operation of the proposed project is expected to generate a range of impacts in the project impact area. The anticipated impacts will be on a range of biophysical and socio-economic aspects of the environment. Some of the impacts are expected to be positive while others may be negative. The main purpose of this chapter is to identify the potential environmental impacts associated with the project from planning and design, construction, demobilization and operation and maintenance phases; assess their extent and significance; and propose mitigation and enhancement measures to manage the impacts. The positive measures if properly enhanced will contribute towards social and economic development of the area and Tanzania as a whole. The negative impacts will have to be managed to prevent environmental degradation of both the social and physical environment in the project area. Specifically, the chapter is aimed at the following:

a) Predict the potential environmental and social impacts arising from implementation of the project;
b) Assess the possible extent /severity of the predicted impacts (both positive and negative);
c) Assess the significance of the predicted impacts; and
d) Recommend measures for managing the impacts.

6.2 Methodology of impact identification

Impact identification was done by analyzing the project activities and determining their influence on the baseline environmental and social characteristics of the project area. The environmental characteristics of the project include biophysical (topography, soils, climate, rainfall, water resources, flora and fauna) and social characteristics (demography, settlement, land administration and tenure, economic activities, infrastructures and services, water supply and sanitation, healthy and HIV and AIDS). Public consultation complemented the field investigations and literature review. Identification of potential impacts and physical assessment of the following environmental components likely to be impacted was also conducted: a) physical /chemical; b) biological /ecological; c) social /cultural; and d) economic /operational.

Based on the project activities, the approach followed included:

a) Analysis of topographical maps, in order to identify the main environmental and social components of topography, land under cultivation, existing industrial establishments, infrastructure and water resources;
b) Site investigations, focusing particularly on the areas of project influence especially the neighboring designated institutions to identify critical environmental and social elements to be affected including soils, physical developments, social infrastructure, water and sanitation, health, flora and fauna, soils and local economy;
c) Screening of the anticipated potential and significant impacts of the project, in accordance with the project stages of planning and design, construction, operation and maintenance and decommissioning; and
d) Assessment of environmental impacts in order to describe the positive and negative impacts, both direct and indirect as identified at each stage of the project cycle.

The methodology adopted for impact identification mainly considered the environmental impacts at various phases of the project and the activities to be undertaken at each phase. The following phases were considered:

a) **Planning Phase** – Activities during planning and design phase include preparation of building designs, tender process, obtaining building permits and all the approvals necessary for the construction and operation of the project. It is expected that the environmental management measures, which will be proposed for the project will be incorporated into the engineering design of the project.
b) **Construction Phase** – For this phase, the main activities are land clearing; landscaping; grading; excavation; compacting; trenching; construction of service infrastructure such as access roads, construction of temporary structures such as storage, backfilling with compaction consolidation; levelling and earth marking; transportation of building materials; and construction of the worker's house and renovation of factory buildings. Other activities include land cultivation, planting etc.,
c) **Operation Phase** – During operation phase, sisal fibres will be produced. Sisal fibre process include decortication, brushing, drying, grading, balling, storage and market. The impacts were identified by considering project activities including inputs and outputs in the various project phases outlined above and how these would affect various components of the environment. The steps undertaken were:

i. Assessment of baseline conditions

The purpose of assessing baseline conditions was to understand the existing situation as this is the basis for determining changes that may occur as a result of the project.

ii. Assessment of project inputs associated with the project

Project inputs were examined to determine the potential changes and impacts that would be created through the application of project inputs.

iii. Assessment of project activities that will be undertaken

Project activities were examined to identify the impacts that the activities would bring on the environment.

iv. Assessment of project outputs associated with the project

Project outputs were examined to determine the potential changes and impacts that would happen as a result of the outputs.

v. Determination of environmental impacts

Based on the above steps, the environmental impacts of the project were identified.

6.3 Impact Evaluation and Scoring Matrix

After identifying the positive and negative environmental impacts the project will have on the environment, further analysis was conducted to determine the extent and significance of the impacts. The aspects that were considered were magnitude, significance, probability of occurrence and duration of impacts which have been properly explained.

6.3.1 Magnitude

Magnitude is a measure of the general degree, extensiveness, or scale of impacts. The magnitude was scored at four levels i.e. household level, local level, regional level and national level.

6.3.2 Significance

This is a measure of the importance of a particular action on the environmental factor in the specific instance under consideration. This was scored using values ranging from +3 to - 3 with a score of 1 representing a low/minimal impact, 2 moderate impact and 3 representing a high impact. Negative impacts were assigned a minus (-) sign and positive impacts are given a plus (+) sign.

6.3.3 Probability of occurrence

Provides an estimate of the probability of an impact occurring before mitigation is applied. The impacts were considered as:

a) Possible (impact may occur but it is not probable);
b) Probable (the impact is very likely to occur); and

c) Definite (impact is unavoidable).

6.3.4 Duration

Refers to the period of time over which an impact may occur, from once-off to continuous for the life of the project. Duration of impacts was considered as 1 for a low/ minimal impact and the score of 3 for a high impact. Each impact is given a score from 1 to 3 against each of the four attributes. The scores for each impact are added to give a total score for the four attributes, indicating the overall severity of the impact. A high score (3) represents a high impact and a low score (1) represents a low impact. Negative impacts are assigned a minus sign and positive impacts are given a plus sign. Table 6.1 shows the scoring scale used for evaluation of the impacts. The four rows allow evaluation of impacts in terms of the magnitude, significance, probability and duration. The columns outline the scoring scale; with a score of 1 for a low/ minimal impact and the score of 3 for a high impact. Each impact is given a score from 1 to 3 against each of the four attributes. The scores for each impact are added to give a total score for the four attributes, indicating the overall severity of the impact. A high score (3) represents a high impact and a low score (1) represents a low impact. Negative impacts are assigned a minus sign and positive impacts are given a plus sign. For purposes of this analysis an impact matrix was prepared and is provided in Table below.

Table 15; Impact scoring matrix with significant level

Impact	Spatial extent of the impacts	Significance of the impact	Probability of occurrence of the impact	Duration of the impact	Total Score
IMPACTS DURING PLANNING AND DESIGN					
POSITIVE IMPACTS					
Creation of employment	1	1	3	1	6
IMPACTS DURING CONSTRUCTION					
POSITIVE IMPACTS					
Creation of employment	3	3	3	3	12
Creation of a market for local	3	2	3	2	10
Increase in business	3	3	3	2	11
NEGATIVE IMPACTS					

Impact from exhaust emission	-2	-2	-2	-2	-8
Noise Pollution	-1	-2	-2	-2	-7
Impact from Vibration	-1	-2	-2	-2	-7
Soil erosion	-2	-2	-2	-3	-9
Vegetation disturbance	-1	-2	-2	-3	-8
Impact from solid waste generation	-1	-2	-2	-2	-7
Soil contamination	-1	-2	-2	-2	-7
Increase in accident incidences	-1	-2	-2	-2	-7
HIV/AIDS and other sexually transmitted diseases	-1	-2	-2	-2	-7
Increase in criminal activities	-1	-2	-2	-2	-7
Inadequate waste management	-1	-2	-2	-2	-7
Inadequate sanitation	-2	-2	-2	-2	-8
Gender based violence (GBV)	-2	-2	-2	-2	-8
IMPACTS DURING OPERATION					
POSITIVE IMPACTS					
Increase in Sisal fibre production	3	3	3	2	11
Increase in revenue to the National and District Government	3	3	3	2	11
Income generation to local communities/ villagers	2	2	3	3	10
Corporate Social responsibility benefits from the Estate	3	2	2	3	10
Creation of employment	3	2	3	3	11
NEGATIVE IMPACTS					
HIV/AIDS and other sexually transmitted diseases	-1	-2	-2	-2	-7
Increased pressure on social services and utilities	-1	-2	-2	-2	-7
Risks of fire hazards	-1	-3	-2	-3	-9
Soil contamination	-1	-2	-2	-2	-7

Impacts associated with Solid waste generation	-1	-2	-2	-2	-7
Ground water and surface water pollution	-1	-2	-2	-2	-7
Impacts on Fauna	-1	-2	-2	-2	-7
GBV/SEA/SH impacts	-1	-2	-2	-2	-7
Increase in Criminal Activities	-1	-2	-2	-2	-7
Cultural resources impact	-1	-2	-2	-2	-7
Security (private) personnel and interaction with communities including use of force	-1	-2	-2	-2	-7
IMPACTS DURING DEMOLITION					
POSITIVE IMPACTS					
Employment Opportunities	3	3	3	3	12
Rehabilitation	3	2	3	2	10
NEGATIVE IMPACTS					
Soil Erosion	-2	-2	-2	-2	-8
Loss of employment	-1	-2	-2	-3	-8
Loss of income	-1	-3	-2	-3	-9
Solid Waste Generation	-1	-2	-2	-2	-7
Worker's accidents and hazards during demolition	-1	-2	-2	-2	-7

KEY;

+3	High positive impacts
+2	Moderate positive impacts
+1	Minor positive impact
-1	Minor negative impact
-2	Moderate negative impacts
-3	High negative

6.4 Positive Impacts –Construction / Renovation Phase

i. Employment opportunities

The proposed Project will directly and indirectly create employment for a number of workers, especially seasonal workers within Mabogo village. Though the employment terms will be fixed term or permanent, those who will be employed will earn income hence use the money to satisfy some of their needs.

6.5 Negative Impacts –Construction / Renovation Phase

i. Impacts associated with solid waste generation

Considerable volumes of solid waste will be generated during renovation of the factory and farm expansion. There will be solid wastes such as garbage waste like papers, food remains and plastics, scrap metal from used and worn – out production machines and vehicles. This waste will negatively impact the aesthetic value of the site and surrounding environments if not properly managed.

ii. Impacts associated with noise and vibration

The extension activities would generate noise and vibration in the factory area due to the installation of the second line of production and other improvements such as machines welding activities excavations, motorized equipment etc. Noise can lead to annoyance and disturbance such as interference with speech among workers and communication and interruption of rest and sleep. At extreme it can induce hearing impairment. Such noise emissions should be minimized as much as possible from the source point through appropriate measures.

iii. HIV/AIDs, STDs and other diseases (i.e., COVID – 19)

The concentration of too many people in a project site with relatively temporary social facilities is likely to cause increased levels of communicable diseases. During renovation phase about 100 workers (skilled and unskilled) both local and experts from different areas will be employed hence with the onset of HIV/AIDS in Tanzania, any concentration of people is likely to be the source of the spread of HIV/AIDS, Sexually Transmitted Diseases (STDs) and the risk of spreading COVID - 19. Although for short term only, may complicate the already fragile situation.

iv. Incidences of risks, hazards and accidents

Risk is the possibility that something negative will occur; expressed in terms of probability while hazards can cause injury, disease, economic loss or Environmental damage. Risks and hazards are likely to occur during renovation of the industry. The activities which may lead to OHS risks are working at height, confined spaces, equipment accidents, non-usage of PPEs, welding. The use of machines and equipment during renovation may cause accidents if not properly managed. The impact is considered to be low, short term and insignificant if properly managed.

v. Impacts associated with disposal of sewage

When access to adequate sanitation is limited, it can lead to challenges such as the use of secluded areas for defecation, which may create unsanitary conditions. Management of sewage disposal presents an opportunity to protect underground water resources. With appropriate mitigation the impact is considered to be indirect, short term and insignificant.

vi. Labour influx

Labor influx for renovation works can lead to a variety of adverse social and environmental risks and impacts. Accommodating workers in project areas can have positive and negative effects, for the workers, the host community, and the environment. The social risk associated with labor influx are such as Risk of social conflict, Increased risk of illicit behavior and crime, Influx of additional population, Impacts on community dynamics

vii. Child Labour/Forced Labour

Increased opportunities for the host community to sell goods and services to the incoming workers can lead to child labor to produce and deliver these goods and services, which in turn can lead to enhanced school dropout.

viii. Soil erosion due to with Vegetation clearance.

