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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF BIO-FUEL OIL MECHANICAL EXTRACTION PLANT IN WOTE, MAKUENI COUNTY, KENYA

FINAL REPORT

SEPTEMBER 2021

Submitted By:

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

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DECLARATION

This ESIA was prepared by EMC Consultants Limited, Shelter Afrique Centre, 3rd Floor, Wing A Longonot Road, Upperhill P.O.BOX 9648-00100, Nairobi Kenya. It is the result of data collection, analysis, and interpretation to the best of our professional knowledge.

Signed _____ Date 28/09/2021

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EMC CONSULTANTS LTD.
28 SEP 2021
P. O. Box 9648-00100,
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This ESIA was commissioned by
ENI Kenya B.V., the Project Proponent

Signed: _____ Date 27.09.2021

Name: ENRICO TAVOLINI

Position MD

eni kenya b.v.
Managing Director
Enrico Tavolini

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Environmental and Social Impact Assessment (ESIA) for the proposed Construction and Operation of Mechanical Oil Extraction Plan in Wote, Makueni County, Kenya

For and behalf of
EMC Consultants Limited

Approved by: Mark Owuondo
Position: Principal Partner

Signed: 

Date: 28/09/2021

This report is prepared by EMC Consultants Limited the trading name of EMC Consultants Limited. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above

This report is confidential to the client, and we accept no responsibility of whatsoever nature to third parties to whom this report, or any other thereof, is made known. Any such party relies on the report at their own risk.

NEMA Submission Form

Kenya Subsidiary Legislation, 2003

(r19)

FORM 1

Application Reference No.....................

FOR OFFICIAL USE

THE ENVIRONMENT MANAGEMENT AND CO-ORDINATION ACT

SUBMISSION OF ENVIRONMENT IMPACT ASSESSMENT PROJECT REPORT

Part A: DETAILS OF THE PROPONENT

A1 Name of proponent (Person or Firm)...... Eni Kenya BV

A2 PIN No. P051412106K

A3 Address ...... Eka Place, 5th floor Gigiri

A4 Name of contact person ...... Enrico Tavolini

A5 Telephone ...... 4254 709954000 ...... A6: Fax No. 4254 709992872

A7 E-mail ...... enricotavolini@eni.com

PART B: DETAILS OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROJECT REPORT

B1 title of the proposed project ...... Environmental and Social Impact Assessment for Proposed Construction and operation of Mechanical Oil extraction Plant

B2 Objectives and scope of the project...... To stimulate agro-industrial and small scale farming activities to ensure not wanted for food production

B3 Description of the Activities ...... The Project activities include Seed receiving, Seed cleaning, seed storage, oil extraction, Oil cleaning and storage and Cake management

Location of the project ...... Mutomo, Kikumini Ward, Wote Sub County, Makueni County, Kenya

Part C: DECLARATION BY THE PROPONENT

I hereby certify that the particulars given above are correct and true to the best of my knowledge.

Name	Position	Signature
ENRICO TAVOLINI	MD	[signature]

On behalf of ...... Eni Kenya ...... Date 17.09.2021

eni kenya b.v.
Managing Director
Enrico Tavolini

(Firm Name and Seal)

PART D: DETAILS OF ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Name (individual/firm) Emc Consultants

Certificate of registration No. 66

Address Shelter Afrique Centre 3rd Floor

Tel. 0722 579072 Fax N/A

EMC CONSULTANTS LTD. 17 SEP 2012 P.O. Box 00100, NAIROBI

PART E: OFFICIAL USE:

Approved /Not Approved

Comments .....

.....

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.....

Officer..... Sign..... Date .....

Important Notes: Please submit the following:

a) Three Copies of this form
b) 10 copies of the project/study report
c) A soft copy of the project in a CD
d) Prescribed fees to:

Director General
The National Environment Management Authority
Popo Road, South C
P.O. Box 67839 00200
NAIROBI

Tel. +254-02-609013/27/79 or 608999 Fax: 254-02-608997 E mail: dgnema@swiftkenya.com

Firms NEMA Practising License

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/11943

Application Reference No: NEMA/EIA/EL/16036

M/S **EMC Consultants**
(individual or firm) of address

P.O. Box 9648-00100, Nairobi

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts**
registration number **6669**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **2/21/2020**

Expiry Date: **12/31/2020**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

Lead Expert Practising License

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/14165

Application Reference No: NEMA/EIA/EL/19175

M/S **Joel Tito Kodiaga**
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in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **2/18/2021** Expiry Date: **12/31/2021**

Signature.....

(Seal)
Director-General
The National Environment Management Authority

P.T.O.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF BOXES

ACRONYMS

ATC	Agricultural Training Centre
CBD	Convention on Biological Diversity
CESMP	Construction Environment and Social Management Plan
CO	Carbon Monoxide
CO2	Carbon Dioxide
COVID	Corona Virus Disease
DCS	Distributed Control System
ESIA	Environmental and Social Impact Assessment
ESIA	Environmental and Social Management Plan
EU	European Union
FGDs	Focus Group Discussions
GBV	Gender Based Violence
GHGs	Green House Gaseous
HDV	Heavy-Duty Vehicles
KALRO	Kenya Agricultural and Livestock Research Organisation
KIHBS	Kenya Integrated and Household Budget Survey
KPLC	Kenya Power and Lighting Company Limited
LDVs	Light Duty Vehicles
LPG	Liquefied Petroleum Gas
MOE&P	Ministry of Energy and Petroleum
NBSAP	National Biodiversity Strategy and Action Plan
NEMA	National Environmental Management Authority
NO2	Nitrogen Oxides
NSR	Noise Senstive Receptors
OCS	Operator Control Station
OSHA	Occupational Safety and Health Act
PM	Particulate Matter
PPE	Personal Protective Equipment
SEA	Sexual Exploitation and Abuse
STDs	Sexually Transmitted Diseases
VOC	Volatile Organic Compounds
WOWASCO	Wote Water and Sewerage Company
WRA	Water Resources Authority

EXECUTIVE SUMMARY

This Environmental and Social Impact Assessment (ESIA) Study Report presents an assessment of the potential environmental and social impacts associated with the proposed construction and operation of mechanical oil extraction plant from plant seeds refered to as Agri-Hub ('the Project') in Makueni County to ensure that environmental and social aspects are diligently considered and managed during the project lifecycle.

This Environmental and Social Impact Assessment (ESIA) Study report has been prepared by **EMC Consultants Limited** for Eni Kenya B.V. (proponent) which is to construct and operate a mechanical oil extraction plant (Agri-Hub) from plant seeds.

PROJECT PROPONENT

Eni S.p.A. (Eni hereinafter) is an international integrated energy company, active in 71 countries in the world with a staff of over 33,000 employees. Eni is already operating in Kenya through its branch Eni Kenya since 2013. Eni S.p.A. has the mission to promote a more rational use of fossil sources and a greater recourse to renewable sources in compliance with the provisions of the Paris Agreement on Climate Change and, within this framework, is interested in building feedstock chains to supply its biorefinery system worldwide by applying its proprietary technologies, know-how and expertise in the refining processes and downstream products, and to develop new technological solutions aimed at increasing efficiency and sustainability.

The Mission Statement of Eni is below reported: We are an Energy Company. We concretely support a just energy transition, with the objective of preserving our planet and promoting an efficient and sustainable access to energy for all. Our work is based on passion and innovation, on our unique strengths and skills, on the equal dignity of each person, recognizing diversity as a key value for human development, on the responsibility, integrity, and transparency of our actions. We believe in the value of long-term partnerships with the countries and communities where we operate, bringing long-lasting prosperity for all.

Eni's strategies, resource allocation processes and conduct of day-by-day operations underpin the delivery of sustainable value to shareholders and, more generally, to all of stakeholders, respecting the Countries where the company operates and the people who work for and with Eni. Eni's way of doing business is based on operational excellence, focus on health, safety, and the environment, and in the commitment to prevent and mitigate operational risks. Furthermore, Eni is a socially responsible actor and contributes to the economic development of the countries where it operates.

This approach is based on the respect of universal principles such as the protection of human rights, the adoption of the highest standards of work, the respect of the environment and communities. The respect for universal principles incorporated in Eni's business model is expressed mainly in responsibility towards applicable laws and the adoption of best standards, the inclusion of all its people through fair and non-discriminating policies, excellence in operations with the adoption of quality systems and advanced technologies.

Eni's Operations in Kenya

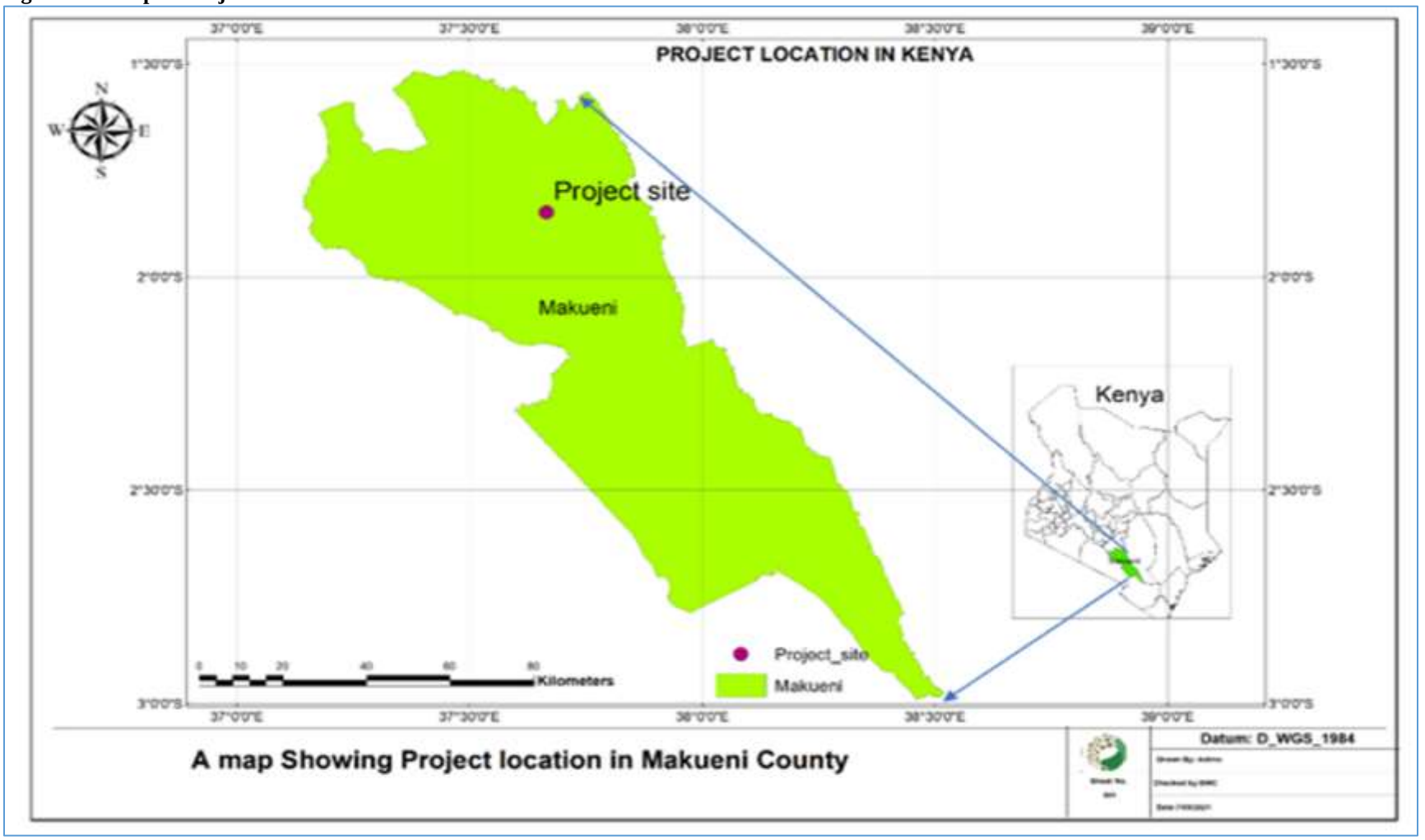
Eni's presence in Kenya goes back to 1960 with the creation of Agip Kenya, which was set up for the importation and distribution of petroleum products and by-products, nitrogen fertilisers and synthetic rubber. Eni has been operating in Kenya in the exploration and production sector, since June 2012, through its subsidiary Eni Kenya BV. Eni operates in three blocks in the deep offshore of the country, bordering on Somali waters, at depths ranging from 2,800m to 4,000m on a gross total area of 50,677 square kilometers, 43,948 net to Eni.

PROJECT LOCATION

The proposed project site will be located at coordinates 351466.44 m E and 9795659.73 m S, it is within the Agriculture Training Centre (ATC), in Kwa Kathoka, Mufau Kikumini ward,Makueni/Kathonzweni Sub county in Makueni County. The total area that the Agricultural Hub will occupy is 3.362 acres. The site is situated in a rural area called Kwa Kathoka. Kwa Kathoka area is dominated by mixed sparse agricultural (crop and livestock production) land use. There are mixed land use of a commercial and resdential at Kwa Kathoka market center which is about 0.63 km from the project. At the center there are shops, dispensery, a police station and schools. Wote-Makindu road is about 1km from the site connected by a earth road that is motorable but dusty in dry season.

The current land use land cover at the site is a bush land at the site dominated by shrubs and a few trees. To the west within the broader of ATC land there are conference facilty/training center, admnistration offices, fruit collection centre and various agricultural demonstration fields/plots and fish production demonstration facility. There is an agricultural mechanization center south of the site and futher south its bordered by farms and residence. The north of the site is also dominated by farmlands and homesteads.

Figure 0-1: Map of Project Area



ESIA STUDY OBJECTIVES

The purpose of this study was to undertake an Environmental and Social Impact Assessment study for the proposed construction and operationalization of a mechanical oil extraction plant from plant seeds. The ESIA study has been developed in compliance with the Environmental and Social Impact Assessment/Audit Regulation, 2003. The purpose of an ESIA is to provide information to regulators, the public and other stakeholders to aid the decision-making process. The objectives of the ESIA are to:

- Define the scope of the project and the potential interactions of project activities with the environment (bio-physical and socio-economic).
- Identify relevant national and international legislation, standards, and guidelines and to ensure that they are considered at all stages of project development.
- Provide a description of the proposed project activities and the existing environmental and social conditions that the project activities may interact with.
- Predict, describe, and assess impacts that may result from project activities and identify mitigation measures and management actions to avoid, reduce, remedy, or compensate for significant adverse effects and, where practicable, to maximize potential positive impacts and opportunities.
- Provide a plan for implementation of mitigation measures and management of residual impacts as well as methods for monitoring the effectiveness of the plan.

ESIA METHODOLOGY AND APPROACH

The approach taken in this study is guided by the principles of integrated environmental management. The approach is therefore guided by the principles of transparency which is aimed at encouraging decision making. The underpinning principles of integrated environmental management are:

- Informed decision making;
- Accountability for information on which decisions are made;
- Consultation with stakeholders;
- Due consideration of feasible alternatives;
- An attempt to mitigate negative impacts and enhance positive impacts associated with the proposed project;
- An attempt to ensure that social costs of the development proposals are outweighed by the social benefits;
- Regard to individual rights and obligations;
- Compliance with these principles during all stages of planning, implementation and decommissioning of the proposed development; and
- Opportunities for public and specialist input in the decision-making process.

The study has also been guided by the requirements of the EIA Regulations set out in terms of the Environment Management and Coordination Act, 1999 and (amendment) 2015. The ESIA has also been developed in Compliance with Eni Technical Guideline AMTE-TG 002 Environmental, Social and Health Impact Assessment in Exploration.

a) Literature Review

Numerous literatures were reviewed as part of the ESIA study and included policy and legal related secondary data as well as non-statutory literature. A number of documents were reviewed including: -

- Relevant project area baseline biophysical and socio-economic documents
- Detailed design report

b) Field Site Surveys and Stakeholder Consultations

Field site surveys formed part of the preparation of the ESIA report. The main objective of this activity was to carry out on-site field assessments of the expected effects of the project on the physical, biological, and socio-economic environment. During these site surveys, consultations with key informants and the project affected persons and other interested stakeholders were conducted using a variety of appropriate tools. Direct observation was also used as a technique.

PROJECT ACTIVITIES

The proposed works associated with the construction and operationalization of the mechanical oil extraction plant will include the following activities:

1. Site preparation (clearing)
2. Excavation works
3. Construction works
4. Electrical works
5. Mechanical works
6. Extraction of oil, storage, and shipment

Public Consultations

Stakeholders were identified, mapped, and consulted as part of the ESIA study in accordance with the NEMA's EIA/EA regulations (2003) which require public consultations during ESIA preparation. The consultations targeted communities who were in the project Area of Influence (AoI) and hence likely to be direcly or indirectly affected adversely by the project. Consultations also targeted key institutions in the national and county governments who were identified to have a stake or interest in the project. **Tables 0-1** below shows the dates, venues and number of stakeholders consulted.

The key issues and concerns emanating from the consultations are highlighted below and were incorporated in the ESIA in relation to mitigation measures.

- Waste Management during construction and operation
- Community Health and safety during construction and operation
- Noise pollution during construction
- Air emission impacts during construction
- Price of feedstock supplied
- Interference by brokers (middlemen)
- Infestation of proposed crop (castor) has leaves that at times are affected by pests which affect small stock (goats) when ingested.

- Employment procedure for local community members
- Assurance of market for feedstock by Eni Kenya B.V.

Table 0-1: Dates, Venues and Number of Stakeholders Consulted

Consultations Venues, Dates and Number of Participants				
DATES	**VENUE**	**NO. OF PARTICIPANTS**	**MALE**	**FEMALES**
24th August 2021	NEMA County Office-Wote	03	03	00
24th August 2021	Makueni County Commissioner's office–Wote	03	03	00
24th August 2021	Makueni County Director of Cooperatives office – Wote	03	02	01
24th August 2021	Makueni County-Chief Officer's Agriculture and Livestock office	03	03	00
24th August 2021	Kakueni County-Chief Officer's office – Environment	03	02	01
24th August 2021	Deputy County Commissioner's office – Makueni sub county	03	03	00
24th August 2021	Kikumini location chief's office	03	03	00
30th August 2021	Kambi Mawe Assistant Chiefs office – Public Baraza	34	24	10
01 September 2021	Mavindini Multipurpose Co-operatives Society	16	14	02
01 September 2021	Makueni Fruits Value Chain- Kathonzweni Church	20	14	06
01 September 2021	Makueni County Fruit Processors Co-Operative Society-Wote Catholic Church	14	12	02
02 September 2021	Malili-Kyale fruits farmers Co-operatives Society- Makindu	12	09	03
02 September 2021	Katika Joint Farmers' Co-operative Society-Kanzokea Chiefs Camp	10	07	03
02 September 2021	Kitise Farmers' Co-operative Society	14	10	04
03 September 2021	Ngwata Farmers' Co-operative Society	14	10	04
03 September 2021	Kamagro Co-operative Society	10	08	02

Potential Beneficial Impacts

The major beneficial long-term impact of the project will be during the operational phase from: -

- Employment: Farmers groups, cooperatives, industries which will be engaged in the supply of raw materials (seeds) will receive payment for their products and will in effect spur the local economy.
- Enhanced food security with rotational crops and valorization of agricultural residues that are not subtracting land already used for food production and provide additional revenues to farmers.
- Create access to market also for small farmers by creating aggregation and agro-processing hubs (oil extraction)
- Stimulate agro-industrial and small farming activities in areas not vocated to food production, guaranteeing access to land and land rights for rural communities
- Promote land restoration with agro-forestry activities and conservation of productive forests
- Environmental Benefits: The proposed project will contribute to reduction in Green House Gaseous (GHGs) emissions. Plants absorbs carbon dioxide from the atmosphere when its plant matter base (biomass) is grown. The carbon dioxide is then released back into the atmosphere when the fuel is burnt. The combustion of petrol and diesel produces many different types of local air pollutants. It is anticipated that bio-based fuels can provide an estimated 80% reduction in overall CO_2 life cycle emissions compared to fossil fuels.