Some trees, grasses and bushes will be cleared to provide space for expansion of Sisal farming may cause soil erosion.

ix. GBV/SEA/SH impacts

Large component of workers will be from local area. Some Workforce, largely composed of younger males, may experience a shift in their social dynamics as they navigate new environments and interactions while being away from home. This situation highlights the importance of understanding the complexities of community relationships, particularly regarding the well-being of women and girls. The influx of male labor can lead to various social challenges. The impact is considered to be low, short term and insignificant if properly managed.

x. Crime

The influx of workers and service providers into communities may increase the rate of crimes and/or a perception of insecurity by the local community. Such illicit behavior or crimes can include theft, physical assaults, substance abuse, prostitution and exploitation. The impact is considered to be low, short term and insignificant if properly managed.

xi. Community health and safety impacts

Delivery of supplies for project workers and the transportation of workers can lead to an increase in traffic

as well as additional burden on the transportation infrastructure.

xii. Degradation of existing vegetation

The proposed site has some vegetation and greenery areas that blend very well with the surroundings. Some trees, grasses and bushes will be cleared to provide space for planting of new sisal.

xiii. Change in species and habitat diversity

The presence of the proposed project may result into changes in species and habitat diversity, as the project might interfere and affect local biodiversity and also can result in to introduction of invasive species and exotics. Hence this impact is considered to be of short term, direct and insignificant with proper mitigation.

xiv. Air pollution

Dust particles will be emitted into the atmosphere through clearing of the land, levelling and platform preparation for the construction of buildings. This impact is considered to be direct, negative, long-term and of low significance.

xv. Impact of construction of infrastructure

One among the components of the project will be construction of infrastructure such as roads, buildings etc. it is during these activities where by habitats may be disturbed.

6.6 Positive Impacts – Operational Phase

i. Increase in revenue to the National and District Government

The operation of the proposed Project will result in positive gains for numerous Authorities- The local government, Tanzania Revenue Authority (TRA), Sisal Board etc. through payment of relevant taxes, rates and fees to respective institutions.

ii. Income generation to local communities/ villagers

There would be secondary benefit as money would move into the local communities through selling of food supplies. This will increase the income of local communities as well as improving their living standard.

iii. Corporate Social responsibility benefits from the factory

Corporate Social Responsibility (CSR) is essential towards the success of companies. Its essence is in making companies part of the community in assisting its development through establishing projects, as a way of sharing part of their success to the marginalized communities. It is the proponent's duty to attend such responsibilities and to be socially accountable to itself, its stakeholders, and the public.

iv. Employment opportunities

The Project will directly and indirectly create employment for a number of workers, especially casual workers within arc mountain and other location. Though the employment terms will be temporary or

permanent, those who will be employed will earn income hence use the money to satisfy some of their needs.

6.7 Negatives Impacts –Operational Phase

i. Increased pressure on social services and utilities

The presence of the proposed will increase pressure on social services and utilities such as water, electricity, waste water and solid waste collection facilities, etc. The demands will strain the service delivery system in one way or the other.

HIV/AIDs, STDs and other diseases (i.e. COVID – 19)

The concentration of many people during the project operation with relatively temporary social facilities is likely to cause increased levels of communicable diseases. Currently there about 250 workers (skilled and unskilled), more workers will be employed after expansion depending on the season hence with the onset of HIV/AIDS in Tanzania, any concentration of people is likely to be the source of the spread of HIV/AIDS, Sexually Transmitted Diseases (STDs) and the risk of spreading COVID - 19. Although for short term only, may complicate the already fragile situation.

ii. Risks of fire hazards:

Fire outbreak is fast propagative and may cause magnitude economic losses to buildings, installation, flora and fauna. If not contained in time fire outbreak may result in injuries, loss of human life and air pollution beyond the boundary of the project area. During operation phase of the factory there some activities which may lead to fire outbreak such as smoking, fuel leaking, improper storage of chemicals etc

iii. Soil contamination

Oil contamination can occur due to oil spills from the standby generators and vehicle services areas at the project site.

iv. Impacts associated with Solid waste generation

Considerable volumes of solid waste will be generated during operation of the factory and farming activities. There will be solid wastes such as domestic waste like papers, food remains, and plastics. This waste will impact the aesthetic value of the site and surrounding environments if not properly managed. The impact is considered to be high, long term and insignificant if properly managed.

v. Child Labour/Forced Labour

Increased opportunities for the host community to sell goods and services to the incoming workers can lead to child labor to produce and deliver these goods and services, which in turn can lead to enhanced school dropout.

vi. GBV/SEA/SH impacts

Large component of workers will be from local area. Some Workforce, largely composed of younger males, may experience a shift in their social dynamics as they navigate new environments and interactions while being away from home. This situation highlights the importance of understanding the complexities of community relationships, particularly regarding the well-being of women and girls. The influx of male labor can lead to various social challenges. The impact is considered to be low, short term and insignificant if properly managed.

vii. Crime

During operation phase, the influx of workers and service providers into communities may increase the rate of crimes and/or a perception of insecurity by the local community. Such illicit behavior or crimes can include theft, physical assaults, substance abuse and exploitation.

viii. Soil contamination from materials for agrochemicals;

Sisal plants are often treated with pesticides to protect them from pests and diseases. However, the use of these chemicals can have negative environmental impacts such as soil contamination and harm to non-target organisms.

6.8 Positive Impacts - Decommissioning Phase

i. Employment opportunities

For demolition to take place properly and in good time, several people will be involved. As a result, several employment opportunities will be created for the demolition during the demolition phase of the proposed project. This is considered to be of short term with high significance.

6.9 Negative Impacts - Decommissioning Phase

i. Loss of employment

Decommissioning will result in the loss of employment for the workers such as farmers, cleaners, guards, specialists, engineers, and managers who were employed. This loss will be significant at individual level and at the national level, especially as national policies seek to create more jobs.

ii. Impacts associated with Solid Waste Generation

Demolition of the proposed development will result in large quantities of solid waste. The waste will contain the materials used in renovation including concrete, metal, drywall, glass, paints etc. There is growing evidence that such waste may lead to release of certain chemicals into the environment. In addition, even the generally non-toxic chemicals such as chloride, sodium, sulphate and ammonia which may be released as a result of leaching of demolition waste. Hence the impact is considered to be direct and short-term impact.

iii. Dust emission

Dust will be generated during demolition works. This will impact on the demolition staff as well as the neighboring residents. The impact is indirect and of short term if there will be proper mitigation measures.

iv. Impacts associated with Noise and vibration

The demolition works will lead to deterioration of the acoustic environment within the project site and the surrounding areas. This will be as a result of the noise and vibration that will be experienced as a result of demolishing the project.

CHAPTER SEVEN

7.0 Impact Mitigation and Enhancement Measures

7.1 Overview

This chapter is devoted to describing measures or actions that shall be implemented so as to minimize any of the potential impacts identified. Many of the mitigation measures put forward are nothing more than good engineering practice that shall be adhered to during the design and Modernization /Renovation phases. The Proponent is committed to the implementation of mitigation measures contained in this report.

In order these mitigation measures to be implemented, the safeguards mandatory tools which shall also form part of the tender and bid documents and the contract shall be prepared by the Contractor. These safeguards tools include: ESMP, Contractor's ESMP (C-ESMP); Health and Safety Management Plan (HSMP); Waste Management Plan (WMP); Emergence Preparedness Plan (EPP).

Table 16; Impacts Mitigation / Enhancement measures

Positive Impacts – Expansion /Renovation Phase		
No	**Impacts**	**Enhancement Measures**
1	Employment opportunities	- The first priority will be given for qualified Tanzanians in Mabogo village
2	Provision of markets for Modernization /Renovation materials	- The proponent should continue procuring of renovation materials such from the local community
Negative Impacts – Expansion /Renovation Phase		
No	**Impacts**	**Mitigation Measures**
1	Impacts associated with solid waste generation	- Use of an integrated solid waste management system i.e., through a hierarchy of options: source reduction, Recycling, Reuse before disposal of waste at the designated District dumpsite. - Transportation of wastes from the site to be done by a registered solid waste handler who will use appropriate vehicles for conveyance of wastes from site to designated District Council dumpsite

		- The Contractor to prepare a Solid Waste Management Plan, which should contain: - An inventory of the types and quantities of waste to be produced. - The most appropriate waste management approach for each type of waste including details on (temporary) storage, transport and final destination of the waste. - An assessment of any opportunities for reducing solid waste generation, in particular of hazardous and undesirable (persistent and non-reusable) types of wastes.
2	Impacts associated with noise and vibration	- Maintain vehicle and equipment according to manufacturers' specifications. - Siting noisy plant and equipment as far away as possible from human settlement, and use of barriers (e.g., site huts, acoustic sheds or partitions) to reduce the level of renovation noise at receptors wherever practicable; - Where practicable noisy equipment will be orientated to face away from the nearest human settlement and other receptors; - Working hours for significant noise generating renovation / modernization work (including works required to upgrade existing access roads or create new ones), will be daytime only; - Alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric-controlled units, will be used, where practicable; - Equipment should be regularly inspected and maintained to ensure it is in good working order by manufacturers
3	Impacts associated with disposal of sewage	- The design of the internal sewerage system should consider the estimate discharges from individual sources and the cumulative discharge of the entire project i.e., it should have

		the capacity to consistently handle the loads even during peak volumes; - All drain pipes passing under building, driveway or parking should be of heavy-duty PVC pipe tube encased in concrete surround. - Sanitary facilities should be kept clean always, through regular washing/cleaning; - Frequent monitoring of the internal drainage system; and - Blockages and damages should be fixed expeditiously - Construction of double chambered septic tanks for disposal of liquid wastes; - Regular inspection and maintenance of the septic tank network; - Use of improved pit latrines for easy maintenance; - Provision of potable water within the site.
4	Incidences of risks, hazards and accidents	- Contractor should establish contractual clauses (signed code of conduct) to be embedded in the contracts of the workers and sub-contractors that require adherence to law and international standards to be upheld related to worker. - Contractor should prohibit the use of alcohol or drugs, which could adversely affect the ability the employee to perform the work safely or adversely affect the health and safety of other employees, community members or the environment. - Contractor and self-employed contractors should assess the H&S risks related with the tasks to be performed during the renovation / modernization phase. - Pre-employment medical assessments should be put in place as a workforce risk management tool to screen individuals for risk factors that may limit their ability to perform a job safely and effectively. Expected benefits of conducting pre-employment medical assessments include a safer working environment, reduction in workplace injuries, minimized

		downtime, matching the capacity of the employee with the role, and overall recruitment cost and risk reduction. - Contractor should ensure that training on health and safety measures is provided to all renovation / modernization workers prior to starting to work on the Project and that supervisors have adequate experience to deliver on their responsibilities. - Contractor should implement regular health and safety checks and audits of workers, and subcontractors and implementing sanctions in case of breaches of national standards and the Project's specific standards. Such audits to include workplace H&S; worker contracts, working hours, pay and conditions; housing and food standards. - Contractor should develop and implement a Workers Grievance Mechanism for the Project workforce including workers and subcontractors. - Contractor should establish a procedure for the recording and analysis of incidents and lessons learned such that additional actions can be implemented to avoid or minimize occupational health and safety risks. - Contractor should ensure that facilities and work sites are designed and maintained such that robust barriers are in place to prevent accidents. - Contractor should ensure that its Code of Conduct is followed to regulate the performance and behavior of all workers, including provision for disciplinary action for anti-social behavior and non-compliance with health and safety regulations such as lack of use of PPE. - Contractor should ensure that World Bank Health and Safety guidelines regarding the renovation / modernization and management of worker accommodation and the provisions of medical facilities at worker accommodation are followed.

		- Contractor should ensure that adequate clean water, adequate food and access to medical care is provided to all workers on the worksite and at accommodation. - Contractor should develop and implement a Traffic Management Plan covering aspects such as vehicle safety, driver and passenger behavior, use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations. - Contractor should develop a Waste Management Plan for the project phase with clear guidelines for the safe storage and disposal of hazardous waste and handling of hazardous materials.
5	HIV/AIDs, STDs and other diseases (i.e., COVID – 19)	- Contractor should establish HIV/AIDS programmes to raise awareness - Put posters with various messages such as ‘‘HIV/AIDS kills’’, ‘‘be faithful’’. - Preventive measures against the spread of COVID – 19 shall be practiced at the project site.
6	Child Labour/Forced Labour	- Conduct Selection and Qualification of Subcontractors - Awareness-Raising and Training of Internal Inspectors and Local Authorities - Promoting Access to Education
7	GBV/SEA/SH impacts	- Appoint senior focal points in both clients and contractors with responsibility for ensuring that commitments and policies to prevent GBVH are implemented. - Increase women’s representation, including at senior and decision-making levels in engineering, procurement and renovation / modernization - Put in place monitoring systems at the highest levels for regular reporting on GBVH. - Include requirements around GBVH in codes of conduct, policies and protocols for contractors, including training on

		policies and procedures once developed. - Ensure codes of conduct are publicly disclosed in local languages and are widely accessible to all workers and all groups of people in project areas. - Build GBVH risk assessments into key processes, including environmental and social impact assessments (ESIAs) and environmental and social management plans (ESMPs).
8	Crime	- The contractor or project Management Company should designate an employee as the company crime prevention coordinator. - All assets on a project site should be identified (marked), inventoried (records), and tracked as closely as practical. A company identification numbering system should be developed. - The company crime prevention coordinator should contact neighbors around the job site residents, businesses, even children and solicit their support and help in maintaining a safe and secure job site - Electronic alarm systems can be an effective means of providing security on the job site, particularly for office and storage trailers or for material storage areas.
9	Degradation of existing vegetation	- Vegetation clearance for temporary infrastructure should be limited to the minimum core area at the site. - Areas cleared of vegetation should be re-vegetated to prevent soil erosion. - However, plants and grasses for re-vegetation should be sourced within the project area to avoid introduction of exotic species. - Re-vegetation is only possible given suitable ground conditions (soils, slopes, drainage) moisture, and protection from destruction

10	Change in species and habitat diversity	- Construction activities will be carried out only on the core area of the project site and ensure that none of the exotic species are introduced on site; and - The construction activities will ensure that ecosystem of the area is conserved.
11	Air pollution	- Applying water regularly to civil works and earth roads to suppress dust; and - Controlling the speed of construction vehicles to reduce generation of dust.
12	Impact of construction of infrastructure	- Ensure that critical environmental sites such as forested areas, habitats containing rare and endangered species are identified and not threatened by the project location. - Plant trees as barriers
Negative Impacts – Operation Phase		
No	**Impacts**	**Mitigation Measures**
1	Increased pressure on social services and utilities	- Alternative measures such as the use of modern technology equipment that saves energy. - Also, the Proponent will try to reduce amount of waste generation at the source so as to ease the solid waste collection facility. - Proponent should consider installation of solar lighting systems complement electricity supply from the national grid. - The project design includes ventilation systems at the factory that allow for sufficient air circulation and lighting to lower the energy demand for the facility.

2	HIV/AIDs, STDs and other diseases (i.e. COVID – 19)	- Contractor should establish HIV/AIDS programmes to raise awareness - Put posters with various messages such as ‘‘HIV/AIDS kills’’, ‘‘be faithful’’. - Preventive measures against the spread of COVID – 19 shall be practiced at the project site.
3	Impacts due to mismanagement of hazardous waste like packaging materials for agrochemicals;	- Decontamination at the source: Development of a protocol for rinsing and decontaminating (Agrochemical Plastic Packaging Waste Management) APPW upon preparation of the spray, in order to characterize them as non-hazardous waste. - Development of a secure mechanism to assure the effectiveness of the decontamination method. - Sorting at the source: Sorting of decontaminated, clean APPW to categories of homogenous materials to facilitate their recycling.
4	Soil erosion due land clearance during farm preparation;	- The contractor to confine the activities within the project core impact area and re-vegetation of the cleared area after planting of Sisal
5	Risks of fire hazards:	- There shall be a well- designed and properly laid fire hydrant system effectively fighting fires of various proportions and of all classes of fire risks. - The management will have to ensure high level training for fire unit personnel and ensures periodical grilling of workers to cope with fire emergencies. - Consider using of fire breaks
6	Soil contamination from oil spills	- Find and resolve source of leak - Contain the spill by using booms and spill berms. - Prevent oil from entering storm or sewer drains (seal floor drains, drain inlets). - Use spill kits, sorbent pads, and granular oil sorbents to clean

		up spill. - Use granular oil sorbents to clean up oil spill. Sand may be used but sand is not as effective as granular sorbents.
7	Impacts associated with Solid waste generation	- Provide each section of the facility with sufficient trash bins that promote sorting at source. - Encourage staff to handle waste through the hierarchy of options that including reduction at source, separation of waste to make it easier to undertaking recycling or reuse
8	Child Labour/Forced Labour	- Conduct Selection and Qualification of Subcontractors - Awareness-Raising and Training of Internal Inspectors and Local Authorities - Promoting Access to Education
9	Impacts associated with Vegetation clearance.	- Vegetation clearance for temporary infrastructure should be limited to the minimum core area at the site. Areas cleared of vegetation should be re-vegetated to prevent soil erosion. - Re-vegetation is only possible given suitable ground conditions (soils, slopes, drainage) moisture, and protection from destruction.
10	GBV/SEA/SH impacts	- Appoint senior focal points in both clients and contractors with responsibility for ensuring that commitments and policies to prevent GBVH are implemented. - Increase women's representation, including at senior and decision-making levels in engineering, procurement and renovation / modernization - Put in place monitoring systems at the highest levels for regular reporting on GBVH. - Include requirements around GBVH in codes of conduct, policies and protocols for contractors, including training on policies and procedures once developed. - Ensure codes of conduct are publicly disclosed in local languages and are widely accessible to all workers and all groups of people in project areas.

		- Build GBVH risk assessments into key processes, including environmental and social impact assessments (ESIAs) and environmental and social management plans (ESMPs).
11	Crime	- The contractor or management company should designate an employee as the company crime prevention coordinator. - All assets on a project site should be identified (marked), inventoried (records), and tracked as closely as practical. A company identification numbering system should be developed. - The company crime prevention coordinator should contact neighbors around the job site residents, businesses, even children and solicit their support and help in maintaining a safe and secure job site - Electronic alarm systems can be an effective means of providing security on the job site, particularly for office and storage trailers or for material storage areas.
12	Community health and safety impacts e.g., traffic hazards, site access hazards	- Identify emergency scenarios and develop emergency preparedness and response plans with allocation of responsibilities to local communities and authorities, (where appropriate). - Develop specific stakeholder engagement plan based on consultation and participation with government and communities regarding the nature and potential consequences of the risks - Define protocol for community reporting of observed incidents - Maintain community grievance process - Continue safety awareness and education programs for impacted communities, including school programs.
Positive Impacts – Operational Phase		
No	**Impacts**	**Enhancement Measures**

1	Increase in revenue to the National and District Government	- In order to ensure that the benefits are sustained, the Government has to improve the collecting authority for taxes (Tanzania Revenue Authority) and strengthen collection mechanisms.
2	Income generation to local communities/ villagers	- In order to ensure that the benefits are sustained, the Proponent is advised to continue procuring goods from the local communities.
3	Corporate Social responsibility benefits from the factory	- The proponent should adhere to Corporate Social responsibility law
4	Employment opportunities	- The first priority will be given for qualified Tanzanians in Mabogo village
Positive Impacts – Decommissioning Phase		
No	**Impacts**	**Enhancement Measures**
1	Employment opportunities	- The first priority will be given for qualified Tanzanians in Mabogo village
Negative Impacts – Decommissioning Phase		
No	**Impacts**	**Mitigation Measures**
1	Impacts associated with Noise and vibration	- Restriction of noisy demolition activities during normal working hours (8am - 5pm). - Local residents will be informed via notices and advisories, of pending noisy periods and solicit their tolerance well before the commencement of piling works. - Workers operating equipment that generates noise will be equipped with noise protection gear including ear muffs and plugs. Workers operating equipment generating noise levels greater than 80 dBA continuously for 8 hours or more should use earmuffs whereas those experiencing prolonged noise levels of 70 - 80 dBA should wear earplugs.
2	Loss of employment	- Workers will be provided with skills for self-employment and

		others with special skills will be availed jobs to other places.
3	Dust emission	- Access roads and exposed ground will be wetted in a manner and at a frequency that effectively keeps down the dust. - Workers in dusty areas on the site will be issued with dust masks during dry and windy conditions.
4	Impacts associated with Solid Waste Generation	- A site waste management plan will be prepared by the contractor prior to commencement of demolition activities. This will include designation of appropriate waste storage areas, collection and removal schedule, identification of approved disposal site, and a system for supervision and monitoring.

7.2 Traffic Management Plan

Traffic congestion is largely caused by inadequate road usage due to a poor traffic management. An appropriate systematic traffic management system is essential for safety and smooth traffic flows on roads, making a maximum usage of road facilities to enlarge the current road capacities.

7.2.1 Objectives

- Facilitate safe and quick travel to/from the event site for spectators and participants.
- Utilize excess transportation system capacity.
- Maximize efficiency of parking operations and internal circulation.
- Accommodate pedestrians.
- Automate traffic control tasks.
- Disseminate useful and credible traveler information.
- Maximize safety.
- Minimize impact on affected residents and Environment

7.2.2 Key Components of Traffic Management Plan

The key components of a traffic management plan for planned special events include;

- Site access and parking plan
- Pedestrian access plan
- Traffic flow plan
- Traffic control plan

- En-route traveler information plan
- Traffic surveillance plan
- Traffic incident management and safety plan

Table 17; Traffic management plan components

Component	Consideration
Site Access and Parking Plan	- Lot assignment - Vehicle access and circulation ▪ Parking area ingress ▪ Pick-ups and drop-offs ▪ Parking area egress - Parking area design and operation ▪ Process component ▪ Park component - Parking occupancy monitoring - Parking regulations - Traveler information
Traffic Flow Plan	- Route planning ▪ Corridor traffic flow route ▪ Local traffic flow route - Alternate routes - Emergency access routes - Background traffic accommodation - Transit accommodation
En-route Traveler Information Plan	- Static signing - Changeable message signs - Highway advisory radio - Media - Other technology applications
Traffic Incident Management and Safety Plan	- Crash prevention ▪ Signing ▪ Public information safety campaign - Service patrols

	- Traffic incident quick clearance initiatives
Pedestrian Access Plan	- Pedestrian control ▪ Pedestrian routing ▪ Pedestrian crossing - Disabled accessibility - Shuttle bus service ▪ Service design ▪ Station design ▪ Management ▪ Cost
Traffic Control Plan	- Freeway traffic control ▪ Traveler information ▪ Interchange operations - Street traffic control ▪ Alternative lane operations ▪ Route marker signing ▪ Monitoring - Intersection traffic control ▪ Turning movement lane balance ▪ Traffic signal operations
Traffic Surveillance Plan	- Closed-circuit television systems - Field observation - Aerial observation - Media reports

7.3 Climate Change risks mitigation and adaptation in the Project Design

In order to mitigate and adapt the climate change risks (e.g heat, drought, floods, water scarcity, etc), the design of the project shall accommodate the infrastructures to enhance low energy use, rainwater harvesting, storm water management systems, adequate natural ventilation and lighting, and maintaining a significant green spaces, as described hereunder;

- ***Park and open space:*** A park and public open spaces are planned to maximize the tree canopy cover and shade provided by trees in the area and more provision of ecosystem services. In the open spaces, native plants have been recommended to add the benefit of being useful for storm water treatment and infiltration in the valley, which is located in the central part of the site.