Potential Negative Impacts and Mitigation Measures

The potential negative impacts during construction, operation and decommissioning are generally short-term, reversible impacts which can be reduced or eliminated by appropriate construction mitigation and application of best practice in construction and operation of the oil extraction plant. Many of the adverse impacts will only occur within the construction site footprint.

A summary of the results of the impact assessment is provided in table below. Table 0-1 illustrates the potential impact along with what the impact significance of the impact is before and after proposed mitigation measures. Mitigation measures that are included in this report are commitments which will be implemented by Eni Kenya B.V. (including contractors). The Environmental and Social Management Plan (ESMP) details roles and responsibilities that will be assumed by all the responsible agencies during project implementation phase. Eni Kenya B.V. has already acknowledged its commitments in this regard and have indicated that they also understand their responsibilities in this regard.

Environmental / social variable	Project activities/impacts	Phase	Predicted significance	
			Before mitigation	With mitigation
Air Quality	Road traffic exhaust emissions	Construction/Operation/Decommissioning	Negligible	Negligible
	Dust and PM10 from unpaved roads during construction activities	Construction/Operation/Decommissioning	Minor	Negligible
Noise emissions	Noise from construction activities affecting nearby dwellings	Construction/Operation/Decommissioning	Negligible	Negligible
Soil erosion and Contamination	Loss of soil resources due to erosion	Construction/Decommissioning	Minor	Negligible to minor
Surface and subsurface water	Availability and quality of water resources	Construction/Decommissioning	Minor	Negligible to minor
Flora and vegetation	Disturbance to vegetation during construction works	Construction/Decommissioning	Minor	Negligible
Fauna	Disturbance to fauna species and degradation to environment during construction	Construction/Decommissioning	Minor	Negligible
Solid and liquid waste	Release to environment	Construction/Operation/Decommissioning	Moderate	Minor
Landscape and visual amenity	Deterioration of visual amenity	Construction/Operation/Decommissioning	Negligible	Negligible
Worker's health and safety including child labour	Effects of workers health and safety and labour rights; and child labour impacts	Construction/Operation/Decommissioning	Moderate	Minor
Community health and safety	Community safety (road accidents, trespass,)	Construction/Decommissioning	Minor	Minor
	Environmental health (noise and air)	Construction/Decommissioning	Minor	Minor
Gender Based Violence	An influx of in-migrants may lead to Gender-Based Violence (Sexual Exploitation and Abuse and Sexual Harassment.	Construction/Decommissioning	Minor	Minor
Labour Influx	An influx of in-migrants may lead to Gender-Based Violence (GBV); Sexual Exploitation and Abuse (SEA): Sexual Harassment (SH), child labor etc.	Construction/ /Decommissioning	Minor	Minor
Unplanned events	Reduction in local soil/ground water quality	Construction/Operation/Decommissioning	Minor	Negligible
Archaeology and Cultural Heritage	Disturbance to grave sites during vegetation removal and construction activities	Construction /Decommissioning	Minor	Negligible to minor

Violence against Children	Recruitment of children under the age of 18 during construction (child labour).	Construction/Decommissioning	Minor	Minor
Employment and Job Creation	The construction including operation and activities will provide employment opportunities–directly and indirectly–to skilled as well as unskilled manpower primarily to local manpower. Farmers will also get gainful employment through payments made for seeds supplied.	Construction/Operation/Decommissioning	Positive	Positive
Economy and employment	Local employment opportunities, capacity building and economic development	Construction/Operation/Decommissioning	Positive	Positive
Environmental Benefits	The proposed project will contribute to reduction in Green House Gaseous (GHGs) emissions.	Operation	Positive	Positive

Table 0-2: Summary of the Results of the Impact Assessment

Key

Negligible	Impacts are expected to be indistinguishable from the baseline or within the natural level of variation. These impacts do not require mitigation and are not a concern of the decision-making process.
Minor/Low	Impacts with a "Low" significance are expected to be noticeable changes to baseline conditions, beyond natural variation, however well below the applicable standards (e.g., environmental quality standards, and are not expected to cause hardship, degradation, or impair the function and value of receptor. These impacts warrant the attention of decision-makers and should be avoided or mitigated where practicable.
Moderate	Impacts with a "Moderate" significance are likely to be noticeable and result in lasting changes to baseline conditions, which may cause hardship to or degradation of a receptor, although the overall function and value of a receptor is not disrupted. These impacts must be mitigated to avoid or reduce the impact.
Positive	Impact is positive (+ve); beneficial

EVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This ESIA includes an ESMP which details the mitigation measures, environmental monitoring activities, institutional responsibilities, and environmental management capacity building. The relevant ESMP provisions are included in bid documents for contractors. During construction, the project management team will closely monitor the works contractors' environmental performance and overall ESMP implementation.

Construction Environment and Social Management Plan

For an effective integration of environmental and social safeguards into the project implementation the Contractor will need to adopt this ESMP and prepare a comprehensive Construction Environment and Social Management Plan (C-ESMP) that will provide the key reference point for compliance.

Project Supervision Engineer

The Project Supervision Engineer will be required to recruit a qualified Environmental and Social Expert who will be charged with the responsibilities of supervision, review of site reports, preparation of monthly progress reports, prepare and issue appropriate instructions to the Contractor and monitor ESMP implementation.

Contractor

The Contractor will ensure that the established mitigation measures are integrated and implemented throughout the project works as per the C-ESMP. The Contractor will internalize the C-ESMP, prepare monthly progress reports and implement instructions issued by the Supervision Consultant.

National Environment Management Authority

The National Environment Management Authority (NEMA) is responsible for ensuring environmental compliance in the country and has offices in Makueni County with staffing who will further ensure that the ESMP is implemented as part of their mandate, functions, and responsibilities. NEMA will undertake surveillance on the project implementation and review compliance performance based on the supervision monitoring reports.

CONCLUSION

The anticipated benefits of the construction and operation of the Project are immense. All negative impacts can be effectively mitigated to negligible or minor level following the ESMP.

1 INTRODUCTION

1.1 Background of the Project

This Environmental and Social Impact Assessment (ESIA) report has been prepared for the construction and operation of a mechanical oil extraction plant from plant seeds (Agri Hub) in Wote, Makueni County, Kenya.

1.2 Project Proponent

Eni S.p.A. (Eni hereinafter) is an international integrated energy company, active in 71 countries in the world with a staff of over 33,000 employees. Eni is already operating in Kenya through its branch Eni Kenya since 2013. Eni S.p.A. has the mission to promote a more rational use of fossil sources and a greater recourse to renewable sources in compliance with the provisions of the Paris Agreement on Climate Change and, within this framework, is interested in building feedstock chains to supply its biorefinery system worldwide by applying its proprietary technologies, know-how and expertise in the refining processes and downstream products, and to develop new technological solutions aimed at increasing efficiency and sustainability.

The Mission Statement of Eni is below reported: We are an Energy Company. We concretely support a just energy transition, with the objective of preserving our planet and promoting an efficient and sustainable access to energy for all. Our work is based on passion and innovation, on our unique strengths and skills, on the equal dignity of each person, recognizing diversity as a key value for human development, on the responsibility, integrity, and transparency of our actions. We believe in the value of long-term partnerships with the countries and communities where we operate, bringing long-lasting prosperity for all.

Eni's strategies, resource allocation processes and conduct of day-by-day operations underpin the delivery of sustainable value to shareholders and, more generally, to all of stakeholders, respecting the Countries where the company operates and the people who work for and with Eni.

Eni's way of doing business is based on operational excellence, focus on health, safety, and the environment, and in the commitment to prevent and mitigate operational risks. Furthermore, Eni is a socially responsible actor and contributes to the economic development of the countries where it operates.

This approach is based on the respect of universal principles such as the protection of human rights, the adoption of the highest standards of work, the respect of the environment and communities. The respect for universal principles incorporated in Eni's business model is expressed mainly in responsibility towards applicable laws and the adoption of best standards, the inclusion of all its people through fair and non-discriminating policies, excellence in operations with the adoption of quality systems and advanced technologies.

Eni's Operations in Kenya

Eni's presence in Kenya goes back to 1960 with the creation of Agip Kenya, which was set up for the importation and distribution of petroleum products and by-products, nitrogen fertilisers and synthetic rubber. Eni has been operating in Kenya in the exploration and production sector, since June 2012, through its subsidiary Eni Kenya BV. Eni operates in three blocks in the deep offshore of the country, bordering on Somali waters, at depths

ranging from 2,800m to 4,000m on a gross total area of 50,677 square kilometers, 43,948 net to Eni.

1.3 Project Justification

Kenya ratified Paris Agreement in 2016 and recently updated its NDC commitment to a 32% reduction by 2030, up from its previous target of 30%. Biofuel development is supported by Vision 2030, Climate Change Act 2016 and Energy Act 2019, while no biofuel blending mandates are in place. Eni is developing natural resources in the Country. Eni is conducting a transformation to decarbonize its product portfolio by 2050. On December, the 18th 2020, the President of the Republic of Kenya and CEO of Eni met and decided to develop an initiative to make a decisive contribution to the country's decarbonization process. To support the development of a decarbonization policy for the country, it has been agreed to design a Master Plan with a long-term horizon (10-15years) leveraging on Eni proprietary technologies for circular economy. The success of this initiative might add on to the leadership that Kenya has already shown in areas as such as climate policy, clean energy, and green finance. In July, the 21st 2021 Eni and Governement of Kenya signed an Mou to jointly perform a feasibility study for the green initiative starting from the agriculture development.

Project Benefits

- Employment: farmers, farmers groups and cooperatives, large farmers in agri-business, agro industries will gain income by supply the feedstock.
- Enhance food security with rotational crops and valorization of agricultural residues that are not subtracting land already used for food production and provide additional revenues to farmers.
- Create access to market also for small farmers by creating aggregation and agro-processing hubs (oil extraction plant)
- Stimulate agro-industrial and small farming activities in areas not vocated to food production, guaranteeing access to land and land rights for rural communities (no land grabbing)
- Promote land restoration with agro-forestry activities and conservationof productive forests

1.4 Legal Framework

1.4.1 Kenyan Legal Framework

The principal national legislation governing issues of environmental concern in Kenya is the Environmental Management and Coordination 1999 and Environmental Management and Coordination (Amended) Act of 2015 typically referred to as EMCA. EMCA calls for Environmental Impact assessment (EIA) (under Section 58) to guide the implementation of environmentally sound decisions and empowers stakeholders to participate in sustainable management of the natural resources. Projects likely to cause environmental impacts require that an environmental impact assessment study to be carried out. It is under this provision that the current study has been undertaken. Other legislation adhered to during this study are the Environmental Impact Assessment and Audit Regulations 2003; Waste Management Regulations 2006; Water Quality Regulations 2006; Noise and Excessive Vibration Pollution Control Regulations 2009 (Legal Notice 61), Air quality Regulations 2009, Water Act (2016), Constitution of Kenya (2010), Public Health Act (CAP. 242), Employment Act (2007), Children's Act (2012), Sexual Offences Act (2006), Traffic Act (Chapter 403) among others.

1.5 Objective and Scope of ESIA

The purpose of this study was to undertake an Environmental and Social Impact Assessment for the construction of a mechanical oil extraction plant (Agri-Hub) from seeds. The ESIA study has been developed in compliance with the Environmental Impact Assessment/Audit Regulation, 2003. The purpose of an ESIA is to provide information to regulators, the public and other stakeholders to aid the decision-making process. The objectives of an ESIA are to:

- Define the scope of the project and the potential interactions of project activities with the environment (natural and social).
- Identify relevant national and international legislation, standards, and guidelines and to ensure that they are considered at all stages of project development.
- Provide a description of the proposed project activities and the existing environmental and social conditions that the project activities may interact with.
- Predict, describe, and assess impacts that may result from project activities and identify mitigation measures and management actions to avoid, reduce, remedy, or compensate for significant adverse effects and, where practicable, to maximize potential positive impacts and opportunities.
- Provide a plan for implementation of mitigation measures and management of residual impacts as well as methods for monitoring the effectiveness of the plan.

1.6 Report Structure

In order to provide clear presentation of the ESIA procedures including their results, conclusions and recommendations, this report is structured as follows:

Chapter 1. Project Overview	The chapter introduces the Project by providing details of its location, scope, owner, and developer.
Chapter 2. ESIA Methodology.	This chapter provides an overview of the overall process of environmental and social impact assessment and applicability of the international methodology for the ESIA procedure. The chapter further addresses definitions of key terms; identification of potential environmental and social impacts (through consultation and scoping process); description of the criteria used to determine the significance of impacts for various environmental and social topics; and how mitigation measures are considered within the assessment process.
Chapter 3. Project Description.	This chapter describes the background and phasing of the Project, including descriptions of the main and auxiliary facilities, infrastructure, associated facilities, as well as definition of the Project boundaries in the form of the Project area of influence.
Chapter 4. Policy Legal and Institutional Framework.	This chapter provides an overview of the national and international legal framework, within which the Project is to be developed and implemented. Environmental and social legal requirements of the Republic of Kenya is considered together.

Chapter 5. Baseline Environmental and Socio-Economic Conditions	The existing environmental and socio-economic baseline is described and characterized in this chapter.
Chapter 6. Stakeholder Engagement	This chapter describes the stakeholder engagement process adopted by the Project. It describes the results of consultation activities undertaken earlier and as part of the ESIA process.
Chapter 7. Analysis of Project Alternatives.	The key process solutions are presented as they are seen at the current stage of planning, alongside with considered alternatives and justification of the preferred alternative.
Chapter 8. Assessment of Potential Risks and Impacts	This chapter presents the assessment of potential environmental and socio-economic impacts, including identification of mitigation measures and monitoring requirements. Impacts of the Project are assessed for each component of the environment. Impacts during the Project implementation are assessed on a topic-by-topic basis. This chapter addresses potential cumulative impacts of the Project and other third-party economic activities in the region.
Chapter 9. Environmental and Social Management.	This chapter describes the approaches to environmental and social management across all Project activities and recommends the management procedures and plans to be adopted to ensure compliance with the applicable international requirements throughout the life of the Project.
Chapter 11. Conclusion	Provides summary of the key significant impacts, mitigations, and monitoring, as well as recommendations for further studies to remove uncertainties.
Chapter 12. Reference	
Chapter 13. Annexures	

1.7 Details of Proponent and Environmental and Social Assessment Team

Project Proponent

The proponent for the proposed Project is Eni Kenya BV. The contact details for the applicant are as follows:

eni kenya

Kenya Branch
Eaton Place, 5th Floor
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Fax: +254 709 993 272

EMC Consultants Limited is a provider of environmental and social consulting related services.

Name: Tito Kodiaga
Title: Principal & Team Leader
Company: EMC Consultants Ltd.

Address:
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P.O.Box 9648- 00100
NAIROBI, Kenya

Phone: +254- 020-520-6162
Cell: +722-579272
Email: info@emconsultants.org;
tito@emconsultants.org
URL: http://www.emconsultants.org

The study team presented in **Table 1-1** will undertake the ESIA.

Table 1-1: EMC Study Team

Position	Name	Qualifications
Lead Expert	Tito Kodiaga	Master's in environmental studies (planning and management)
Social and Stakeholder Engagement Expert	Dorothy Mbuvi	Masters in Sociology
Natural Resources Management Expert	Dr. Aggrey Adimo	PhD in Natural Resources

Source: EMC Consultants, 2021

2 ESIA APPROACH AND METHODOLOGY

2.1 ESIA Approach

The Project ESIA is intended to provide an accurate and comprehensive assessment of adverse impacts, benefits, and potential risks of the planned operations, and develop prevention, mitigation and remediation measures for the identified environmental and social impacts, as well as the approaches to monitor and control them.

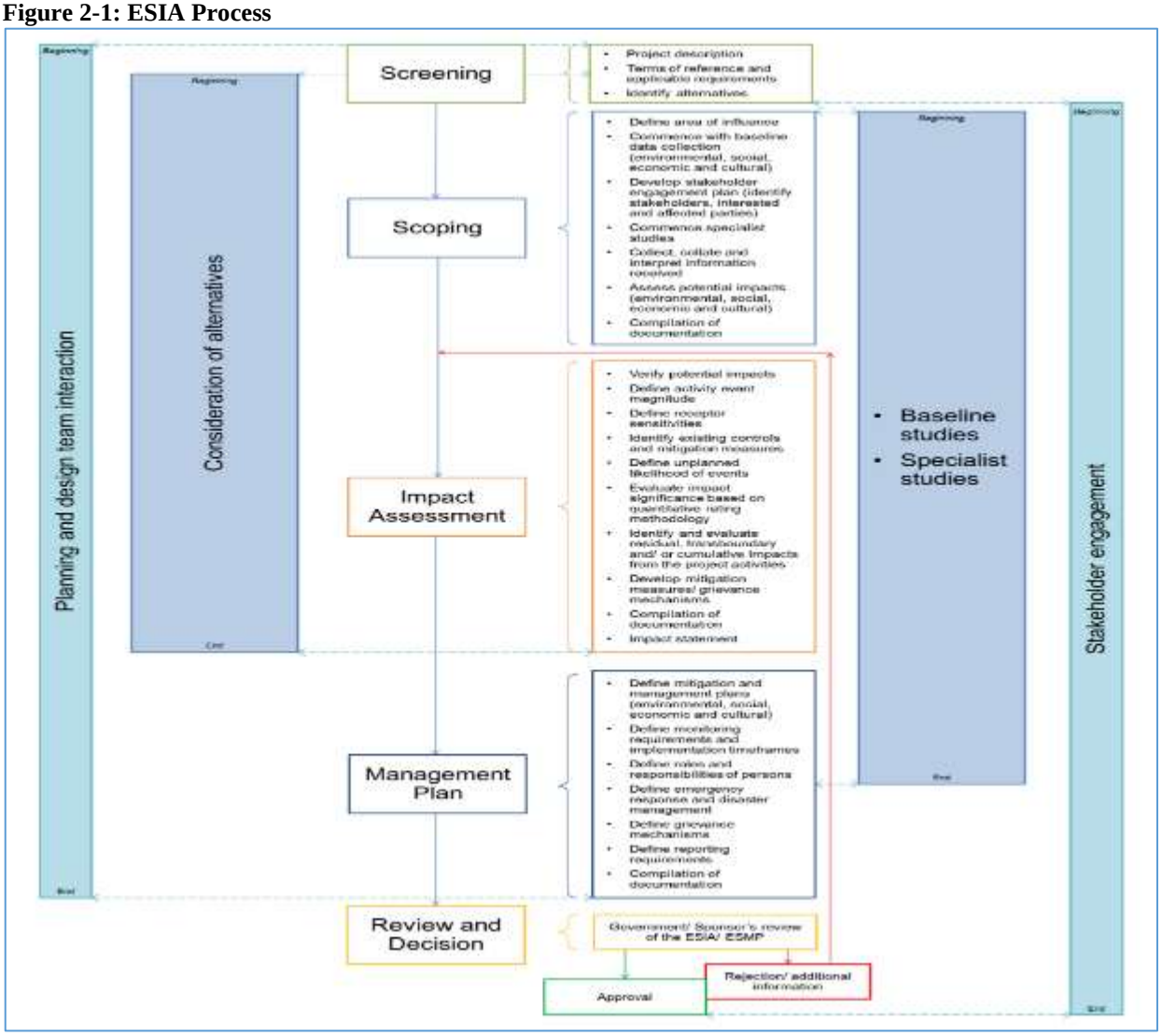
This chapter provides a structured description of the ESIA methodology including:

- Main stages of ESIA process
- ESIA scoping
- Baseline studies
- Impact identification and evaluation of significance; and
- Mitigation measures.