- ***Greenery walkways:*** The design maximizes pedestrian movement and minimizes motorized transport within the site in order to reduce air emissions (greenhouse gasses (GHGs)) and maximizing Carbon sequestration. Walkways are provided to restrict free movement that causes vegetation destruction in the site, and reducing land cover important for carbon sequestration. Trees are proposed to be planted along the vehicular access road and footpaths to improve landscape and reduce effects of sun radiation during the day.

- ***Green areas:*** Green areas are distributed in every zone to allow cross fresh air into the surroundings. Due to the topographical nature and natural vegetation cover, green belt and conservation zone intend to preserve the ecosystem and control land degradation and enhance mountainous scenery in the part of the site. Vegetation including artificial forests will reduce soil erosion in sloping plains and all areas prone to soil erosion.

- **The building with low energy use**; Provisions for adequate openings for cross ventilation, that will ensure easy flow of clean air and reduce energy use (thus reducing emissions); provisions for motion sensors in public areas, to enable auto switch ON/OFF of lights; installation of *presence sensors* in offices and workshop areas; proper orientation to reduce indoor discomfort and capture natural air as much as possible and minimization of the sun effects (installation of fins; and provisions for solar lights along the pathways for sun shading); maximizing the potential of utilization of renewable energy options such as solar and wind; Utilization of biogas from the wastewater treatment plant for cooking; buildings to be oriented and constructed to take advantage of natural lighting and cross ventilation as a means of minimizing energy consumption during operation;

- **The buildings with low footprint.** This increases green spaces; and accommodation of rainwater harvesting, storm water and waste management systems and embracing water-efficient processes

CHAPTER EIGHT

8.0 Project Alternatives

8.1 Overview

Consideration of project alternatives is crucial in ensuring that the Proponent and decision–makers have a wider base from which they can choose the most appropriate option. In this study, the following alternatives are considered and will be examined in detail during the EIA process.

8.2 No Project Alternative

This involves maintaining the current status quo without Expansion of Sisal Estate and Factory. Accepting this option would mean avoiding most of the negative effects associated with the project and missing all the positive benefits that would occur.

Advantages

- Air pollution from dust as a result of the renovation will not occur.
- There would not be removal of bushes
- There would be no soil or water contamination.

Disadvantages

- There will be no creation of new employment
- There will be no secondary development as a result of the project
- The factory will not be renovated

8.3 Project Alternative

Before the decision of the renovation and expansion, the study was specially made with the aims of analyzing the prevailing cost and benefits of various alternatives. The study was hinged on the following criteria for suitable facility. The project option for the proposed project development is very strategic and will open up other avenues of economy for the community around and in the Region at large. The do the project option is in order to comply and conform to future development as; a new economic regime will emerge. This approach will increase revenue collection for the Korogwe District Council. This option implies that the project will be implemented and once implemented there will be a number of losses and gains that will be realized. We strongly recommend these options as the benefits far outweigh the negative impacts.

Advantages

- There will be creation of employment.
- There will be secondary development as a result of the project.
- The expected income in the form of profits to the Proponent and in the form of taxes to

The government will be realized.

Disadvantages

- Air pollution from dust as a result of the renovation will occur
- There will be noise pollution due to renovation activities

8.4 Different Site Selection/ Location.

This option involves using another area from the proposed site location.

Selected alternative

Under the proposed development alternatives, the proposed development would create employment; improve people's welfare and so on. Thus, the proposed site provides the optimum alternative for implementing and operating the proposed project subject to the effective implementation of the proposed ESMP and EMP.

8.5 Alternative Source of Water

Alternative one: Borehole

Water will be extracted from the existing borehole on site.

Alternative two: Water from the Ngua spring

Water will be extracted from the spring sources to run factory activities.

Alternative three; Design of rainwater harvesting and storage system. The proponent might use this water for sanitary purposes.

Selected Alternative.

From the findings of this study, Water from the Ngua spring and borehole will be used so as to maintain availability of water supply on site.

8.6 Alternative Source of Power

Alternative one: TANESCO

Currently, the proposed site is supplied with electricity from TANESCO and there are high tension lines passing near the proposed site.

Alternative two: Standby Generator

Standby generators will be used as source of energy during power cut.

Alternative three: Solar Energy

This will be another source of Energy in the Sisal estate supplying clean solar electricity during the daytime to meet most of the factory's energy demand.

Selected alternative

The Estate will use the alternatives from both TANESCO and standby generator.

8.7 Solid Waste Management Alternatives

Alternative one: Source reduction

The proponent will give priority to reduction at source of the materials. This option will demand solid waste management awareness programme.

Alternative two: Reuse and Recycling

Reuse and recycling of the waste will be the second alternative in priority. This will call for a source separation programme to be put in place. The recyclables will be solid to waste buyers within the surrounding areas.

Alternative three: Disposal of waste

The waste will be stored in sealed units in order to minimize litter contaminating the surrounding area. The proponent will have to liaise with the District Council to contract a waste handler to dispose the waste into a designated dumpsite.

Selected solid waste management alternative

The proposed project will implement all alternative for effective solid waste management. The management of the project will implement reduction of solid waste at the source, reuse and recycle and lastly will dispose waste at the designated dump site.

8.8 Waste Water Management Alternatives

At the factory sources of water, one from sanitary facilities and kitchen and another is from decortication process. Their management alternatives are as follows;

- **Waste water management from sanitary facilities and kitchen**

Alternative one: Waste water treatment plant

This can be constructed for the purpose of using chemicals or natural bacteria to treat effluent water to acceptable levels before discharging the water into the open environment. This process is expensive and requires vigilant attention and use of substantial amount of space.

Alternative two: Use of septic tank and soak away pit

This involves the renovation of underground concrete-made tanks to store the sludge with soak pits. Septic tanks and soak pits demand little space compared to other options.

Selected waste water management alternative

Septic tank and soak away pit will be used to manage waste water for the project. Waste water will be disposed by the service providers of the area to the district designated sites.

- **Waste water management from decortication process**

Alternative one: Waste water treatment plant

This can be collected to a treatment plant to be treated before discharging the water into the open environment. This process is expensive and requires vigilant attention and use of substantial amount of space.

Alternative two; Waste water from decortication process is directed to a stream to be used for irrigation of nearby farms.

Selected waste water management alternative

The selected liquid waste management from decortication is directed to a stream to be used for irrigation of nearby farms.

8.9 Alternative pesticides

Chemical pesticides are used widely in agriculture. They play a significant role in many different types of farming, including Sisal production. However, due to the potential environmental and health risks associated with their use, pesticides are beginning to alarm both consumers and producers alike.

Selected alternative; Integrated Pest Management (IPM) - means considering all available pest control techniques and other measures that discourage the development of pest populations, while minimizing risks to human health and the environment. IPM is the best combination of cultural, biological and chemical measures to manage diseases, insects, weeds and other pests. It takes into account all relevant control tactics and methods that are locally available, evaluating their potential cost-effectiveness. IPM does not, however, consist of any absolute or rigid criteria. It is a flexible system that makes good use of local resources and the latest research, technology, knowledge and experience.

Benefits of IPM

IPM provides multiple benefits for society and the environment. It is vital for the long-term future of the plant science industry.

- Improved crop profitability due to better pest control measures and appropriate use of crop protection products
- Stable, reliable and quality crop yields
- Decreased severity of pest infestations
- Reduced potential for problems of pest resistance or resurgence
- Increased consumer confidence in the safety and quality of food and fiber products
- Sustained market shares and access
- Less risk of restrictions or deregistration
- New opportunities for established and novel products, techniques and services
- Longer product lifecycles

- Decreased resistance of pests to crop protection products and biotech plants
- Increased public confidence in, and credibility of, the crop protection industry

CHAPTER NINE

9.0 Environmental and Social Management Plans

9.1 Overview

Environmental and Social Management Plan (ESMP) for developing projects usually provides a logical framework within which identified negative environmental impacts can be mitigated and monitored. In addition, the ESMP assigns responsibilities of action to various actors and provides a time frame within which mitigation measures and monitoring can be done. The ESMP is a vital output of a proposed project as it provides a checklist for project monitoring and evaluation. The ESMP outlined has addressed the identified potential negative impact and mitigation measures of the proposed project based on the section of Environment Impact and Mitigation Measures of the Negative Impacts.

9.2 Institutional roles and responsibilities

9.2.1 Financing agency

Mohammed Enterprises Tanzania Limited (METL) is the financing agency for this project. They are responsible for providing funds for implementation of mitigation measures and compliance monitoring.

9.2.2 Implementing agency

The implementing agency for this project is the Mohammed Enterprises Tanzania Limited (METL). The organization holds final responsibility for the environmental performance of the project.

9.2.3 Supervision Consultant

The Supervision Consultant is appointed by the implementing agency and is responsible for monitoring and supervision of the renovation works including implementation of ESMP. The Consultant shall appoint a Resident Engineer to oversee the renovation works and monitor the works undertaken by the Contractor and implementation of ESMP to ensure compliance with contract specification and contractual requirements. However, for supervision and monitoring of the implementation of ESMP throughout the renovation phase the implementing agency can engage an Independent Environmental Consultant. The Environmental Consultant shall be responsible for environmental compliance monitoring. This includes checking, verifying and validating the overall environmental performance of the project through regular audits, inspection and review of project submissions.

9.2.4 Contractor

The Contractor and his team shall be responsible for implementation of renovation works and ensure compliance with environmental requirements. The Contractor shall appoint a Site Engineer who shall be responsible for implementation and management of the ESMP programme and the required

environmental monitoring works. The contractor shall be obligated to include a EHS trained personnel among his staff, and that the same personnel shall take charge of EHS related site management, including Tool Box Talks, inspections, monitoring compliance to the ESMP and reporting to the site office management on key issues. .

9.2.5 Local government authorities and local NGOs / CBOs

The involvement of local authorities is crucial for successful implementation of ESMP because some of the mitigation measures are better undertaken by local communities with the support of the Local Government Authorities and NGOs. It is therefore important that the Korogwe District Council be involved in the implementation of ESMP. The respective Local Government Authorities and local NGOs should be well informed and invited to comment on the ESIA report at the design stage rather than when all major decisions have been made. One copy of this report should be sent to Korogwe District Council to ensure that, the Council through its Environmental Management Officer will be involved in monitoring compliance with mitigation measures.

9.2.6 Local communities

In general, the local communities do support the project because they know it is going to benefit them and the nation at large. However, the project can obtain maximum benefit if it involves the local communities and spends some amount of funds for the benefit of the local communities. Table below outlines the environmental and social management plan for the proposed development. The plan considers the development activity, predicted environmental impact, proposed mitigations, actors, timeframe and costs for implementation.

9.3 Environmental and Social Cost

The environmental and social cost were proposed based on knowledge of activities involved, consultations and experience of the experts. However, the proposed costs are only indicative, should the proposed development proceed with the suggested changes, the developer will work out on actual costs and include them in the overall cost of the project. These costs are indicated in Table below METL shall cover all the costs proposed in the ESMP

Table 18: Shows Environmental and Social Management Plan

SN	Potential Impact	Recommended Mitigation Measures	Responsible authority	Cost Estimates (Tshs)
Negative impact Construction Phase				
1.	Impact associated with Solid waste generation	• Use of an integrated solid waste management system i.e., through a hierarchy of options: source reduction, Recycling, Reuse before disposal of waste at the designated District dumpsite. • Transportation of wastes from the site to be done by a registered solid waste handler who will use appropriate vehicles for conveyance of wastes from site to designated District Council dumpsite.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
2.	Impact associated with Noise and vibration	• Restriction of noisy renovation activities to normal working hours (7am - 6pm). • Local residents will be informed via notices and advisories, of pending noisy periods and solicit their tolerance well before the commencement of piling works. • Workers operating equipment that generates noise will be equipped with noise protection gear including ear muffs and plugs. • Workers operating equipment generating noise levels greater than 80 dBA continuously for 8 hours or more should use earmuffs whereas those experiencing prolonged noise levels of 70 - 80 dBA should wear earplugs.	Mohammed Enterprises Tanzania Limited (METL)	1,500,000

3	Impact associated with Disposal of sewage	• Providing adequate sanitary facilities for workers with appropriate sanitary arrangement to prevent runoff. • Sensitize workers on the rationale of using the sanitary facilities	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
4	Incidences of risks, hazards and accidents	• Engaging only those workers that are trained to operate specific machines and equipment • Proper signs on site to warn workers of safety requirements as regards machines with moving parts and other equipment at site. • Provision of First Aid box and have a trained person to handle site emergencies and incidences. • Display in the site telephone numbers of ambulances or provide a site vehicle to specifically transport the injured to hospital. • Provision of fire-fighting mechanism at site. Display emergency call numbers that can be used in case of a site fire. • Provide safe scaffoldings and railings at heights. • Provision of washing (enclosed bathroom) and toilet facilities at site with both drinking and washing water. • The number of workers engaged determines the number of the toilets and bathrooms provided. • Providing safety helmets, safety masks (welders), safety shoes (loaders), uniforms and hand gloves to the workers. • Using well-maintained equipment by qualified personnel.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000

5	Labour influx	• The recruitment criteria should be transparent and fair to local communities to avoid conflicts. • The contractor should be able to identify a suitable labor pool locally which will not need bringing in large numbers of laborers.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
6	Child Labour/Forced Labour	• Conduct Selection and Qualification of Subcontractors • Awareness-Raising and Training of Internal Inspectors and Local Authorities • Promoting Access to Education	Mohammed Enterprises Tanzania Limited (METL)	6,000,000
7	Impacts associated with Vegetation clearance.	• Vegetation clearance for temporary infrastructure should be limited to the minimum core area at the site. • Areas cleared of vegetation should be re-vegetated to prevent soil erosion. • Re-vegetation is only possible given suitable ground conditions (soils, slopes, drainage) moisture, and protection from destruction.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
8	Impacts on Fauna	• Any slow-moving fauna, such as tortoises observed at the site during the renovation/ expansion phase should be removed to safety by the ECO. • In order to reduce collisions of vehicles with fauna, speed limits should apply to all roads and vehicles using the site, a maximum of 40 km/h are recommended. Animals should have right of way.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000

		• All cleared areas which do not need to remain clear of vegetation should be rehabilitated or seeded with local species if natural recovery does not take place within a year of being cleared.		
9	GBV/SEA/SH impacts	• Appoint senior focal points in both clients and contractors with responsibility for ensuring that commitments and policies to prevent GBVH are implemented. • Increase women's representation, including at senior and decision-making levels in engineering, procurement • Put in place monitoring systems at the highest levels for regular reporting on GBVH. • Include requirements around GBVH in codes of conduct, policies and protocols for contractors, including training on policies and procedures once developed. • Ensure codes of conduct are publicly disclosed in local languages and are widely accessible to all workers and all groups of people in project areas. • Build GBVH risk assessments into key processes, including environmental and social impact assessments (ESIAs) and environmental and social management plans (ESMPs).	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
10	Crime	• The contractor or Management Company should designate an employee as the company crime prevention coordinator.	Mohammed Enterprises	5,000,000

		• All assets on a renovation site should be identified (marked), inventoried (records), and tracked as closely as practical. • A company identification numbering system should be developed. • The company crime prevention coordinator should contact neighbors around the job site residents, businesses, even children and solicit their support and help in maintaining a safe and secure job site • Electronic alarm systems can be an effective means of providing security on the job site, particularly for office and storage trailers or for material storage areas.	Tanzania Limited (METL)	
11	Community health and safety impacts e.g., traffic hazards, site access hazards	• Identify emergency scenarios and develop emergency preparedness and response plans with allocation of responsibilities to local communities and authorities, (where appropriate). • Develop specific stakeholder engagement plan based on consultation and participation with government and communities regarding the nature and potential consequences of the risks • Define protocol for community reporting of observed incidents • Maintain community grievance process • Continue safety awareness and education programs for impacted communities, including school programs.	Mohammed Enterprises Tanzania Limited (METL)	7,000,000
12	Cultural resources impacts	• Preparing Environmental Protection Plans which describe the cultural management requirements applicable to their scope of work and work areas;	Mohammed Enterprises	4,000,000

		• Compliance with cultural obligations applicable to their scope of work and work areas as set out in the applicable Environmental Protection Plans, including site specific measures; • Compliance with Chance Find Procedures	Tanzania Limited (METL)	
13	Security (private) personnel and interaction with communities including use of force.	• For projects with high security risks, a stand-alone Security Management Plan contains all the procedures and protocols related to security for the project. • While the Security Management Plan should be an actionable and practical document, it is unlikely to be able to address every possible scenario in detail	Mohammed Enterprises Tanzania Limited (METL)	8,000,000
14	HIV/AIDs, STDs and other diseases (i.e. COVID – 19)	• Contractor should establish HIV/AIDS programmes to raise awareness • Put posters with various messages such as ‘‘HIV/AIDS kills’’, ‘‘be faithful’’. • Preventive measures against the spread of COVID – 19 shall be practiced at the project site.	Mohammed Enterprises Tanzania Limited (METL)	7,000,000
Positive impacts construction phase				
SN	Impact	Enhancement Measures	Responsible Parties	Cost Estimates (Tshs)
1	Creation of Employment opportunities	• The first priority will be given for qualified Tanzanians in Mazinde village	Mohammed Enterprises Tanzania Limited (METL)	N/A

2	Increase in market for local construction materials	• Purchasing materials from as many local suppliers • Hiring trucks to transport construction materials like sand, • quarry and cement to the project site.	Mohammed Enterprises Tanzania Limited (METL)	N/A
3	Increase in business activities within the project area	• Designating an area as a market within the project site	Mohammed Enterprises Tanzania Limited (METL)	N/A
Negative impacts operational phase				
S/N.	Impacts	Mitigation Measures	Responsible Parties	Cost Estimates (Tshs)
1	Soil contamination from oil spills and materials for agrochemicals	• Find and resolve source of leak • Contain the spill by using booms and spill berms. • Prevent oil from entering storm or sewer drains (seal floor drains, drain inlets). • Use spill kits, sorbent pads, and granular oil sorbents to clean up spill. • It is essential for Sisal producers and consumers to prioritize sustainable practices to reduce the environmental impact	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
2	Risks of fire hazards:	• There shall be a well- designed and properly laid fire hydrant system effectively fighting fires of various proportions and of all classes of fire risks.	Mohammed Enterprises Tanzania Limited (METL)	6,000,000

		• The management will have to ensure high level training for fire unit personnel and ensures periodical grilling of workers to cope with fire emergencies.		
3	Impact associated with Solid waste generation	• Provide each section of the facility with sufficient trash bins that promote sorting at source. • Encourage staff to handle waste through the hierarchy of options that including reduction at source, separation of waste to make it easier to undertaking recycling or reuse.	Mohammed Enterprises Tanzania Limited (METL)	4,000,000
4	Increased pressure on social services and utilities	• The project design includes ventilation systems at the factory that allow for sufficient air circulation and lighting to lower the energy demand for the facility. • Proponent should consider installation of solar lighting systems complement electricity supply from the national grid.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
5	HIV/AIDs, STDs and other diseases (i.e. COVID – 19)	• Contractor should establish HIV/AIDS programmes to raise awareness • Put posters with various messages such as ‘‘HIV/AIDS kills’’, ‘‘be faithful’’. • Preventive measures against the spread of COVID – 19 shall be practiced at the project site.	Mohammed Enterprises Tanzania Limited (METL)	3,000,000
6	Labour influx	• The recruitment criteria should be transparent and fair to local communities to avoid conflicts.	Mohammed Enterprises	5,000,000

		• The management should be able to identify a suitable labor pool locally which will not need bringing in large numbers of laborers.	Tanzania Limited (METL)	
7	Child Labour/Forced Labour	• Conduct Selection and Qualification of Subcontractors • Awareness-Raising and Training of Internal Inspectors and Local Authorities • Promoting Access to Education	Mohammed Enterprises Tanzania Limited (METL)	6,000,000
8	GBV/SEA/SH impacts	• Appoint senior focal points in both clients and contractors with responsibility for ensuring that commitments and policies to prevent GBVH are implemented. • Increase women's representation, including at senior and decision-making levels in engineering, procurement and renovation • Put in place monitoring systems at the highest levels for regular reporting on GBVH. • Include requirements around GBVH in codes of conduct, policies and protocols for contractors, including training on policies and procedures once developed. • Ensure codes of conduct are publicly disclosed in local languages and are widely accessible to all workers and all groups of people in project areas.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000

		• Build GBVH risk assessments into key processes, including environmental and social impact assessments (ESIAs) and environmental and social management plans (ESMPs).		
9	Crime	• The management of the company should designate an employee as the company crime prevention coordinator. • All assets on site should be identified (marked), inventoried (records), and tracked as closely as practical. • A company identification numbering system should be developed. • The company crime prevention coordinator should contact neighbors around the job site residents, businesses, even children and solicit their support and help in maintaining a safe and secure job site • Electronic alarm systems can be an effective means of providing security on the job site, particularly for office and storage trailers or for material storage areas.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
10	Worker's health and safety	• Management needs to be more cautious in the application of pesticides and every pesticide handler should get proper training from experts.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
11	Ground water and surface water pollution	• To reduce the environmental impact of Sisal production on water usage, sustainable farming practices can be introduced, such as utilizing rainwater harvesting techniques.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000

12	Spread of invasive species	• Develop and implement a robust downstream waste water Management program including waste water ponds, waste waters quality analysis and sisal fibers recycling & recovery initiatives (composts manure).	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
13	Perishing of indigenous tree species due to clearance	• Use of Solar energy, the solar system will cut energy costs by around 30%, supplying clean solar electricity during the daytime to meet most of the Sisal processing factory's energy demand.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
14	Impacts on Flora/Vegetation clearance.	• Vegetation clearance for temporary infrastructure should be limited to the minimum core area at the site. Areas cleared of vegetation should be re-vegetated to prevent soil erosion. • Re-vegetation is only possible given suitable ground conditions (soils, slopes, drainage) moisture, and protection from destruction.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
15	Impacts on Fauna	• Any slow-moving fauna, such as tortoises observed at the site during the renovation/ expansion phase should be removed to safety by the ECO. • In order to reduce collisions of vehicles with fauna, speed limits should apply to all roads and vehicles using the site, a maximum of 40 km/h are recommended. Animals should have right of way.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000