2.2 ESIA Process

To ensure a robust and comprehensive impact assessment, the ESIA process is structured around a series of progressive and iterative stages (Figure 2-1). Stakeholders, entities, and individuals responsible for development/implementation of the Project design, the ESIA team provide inputs to these stages. Public engagement is maintained at all stages of the ESIA process. This ESIA shall cover all required stages: from scoping, stakeholder identification and consultations, review of alternatives, identification and assessment of benefits and adverse impacts of the Project, to development of mitigation and remediation measures, and proposals for the control and monitoring to be undertaken.

Figure 2-1: ESIA Process



2.3 ESIA Scoping

Scoping of studies to be conducted for assessment of the Project impacts is a vital element of ESIA preparation. Scoping is the process of determining the content and extent of the matters that should be covered in the ESIA and associated documentation as well as identifies methods for assessment of impacts. The scoping process is intended to identify the types of the environmental and social impacts to be examined and documented by the ESIA, considering the most significant potential aspects and risks. The main objectives at the scoping stage are:

- Preliminary review (screening) of documents provided by the client regarding proposed operations and potential alternatives;
- Collection and high-level analysis of the available information of the environmental and social conditions at the Project site and wider area, and identification of the most sensitive (vulnerable) receptors;
- Identification of the applicable local and international requirements and standards;
- Identification of similar projects for benchmarking of the proposed operations;
- Preliminary identification of stakeholders and initial consultations with them; and
- Initial identification of the Project impacts.

2.4 Baseline Studies

Baseline studies are primarily undertaken at two key stages, i.e., scoping and impact assessment. However, as shown in Figure 2-1, they are an ongoing activity throughout the ESIA Process. During scoping work, relatively 'high-level' baseline data are required to assist identification of likely gaps and key impacts to be considered in more detail at later stages. Where gaps are identified between available baseline data and data required for the ESIA at the scoping stage, then additional surveys or studies are undertaken to collect the required data. The work included desk-based studies and the site visit conducted by environmental and social teams of EMC Consultants.

It is important to ensure that receptors are identified and analysed, and their sensitivity is determined during scoping and baseline studies. Receptors are environmental and social components that may be affected, adversely or beneficially by the proposed operations.

Three high-level categories of receptors can be identified:

- Environmental (such as air quality, water bodies, landscapes, terrestrial soils, marine sediments, etc.)
- Biodiversity and biological resources (such as habitats, species, and ecosystem services, for example, flood protection provided by nearby wetlands); and
- Social (such as residents of local communities, businesses, land and other resource users, cultural heritage resources).

Details of receptor categorization and the approach to assessment of their sensitivity to identified impacts are provided in Section 2.5.6.

2.5 Impact Identification and Evaluation of Significance

2.5.1 Identification of Impacts

The following approach supports identification of environmental, social, and cumulative impacts:

- Review of previous studies, surveys, impact assessments, environmental monitoring data in the proposed location area and associated facilities within the scope of the Project;
- Review of the design documentation, including potential alternatives, as well as characteristics of the proposed operations (separately for construction, operation, decommissioning) and associated activities which may cause environmental, social and human health impacts;
- Consideration of the local area development plans and strategic development programmes for the region;
- Review of applicable national and international requirements and standards, and requirements of the World Bank;
- Stakeholder consultation, including their input to identification, mitigation, and control of Project impacts. Stakeholder engagement should be initiated early in the Project, to ensure open access to all relevant information;
- "Source-Path-Receptor" Analysis. Potentially significant social and environmental impacts are also identified by structured analysis of potential sources of impacts, ways they can impact the environment and human health (e.g., direct impact or transport of pollution emissions/discharges in the environment), and sensitivity of potentially affected receptors.

Potential impacts on individual components of the environment are identified for all phases of the planned operations, and their magnitude is assessed.

2.5.2 Project Implementation Phases

A phase of any project is a period of time when certain activities are implemented that collectively shape a stage in the Project life cycle. The following phases are considered by the ESIA Report:

- Construction and commissioning
- Operation; and
- Decommissioning (including demolition/dismantling).

2.5.3 General Approach to Impact Assessment

An impact is any change to an environmental or social (including community health and safety) receptor, whether direct or indirect, expected to result from the construction, operation and decommissioning of a proposed Project. Impacts on individual receptors may be negative (adverse) or positive (beneficial). The actions undertaken to determine and evaluate the significance of potential project impacts is illustrated in figure 2-2 and involves four key steps:

- **Prediction:** What will happen to the status of specific receptors as a consequence of this Project (direction, extent, duration, reversibility)?
- **Evaluation of significance:** How significant is the impact? What is its relative significance when compared to other impacts?
- **Mitigation:** If there are impacts of concern (adverse), can anything be done to avoid, minimise, or offset the impacts? Or to enhance potential beneficial impacts? and;
- **Residual impact assessment:** After mitigation, are the impacts still of concern?

If yes, the process needs to be repeated at least once before the 'final' determination of residual impact significance occurs. A residual impact is the impact that remains following the application of mitigation measures. Once mitigation and enhancement measures are declared, the next step in the impact assessment process is to assign residual impact significance. This is essentially a repeat of the impact assessment steps discussed above, considering the assumed implementation of the additional declared mitigation and enhancement measures

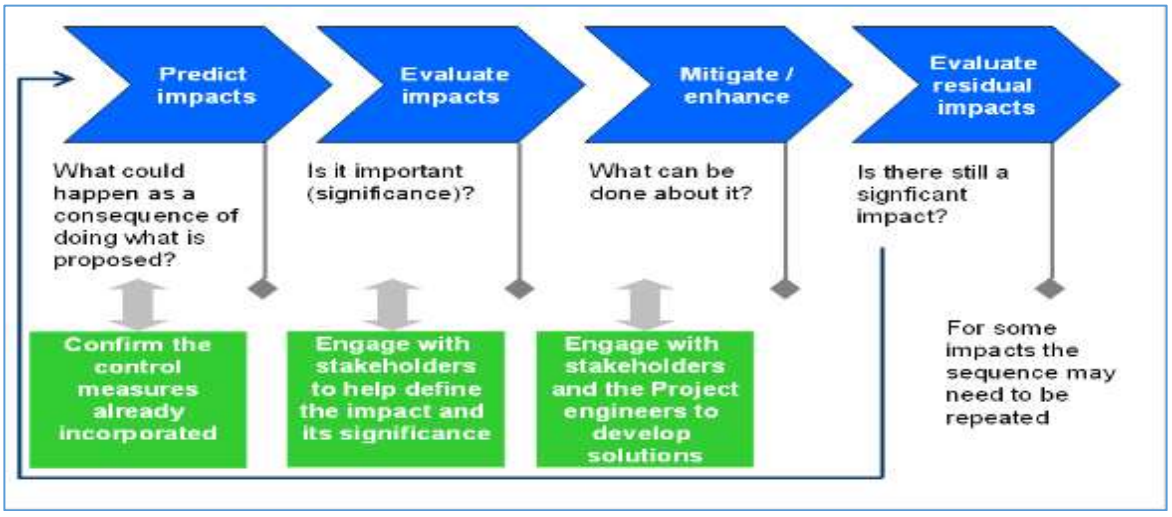


Figure 2-2: Impact Evaluation Process

2.5.4 Prediction

Impact prediction involves determining the magnitude or extent of a change or changes in the status of a receptor or linked receptors resulting from the planned operations, through application of forecast models, analysis of experience of similar operations, or environmental science. Impact prediction provides valuable information to determine the broader characteristics of impacts.

2.5.5 Impact Types

Impacts can be divided into types, and exhibit a number of characteristics. The degree to which an impact may be managed or modified by the mitigation measures is dependent upon the impact type and its characteristics. Table 2.1 provides definitions of key impact types. All of these impact types exhibit certain characteristics in terms of:

- Reversibility;
- Extent;
- Duration; and
- Frequency.

Table 2-1: Classification of Project Impacts

Classification of Impacts	Definition	Characteristics
By overall effect	Beneficial	Impacts expected to result in positive changes at the identified receptors
	Adverse	Impacts expected to result in negative changes at the identified receptors
By origin	Direct	An impact that results from a direct interaction between a planned activity and the receiving environment (receptors)
	Indirect	An impact that follows on from the primary interactions between the Project and its environment as a result of subsequent interactions within the environment (e.g., increased demand for resource as a result of workforce drift to the area of planned activities from other regions, or feedback effects in ecosystems affected by direct impacts)
By the nature of secondary effects	Cumulative	Project impacts which may be amplified if combined with impacts caused by third party operations (projects) on the same resources and/or receptors

Cumulative impacts include impacts on the receptors identified for the Project, as well as other existing, planned or reasonably defined projects (in the studied area) and activities which are not directly related to the Project and its associated facilities. The approach to assessment of cumulative impacts is provided in Section 2.7.

2.5.6 Evaluation of Significance: Planned Events

Impacts significance is assessed in this Report using the qualitative, and where possible quantitative methods applicable for major project ESIAs. The quantitative methods provide an outlook of the measurable changes induced by the Project, based on available design documentation or experience of similar facilities. Quantitative assessment of the Project impacts on receptors can be also provided using the official Kenyan methodologies for estimation of potential damage which may be caused by specific impacts.

The qualitative methods are based on expert estimations, experience of other projects of similar nature and scale, and follow a structured format to produce consistent and logical projections. It should be noted that environmental impacts are sometimes difficult to

evaluate in quantitative terms, due to their intangible nature (e.g., emotional impacts or sensitivity), or due to interrelation of the change and specific local situation (e.g. scale of migrant inflow compared to the baseline population).

The impacts are assessed in a structured and coordinated manner throughout the ESIA process. The approach adopted enables attribution of potential impacts to specific environmental and social aspects. For adverse impacts, significance is assigned based on determining impact magnitude and receptor sensitivity, after which mitigation is identified depending on impact characteristics.

Beneficial impacts are identified, assessed, and evaluated, making use of impact magnitude (as per the guidance below), but not receptor sensitivity. Instead, beneficial impacts are described and evaluated based on available data, alignment with government policies/targets, stakeholder inputs and professional expert judgement. Measures to enhance them will be identified to try to maximize the expected benefits.

The magnitude of an impact is a measure of the scale of a change from baseline conditions for a receptor. This measure of change can be described by considering the following criteria in combination:

- **Reversibility:** Restoration of the pre-impact status of a receptor.
- **Extent:** Spatial extent (e.g., pollution dispersion or habitat impacted) or population/community extent; and
- **Duration:** Period of time over which an impact will interact with a receptor. This factor may also cover the frequency and regularity criteria, or they can be considered separately.

The magnitude of each impact is assessed using the above criteria and the characteristics provided in **Table 2-2.**

Table 2-2: Description of impact criteria

Criterion	Description	Definition
Reversibility	Irreversible	Impacts that cause a permanent change in the affected receptor
	Reversible	Restoration of the pre-impact status of a receptor due to mitigation/reinstatement measures and/or natural recovery. Duration of an impact and a subsequent recovery period should be considered
Extent (spatial)	Site	Within the boundaries of land and water area allocated for the Project and associated use-restricted zones (sanitary protection, security, etc.)
	Local	Within the boundaries of local municipality
	Regional	Within the boundaries of a region, territory, republic
	National	Impacts that affect more than one region or constituent entities of Kenya's water flows/bodies of national significance
	Transboundary	Impacts that affect receptors beyond the boundaries of the country in which the project is located and producing transboundary/ global effects (e.g. impacts of greenhouse gas emissions)
Duration	Short-term irregular or occasional	Impacts caused by short-term single or recurrent events
	Mid-term regular or associated with	Impacts with duration equal or nearly equal to that of certain activity or a phase of the planned operations

	a phase of activities	
	Long-term	Impacts with duration equal or comparable to the Project lifetime. Impacts of this category may cease after completion of Project activities

Assessment of duration of an impact also considers its frequency (e.g. single, rare, periodic, and constant) for a more detailed characterization of duration of time when impact is felt. All characteristics listed above are factored into the assessment of impact magnitude.

Table 2-3 provides generic criteria to be used to determine the impact magnitude. Taking the results derived from the previous step a decision can be made on impact magnitude (negligible, low, moderate, high). Discipline specific criteria have been determined if appropriate and presented in Chapters 8 and 9, respectively.

Table 2-3: Impact Magnitude

Impact	Criteria
Negligible	No persistent discernible impact. The change is essentially indistinguishable from natural background variation.
Minor	Limited impacts that can be identified by the available means of monitoring, with no effect on functions of ecosystems and communities **Extent:** Local **Duration:** Short / medium term **Reversibility:** Reversible
Moderate	Noticeable impacts which may result in quantitative changes in ecosystems, however without their quality transformation, and without loss (partial or complete) of their natural functions. **Extent:** Local/regional **Duration**: Medium/long term **Reversibility:** Reversible/irreversible
Major	Prominent impacts that may result in temporary or permanent transformation of ecosystems, with loss of their functions, and transformation of communities' lifestyle and quality. **Extent**: Regional/national/transboundary **Duration:** Medium/long term **Reversibility**: Reversible/irreversible

Once the respective magnitudes of each impact have been allocated the next step is to determine receptor sensitivity. Receptor sensitivity is based on two components: the degree to which a receptor is resilient to a change and the value attributed to the receptor by stakeholders or applicable regulations/policies.

Receptor resilience takes into consideration not only activity-receptor-impact pathways, but also the characteristics of a receptor that might make it more or less resilient to change. As such, a receptor can be considered as existing within a spectrum of 'vulnerable' to 'resilient'. Receptor value considers importance represented by conservation status, socio-cultural importance and/or economic value. Certain receptors are deemed to be of greater importance than other receptors.

The final step is to combine the impact magnitude and receptor sensitivity results to determine impact significance in relation to its receptors. For known (planned) impacts, significance is determined by their intensity, based on the impact magnitude and sensitivity of the receptor. For example, an impact of low magnitude affecting a receptor of moderate

sensitivity is an impact of low/moderate significance (the actual significance determination -low or moderate-in this case can be made by the ESIA team) or an impact of high magnitude affecting a receptor of moderate sensitivity results in an impact of high significance. **Table 2-4** provides an account of the key features (definitions) of each of the impact significance classifications (from Not Significant to High); specifically linking them to need for mitigation measures.

Table 2-4: Impact Significance Matrix

		Receptor Sensitivity			
		Negligible	**Low**	**Moderate**	**High**
Impact Magnitude	Negligible	Not Significant	Not Significant	Not Significant	Not Significant / Low35
	Minor	Not Significant	Low	Low / Moderate	Moderate
	Moderate	Not Significant	Low / Moderate	Moderate	High
	Major	Low	Moderate	High	High

Definitions of the above significance ranks adopted in international ESIA practice are provided in **Table 2-5.**

Table 2-5: Project impacts ranking by significance

Impact Significance	Description
Negligible	Impacts are expected to be indistinguishable from the baseline or within the natural level of variation. These impacts do not require mitigation and are not a concern of the decision-making process.
Low	Impacts with a "Low" significance are expected to be noticeable changes to baseline conditions, beyond natural variation, however well below the applicable standards (e.g., environmental quality standards, and are not expected to cause hardship, degradation, or impair the function and value of receptor. These impacts warrant the attention of decision-makers and should be avoided or mitigated where practicable.
Moderate	Impacts with a "Moderate" significance are likely to be noticeable and result in lasting changes to baseline conditions, which may cause hardship to or degradation of a receptor, although the overall function and value of a receptor is not disrupted. These impacts must be mitigated to avoid or reduce the impact.
High	Impacts with a "High" significance are likely to disrupt the function and value of a receptor and may have broader systemic consequences (e.g., ecosystem or social well-being). They may also result in a failure to maintain adverse effects within the permissible regulatory levels. These impacts are a priority for mandatory mitigation to avoid or reduce the significance of the impact.

This method is applied at least twice: to both pre- and post-mitigation scenarios for all impacts identified. In general, residual impacts classed as "Not Significant" or "Low Significance" are not considered to be of concern for the assessment. For adverse impacts of "Moderate" and "High" significance, an iterative process is undertaken to further investigate opportunities for mitigation, according to the hierarchy above.

Where the significance cannot be further reduced, an explanation is provided of why further reduction is not practicable. Monitoring may be required to confirm the measures used to mitigate adverse impacts are working properly and that the impact is not worse than predicted. Monitoring requirements are presented in Chapters 8 and 9.

2.5.7 Risks and Unplanned Events

Where there is uncertainty about occurrence of an event (e.g. intrinsically occasional event during normal operation and/or where impacts are caused by unplanned/emergency situations), the magnitude of risk associated with such event is determined as a function of its occurrence probability and intensity of potential impact. Probability criteria applicable to this ESIA are described below **(Table 2-6).** They are set for the whole ESIA process and are equally applicable to all types of impact.

Table 2-6: Risk Occurrence Criteria

Likelihood	Qualitative assessment of impact / event probability
High	Impacts/events which are observed in the sector (studied operations or region) and reoccur more than once a week
Moderate	Impacts/events regularly observed in the sector and region, including seasonal cycling, which can be considered as very likely for the design lifetime of the planned operations
Low	Impacts/events which are rarely observed in the sector and region, or regularly observed in other sectors. These would generally occur 1 to 2 times per year
Not significant	Impacts/events that have never been observed in a wider range of sectors or in the region. Impact/event which can be considered as unlikely for the design lifetime of the proposed operations

The criteria of general risk/impact (change) occurrence risk are shown in **Table 2-7**.

Table 2-7: General risk / event occurrence risk criteria

	Impact intensity			
	Not significant	**Low**	**Moderate**	**High**
High	Insignificant	Medium / Minor	Medium / high	Critical
Moderate	Insignificant	Minor	Medium	High
Low	Insignificant	Minor	Medium / minor	Medium / high
Not significant	Insignificant	Insignificant	Minor	Medium

Unplanned events will often result in a high impact significance, even with mitigation/remedial measures in place e.g., oil spills. In such cases, not only the specific measures must be in place to manage an unplanned event, but the probability has to be minimised to levels seen to represent good industry practice. In this table, unplanned events with high residual impact significance would need to be minimized to extremely unlikely ("Improbable") events. Sometimes, if such events can be assessed quantitatively, a special analysis of risks is required to define numeric value of the event probability. In this case the probability value should be less than $1x10^{6}$.

2.6 Impact Mitigation

Mitigation measures are developed as necessary or appropriate to minimize the risk intensity and/or impact probability, and therefore make the impact or risk less significant. Assessment of significance of potential impact/risk has been assessed during the ESIA process based on potential and residual impacts, using the criteria mentioned in Section

2.5.6. As part of the ESIA process, when adverse impacts are identified, measures for mitigation, minimization and control of risks, and monitoring of residual impacts are developed (as necessary or appropriate). A residual impact is the impact that remains following the application of mitigation measures. The process of identifying design controls and mitigation measures must follow the sequence of the mitigation hierarchy **(Figure 2-3)** which is widely regarded as the best practice approach to managing impacts.

First, efforts are made to avoid or prevent, then minimize or reduce adverse impacts. If the impact cannot be fully avoided by application of design controls, they are supplemented by further engineering measures for minimization and mitigation of the adverse impacts. These measures are supplemented by additional mitigation measures to be applied through the effective management of project-related activities during construction, operation, and de-commissioning. Any remaining residual impacts are then addressed via mitigation measures such as restoration and remediation (e.g., at the end of construction) and/or offsetting and compensation. The measures are developed and implemented in the same order as they are listed above.

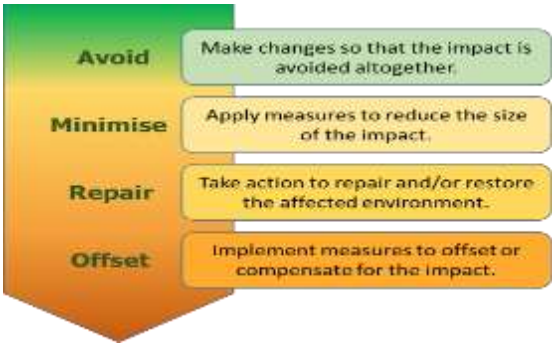


Figure 2-3: Mitigation Hierarchy

Development of mitigation measures will be primarily focused on minimization of the impacts of "High" significance. However, where possible and appropriate, mitigations are also proposed for the impacts of "Moderate" and "Low" significance, in order to reduce environmental and social effects/risks to the lowest level.

2.6.1 Presentation of ESIA Results

The table below contains a form of a summary table which is designed to provide a visual presentation of the environmental and social impact assessment, including types of activities, impacts and their receptors, description of mitigations and assessment of the residual impact. A key to the alphabetical symbols of stages of the Plant Project, receptors sensitivity, impact significance and risk category is provided under the summary table form.

Table 2-8: Evaluation of impact significance: a form of a summary table

Impact	Direction	Receptor	Receptor Sensitivity	Stage	Impact significance	Risk Significance	Mitigation measures	Residual significance		
								Likelihood	Impact Rating	Risk Rating

Table 2-9: Impact Parameter

Parameter	Abbreviation	Description	Parameter	Abbreviation	Description
Stage	C	Construction	Risk	Cr	Critical
	O	Operation		H	High
	Cm	Commissioning		M	Medium
	DCm	Decommissioning		Mr	Minor
Recipient Sensitivity	H	High		I	Insignificant
	M	Moderate	Impact Significance	H	High
	L	Low		M	Moderate
	N	Negligible		L	Low
Sign	P	Positive		N	Insignificant
	N	Negative			

3 PROJECT DESCRIPTION

3.1 Project Overview

The "Agri Hub" project aims at developing and deploying a first-of-its-kind facility for the extraction of oils from plant seeds to be used as feedstock for bio-refineries. The project will be developed by Eni Kenya B.V., a company fully owned by Eni SpA. The Agri-Hub will process various seed types in two physically separated treatment and extraction lines, each one with a nominal crushing capacity of 1000 kg/h seeds at press inlet.

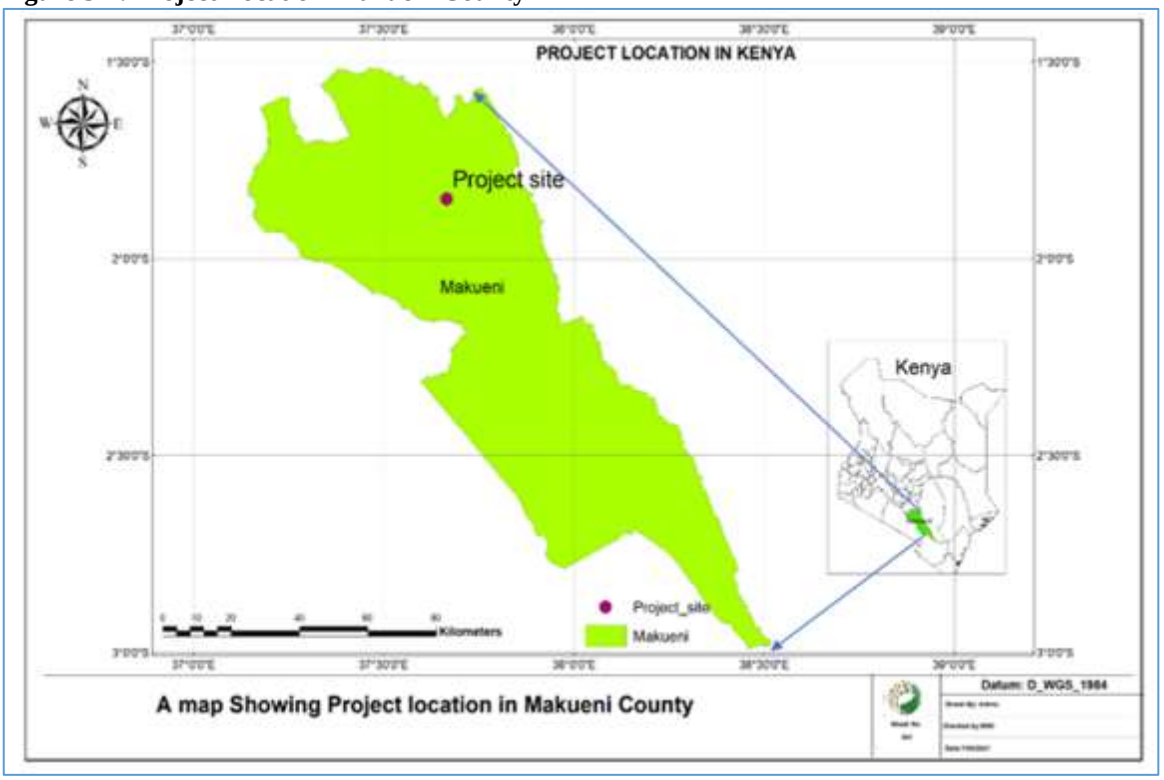
1. Multiseed line (line 1): 1000-2000 kg/h extraction line capable to process mainly cottonseed and croton, plus a minor contribution of rapeseed, brassica carinata, camelina sativa (one seed type at a time).
2. Castor seed line (line 2): 1000-2000 kg/h hot extraction line (without use of steam) capable to process castor seed.

The extracted oil will be cleaned, stored, and then exported by tank-truck to Mombasa for shipping overseas. The cake from the multiseed line will be utilized as animal feed and the one from the castor line as organic fertiliser for use in agriculture.

3.2 Project Location

Makueni County is a county in the former Eastern Province of Kenya. Its capital and largest town is Wote. The county has a population of 987,653 (2019 census). The county lies between Latitude 1º 35´ and 32 00´ South and Longitude 37º10´ and 38º 30´ east. It borders Machakos to the North, Kitui to the East, Taita Taveta to the South and Kajiado to the West and covers an area of 8,008.9 km^2. The project area coordinates are in UTM WGS84 Zone 37s.

Figure 3-1: Project Location-Makueni County



3.3 Site Location

The proposed project site is located at coordinates 351466.44 m E and 9795659.73 m S, it is within the Agriculture Training Centre, in Kwa Kathoka, Mufau Kikumini ward, Makueni/Kathonzweni Sub County in Makueni County. The total area that the Agricultural Hub will occupy is 3.362 acres.

Figure 3-2: Site Location

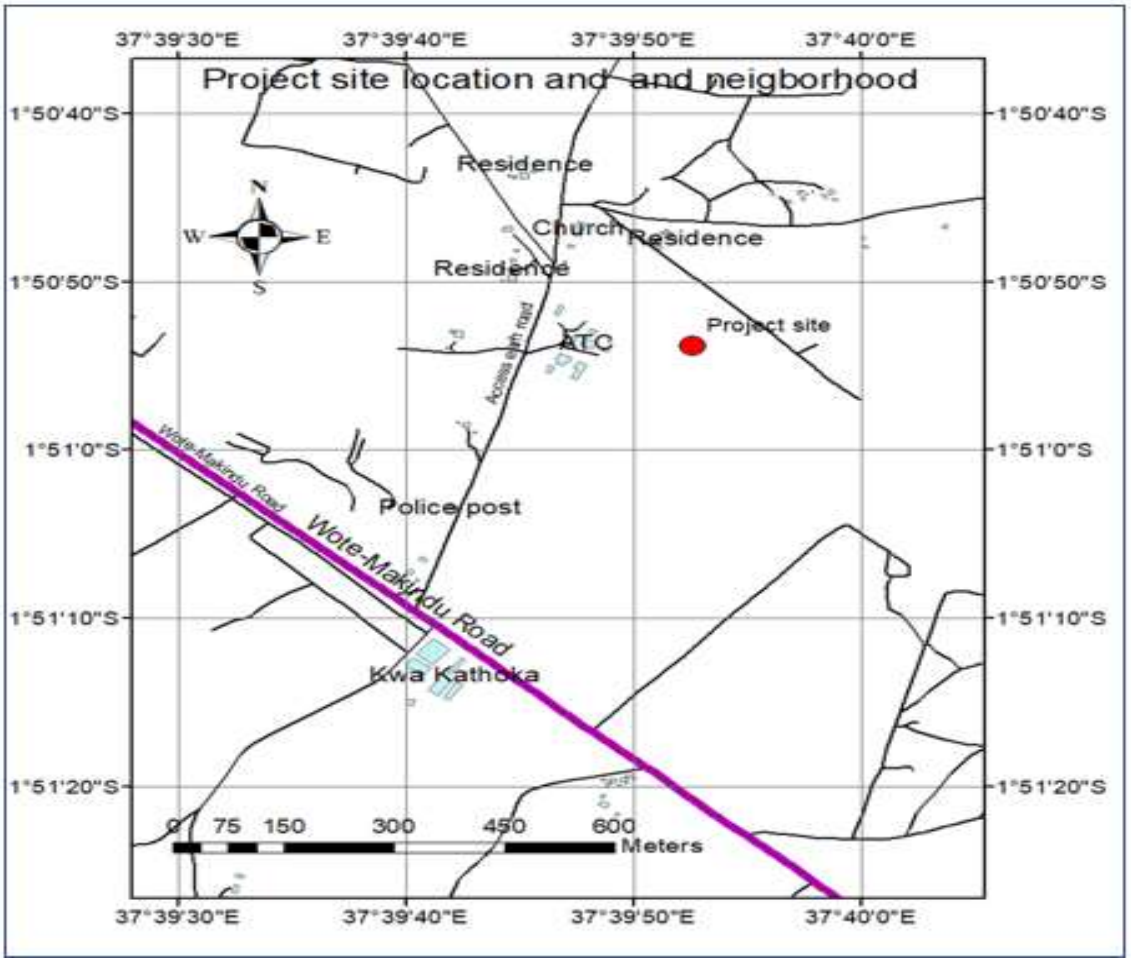


Table 3-1 and **Figure 3-3** below gives the coordinates of various points taken around the boundary of the property.

Table 3-1: Site Coordinates

Area		**1.360 HA (3.362 Acres)**		
Corner coordinates UTM WGS84 Zone 37s		Northing	Easting	Altitude
	FC4	9795790.051	351432.413	1148.069
	B5	9795673.259	351553.341	1143.071
	B9	9795614.064	351492.836	1142.874
	FC1	9795628.397	351424.848	1147.987
	FC2	9795686.758	351439.213	1147.928
	FC3	9795698.867	35395.439	1148.508

Figure 3-3: Project site with coordinates

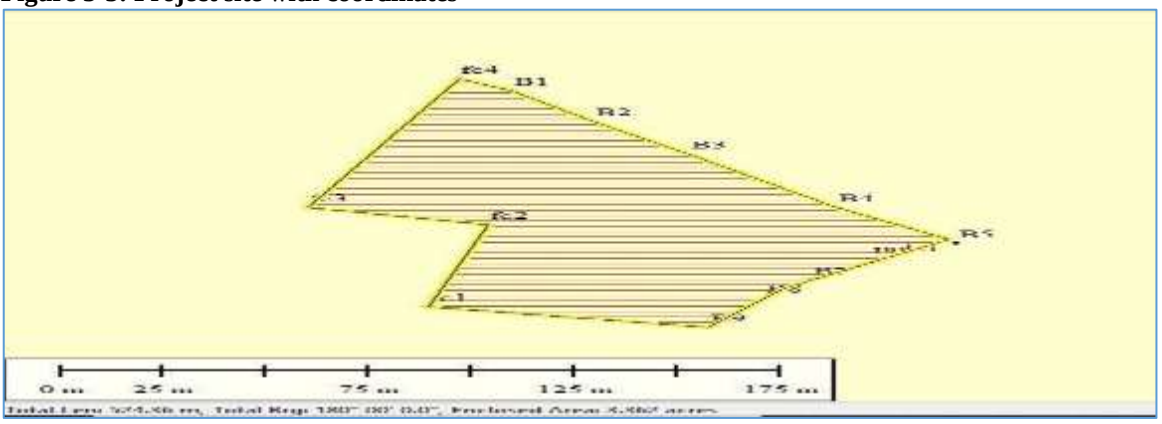


Figure 3-4: Photo of Project Site

3.4 Project Components

Mechanical extraction of the oil will be accomplished by exerting sufficient force on confined seed. Under this condition pressure is high enough to rupture the cells and force oil from the seed to "escape." Extraction is accomplished by compressing the material in a container that has small perforations, either round or slotted, that allow the liquid component to leave.

3.4.1 Processing/Extraction Facility

3.4.1.1 Plant Description

The seed oil extraction plant is divided into six main sections of 2 lines each as outlined below:

1. Seed receiving
2 Seed cleaning
3. Seeds Storage
4. Oil extraction
5. Oil cleaning and storage
6. Cake management

The two lines (line 1, multiseed; the first line will process one seeds type at a time and is not intended to be operated with seeds mixture) and (line 2, castor seed) are physically separated inside the warehouse. The sections in the two lines have the same setup, except for the delinter in the cleaning section and the dehullerin the extraction section of line 1.

Table 3-2: Tentative area allocation for each plant section.

Plant section	Available area
Seed cleaning	360 m^2
Seed storage	260 m^2
Production line	360 m^2
Multiseed cake storage	70 m^2
Castor cake storage	270 m^2

3.4.2 Receiving

Seeds will be delivered to the hub both by truck and in jute bags (approx. 30 kg/bag), quality-controlled for acceptance, conditioned for the removal of foreign material (metals, stones) and moisture content and then stored into silos.

The two lines share the same receiving section and procedure except for the intake pit that is line specific. This section has the purpose of checking the seed quality and register the input seed quantity of the Agri Hub. The seed quality control will check the moisture and the foreign material content in the seed stock before the unloading pit. If the moisture and the foreign material content of the seed stock is below 10 wt% w.b. and 2 wt% respectively, the cleaning line is by-passed, and the seed will be directly stored in the silos.

The truck is weighted on a truck scale, a representative sample of the truck load is collected by the plant personnel and the seed quality (moisture and foreign material levels) are checked by the personal in the qualitycontrol shed. The requirement for the seeds to be accepted are:

- Foreign materials < 5 wt%
- Moisture < 15 wt%

The seeds that exceed these requirements will be rejected at the quality control section and the truck will be returned. The seeds that pass the quality control are then unloaded into a 30 m^3 seed intake pit and either directly sent to the appropriate silos (provided an appropriate quality of seeds) or to the pertinent cleaning section ofline 1, or 2 depending on the type of received seed.

Table 3-3: Equipment of the receiving section

Equipment	Notes	Capacity
Intake pit	Bucket elevator to load the seed to cleaning line inlet	Approx. 30 m^3

3.4.3 Cleaning

The cleaning section is for both line 1 and line 2 and include:

- In line magnetic separator to remove metallic bodies.
- Vibrating sieve to remove foreign materials (straw, plastics, wood, etc);destoner to remove heavy particles.
- Delinter (solely for cotton seeds; seed transfer line shall allow to bypass the delinter when operating with other seeds)
- Dryer (either batch or continuous drying systems can be accepted, provided the required minimum through put is guaranteed).

The seed cleaning section aims to reach a maximum foreign materials content of 2 wt% and a moisture content below 10 wt% (ideally 7-8%); the seed cleaning section shall be equipped with an air-extraction and dedustingsystem. The seed cleaning section is meant to operate batchwise, with single seeds. The necessary heat for the dryer will be provided by a diesel burner. The seeds will be stored in silos with a volume of 450 m^3 each with a moisture level between 8–10 wt% w.b.

Table 3-4: Equipment of the cleaning section

Equipment	Notes	Capacity
Magnet	• To remove metal impurities and preserve the downstream equipment	• Approx. 13 t/h
Vibrating sieve	• To remove impurities from the seeds • The vibrating sieve type has the smallest footprint, but other sieving machine will be taking into account • A sieving machine with dust removal is preferred (i.e cyclone addition) • Possibility to process different seeds changing sieve mesh size	• Approx. 13 t/h
Destoner	• To remove heavy particles (metal and stones)	• Approx. 13 t/h
Dryer	• The seeds are expected to arrive dry; the dryer has to be considered as an optional equipment and shall be quoted as such.	• Approx. 24 t/day
Exhaust air treatment	• Cyclones and bag filter (different arrangement can be accepted) for the treatment of the exhaust air from the cleaning section	• tbd

3.4.4 Storage

Cleaned seed are conveyed to an external storage area formed by sheet metal silos, seed conveyors and elevators. The seed are then transported to the extraction line working in continuous mode 24 hours per day. The storage section is composed of an intake pit for the direct truck unloading, in case of cleaning section by-pass. The volume of the pit is 30m^3 intended for the direct loading of the silos using a bucket elevator and a set of screw conveyor. After the cleaning line, the seeds are sent to the same silos for the storage using another bucket elevator.