		• All cleared areas which do not need to remain clear of vegetation should be rehabilitated or seeded with local species if natural recovery does not take place within a year of being cleared.		
16	Impacts due to mismanagement of hazardous waste like packaging materials for agrochemicals;	• Decontamination at the source: Development of a protocol for rinsing and decontaminating APPW upon preparation of the spray, in order to characterize them as non-hazardous waste. • Development of a secure mechanism to assure the effectiveness of the decontamination method. • Sorting at the source: Sorting of decontaminated, clean APPW to categories of homogenous materials to facilitate their recycling.	Mohammed Enterprises Tanzania Limited (METL)	7,000,000
17	Soil erosion due land clearance during farm preparation;	• The contractor to confine the activities within the project core impact area and re-vegetation of the cleared area after planting of Sisal.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
18	Ground water and surface water and soil pollution	• To reduce the environmental impact of Sisal production on water usage, sustainable farming practices can be introduced, such as utilizing rainwater harvesting techniques. • Proper sanitary facility should be available at all time throughout the phases. • Advice to people on the importance of using sanitary facility at all-time	Mohammed Enterprises Tanzania Limited (METL)	5,000,000

		throughout the phases.		
19	Impact of waste water from decortication	• Discharge all the liquid waste into a waste treatment plant. • Conduct water quality test before used for irrigation • Frequent monitoring of the treatment ponds system	Mohammed Enterprises Tanzania Limited (METL)	17,000,000
Positive impacts operational phase				
SN	Impacts	Enhancement Measures	Responsible authority	Cost Estimates (Tshs)
1	Increase in revenue to the National and District Government	• In order to ensure that the benefits are sustained, the Government has to improve the collecting authority for taxes (Tanzania Revenue Authority) and strengthen collection mechanisms	Mohammed Enterprises Tanzania Limited (METL)	3,000,000
2	Income generation to local communities/ villagers	• In order to ensure that the benefits are sustained, the Proponent is advised to continue procuring goods from the local communities.	Mohammed Enterprises Tanzania Limited (METL)	N/A
3	Impact associated with Corporate Social responsibility benefits from the factory	• The proponent should adhere to Corporate Social responsibility law	Mohammed Enterprises Tanzania Limited (METL)	N/A
Negative impact decommissioning phase				
S/N	Impact	Mitigation measures	Responsible authority	Cost Estimates (Tsh)

1.	Impact associated with Noise & Air pollution during demolition	• Demolition works to be carried out only during daytime. • Workers working in noisy section to wear ear muffs • Workers should be provided with dust masks • Spraying water in dusty areas • Install dust trappers around the site	Mohammed Enterprises Tanzania Limited (METL)	3,000,000
2	Impact associated with Solid waste generation	• A site waste management plan will be prepared by the contractor prior to commencement of demolition activities. • This will include designation of appropriate waste storage areas, collection and removal schedule, identification of approved disposal site, and a system for supervision and monitoring.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
3	Impact associated with Occupational health and safety	• Provide Personal Protective Equipment to workers • Train workers on personal safety and how to handle equipment and machines • A well-stocked first aid kit shall be maintained by qualified personnel • Demarcate area under demolition with Danger	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
4	Loss of employment	• Workers will be provided with skills for self-employment and others with special skills will be availed jobs to other places.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
5	Potential increase of Soil contamination	• Trash and waste shall be well collected and removed from the site to designated dumpsite;	Mohammed Enterprises	5,000,000

		• Making arrangements for the daily collection of litter and demolition debris from the site by a licensed solid waste transporter for dumping at approved site. • All machinery must be keenly observed not to leak oils on the ground through regular maintenance; • All machinery maintenance must be carried out in a designed area (protected service bay) and where oils are completely restrained from reaching the ground, such areas should be covered to avoid storm from carrying away oils into the soil or water systems. Waste water/wash water from these areas should be properly disposed out of the park boundary; and • All oil products and materials should be stored on site stores and should be handled appropriately to avoid spills and leaks	Tanzania Limited (METL)	
6	Potential Crime	• The contractor or Management Company should designate personnel as crime prevention coordinator. • All assets on a decommissioning site should be identified (marked), inventoried (records), and tracked as closely as practical. A company identification numbering system should be developed.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
7	Potential Child Labour/Forced Labour	• Conduct Selection and Qualification of Subcontractors	Mohammed Enterprises Tanzania Limited (METL)	5,000,000

8	Potential GBV/SEA/SH impacts	• Appoint senior focal points in both clients and contractors with responsibility for ensuring that commitments and policies to prevent GBVH are implemented. • Put in place monitoring systems at the highest levels for regular reporting on GBVH. • Include requirements around GBVH in codes of conduct, policies and protocols for contractors, including training on policies and procedures once developed.	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
9	Dust emission	• Covering of all haulage vehicles carrying debris for dumping at approved sites; • Stockpiles of fine materials will be wetted or covered with tarpaulin during windy conditions;	Mohammed Enterprises Tanzania Limited (METL)	5,000,000

CHAPTER TEN

10.0 Environmental and Social Monitoring Plan

10.1 General Overview

Monitoring is a long-term process, which should start from the beginning of the project and should continue throughout the life of the project. Monitoring involves the continuous or periodic review of Renovation/expansion, operation and maintenance activities to determine the effectiveness of recommended mitigation measures. Consequently, trends in environmental degradation or improvement can be established and previously unforeseen impacts can be identified or pre- emptied.

The outcomes of the monitoring will be recorded and assessed by Mohammed Enterprises Tanzania Limited (METL)and their contractual representatives during renovation and operations of the Factory so as to either conforms or otherwise with the ESMP. Where non-compliance is observed the necessary corrective actions will be implemented as soon as possible such that the environmental or social impact is addressed and returned to acceptable levels. Corrective actions may include changes to work methods type/condition of plant and equipment and personnel and may also include changes to the frequency and type of monitoring.

There are four types of monitoring that are also relevant to this project. These are:

- Baseline monitoring – The measurement of environmental parameters during a pre-project period and operation period to determine the nature and ranges of natural variations and where possible establish the process of change.
- Impact/effect monitoring*:* Involves the measurement of parameters (performance indicators) during renovation, operation and decommissioning phase in order to detect and quantify environmental and social change, which may have occurred as a result of the project.
- Compliance monitoring: Takes the form of periodic sampling and continuous measurement of levels of compliance with standards and thresholds – e.g. for waste discharge and diseases.
- Mitigation monitoring: Aims to determine the suitability and effectiveness of mitigation measures and programs, designed to diminish or compensate for adverse effects of the project.

10.2 Implementation of monitoring plan

The environmental monitoring during renovation phase will be comprised of two activities:

- Review of Contractor's plans, methods statement, and temporary works design and arrangements to ensure that environmental protection measures specified in the contract documents are adopted and Contractor's proposals provide acceptable levels of impact control.
- Systematic observation of all site activities and the Contractor's offsite facilities, including borrow pits and quarry sites areas. To ensure that the contract requirements relating to environmental matters are being complied with, and that no impact foreseen and unforeseen are occurring.

The monitoring activities will be comprised of visual observation during site inspection and will be carried out at the same time as the engineering monitoring activities. Site inspections will take place with emphasis on early identification of any environmental problem and the initiation of suitable remedial action. Where remedial actions have been required on the part of the Contractor, further checks will need to be made to ensure that these are actually being implemented to the agreed schedule and in the required form. All sites where renovation is taking place will be formally inspected from an environmental view point on a regular basis.

The monitoring plan will also be integrated with other renovation supervision and carried out by the Implementing Agency's Engineer. The Engineer will decide on the appropriate course of action to be taken in cases where unsatisfactory reports are received from the field staff regarding environmental matters. In case of relatively minor matters, advice to the Contractor on the need for remedial action may suffice, but in all serious cases, Implementing Agency's Engineer should issue a formal instruction to the Contractor to take remedial action, depending on the extent of delegated powers. Table below provides a variety of tools and methods to be used in the monitoring exercise.

Table 19: Monitoring plan for the proposed project

Monitoring tool	**Comments**
Visual inspection/witness	Inspection of work methods, temporary works site cleanliness, drainage and flooding
Professional certification	Skilled personnel to provide
Method statements	Contractor of renovation will provide overall method statement as well as task specific method statement as instructed.
Work schedules	Updates of work schedules showing main activities, planned progress and actual critical path allocation of resources.

Monitoring tool	Comments
ESMP, H & S Plan	The contractor shall take the responsibility of preparing a detailed ESMP and a health and safety plan. These will provide guidelines concerning procedures and documentation and will be used to monitor compliance.
Periodic meetings	Includes project progress meetings, technical coordination meetings.
External audits	Organized by Mohammed Enterprises Tanzania Limited (METL)
Approvals and permits from jurisdictional authorities/ agencies	At various points in time, it may be necessary to obtain approvals
Miscellaneous documentation	Various documentations may be requested from time to time to ensure performance and/or compliance such as delivery notes of materials, labour and insurances, equipment performance.
Technical specification and drawings	The contracts documents, including the technical specifications and drawings will provide clear guideline concerning procedures and documentation and will be used to monitor compliance.

Table 20: Environmental Monitoring Plan

Potential Impact	Recommended mitigation measures	Targeted level / standards	Means of verification	Frequency of monitoring	Responsible authority	Cost
Negative impacts construction/ renovation phase						
Noise emission	• Fitting construction vehicles with silencers to reduce the noise • Servicing machinery so that they can be in good condition at all times • Providing ear protection materials for the workers in noisy areas	Noise standard level (dBA) 85	No. of vehicles fitted with silencers Machines in good condition No. of workers using PPEs inspections	Quarterly	Mohammed Enterprises Tanzania Limited (METL)	3,000,000
Vibration	• Conduct regular vibration monitoring tests to assess the frequency and scale	Tolerance Limits for Whole Body Vibration Daily exposure limit value 1.15 m/s2 Tolerance Limits for	Number of complaints about excessive noise	quarterly	Mohammed Enterprises Tanzania Limited (METL)	5,000, 000

	of the vibrations on site, and make more informed decisions about the preventive or corrective actions they can take to better protect their people, other stakeholder and the environment.	Hand Arm Vibration Daily exposure limit value 5 m/s2				
Air pollution	• Applying water regularly to civil works and earth roads to suppress dust; • Controlling the speed of construction vehicles to reduce generation of dust.	SO_2<0.5 µg/m3 for 10 mins CO < 150 µg/m^3 for less than 15 mins NOx< 150 µg/m^3 for 24 hours PM 2.5 [WHO:2005] 25 µg/m^3 PM 10 Local standard (TZS: 845:2005)60-90 µg/m^3	Exhaust emissions consisting of carbon monoxide (CO), Carborndioxide (CO_2), Sulphur dioxide (SO_2), Nitrogen oxide (NO_2) Number of PM 2.5 and 10	Quarterly	Mohammed Enterprises Tanzania Limited (METL)	8,000,000
Soil erosion	• Carrying out construction works	Construction period Availability of drainage	inspections	Once on commencement	Mohammed Enterprises	6,000,000

	out from May – September • Creating drainage channels to direct storm water movement • Creating stone pitching where soils have been excavated • Clearing only those places where buildings will be constructed	channels Presence of stone pitching			Tanzania Limited (METL)	
Soil Contamination	• Construction vehicles should be in good condition to avoid fuel leaks • Servicing areas for vehicles should have impermeable surfaces	No. of vehicles serviced Availability of impermeable surface	Records	Quarterly	Mohammed Enterprises Tanzania Limited (METL)	5,000,000
Increase in	• Introducing humps	No. of humps on the	Inspections	Once on	Mohammed	6,000,000

accident/ incidences	on the road to help reduce the speed of the vehicles • Erecting warning signs showing that there is heavy machinery and construction vehicles using that road for people to be alert • Following health and safety regulations • Providing workers with protective clothing • Training workers in the proper use and handling of heavy equipment and machinery • Maintaining a first aid kit at the project site	local road No. of warning signs erected No. of people using PPEs No. of people trained Presence of a first aid kit		commencement	Enterprises Tanzania Limited (METL)	

HIV/AIDS and other diseases	• Sensitizing local people and workers at the site on the dangers of unacceptable unions • Distribute condoms to both men and women • Encouraging girls to go to school to avoid early marriages • Providing women with loans for small scale businesses so that they can be self-sufficient • Develop an HIV and AIDS workplace policy	No. of sensitization meetings No of school drop outs	Records	Quarterly	Mohammed Enterprises Tanzania Limited (METL)	5,000.000
Increase in criminal Acts.	• Employ people from the surrounding areas to reduce	No of criminal incidences No. of local people employed Community	Police records	Quarterly Once on commencement	Mohammed Enterprises Tanzania Limited (METL)	6,000,000

	number of migrant workers • Sensitize the community on the ownership of the project • Introduce community policing in conjunction with the police station • Request for a police unit within the project area	policing in place Police unit in place				
Inadequate waste management	• Provision of dust bins or rubbish pits for the wastes produced • Segregation of wastes by providing different bins for each type of waste • Identification of a dumping site within	Dust bins for each type of waste in place Dumping site identified No. of times rubbish is removed	Inspections	Quarterly Once on commencement	Mohammed Enterprises Tanzania Limited (METL)	6,000,000

	the project area for various types of wastes • Disposing of wastes at the designated places regularly					
Degradation of land and river banks	• Buying sand and quarry from registered local artisans • Carrying out sensitization of local artisans on good mining practices • Designating places for sand and quarry mining • Assisting communities with afforestation programs for river banks	No. of local registered local artisans supplying materials No. of meetings No of official mining sites No. of afforestation programs	Records	Quarterly Once on commencement	Mohammed Enterprises Tanzania Limited (METL)	6,000,000

	• Introducing alternative income generating activities in the area.					
Positive impacts construction/ renovation phase						
Creation of employment	• Employing unskilled labours as much as possible from the project area • Giving women equal employment opportunities as men.	Number of local people employed Number of women employed	Records	Quarterly	Mohammed Enterprises Tanzania Limited (METL)	6,000,000
Increase in market for local construction materials	• Designating a place for the local market close to the site • Purchasing materials from as many local suppliers. • Piling trucks to transport construction	No. of local people supplying material Number of local transporters ferrying material	Interviews	Quarterly	Mohammed Enterprises Tanzania Limited (METL)	6,000,000

	materials like sand, quarry and cement to the project site					
Negative impacts operational phase						
Inadequate waste management	• Provision of dust bins or rubbish pits for the wastes produced • Segregation of wastes by providing different bins for each type of waste • Maintaining the dumping site that will be identified during construction • Collecting and disposing of wastes at the designated places regularly • Used chemicals should be disposed in consultation	No. of dust bins Presence of dumping site Frequency of waste disposal Presence of hazardous waste disposal site	Inspections	Quarterly Once during operation	Mohammed Enterprises Tanzania Limited (METL)	8,000,000

Inadequate Sanitation	• Provision of adequate toilets for workers • Construction of double chambered septic tanks for disposal of liquid wastes • Regular Inspection and maintenance of the septic tank network	No of toilets Presence of septic tank in good condition	Inspections	Quarterly Once during operation	Mohammed Enterprises Tanzania Limited (METL)	8,000,000
Increase in HIV and AIDS and other sexually transmitted diseases	• Carry out sensitization meetings for workers and local communities from time to time. • Develop an HIV and AIDS workplace policy; • Distribution of	No of meetings Policy in place No. of condoms distributed	Records	Quarterly Once during operation	Mohammed Enterprises Tanzania Limited (METL)	8,000,000

	condoms and information materials on HIV and AIDS to workers					
Increase in criminal acts	• Sensitize the communities and workers on how they can live in harmony • Sensitizing the community members on the ownership of the estate • Introduce community policing in conjunction with the police station • Request for a police unit within the project area	No. of criminal incidences Community policing in place	Records	Quarterly Once during operation	Mohammed Enterprises Tanzania Limited (METL)	8,000,000
Fire outbreaks	• Hire competent and properly authorized electrical contractor	Presence of fire exit signs Presence of firefighting equipment and records of	Inspections	Quarterly Once during operation	Mohammed Enterprises Tanzania Limited (METL)	8,000,000

	to do the wiring and other electrical works. • Install fire alarm system for entire project • Install smoke detectors in kitchens. • Installation of firefighting equipment following Country Fire requirements. • Conduct regular firefighting drills within the site. • Develop and adapt an (fire) emergency response plan for the project during and occupation stage. • Ensure that all firefighting	servicing Presence of fire hazard signs				

	equipment are regularly maintained and serviced.					
Increase in Energy Demand	• Put off all lights immediately when not in use or are not needed. • Use energy conserving electric lamps for general lighting • Make use of alternative source of energy such as solar power. • Solar panels proposed in the project should be fully utilized and timely repaired in case of damage.	Presence of energy conserving electric lamps Availability and condition of solar panels	Inspections	Quarterly Once during operation	Mohammed Enterprises Tanzania Limited (METL)	8,000,000
Increase in water	• Install water	Presence of water conserving taps	Inspections	Quarterly Once during	Mohammed Enterprises	8,000,000

demand	conserving taps that turn-off automatically when water is not in use. • Encourage water reuse/recycling during occupation phases. .	Monthly bills		operation	Tanzania Limited (METL)	
Positive impacts operational phase						
Creation of employment	• Employing more people from the communities surrounding the project area and other areas within the country for both unskilled and skilled jobs • Giving equal employment opportunities for both men and women	No. of people local people employed No. of women employed	Records	Quarterly Once during operation	Mohammed Enterprises Tanzania Limited (METL)	8,000,000

Improved access to social services by the local community	• Providing extra social services that can be accessed by the communities.	Presence of social services	Records	Quarterly Once during operation	Mohammed Enterprises Tanzania Limited (METL)	8,000,000
Increase in revenue by government through taxes	• Remitting taxes to TRA from wages and service contracts in time	Remittances to TRA	Records	Quarterly Once during operation	Mohammed Enterprises Tanzania Limited (METL)	8,000,000
Negative impacts decommissioning phase						
Loss of employment	• Informing workers of project duration when employing them • Educating the labour force on the need to save part of their wages • Paying severance benefits to all laid off workers according to	Benefits	Records	Once	Mohammed Enterprises Tanzania Limited (METL)	5,000,000

	the provisions of the labour laws					
Inadequate waste management	• Disposing of construction wastes at the dumping sites that will be identified during construction phase. • Scrap metals will have to be sold or disposed at a dumping site that will be designated specifically for such wastes. • Trees and grass should be planted in bare areas of the project site as a way of restoring the area.	Site clear of construction wastes and scrap metal	Inspections	Once	Mohammed Enterprises Tanzania Limited (METL)	8,000,000
Noise pollution	• Demolition activities to be restricted to daytime i.e. 8am to	Noise standard level (dBA) 85	Inspection Observation Routine	Daily	Mohammed Enterprises Tanzania	8,000,000

	5pm • Use of Suppressors on noisy equipment or use of noise shields for instance corrugated iron sheet structures • Workers in the vicinity or involved in high level noise to wear respective safety & protective gear.		Maintenance		Limited (METL)	
Health and safety of workers	• All workers to wear PPEs e.g. helmets. • All workers will be sensitized before demolition begins, on how to control accidents related to construction • Accordingly, adherence to safety procedures will be	No. of warning signs erected No. of people using PPEs No. of people\ trained Presence of a first aid ki	Inspection Observation Routine maintenance	Daily	Mohammed Enterprises Tanzania Limited (METL)	8,000,000

	enforced. • All workers will be adequately insured against accidents.					

10.3 Monitoring Frequency and Reporting

Monitoring frequency varies for each parameter depending on the likelihood and level of change over time. Some parameters take longer time to show changes while others would change in very short time. For example, liquid effluents outflows should be monitored frequently for compliance with environmental standards in Tanzania for Biological Oxygen Demand ($BOD_{5\ mg/l)}$, pH, Suspended Solids (SS mg/l), for parameters that long take time to manifest; monitoring should at least be on quarterly basis. Other parameters such as income, revenue, employment, changes in livelihoods and use of resources (water, energy) will be monitored on annual basis – so as to allow for significant change to take place.

Monitoring data should be analyzed and reviewed at regular intervals and compared with the existing permissible level standards so that any necessary corrective actions are timely taken. Proponent is required to maintain records of liquid effluents and any hazardous materials or wastes (if any) and is being disposed at remote area. Other parameters to include such as water usage, fires, accidents, and ill health that may impact on the environment or workers

Records of monitoring results should be kept in an acceptable format an easily accessible, and information reviewed and evaluated to improve the effectiveness of the environmental protection plan. The results should be reported to the responsible authorities and relevant authorities as required and be readily available for review and checks by regulatory authorities. The Proponent will have to find out any other existing reporting requirement with the district and national environmental regulatory authorities (e.g. NEMC) and comply.

CHAPTER ELEVEN

11.0 Cost Benefit Analysis

11.1 Introduction

The cost-benefit analysis presents a brief comparison of environmental and social costs of implementing the proposed project versus benefits accrued from the project when implementation of the project has been completed. It is a clear fact that, it is not possible to account for all the impacts accrued from the implementation of the project. This is because some of the impacts are direct while others are indirect; some are short-term while others are long-term, some of the impacts are site specific while others cross the boundaries of the project area to affect a much larger population, though it may not be necessarily a significant impact. Similarly, valuation of these impacts is more or less dictated by the social group biases tied to the environment to which the project has been subjected. Therefore, methodology used in this cost benefit analysis, will base on comparing between the following:

"The total amount of cash that would be spent by the proponent into the local environment" termed as "BENEFIT" **Versus** "The opportunity cost of the items the people and the society will miss when the project is implemented" plus "environmental costs of mitigating any significant impact caused by the project's activities after it is fully implemented to the closure phase". Termed as "COST".

Since this project is expected to exist for a long time, with 3 year of development costs and one year of decommissioning, the aspect of "Time Value for Money" will be ignored and all the costs will be considered as "Constant Dollar" with inflation and cost escalation assumed to be zero.

11.2. Benefits related to the project

The proposed project is expecting to benefit local communities' / farmers in terms of employment and creating linkages with local economy. The facility will require labour force from local communities during renovation and operation, which is expected to benefit local communities. These benefits will in turn trickle down to the local economy. Similarly, the project will directly benefit local communities and promote local economy in terms of increased use of local resources sale including sale of goods and services to the Factory.

11.3 Other Economic Benefits

- Tax Income – the project will pay income taxes, property taxes, corporate taxes and other taxes to the government.
- Dividends – the shareholders will receive dividends from the project.
- Jobs Creation – the project supports more than 150 direct jobs and 0ver 300 indirect employments.

- Source of foreign currency- the project will produce sisal fibre, an export crop which will earn the country the much-needed foreign currency.
- Agricultural development - The project will add value to the large-scale agriculture in the country, an important factor for the country's economic growth and development.

11.4 Benefits to METL

The proposed project has positive impacts to METL since its benefit is a lifetime process throughout the project life span (99 years). The completion of these projects will be one of the pooling factors for Improved Agriculture thus in monetary cost its value has potential to increase annually. METL financial capacity and sustainability are going to improve by far. Further, the improved financial standing is not only going to promote income but also good governance and efficient running of the project. The project will also have several intangible benefits to METL which include improving the Company's image.