Table 3-5: Equipment of the storage

Equipment	Notes	Capacity
Intake pit	• Bucket elevator to load the silos filling system	Min 30m^3
Storage silos	• Hopper silos	Approx. 1800 m^3

3.4.5 Oil Extraction

Line 1 is equipped with a double pressing with extrusion to handle oil seed with high oil content (>25%, like rapeseed and croton), but the pre-pressing stage could be bypassed when cotton seed are processed due to their low oil content (i.e., <25%). Both extraction lines shall not use steam or diathermic oil to heat the seed (i.e. no steam cooker). The oil extraction line must have a minimum oil extraction efficiency of 85%. Before the screw press, the seeds pass through a flow scale to measure the amount of feed that flow into the pressing machine.

Table 3-6: Equipment of the oil extraction

Equipment	Notes	Capacity
Dehuller & Shell separator	• To remove the seed hull of the cottonseed, to increase oil yield	1-2 t/h
Continuous oilseed weighing	• To measure the amount of seeds passing through • To measure the product yields	tbd
Screw pre-press	• If necessary for oilseed with high oil content (>25%) • Possibility to bypass the item when the line is fed withcottonseed	1-2 t/h
Extruder	• For thermal and physical conditioning of the seed	1-2 t/h
Screw press	• For final pressing	1-2 t/h

3.4.5.1 Oil Cleaning

The oil coming out of the screw press is collected in a settling tank, filtered, and then stored in a tank of 75 m^3.

Table 3-7: Equipment of the oil cleaning section

Equipment	Notes	Capacity
Settling tank	• To separate larger particles, if not already present in the press	Tbd
Filtration unit	• Automatic filtration is preferred (vertical leaf filter instead of filter-press). In case of non-automatic filtration, the nominal manpower allocation for filter operation should be stated.	Tbd
Loading station	• To load the tank truck Loading arms	1 h max filling time

3.4.6 Oil and Cake Management

Oil cleaning and cake management sections share the same layout for both lines but are segregated. The oil is settled and then filtered in order to be stored for a period of approximately 7 days (75 m^3 net storage capacity for each line). Depending on the size of the cake at the press outlet, a feed mill (cake grinder) has to be considered. The cake in line 1 shall then be packed in 25 kg plastic bags with a semi-automatic packaging machine, the bags are then stored in the warehouse for maximum one week. The same packaging method shall be used on the cake from line 2 and the bags shall be stored in an external covered area.

Table 3-8: Equipment of the cake management

Equipment	Notes
Cake cooler	• Dust management shall be included
Cake grinder	• Optional item, if press cake breaker provides large cake size, not suitable for animal feed. • Dust management shall be included
Packaging machine	• Electronic bagging machine
Conveyor belt	• To transport the bag in the storage area
Pallet wrapping machine	• Optional item, to be quoted as such.

Figure 3-5: Process Line 1

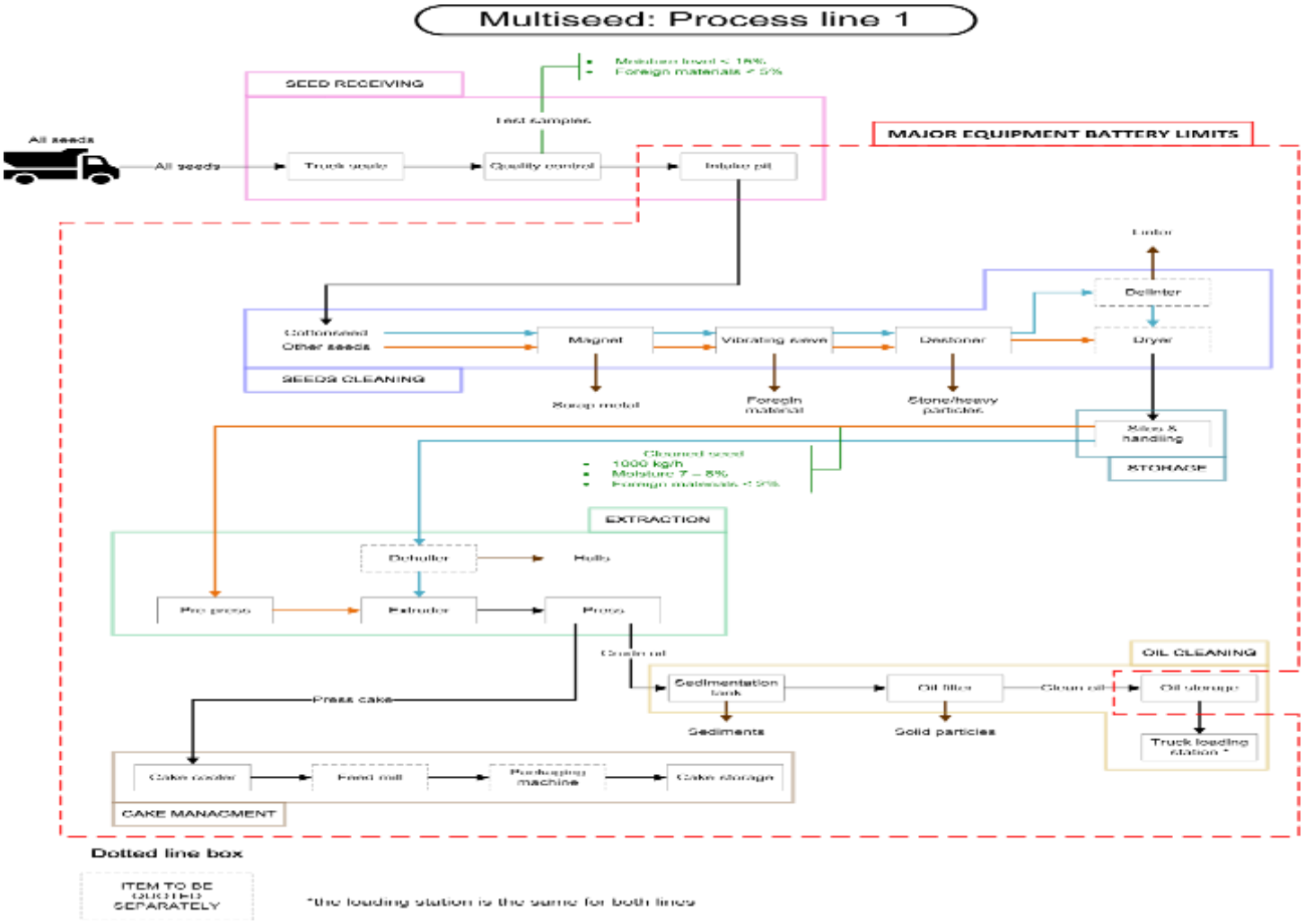
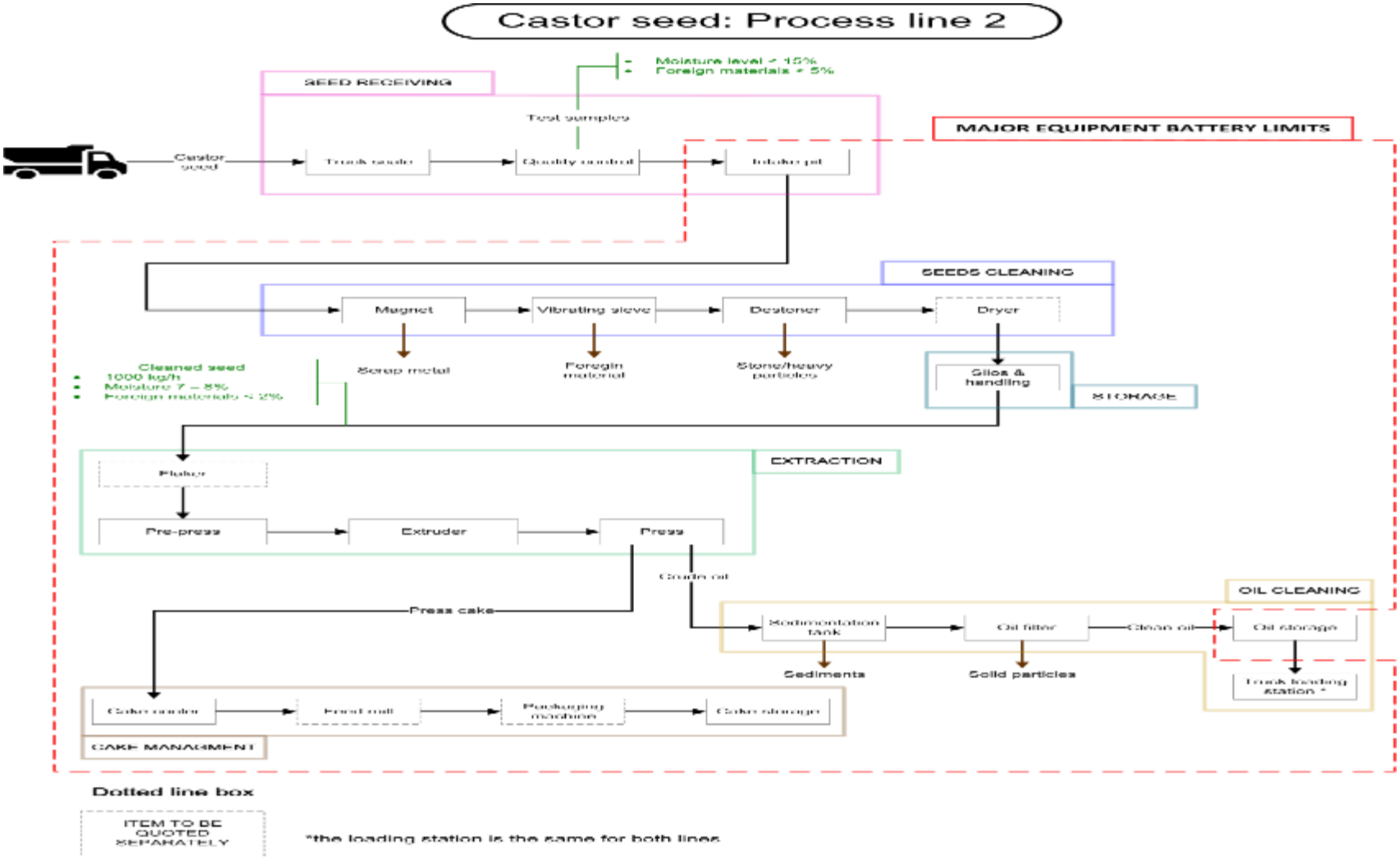


Figure 3-6: Process Line 2



3.5 Quality Criteria for Products

3.5.1 Cake for Animal Feeding

The cake characteristics shall be compatible with storage in plastic bag and use as animal feed, the values arethe following:

Table 3-9: Quality criteria for cake for animal feeding.

Parameter	UoM	Pressed cake value
Residual oil content	wt%	7 (+/- 0.5)
Moisture	wt%	10 maximum
Cake size	-	Suitable for bagging

3.5.2 Cake for Agricultural Use

The cake characteristics shall be compatible with storage in plastic bag and agricultural use, the values are the following:

Table 3-10: Quality criteria for cake for agricultural use.

Parameter	UoM	Pressed cake value
Residual oil content	wt%	7 (+/- 0.5)
Moisture	wt%	10 maximum

3.5.3 Oil

The oil characteristics shall be compatible with storage and freight shipping to the European Union (EU). Sedimentation and pumping problem should be avoided, and a minimal oil cleaning by means of an automatic filtration system is proposed. The preliminary set of quality parameters for the filtered oil, regardless of the origin, are reported in **table 3-11** below.

Table 3-11: Minimum oil quality criteria for Agri Hub project (applies to all seed).

Parameter	UoM	Filtered oil	
		Minimum value	Maximum value
Moisture	ppm	10000	
Impurities	ppm	10000	
Polyethylene	ppm	50	
FFA	wt%	35	
Phosphorous	ppm	400	
Total Metals	ppm	1000	1500
Fe	ppm	5	50
S content	ppm	100	
Cl	ppm	25-50	50
Nitrogen	ppm	150*	250*

***** 30% nitrogen abatement assumed on pretreatment plant, to be verified by laboratory tests.

3.6 Plant Capacity and Working Hours

Line 1 is expected to process mainly cotton seed provided by the local cotton industries, plus a small amount of other seeds when cottonseed is not available. The tables below report the estimated annual quantity of seed as received by the Agri Hub.

Table 3-12: Line 1 Multiseed expected annual share of seeds type

Seed type	Annual share of supply
Cottonseed	Prevailing seed supply
Croton	Secondary seed supply
Other seeds - *Rapeseed* - *Brassica carinata* - *Camelina sativa*	Marginal seeds supply

Table 3-13: Line 2 Castor expected annual quantity

Seed type	Expected annual quantity	Unit
Castor	6000	t/y

The required minimum plant capacity for each extraction line and the minimum plant availability at nominal capacity to be guaranteed by the technology supplier are reported in the tables below.

Table 3-14: Line 1 Multiseed minimum capacity and availability at nominal capacity

Parameter	Value	Unit
Process capacity	1000-2000	kg/h
Hours per day	24	h/d
Hours per year	7500	h/y

Table 3-15: Line 2 Castor minimum capacity and working availability at nominal capacity

Parameter	Value	Unit
Process capacity	1000-2000	kg/h
Hours per day	24	h/d
Hours per year	7500	h/y

3.7 Seeds Physical Characteristics

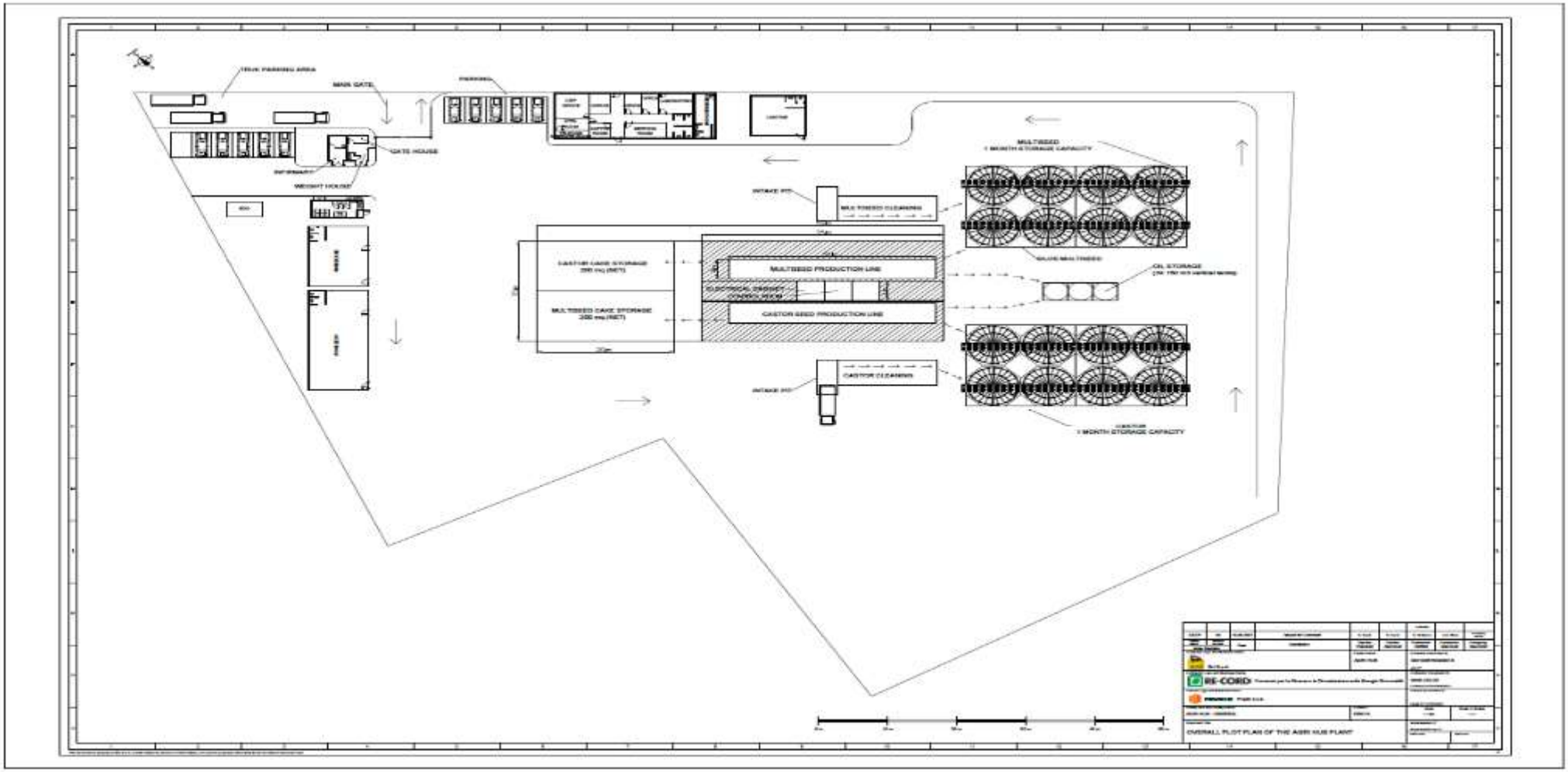
Table 3-16: Physical characteristics of seeds of interest (average values).

Seeds type	Bulk density [kg/m^3]	Average seed size [mm]	Angle of repose [°]
Cottonseed (delinted)	560	10x5x4	45
Rapeseed	640 – 680	Diameter 1.9 – 2.3	45
Camelina sativa	679	2x1.1x1	45
Brassica carinata	tbd	tbd	45
Castor	444	16x10x7	30
Croton	535 – 550	18x12x8	30

3.7.1 Process Control and Monitoring System

The plant control and management shall be fully automated through Distributed Control System (DCS) or integrated PLC with a SCADA system. Operator Control Station (OCS) shall be in a dedicated control room for the supervision control of the plant, using dedicate graphic pages. On-site staff will be available for process monitoring and possible intervention (each shift will guarantee the presence of the service team composed by 2 mechanics and 1 electrician and aides).

Figure 3-7: Facility Layout



3.8 Project Phase Activities

3.8.1 Planning (Pre-Construction Phase)

Activities during the planning (pre-construction) phase will include:

1. Detailed project design
2. Land lease

3.8.2 Construction Phase Activities

There will be several activities during the construction as outlined below.

3.4.2.1. Excavations

Excavations at the site will be undertaken using different equipment and machinery to enable the laying of foundation for the plant structure and other associated ancillary structures.

3.4.2.2. Civil, Mechanical and Electrical Works

Civil works will be undertaken as part of the construction of the plant followed by the electrical and mechanical works.

3.4.2.3. Installation Works

Installation works will be undertaken after the civil and electrical works are completed and will include the installation of the seed oil extraction equipment.

3.9 Materials and Construction Equipment

The following equipment and materials will be required for use during the construction phase. It is expected that construction materials like cement, concrete, gravel, water, aggregate etc. will be sourced from local suppliers and will not require the need for opening material sites (quarries, borrow pits etc.). Other equipment including machinery, electrical wires etc. will be sourced locally or internationally.

Table 3-17: Material and Equipment

Equipment	Source
Trucks	Local and international suppliers
Excavators	Local and international suppliers
Cement	Local suppliers
Sand	Local suppliers
Concrete	Local suppliers
Aggregate	Local suppliers

3.9.1 Material Transportation

As some equipment and materials will be probably sourced outside Kenya, sea shipping or air shipping will be used to transport the equipment to the country. Once construction equipment and materials are present in Kenya, terrestrial shipping (road transport) will be used to convey the equipment to site from Mombasa to the project site.

3.10 Operation Phase

The operation phase will entail the processes described in section 3.4.5 to 3.6

3.11 Decommissioning Phase Activities

The decommissioning procedure will include site specific rehabilitation plan for the footprint of the project and will be executed by the Eni Kenya B.V. The decommissioning activities will include: -

- Dismantling structures
- Rehabilitation of the disturbed areas

3.12 Resources required during construction and operation

3.12.1 Land Requirements

The total area that the Agricultural Hub will occupy is 3.362 acres. This land is owned by Makueni County Government and will be acquired by Eni Kenya B.V. through lease.

3.12.2 Construction Staff

It is typical for this kind of construction to have a mix of skilled, semi-skilled and unskilled workers as part of the workforce. Whereas the contractor will be at liberty to hire workers as per skills required, he/she will be encouraged to source for workers from the local community as much as possible. This will reduce instances of negative impacts related to labour influx, Gender Based Violence (GBV) as well as provide jobs and income to the local community.

3.12.3 Water

During the construction stage, contractor teams will require water for use during construction works (concrete mixing, slab, washing vehicles) as well as for drinking by the construction workers. The contractor (s) once procured will identify reliable sources of water to be utilized for construction. These sources may include use of piped water supply via water service providers (where applicable), from existing boreholes, drilling of boreholes, or abstracting streams and or rivers. The abstraction of water for construction by the contractor will be expected to follow national regulations and guidelines and permitting requirements as provided by the Water Resources Authority (WRA). Contractor will be required to submit a **Water Use Plan** prior to commencement of construction activities. During operation phase, the water use requirements will be low and required by the staff managing plant, for cleaning and will be obtained from a borehole that will be drilled by Eni Kenya B.V. There is a water supply sytems owned by Wote Water and Sewerage Company (WOWASCO) which will provide water to the project but due to its unreliability, the project will establish its own water source.

3.12.4 Electricity

Electricity will be needed during for construction and for lighting at night during construction phase. During operation phase, plant will require electricity for (i) operating the equipment and machines (ii) security and use by the limited number of staff. During operation, electricity will be obtained from the national grid supplied by Kenya Power and Lighting Company Limited (KPLC). There will be a stand-by generator for use during power outages. Electricity will be supplied using diesel generators or temporary electricity connections during the construction phase.

3.8.4.1. Fuels and Oils

All construction plant/equipment will be in good condition with no excessive emissions of exhaust, oil, fuel or coolants. Plant operators will check machines daily for oil/fuel leaks and take appropriate remedial action. All re-fuelling will be by an approved mobile fuel bowser using a suitable pump and hose. Absorbent material (spill kits) will be available on site and will be deployed to contain drips and small spillages. All other fuels, oils and potential contaminants will be stored within the site compound in secure, fit for purpose containers within bunded containment as appropriate. The dryer for the seeds will use a diesel fuelled burner during operations. The generator for emergency power supply will also be diesel powered.

3.12.5 Wastes and Emissions

3.8.4.2. Effluent Waste

Construction effluent waste will emanate from construction works (mixing of aggregate, cleaning) mobile toilet facilities that will be used by workers while at work among others. Wastewater will also emanate from activities related to washing/cleaning of equipment and vehicles. During operation, effluent waste is going to emanate from cleaning of seeds (removal of foreign bodies), as well as from the workers on site (washrooms and administrative blocks).

3.8.4.3. Solid Waste

Construction solid waste will comprise general domestic waste including sanitary and food waste, office waste, organic material, small volumes of wastes arising from mobile plant, chiefly waste lubricating oil and packing materials (e.g., crates). Human waste will also emanate from the construction workers on site (will require mobile toilets). Construction wastes will include among others:

- Cement waste
- Construction packaging materials (cement bags, packaging wastes,)

No significant solid waste streams are expected during operations. Operation waste will comprise general domestic waste from including sanitary and food waste, office waste, as well as extraction process wastes described in detail below.

During the decommissioning phase, the primary waste will be the scrap metal, rubbles, etc. Trucks will be required to transport wastes generated through the decommissioning phase to appropriate waste disposal sites. These vehicles will consume diesel and produce air emissions as a waste.

The contractor will be required to provide a **Site Waste Management Plan** which will include details on waste minimization, recycling, and disposal of the waste streams. The requirements of this plan will be implemented on site as required. With respect to the control of 'litter' on site, all such waste will be collected and stored within sealed containers within the site compound and serviced by a NEMA licensed waste carrier. No disposal of litter will be permitted at other locations. All forms of wastes generated during the construction, operation and decommissioning phases will be disposed of in compliance with waste regulations in Kenya (Legal Notice 121: Environment Management and Coordination (Waste Management) Regulations, 2006).

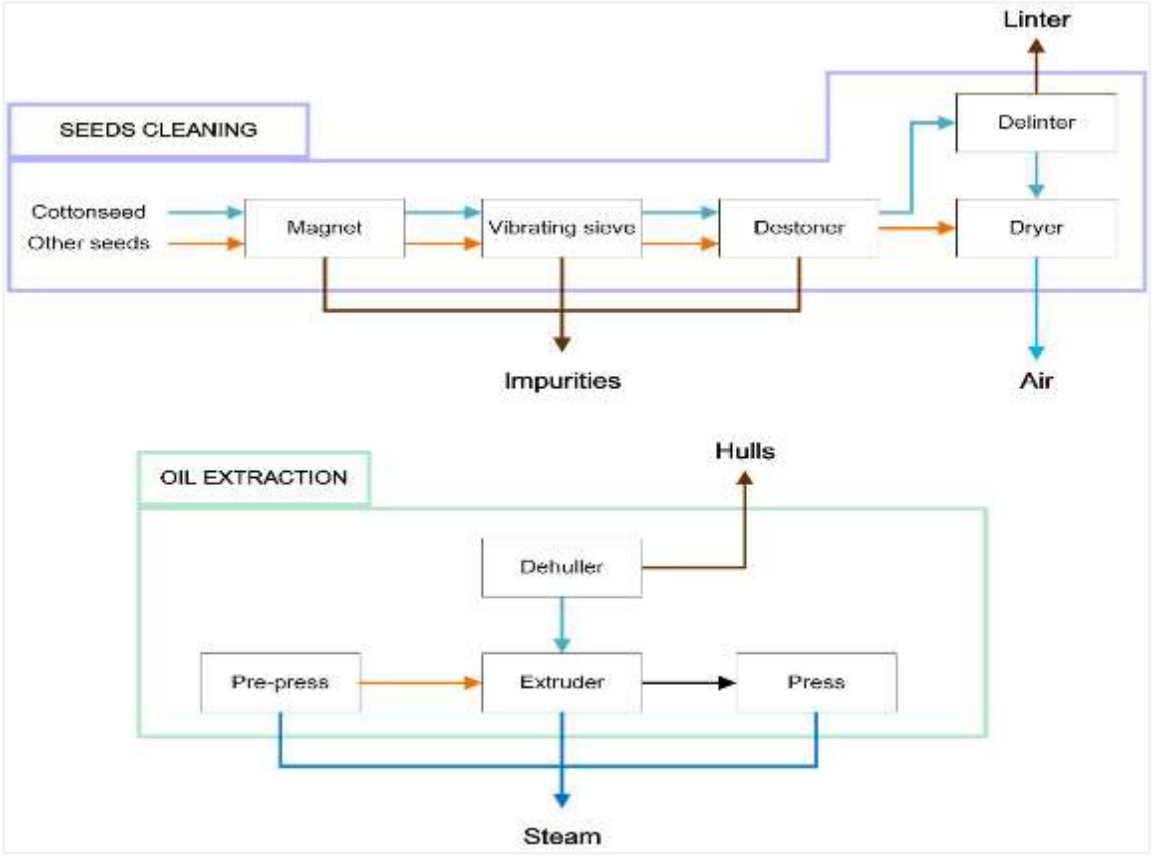
Operation solid wastes: Operation solid wastes will include among others: -

- Impurities: from seed cleaning section, including but not limited to stone, metal particles, straw, broken seeds hulls, husk, soil particles and dust. This stream is considered as a waste.
- Linters: from cotton seed delinting, this stream is considered as side stream due to the multiple uses of linter. The quality and amount of linters depends on the seed conditions from the ginning factory.
- Hulls: from cotton seed dehulling, this stream is considered as side stream. The hulls will be used as composed or integrated with organic fertiliser.
- The cake from the multiseed line will be utilized as animal feed and the one from the castor line as soil conditioner for agriculture.

Table 3-18: Solid waste and side streams

Waste/side stream	Origin	Mass [ton per ton of processed seed]
Impurities	Cleaning machines	0.04
Linters	Cottonseed delinter	0.08
Hulls	Cottonseed dehuller	0.15

Figure 3-8: Effluents, waste, and side streams visualization



3.8.4.4. Gaseous Emissions

The use of motorised equipment during construction will generate gaseous emissions in the project area of influence. Motorised vehicles and equipment including trucks, excavators etc will generate among others SOx, NOx and PM10. Dust will also be

generated by movement of motorised vehicles. The gaseous emissions during the operation phase are not significant but will also include SOx, NOx and PM10 that will be generated by the trucks that bring in the raw materials (seeds) as well as emissions (dust and particles) from the oil extraction process mainly from the sections described in **table 3-19** below.

During the decommissioning phase, the primary waste will be the scrap metal from the steel lattice towers, insulators and cables. Several trucks will be required to transport wastes generated through the decommissioning phase to appropriate waste disposal sites. These vehicles will consume diesel and produce air emissions as a waste. Secondly, through servicing of these trucks, used oils will be generated which are hazardous wastes.

Table 3-19: Gaseous effluents

Effluent	Type of emission	Origin	Flowrate [m3 per ton of processed seed]	Pollutant concentration [µg/m³]
Air	Dust and particles	Cleaning section	4268	500
Air	Dust and particles	Dehuller	293	500
Air	Dust and particles	Dryer	7500	500
Steam	-	Oil extraction section	0.04	-

Air: the cleaning section machines are equipped with air extraction and cyclones to separate large particles and coarse dust; the air should be further purified with filtration. The dryer uses the airstream to lower the moisture content of the seed, such air is then processed in a cyclone. **Steam:** from presses and extruder, will be collected and used to moisturizing the pressed cake with optional equipment.

3.8.4.5. Noise Emissions

The use of motorised equipment during construction will generate noise emissions in the project area of influence. Motorised vehicles and equipment including trucks, excavators etc will generate noise during construction, operation, and decommissioning phases of the project. Construction phase noise levels will be generated by construction plant and equipment such as excavators, lifting equipment, dumper trucks, compressors, generators, etc. Construction plant and equipment will be maintained in accordance with the preventive maintenance schedules indicated in the manufacturer's instructions to ensure that such equipment does not produce excessive noise and vibration.

During operation phase, noise emissions will be generated by the plant production processes and the estimated sound levels related to the plant are below 80 dB, within a distance from the noise source of 1 m. Noise emissions will also be generated by the standby generator (only when power outages are experienced) and trucks bringing in raw materials and shipping out the finished product.

During the decommissioning phase, noise levels will be generated by plant and equipment such as excavators, lifting equipment, dumper trucks, compressors, generators, etc. Machinery and equipment will be maintained in accordance with the preventive maintenance schedules indicated in the manufacturer's instructions to ensure that such equipment does not produce excessive noise and vibration.

3.13 Schedule for Implementation and Workforce

The timeframe needed for construction of the project is about 6 months. Under the current schedule, if a decision is made to proceed with the project after completion of the NEMA process, construction could begin in November 2021.

4 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

This chapter sets out the standards to which the legal, policy and administrative framework within which the Project will be developed. It identifies the applicable lender requirements and national standards. The proponent through this ESIA will conform to the Kenyan legislative and regulatory framework.

4.1 National Policies and Legislation

Table 4-1: Summary of National Policies

Policy	Description
National Environment Policy, 2013	The goal of the policy is to ensure a better quality of life for present and future generations through sustainable management and use of the environment and natural resources. The objectives of the Policy are inter alia to: • Provide a framework for an integrated approach to planning and sustainable management of Kenya's environment and natural resources; • Strengthen the legal and institutional framework for good governance, effective coordination and management of the environment and natural resources; and • Ensure sustainable management of the environment and natural resources, such as unique terrestrial and aquatic ecosystems, for national economic growth and improved livelihoods. Some of the guiding principles in the implementation of the policy include: • Environmental Right: Every person in Kenya has a right to a clean and healthy environment and a duty to safeguard and enhance the environment; • Right to Development: The right to development will be exercised taking into consideration sustainability, resource efficiency and economic, social and environmental needs; • Sustainable Resource Use: Environmental resources will be utilized in a manner that does not compromise the quality and value of the resource or decrease the carrying capacity of supporting ecosystems; and • Public Participation: A coordinated and participatory approach to environmental protection and management will be enhanced to ensure that the relevant government agencies, county governments, private sector, civil society, and communities are involved in planning, implementation and decision-making processes.
Economic Recovery for Wealth and Employment Creation Strategy, 2006	The overall goal of the strategy is to ensure clear improvement in the social and economic wellbeing of all Kenyans; thereby giving Kenyans a better deal in their lives, and in their struggle to build a modern and prosperous nation. The key areas covered in the strategy are: • Expanding and improving infrastructure; • Reforms in trade and industry; • Reforms in forestry; • Affordable shelter and housing; • Developing arid and semi-arid lands; and • Safeguarding environment and natural resources.

Gender Policy, 2011	The overall goal of this Policy is to mainstream gender concerns in the national development process in order to improve the social, legal/civic, economic and cultural conditions of women, men, girls and boys in Kenya.
HIV/AIDS Policy, 2009	In summary, the policy provides a mechanism for: • Setting Minimum Internal Requirements (MIR) for managing HIV and AIDS; • Establishing and promoting programs to ensure non-discrimination and non- stigmatization of the infected; • Contributing to national efforts to minimize the spread and mitigate against the impact of HIV and AIDS; • Ensuring adequate allocation of resources to HIV and AIDS interventions; and • Guiding human resource managers and employees on their rights and obligations regarding HIV and AIDS.
The National Land Policy (Sessional Paper No. 3 of 2009)	The overall objective of the national land policy is to secure land rights and provide for sustainable growth, investment, and the reduction of poverty in line with the governments overall development objectives
Energy Policy	The Energy Policy seeks to ensure an adequate, quality, cost effective and affordable supply of energy to meet development needs, while protecting and conserving the environment, with a bias towards the exploitation of green energy.
National policy on gender and development 2000	The policy framework is geared towards ensuring gender equality and women empowerment in the social, economic, political and cultural spheres as envisaged in the Constitution.
Kenya National Youth Policy 2016	This Policy aims at ensuring that the youth play their role alongside adults in the development of the Country. The National Youth Policy visualizes a society where youth have an equal opportunity as other citizens to realize their fullest potential. Project will provide direct employment to the youth as required by the Policy.
Environment and Sustainable Development Policy, Sessional Paper No. 6 of 1999	This Policy aims to harmonize environmental and developmental goals for sustainability. It also provides comprehensive guidelines and strategies for government action on the environment and development.
The National Biodiversity Strategy of 2000	The National Biodiversity Strategy and Action Plan (NBSAP) was formulated in order to enable Kenya address national and international commitments defined in Article 6 of the Convention on Biological Diversity (CBD). The strategy is a national framework of action for ensuring that the present rate of biodiversity loss is reversed, and present levels of biological resources are maintained at sustainable levels for posterity.
Wildlife Policy, Sessional Paper No. 3 of 1975	This Policy governs wildlife management in Kenya and its goal is "to optimize returns from this resource, taking account of returns from other land use". The policy not only recognizes economic benefits from tourism and consumptive uses but also the intangible benefits that include the aesthetic, cultural and scientific gains that accrue from conservation of habitats and the fauna within them.
The Kenya National Climate Change Response Strategy	The vision of the Strategy is for a prosperous and climate change resilient Kenya. The mission is to strengthen and focus nationwide actions towards climate change adaption and greenhouse gas (GHG) emission mitigation. The following measures are proposed to counter potential threats to the energy sector in Kenya: -Accelerate the development of geothermal energy; -Accelerate the development of green energy including wind, solar and renewable biomass; and

	-Energy efficiency.
Big 4 Agenda.	The Big 4 Agenda includes ensuring food security, affordable housing, manufacturing and affordable healthcare and prioritizes public investments towards their realization in the current budget and aligned to the MTP III of the Vision 2030.
Vision 2030	Long-term development blueprint for the country. It aims to transform Kenya into "a newly industrialized, middle-income country providing a high quality of life to all its citizens.
Makueni County Integrated Development Plan	The CIDP is the development blue print made by each county in Kenya for the period between 2018–2022

Table 4-2. Summary of National Legislations

Legislation	Provisions	Relevance to the Project
The Constitution of Kenya (2010)	Article 69 provides for protection and conservation of the environment and ensuring ecologically sustainable development and use of natural resources; Mandates the State to: -Establish systems of environmental impact assessment, environmental audit and monitoring of the environment; - eliminate processes and activities that are likely to endanger the environment; - Encourage public participation in the management, protection and conservation of the environment; and Article 42 accords every person the right to a clean and healthy environment and where this is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.	Constitutional requirements on right to a clean and healthy environment, protection of the environment, consultation, public participation and access to information will be adhered to by Eni Kenya B.V. and its contractors during the project phases (construction, operation and decommissioning).
Environmental Management and Coordination Act, Cap 387.	Part V, VI and VII provide for protection and conservation of the environment, environmental impact assessment, and environmental auditing and monitoring.	Eni Kenya B.V. in complying with this statute has prepared ESIA study report.
Environmental (Impact Assessment and Audit) Regulations, 2003	Part II, III and IV provide for the procedure for carrying out Environmental Impact Assessment (EIA) and Environmental Audit (EA). Part V provides for the carrying out of an environmental audit study following commencement of project operations.	Eni Kenya B.V. in complying with this statute has prepared ESIA study report in accordance with this regulation. -An initial environmental audit should also be carried out in the first year of operation.