11.5 Benefit to the Neighbourhood

The proposed project meant to increase the capacity of infrastructure. This improvement may lead to the increase in staff requirement that is casual labours, technical and administrators. During and after construction phase the project is going to provide additional employment opportunities for people within the community related to operation and maintenance. However, non-skilled labourers will benefit from the daily wages. Business opportunities will be supporting government initiatives to create employment opportunities for Tanzanians as advocated by the current Government. Notwithstanding that now salaries are yet to be specified, it is envisaged that from employment, workers will get incomes, which will improve quality of their lives and perhaps improve their lifestyles. However, employment opportunities and income from salaries provided will extend beyond the workers and benefits many other people including dependants.

Moreover, employment opportunities and the benefits therein will depend on whether suitably qualified local personnel that can take up positions are available. Capacity building therefore is a prerequisite for these benefits to be realized. Alongside capacity building, there shall be a need for putting in place deliberate policies that would compel developers in the real estate economic sector to employ local labour with the requisite skills and experience. In addition, the project will also have following economic and social benefits:

- Utilization of locally available resources;
- Revenue to the Government will increase through payment of the various taxes (indirect and direct).
- Boosting the infrastructure and economy of the country and Korogwe District in particular

ward in which the project is located.

11.6 Benefit to the Government

The project will benefit the government in different aspects. It is anticipated that during the operation phase, the project will improve METL financial capacity and sustainability resulting from project earnings. For that case, the government will have the opportunity to use the share of the budget which was supposed to go to METL for other government development plans. Further the ability of METL in contributing towards the realization of National Policies.

11.7 Costs related to the project

The estimated costs for implementing enhancement measures, impact management as well as monitoring process as outlined in Chapters nine. The estimated costs for mitigation do not include the environmental costs, which could not be accurately calculated. Since some of the impacts will only to be realized during construction phase, the costs for these will also be short term, especially if mitigation measures are fully implemented. The construction costs for all the projects are detailed in Bills of Quantities.

11.8 Costs to community

The resulting negative environmental and social impacts such as noise, impairment of air quality, and Safety and health risks due to project activities will be absorbed by the surrounding communities. However, the introduction of mitigation measures will reduce the anticipated impacts. Apart from the above, no any community activities will be disrupted. METL management is committed to mitigate the negative social and environmental impacts.

11.9 Environmental Cost

Environmental cost benefit analysis is assessed in terms of the negative and positive impacts. Furthermore, the analysis is considering whether the impacts are mitigatable and the costs of mitigating the impacts are reasonable.

11.10 Project cost benefit analysis

As it has been mentioned in Chapters 6 – 8, the potential benefits of the project, in terms of financial and social benefit are substantial. The environmental impacts are reasonably mitigatable and the financial resources needed to mitigate negative impacts, when compared to the required investment are relatively small. However, the benefit cost ratio concluded the project to have more benefits compared to the total cost of the project, this implies that the project is viable and the proponent is encouraged to develop it.

CHAPTER TWELVE

12.0 Decommissioning Plan of the Project

12.1 Overview

The minimum lifespan of the proposed project might be more than fifty years though the actual time of decommissioning is uncertain. However, when it comes to decommissioning of the building, major activities will be carried out to remove unused construction materials including demolition temporary structures. The developer will have to close the facility and rehabilitate the site back to its original environmental status; the main challenge will be how to deal with the solid waste generated from the demolition of the structure for safe disposal.

Proper handling methods including disposal of solid waste must be followed as outlined in this ESIA. Solid waste might be land filled in pits and covered with soil; preferably top soils stored to encourage indigenous trees and grass to regenerate or otherwise indigenous plants must then be planted to ensure the area returns to its original condition. The other challenge is how to deal with laid off labor force and the loss of income that was coming from the project to the local communities and the national economy. Various mitigation measures are proposed in the previous chapter that will reduce the effect of decommissioning.

A detailed decommissioning plan that takes environmental issues into consideration shall be prepared by the developer prior to the decommissioning works. Should it be done, decommissioning may entail change of use (functional changes) or demolition triggered by change of land use. Therefore, what is presented here is just a Preliminary Decommissioning Plan which gives light to what shall be done if the need for decommissioning arises.

12.2 Preliminary Decommissioning Plan

This Section provides a brief outline of the works required to demolish the proposed project on the site in case it happens. This Plan will be used as a reference document that provides the framework to ensure that demolition activities on the site do not adversely affect the health, safety, habitat, diversity or the environment at large.

The Contractor will be required to prepare a detailed Demolition Plan and Construction Management Plan to the satisfaction of the Proponent and relevant Authorities (NEMC) prior to the commencement of works on site.

12.3 Components to be demolished

The project components to be demolished shall generally be buildings constructed with load bearing masonry walls with steel or timber framed roofs and metal roofs.

12.4 Demolition Methods

It is anticipated that the Contractor will prepare a detailed Demolition Plan prior to the commencement of work on site; however, the indicative demolition methodology will be as follows:

- The strip out and removal of non-structural elements will be undertaken utilizing manual labour including excavators and loaders.
- The materials will be removed from site using small to medium sized trucks.
- The structures will be demolished using larger equipment including hydraulic excavators.
- During the demolition process erosion control measures will be established. These will include treatment of dust and potential discharge into catchment area.
- Rehabilitation of the site by planting indigenous vegetation.

12.4.1 Materials Handling

All the debris from the site will be used to backfill the excavated area and the remains taken offsite to the approved dumpsite. The contractor shall submit a Demolition Waste Management Plan to NEMC which outlines the objectives of:

- maximization, reuse and recycling of demolition material
- minimization of waste disposal
- evidence of implementation for specified arrangements of waste management

On-site storage of reusable materials will occur at Site. Recycling and disposal containers will also be accommodated at this location for collection vehicles. A hazardous materials inspection will be undertaken by an accredited consultant and a report issued. Hazardous materials will be removed in accordance with EMA 2004.

12.4.2 Proposed Sequence

The Contractor will be required to prepare the following documentation prior to the commencement of demolition and/or excavation works:

- Dilapidation Survey
- Construction Waste Management Plan
- Demolition Management Plan

In principle, the demolition process is undertaken in the reverse sequence as construction. Essentially, internal finishes will be stripped out first. Service amenities will then be removed including air conditioning, pipework and conduits. The facades will be removed where necessary and the structure will

then be demolished using the larger plants and equipment. It is estimated that it will take 3 months to demolish and clear the site.

12.4.3 Protective Measures

An A Class hoarding will be erected around the perimeter of the construction site prior to the commencement of demolition works. Additionally, wherever the risk arises of material falling into public areas, overhead protection will be provided in the form of a B Class hoarding. Scaffolding will be erected to facades where materials could fall in excess of 4m. The scaffolding will be clad with chainwire and shadecloth to enclose debris and dust onto the site. During the demolition, dust control measures will be used to minimise the spread of dust from the site. The Contractor will have a senior representative on site at all times to ensure compliance with the safety guidelines and agreed work methods.

12.4.4 Traffic Management

The management of construction traffic during the deccommissioning phase will be subject to the provision of a detailed traffic management plan. This plan will be prepared by the Contractor for the various stages of demolition. During demolition, all traffic will be held within the site boundaries. The site will remain closed to pedestrian traffic and will be generally manned by security.

12.4.5 Occupational Health and Safety

A detailed OH&S measures will be provided by the Contractor prior to work commencement. A detailed Site Safety Plan will be prepared for the specific project.

12.4.6 Environmental Management Plan

A detailed Environmental Management Plan pertaining to demolition works will be provided by the Contractor prior to the commencement of the work.

Table 21: Decommissioning Activities plan

S/N	Decommissioning Activities	Impacts	Mitigation Measures	Institution Responsible	Time	Cost (Tshs)
1.	Support maintenance of the inactive facilities of the estate and provides feedback for evaluating and revising, if necessary, the facility's hazard baseline Documentation.	Potential risk to the people due to contaminations from the facility	Support maintenance of the inactive facility's safety envelope, and To provide feedback for evaluating and revising, if necessary, the facility's hazard baseline documentation.	METL	Depend on decision	4,000,000
2.	All structures will be removed. All machines will be removed and sold to the third user or to recycling industries for iron manufacturing industries. Soils that will be discovered to be contaminated	Environmental pollution such as air, soil and noise pollution. Safety risks to people	The decommissioned area will be fenced. Public notification will be provided. Demolition permit will be provided	METL	After decommissioning	20,000,000

	will be remediated accordingly.					
3.	Filling and plant trees to restore nature condition of the area, if the area is to be for other uses then it must be designed well to meet the requirement for the new use.	Potential risk to human	None	METL	After decommissioning	15,000,000
4.	Loss of employment	Jobless and psychological problems to the workers	Prepare workers for forced retirement by providing skills for self-employment and wise investment of the retirement benefits. Ensure employees are members of security funds.	METL	After decommissioning	17,000,000

CHAPTER THIRTEEN

13.0 Summary and Conclusion

From the environmental assessment conducted for the project, it is clear that the project potentially has some negative impacts which relate to the surrounding environment. The impacts relate to issues pertaining to risk of pollution of the environment in case of improper solid and liquid waste disposal; traffic congestion and general nuisance during renovation. Sanitation is also a challenge that has to be appropriately considered with adequate safety measures in case of bursting of sewage pipes which may pollute the immediate environment. It should be noted, however, that despite the above potential impacts, it is possible with adequate design and implementation measures advanced in this report to mitigate the environmental effects and reduce them to acceptable levels. It is recommended that strict monitoring measures will be instituted both from an engineering and environmental point considering the sensitivity of the site. This will ensure that the project adheres to acceptable practices and standards. It is the consultant's view that the project be allowed to proceed on condition that the measures proposed in this ESIA Report and in particular in the ESMP are fully implemented. Recommendations for the prevention and mitigation of adverse impacts are as follows:

i. All solid waste materials and debris resulting from Renovation activities must be disposed of at Waste management dumping site
ii. Renovation activities must be undertaken only during the day i.e., between 7:30 am – 6:00 pm to minimize disturbance to the general public within the proximity of the site/project;
iii. Traffic along the access/connecting roads should be controlled during renovation and especially when heavy trucks are turning in and out of the site to ensure that no accidents are caused by the site's activities;
iv. Ensure proper water usage during construction/ renovation and occupational phases. Contractor can import water using bowsers and tankers with the approval of relevant water authority. Provide water saving valves and install rainwater harvesting systems (gutters, down pipes and storage facilities);
v. Drains will be properly designed, installed and regularly maintained to prevent storm water (run-off) from accumulating within the site and spreading to the neighborhood. These must effectively drain the storm from the premise in to the existing public drainage system along the road;
vi. Proper and regular maintenance of construction machinery and equipment will reduce emission of hazardous fumes and noise resulting from friction of rubbing metal bodies. Maintenance should be conducted in a designated area and in a manner not to interfere with the environment;

vii. Maintenance activities must be carried out in service bay to reduce chances of oils or grease or other maintenance materials, from coming into contact with environment (water or soil). Waste water from such areas must be refrained from coming into contact with soil mass or water bodies as it contains oil/grease spills;

viii. Used and new oils must be handled and stored appropriately to avoid oil leaks and spills on the site;

ix. Sewerage system must be properly designed within the site /house and effectively connected to the existing sewer line. Design specifications must be followed during installation. Standard cleanliness of sanitary and waste disposal facilities at construction site must be maintained;

x. Workers must be provided with complete protective and safety gear. They must have working boots, complete overalls, helmets, gloves, earmuffs, nose-masks, goggles etc.

xi. Fully equipped first aid kit must be provided within the site. Workers should get food that is hygienically prepared; the source of such food must be legalized or closely controlled;

xii. The contractor must provide adequate security during the construction period and especially during the night when there are no construction activities;

xiii. A complete firefighting system must be provided after completion of the project. The equipment is clearly provided in the design plan, and in the report. This must be installed or provided at strategic points.