Environmental Management and Co-ordination (Water Quality) Regulations, 2006	Part II-V provide for the protection of ground and surface water resources. Part II provides the water quality standards for sources of domestic water.	-During construction, operation and decommissioning, Eni B.V. Kenya and its contractors are required to comply with the water quality regulations in terms of effluent discharge and will obtain effluent discharge licenses/permits as necessary and guided by regulation.
Environmental Management and Co-ordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009	Section 3 (1) prohibits the generation of unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. The First Schedule provides for the maximum noise levels permissible in various environmental set ups such as residential areas, places of worship, commercial areas and mixed residential.	-During construction, operation and decommissioning, Eni B.V. Kenya and its contractors are required to comply with this regulation in terms of noise and excessive vibration control and will obtain licenses as necessary and guided by regulation. -Sound level limits as per the regulations to be observed during construction and operations.
Environmental Management and Co-ordination (Waste Management) Regulations, 2006	Part III-VII provide standards for handling, transportation and disposal of various types of wastes including hazardous wastes. Sections 4, 5 and 6 provide for waste minimization or cleaner production, waste segregation, recycling or composting. Section 7 provides for licensing of vehicle transporting waste. Section 10 provides for the licensing of waste disposal facilities.	- During construction, operation and decommissioning, Eni Kenya B.V. and its contractors are required to comply with this regulation in terms of waste management and will obtain or engaged licensed entities to manage wastes from its activities as necessary and guided by regulation.
Environmental Management and Coordination (Air Quality) Regulations, 2014	The First Schedule provides for ambient air quality tolerance limits. Section 5 prohibits air pollution in a manner that exceed specified levels. Section 16 provides for installation of air pollution control systems where pollutants emitted exceed specified limits. Section 22 provides for the control of fugitive emissions within property boundary. Section 25 provides for the control of vehicular emissions. Section 29 provides for prevention of dispersion of visible particulate matter or dust from any material being transported. Part IX provides for acquisition of an emission license.	- During construction, operation and decommissioning, Eni Kenya B.V. and its contractors are required to comply with this regulation in terms of air quality and will obtain licenses as necessary and guided by regulation.
Environmental Management and Coordination	Section 4 (1) provides that;	Eni Kenya B.V. has prepared ESIA to determine the impacts of the project on biological diversity in accordance with

(Conservation of Biological Diversity and Resources, Access to Genetic Resources, and Benefit Sharing) Regulations, 2006.	1. A person shall not engage in any activity that may- a. have an adverse impact on any ecosystem; b. lead to the introduction of any exotic species; c. lead to unsustainable use of natural resources, Without an Environmental Impact Assessment License issued by NEMA.	this regulation and mitigation measures to conserve biological diversity are outlined in the ESIA.
Physical planning and land use Act 2019	Under Section 3 of the Act, the law provides for norms and principles in physical planning and land use which include the requirement that planning takes into account new approaches such as transit-oriented development, mixed land-uses, planning for public transport and non-motorized transport among others to achieve sustainable development and more efficient use of natural resources, be inclusive and take into consideration the culture and heritage of people concerned; and that development activities be planned in a manner that integrates economic, social and environmental needs of present and future generations.	- Eni Kenya B.V. will take into account these norms and principles in particular new approaches such as transit-oriented development, mixed land-uses, planning for public transport and non-motorized transport among others to achieve sustainable development and more efficient use of natural resources.
The Water Act No. 43 of 2016 revised 2017	Section 3 outlines the objectives of the Act as to provide for the regulation, management and development of water resources and water and sewerage services.	The implementation of the project should conform to sound integrated water resource management practices
County Government Act No. 17 of 2012 Revised 2017	The County Government Act is intended to provide powers, functions, and responsibilities to deliver services to the Counties under the devolved government as spelt out under Section 3 of the Act.	The proposed project will be implemented in Makueni County
The Public Health Act (Cap 242)	Section 115 provides for the prevention of the occurrence of nuisance or conditions dangerous/injurious to humans. Section 126 provides that the relevant local authority shall take all lawful, necessary and reasonably practicable measures -: - for preventing any pollution dangerous to health of any supply of water which the public within its jurisdiction has a right to use and does use for drinking or domestic purposes (whether such supply is derived from	Project activities during construction could lead to public health impacts and project must comply with the requirements of the Public Health Act.

	sources within or beyond its jurisdiction); and - for purifying any such supply which has become so polluted, and to take measures (including, if necessary, proceedings at law) against any person so polluting any such supply or polluting any stream so as to be a nuisance or danger to health.	
Occupational Safety and Health Act (OSHA), 2007	-Section 6 provides for the safety, health and welfare of workers and all persons lawfully present at workplaces. Part V provides for the registration of workplaces. Part VII outlines safety requirements in use of machinery to prevent accidents and injuries.	The construction site will require registration as a workplace.
The Work Injury Benefits Act, 2007	Part V provides for compensation to employees for work related injuries and disease contracted in the course of their employment and for connected purposes. Key sections of the Act include the obligations of employers; right to compensation; reporting of accidents; compensation; occupational diseases; medical aid etc.	Construction activities will have potential to cause injuries/ health hazards to construction workers.
The Energy Act, 2019	The Energy Act, 2019 has made several amendments to the repealed Energy Act, 2006. Its objective is to consolidate the laws relating to energy, to properly delineate the functions of the national and devolved levels of government in relation to energy, to provide for the exploitation of renewable energy sources, to regulate midstream and downstream petroleum and coal activity and for the supply and use of electricity and other forms of electricity.	The project will be implemented in accordance with the regulatory requirements of the Act, including acquiring a generation license from the Energy and Petroleum Regulatory Authority.
The Land Act, 2012	Section 4 (2) obligates the Land Commission and other public officers to use the following guiding principles and values: -equitable access to land; security of land rights; - security of land rights; -sustainable and productive management of land resources; - Regulates the change of use for substation land from agricultural to industrial.	Project will lead to land acquisition and hence will have to follow the procedure for acquisition.

HIV And Aids Prevention and Control Act No. 14 Of 2006 Revised in 2012	The Act provides for measures for the prevention, management and control of HIV and AIDS. Part III-V of the Act are dedicated the protection and promotion of public health and for the appropriate treatment, counseling, support and care of persons infected or at risk of HIV and AIDS infection.	The Contractor shall prepare a project implementation plan that contains a comprehensive Program for: • Regular sensitization of all workers on HIV/AIDS and other Sexually Transmitted Diseases (STDs).
Sexual Offences Act, 2006	-This Act of Parliament makes provision about sexual offences and aims at prevention and the protection of all persons from harm from unlawful sexual acts. Section 15, 17 and 18 focuses mainly on sexual offenses on minors (children).	The contractor is obligated to put in place mechanisms which are necessary or expedient in order to achieve or promote the objects of this Act, including for instance, a sexual harassment policy.
Children Act, 2001	-This Act of Parliament provides safeguards for the rights and welfare of the child including the right to parental care, non-discrimination, education, religion, health care and protection from child labour and armed conflict, among others. Under Section 4 (2) the Act requires that in all actions concerning children, the best interests of the child shall be a primary consideration.	The contractor under this Project will be required to comply with provisions of the Act during Project implementation by ensuring that measures are in place to prevent violation of children's rights particularly protection from child labour. No child will be employed in the project as per the act.
Climate Change Act 2016	Under Section 3 of the Act, the objectives of the Act include to provide for a regulatory framework for enhanced response to climate change; to provide for mechanism and measures to achieve low carbon climate development, and for connected purposes	The contractor under this Project will be required to comply with provisions of the Act during project implementation
National Gender and Equality Commission Act, 2011	As per Section 8, the over-arching goal for NGEC is to contribute to the reduction of gender inequalities and the discrimination against all women, men, persons with disabilities, the youth, children, the elderly, minorities and marginalized communities.	The provisions of the Act become relevant during hiring of workforce on site in a fair and non-discriminative manner. It may also apply in grievance redress if an aggrieved person escalates a complaint to the commission. The project, through the contractor is expected to consider and hire both male and female gender during the duration of the project.
Employment Act, 2007	-This Act of Parliament prohibits discrimination in labour relations under section 5, sexual harassment under section 6, forced labour under section 4 and child labour in section 52. Section 6 (2) obligates all employers with twenty or more employees to issue a policy statement on sexual harassment.	The contractor will be guided by the provisions of this Act on matters touching on equality of opportunities in employment, terms of service, age limit and prevention of sexual harassment in the workplace.

Building Code	This law recognizes the county governments as the leading planning agencies mandating the potential developers to submit development applications for approval. The county governments will approve or reject plans if they do or don't comply with the law, respectively.	In the construction of the plant, Eni B.v. Kenya will adhere to the Building Code.

4.1.1 National Air Quality Emission Standards

In undertaking the construction activities described above, the Contractor will comply with the following national regulatory air quality standards. Regular monitoring to determine compliance will be done by the Supervision Consultant and corrective/mitigation measures applied where necessary.

Table 4-3: Ambient Air Quality Tolerance Limits

Pollutant	**Time Weighted Average**			
		Industrial Area	**Residential, Rural & Other Area**	**Controlled Areas**
Sulphur oxides (SO_X);	Annual Average*	80 ug/m^3	60 ug/m^3	15 ug/m^3
	24 hours**	125 ug/m^3	80 ug/m^3	30 ug/m^3
	Annual Average		0.019 ppm/50ug/m^3	
	Month Average			
	24 Hours		0.048ppm /125ug/m^3	
	Instant Peak		500 ug/m^3	
	Instant Peak (10 min)		0.191 ppm	
Oxides of Nitrogen (NO_X);	Annual Average*	80 ug/m^3	60 ug/m^3	15 ug/m^3
	24 hours**	150 ug/m^3	80 ug/m^3	30 ug/m^3
	Annual Average		0.2 ppm	
	Month Average		0.3 ppm	
	24 Hours		0.4 ppm	
	One Hour		0.8 ppm	
	Instant Peak		1.4 ppm	
Nitrogen Dioxide	Annual Average	150 ug/m^3	0.05 ppm	
	Month Average		0.08 ppm	
	24 Hours	100 ug/m^3	0.1 ppm	
	One Hour		0.2 ppm	
	Instant Peak		0.5 ppm	
Suspended Particulate Matter	Annual Average*	360 ug/m^3	140 ug/m^3	70 ug/m^3
	24 hours**	500 ug/m^3	200 ug/m^3	100 ug/m^3
	Annual Average****		100 ug/m^3	
	24 hours***		180 ug/m^3	
Respirable Particulate Matter (<10m) (RPM)	Annual Average*	70 ug/m^3	50 ug/m^3	50 ug/m^3
	24 hours**	150 ug/Nm^3	100 ug/Nm^3	75 ug/Nm^3
PM2.5	Annual Average	35 ug/m^3		

Pollutant	Time Weighted Average			
		Industrial Area	Residential, Rural & Other Area	Controlled Areas
	24 hours	75 ug/m^3		
Lead (Pb)	Annual Average*	1.0 ug/Nm^3	0.75 ug/Nm^3	0.50 ug/m^3
	24 hours***	1.5 ug/m^3	1.00 ug/m^3	0.75 ug/m^3
	Month Average		2.5	
Carbon monoxide (CO)/ carbon dioxide (CO_2)	8 hours**	5.0 mg/m^3	2.0 mg/m^3	1.0 mg/m^3
	1 hour	10.0 mg/m^3	4.0 mg/m^3	2.0 mg/m^3
Hydrogen sulphide	24 hours**	150ug/m^3		
	Instant Peak**	700ppb		
Total VOC	24 hours	600 ug/m^3		

Source – NEMA

Legend

µg-	microgram
m3	cubic metre
ppm	Parts per million
ppb	Parts per billion
*	* Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.
**	24 hourly/8 hourly values should be met 98% of the time in a year. However, 2% of the time, it may exceed but not on two consecutive days.
	the 24-hour limit may not be exceeded more than three times in one year; k)
	** 24-hour limit may not be exceeded more than three times in one year micrograms/m3
	*** Not to be exceeded more than once per year average concentration m)
	In coversion of units from ppm to mg/m3 and vice versa shall use guidelines set out under Part II of the Fifth Schedule

Table 4-4: National Air Quality Standards for General Pollutants

Pollutant	Time Weighted Average	Property Boundary
Particulate matter (PM)	Annual Average	50 ug/m^3
	24 hours	70 ug/m^3
Oxides of Nitrogen (NOX);	Annual Average	80 ug/m^3
	24 hours	150 ug/m^3
Sulphur oxides (SOX);	Annual Average	50 ug/m^3
	24 hours	125 ug/m^3
Hydrogen Sulphide	24 hours	50 ug/m3
Lead (Pb)	Annual/24 hours	0.5 – 2.0ug/m^3
Ammonia	24 hours	100 ug/m^3

Source-NEMA

4.1.2 National Noise Emission Guidelines

In undertaking the construction activities described above, the Contractor will comply with the following national regulatory noise emission guidelines. Regular monitoring to determine compliance will be done by the Supervision Consultant and corrective/ mitigation measures applied where necessary.

Table 4-5: National Noise Guidelines

Zone	Maximum Noise level limits dB (A)		Time Frame
	Day	Night	
Places of worship	30	25	Day time: 6.01a.m – 8.00p.m Night time: 8.01p.m – 6. 00p.m
Residential: 1. Indoors 2. Outdoors	 35 40	 25 25	
Mixed Residential (inclusive of Entertainment and commercial places)	55	45	
Commercial	70	70	
Silent arena	30	25	

Source - NEMA

Table 4-6: Noise Levels for different areas and facilities

Facility	Maximum Noise level limits dB (A)		Time Frame
	Day	Night	
Health facilities, Educational Centres and homes of disabled	60	35	Day time: 6.01am- 10.00pm Night time: 10.01pm – 6.00am
Residential	60	35	
Industrial	85	65	
Commercial	75	50	

Source - NEMA

Table 4-7: Noise levels from a factory or a workshop (Continuous or intermittent noise)

dB(A)	Daily	Weekly
85	8 hours	40 hours
88	4 hours	20 hours
91	2 hours	10 hours
94	1 minute	5 hours
97	30 minutes	2.5 hours
100	15 minutes	1.25 hours
103	7.5	37.5 minutes
106	3.75	18.75 minutes
109	1.875 minutes	9.375 minutes

Source – NEMA

N/B: Noise levels should not exceed a level of

- **I.** Factory/Workshops 85 dB (A)
- **II.** Offices 50 dB (A)
- **III.** Factory/Workshop Compound 75 dB (A)

Table 4-8: Maximum Permissible Noise level for Impact or Impulsive Noise

Sound Level dB(A) Max	Permitted impulses per day
140	100
130	1,000
120	10,000

Source-NEMA

4.2 National Water Quality Standards

The contractor will comply with the following national regulatory wastewater and effluent discharge standards. Regular monitoring to determine compliance will be done by the contractor and corrective/ mitigation measures applied where necessary.

Table 4-9: National Wastewater Discharge Standards

Parameters	Maximum levels permissible
Suspended solids (mg/L)	250
Total dissolved solids (mg/L)	2000
Temperature ^{0}C	20 -35
pH	6-9
Oil and Grease (mg/L)	where conventional treatment shall be used - 10
Oil and Grease (mg/L)	where ponds is a final treatment method - 5
Ammonia Nitrogen (mg/L)	20
Substances with an obnoxious smell	Shall not be discharged into the sewers
Biological Oxygen Demand BOD_5 days at 20^{o}C (mg/L)	500
	1000
Chemical Oxygen Demand COD (mg/L)	0.02
Arsenic (mg/L)	0.05
Mercury (mg/L)	1.0
Lead (mg/L)	0.5
Cadmium (mg/L)	0.05
Chromium VI (mg/L)	2.0
Chromium (Total) (mg/L)	1.0
Copper (mg/L)	5.0
Zinc (mg/L)	0.2
Selenium (mg/L)	3.0
Nickel (mg/L)	20
Nitrates (mg/L)	30
Phosphates (mg/L)	2
Cyanide Total (mg/L)	2
Sulphide (mg/L)	10
Phenols (mg/L)	15
Detergents (mg/L)	40 Hazen units
Colour Less than	(nd)
Alkyl Mercury Not Detectable	4.0
Free and saline Ammonia as N (mg/L)	Nil
Calcium Carbide	Nil
Chloroform	Nil

Parameters	Maximum levels permissible
Inflammable solvents	Nil
Radioactive residues	Nil
Degreasing solvents of mono-di-trichloroethylene type	

Source-NEMA

4.3.1.1. Solid Waste Management

All construction works are expected to produce one or more forms of waste. The construction will be no exception. Construction wastes and domestic wastes are expected from the site. The Contractor will have to prepare a **waste management plan** using these guidelines that conform to the local legal framework provided in this chapter.

4.3 International Conventions

Relevant international agreements, treaties and conventions that have a social and/or environmental aspect, to which Kenya is a signatory or has acceded to/ratified and which will guide project implementation, are detailed in **Table 4-10** below.

Table 4-10: International Conventions

Convention	Objective
African Convention for the Conservation of Nature and Natural Resources (2003)	The objectives of the ACCNNR have been considered in this ESIA.
Convention on Biological Diversity (1992)	The objectives of the CBD have been considered in this ESIA.
Convention on the Conservation of Migratory Species of Wild Animals	This ESIA has taken into account any potential impacts on migratory species.
Convention on Wetlands of International Importance especially Waterfowl Habitat (Ramsar Convention, 1971)	This ESIA has taken into account any potential impacts on wetlands.

4.4 Institutional Frameworks

4.4.1 Ministry of Energy and Petroleum

Ministry of Energy and Petroleum (MOE&P) - MOE&P is in charge of making and articulating energy policies to create an enabling environment for efficient operation and growth of the sector.

4.4.2 The National Environment Management Authority

The responsibility of the National Environmental Management Authority (NEMA) is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of government in the implementation of all policies relating to the environment.

4.4.3 The National Environmental Complaints Committee

The Act (EMCA) has also established a Public Complaints Committee, which provides the administrative mechanism for addressing environmental harm. The Committee has the mandate to investigate complaints relating to environmental damage and degradation. Its members include representatives from the Law Society of Kenya, NGOs and the business community

4.4.4 The County Environmental Committee

County Environmental Action Plan Committee is charged with the responsibility of preparing a provincial environmental Action based on the county environmental plan. The county Environmental action plans are further compiled at the national level.

4.4.5 Directorate of Occupational Health Safety and Health Services

The institution will be task for registration of the construction site as a workplace and enforcing compliance with Occupational Health and Safety Regulations at the construction site.

5 ENVIRONMENTAL AND SOCIAL BASELINE

This chapter provides a description of the current baseline conditions in the Project Area of Influence (AoI). The baseline characteristics of the biophysical and socio-economic conditions are used as the basis of prediction of possible effects and to monitor changes during construction, operation and decomissioning.

5.1 Overview of Field Surveys

Surveys were undertaken by a combined physical, biological, and social study team which collected and categorized both primary and secondary data. To plan the survey, maps of the Project AoI were created, and the key environmental and social resources were located and analysed. This analysis was used to develop the survey plan and target locations. The following surveys were performed during field work activities:

- Flora and habitats (primary data collection, including vegetation mapping ground-truthing)
- Fauna (primary data collection)
- Noise (primary data collection)
- Water resources, soils, land use and landscape (screening); and
- Stakeholder identification
- Social demographics and other characteristics (secondary and primary data collection)

5.1.1 Bio-Physical Environment

5.1.1.1 Location and Size

The County covers an area of 8,034.7 km^2. The County borders several counties Kajiado to the West, Taita Taveta to the South, Kitui to the East and Machakos to the North. It lies between Latitude 1º 35´ and 3^0 00' South and Longitude 37º10´ and 38º 30´East.

The proposed project site will be located at coordinates 351466.44 m E and 9795659.73 m S, it is within the Agriculture training Centre, in Kwa Kathoka, Mufau Kikumini ward, Makueni/Kathonzweni Sub county in Makueni County **(Figure 5-1).** The total area that the Agricultural Hub will occupy is 3.362 acres.

Figure 5-1: Project site area

Figure 5-2: Location of Project Area in Makueni County

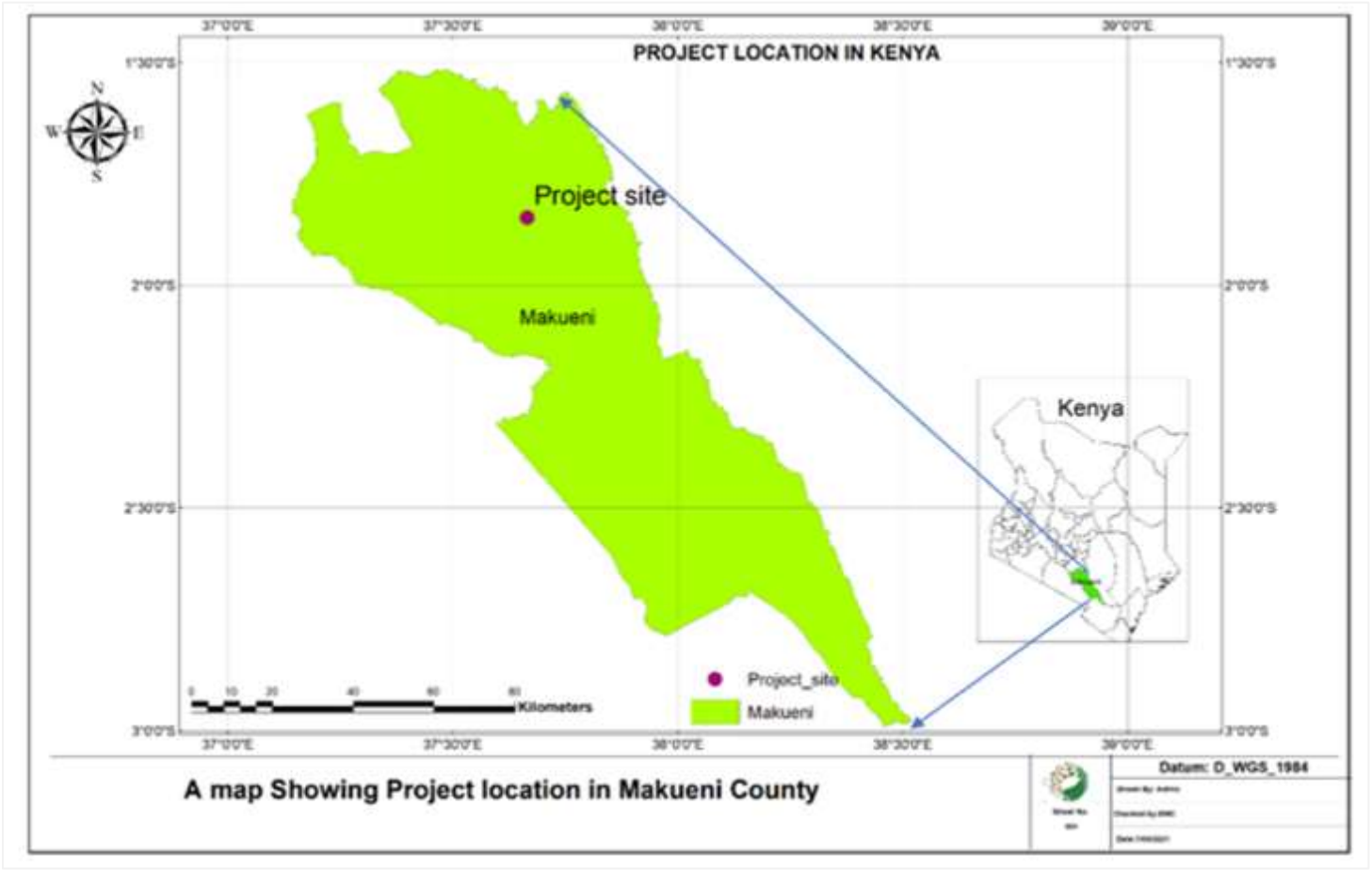
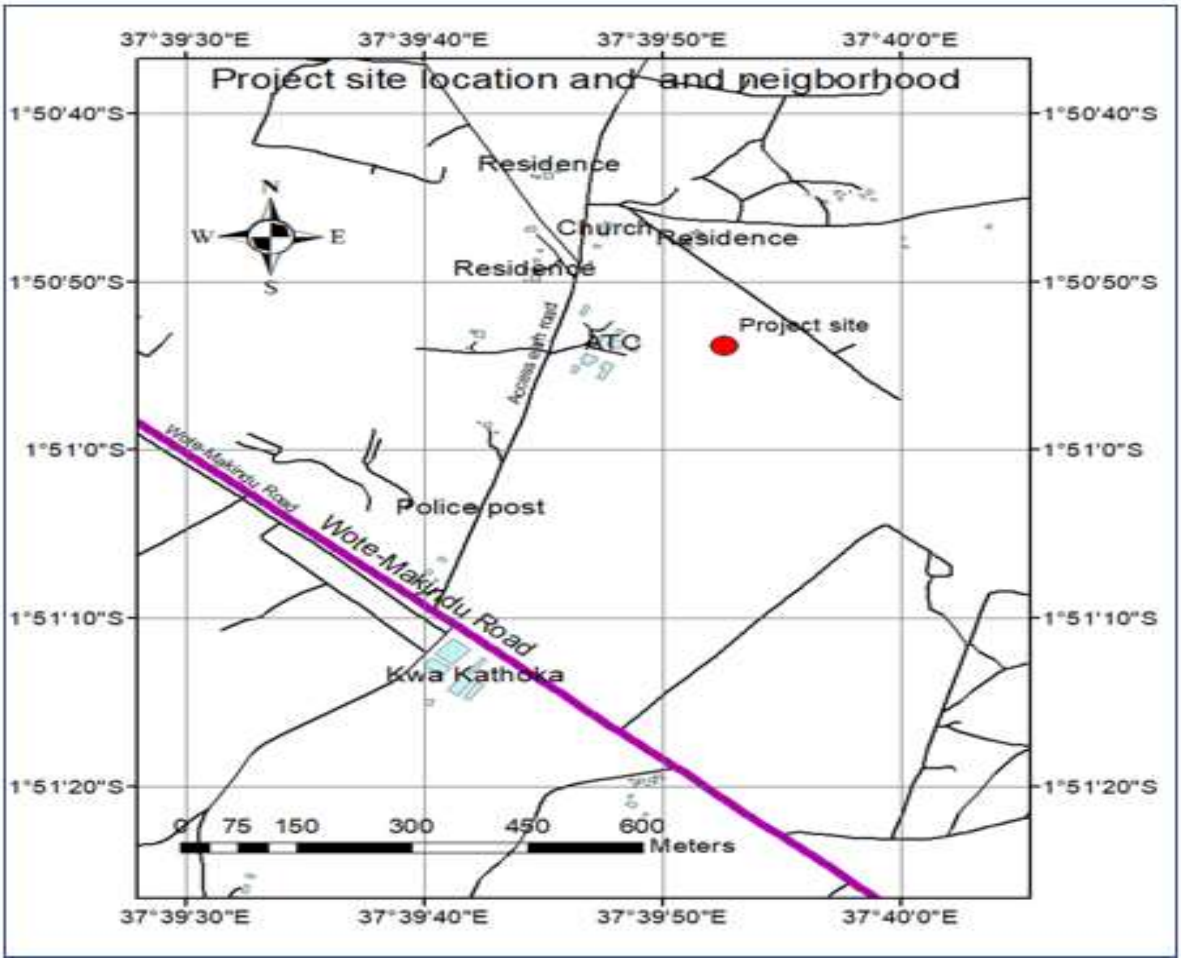


Figure 5-3: Project site location



5.1.1.2 Administrative and Political Units

Makueni County is currently divided into six constituencies Mbooni; Kilome; Kaiti; Makueni; Kibwezi West and East; nine sub-counties and twenty-five divisions. The districts are Kibwezi, Makueni, Kilungu, Mukaa, Kibwezi, Kathonzweni, Makindu, Mbooni East, Mbooni West and Nzaui. Among the Divisions, Mtito Andei, Makindu and Kibwezi are the largest and are situated in the low potential areas of the County while, Kee, Mbitini, Kalamba, Kilome and Kasikeu are the smallest in that order. The County has six constituencies namely: Mbooni, Makueni, Kaiti, Kibwezi East, Kibwezi West and Kilome. There are thirty County Assembly Wards with Makueni Constituency having the largest number of wards at seven while Kilome has the least at three.

5.1.1.3 Climatic Condition

Rainfall and Temperature

Makueni in general experiences homogenous climatic conditions characterized by high temperatures during the day measuring up to 32^{o}C and low temperatures at night at an average of about 25^{o}C. During the dry season between May and October extreme heat is experienced in the low-lying zones while the high-altitude zones experience relatively cool temperatures.

The County experiences two rainy seasons, the long rains occurring in March/April while the short rains occur in November/December. The hilly parts of Mbooni and Kilungu receive 800-1200mm of rainfall per year. High temperatures of 35.8^{o}C are experienced in the low-lying areas causing high evaporation which worsens the dry conditions. Climate variations and extreme differences in temperatures can be explained by change in altitude. The areas to the North such as Kilungu, Iuani and Mbooni hills are usually cool with temperatures ranging from 20.2^{o}C to 24.6^{o} C, while the low-lying areas of the South such as Kitise and Kambu are usually hot. Generally, the County experiences high temperatures during the day and low temperatures at night. During the dry periods between May and October the lower parts of the County experience severe heat.

5.1.1.4 Soils and Geology

The geology of Makueni is characterized with Achaean gneisses of the basement system. These are the oldest rocks in the area comprising of quartz-felspathic gneisses and biotite gneisses beneath the recent soils. Most areas around the Makueni County are generally covered by deep sandy alluvium and red sandy soils in addition to patches of black cotton soils and murram. Typical soils are sandy (eroded from the base sedimentary rock) and contain little organic matter and hence have low fertility. Valleys and river flood plains, however, have notable productive soils due to accumulation of silt and minerals though they are limited by lack of adequate rainfall.

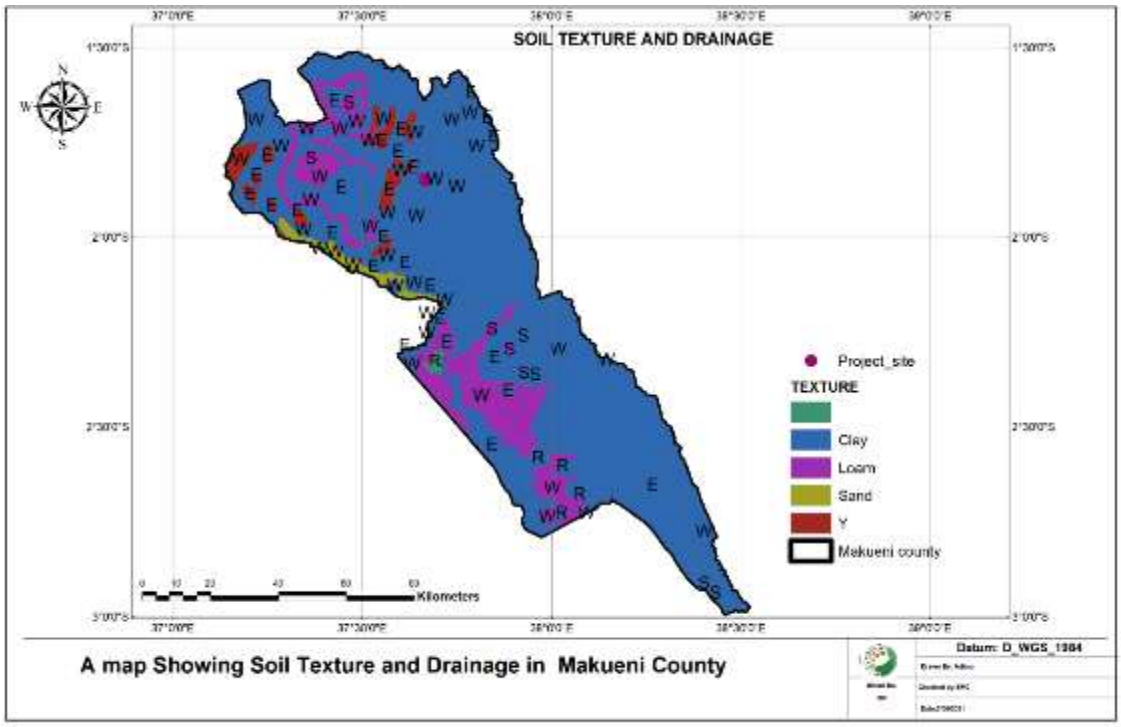


Figure 5-4: Map showing Soil Texture and Drainage in Makueni County

5.1.1.5 Topography

The area is relatively undulating terrain with a general slope running in a north-easterly direction and an elevation of between 600m above sea level in the southeastern to 1,900m

above sea level in the northwestern. Among the notable physical features dominating the area and the adjoining districts include Unoa Hills (1,280m above sea level), Malivani Hills (1,340m above sea level) and Nzueni hills at (1,403m above sea level). Further north are highlands constituting surface water sources among them Nthagu, Kitondo and Iuani Hills where seasonal streams originate flowing south and east eventually draining into Kaiti River and eventually into Athi River. On the Kitui side, Yatta plateau stands high at an average of 1,170m above sea level and creates a major physiological barrier between the larger Makueni and the larger Kitui districts.

The plateau runs in a northwest – southeast direction with Athi river flowing in the same direction to the south sits on hard basements that also determines the drainage trends of the area. Among the outstanding physiological features on the Yatta plateau and within the immediate proximity of the dam project area include Kanyangi hill (1,160m a.s.l.), Kilisa hill (1,146m a.s.l.) and Ndandoni hill (1.056m a.s.l.). This is in addition to numerous depressions and valleys as well as notable peaks. Basement activity has dominated history of the area and has controlled the geomorphologic evolution as well. The rocks of the area (mainly tertiary strata) rest directly on the Basement system and generally have a gentle easterly slope.

Slope of the site

The project site is a gently sloping with the hieghest pont being 1160m asl and the lowest 1154.

Figure 5-5: Site slope profile across the gradient

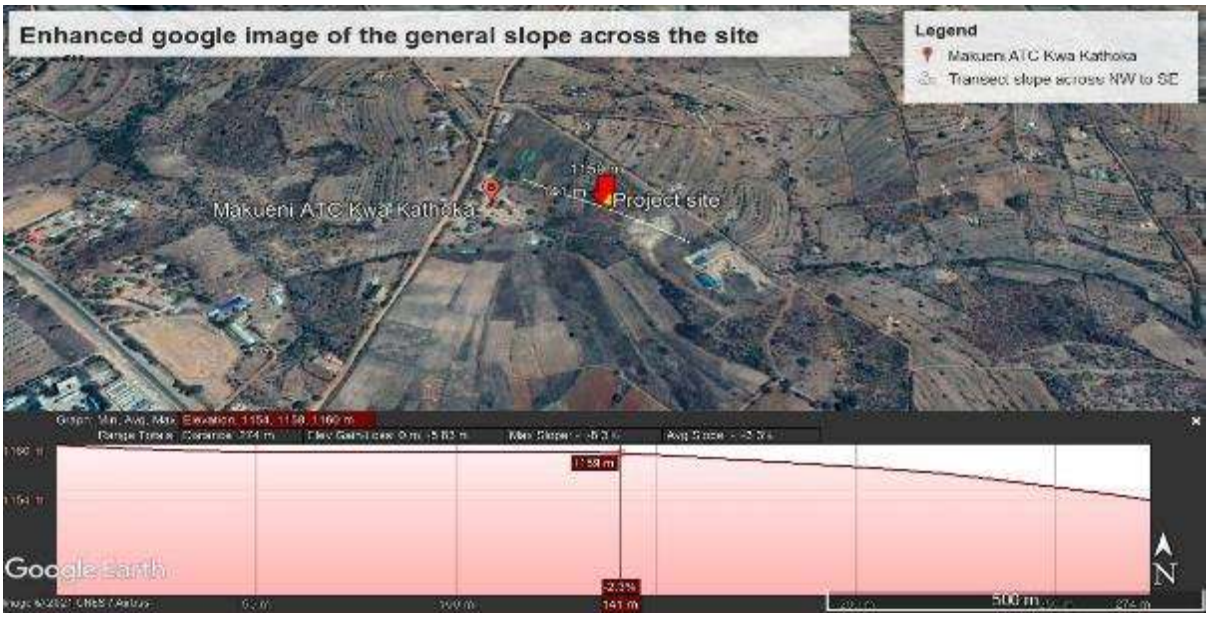


Figure 5-6: Site slope profile along the gradient

5.1.1.6 Hydrology

The project area falls within the greater Tana and Athi drainage basin which includes mostly the central and eastern parts of the country. Management of water resources in this drainage mainly falls under Tanathi Water Works Development Agency that sits in Kitui Town, though the upper sections of Athi river basin are under the Athi Water Works Development Agency sitting in Nairobi. The drainage pattern of the greater Makueni County highly influenced by the Athi River and its tributaries (Kambu, Kaiti, Kiboko, MtitoAndei, Thwake, Thange, Uani, Muoni, Tawa and Kiangini among others) rising from the central highlands running eastwards toward the Indian Ocean as the Galana/Sabaki River. While Athi River runs southeasterly direction on the southern edge of the plateau following its alignment, part of the watershed and tributaries are to the north of the plateau and join Athi River far downstream of the plateau. Among the stream is the Tiva river and its main tributary Mwitasyano river (seasonal) that traverses Kitui Influencing general drainage towards Athi river.

The recharge mechanisms (and the rate of replenishment) of the local aquifers of the general area is mainly through infiltration through the lavas and recent Chyulu Volcanics to the far south of the project area. Discharge from aquifers is either through natural processes as base-flow to streams and springs (Simba, Kiboko and Umani springs), or artificial discharge through human activities. However, considering the few numbers of boreholes in the area this form of discharge is not much pronounced. The total effective discharge from the aquifers via either of the above means is not known; and should in fact be studied. The main form of discharge is through flow along formations and faults/interconnected fractures.

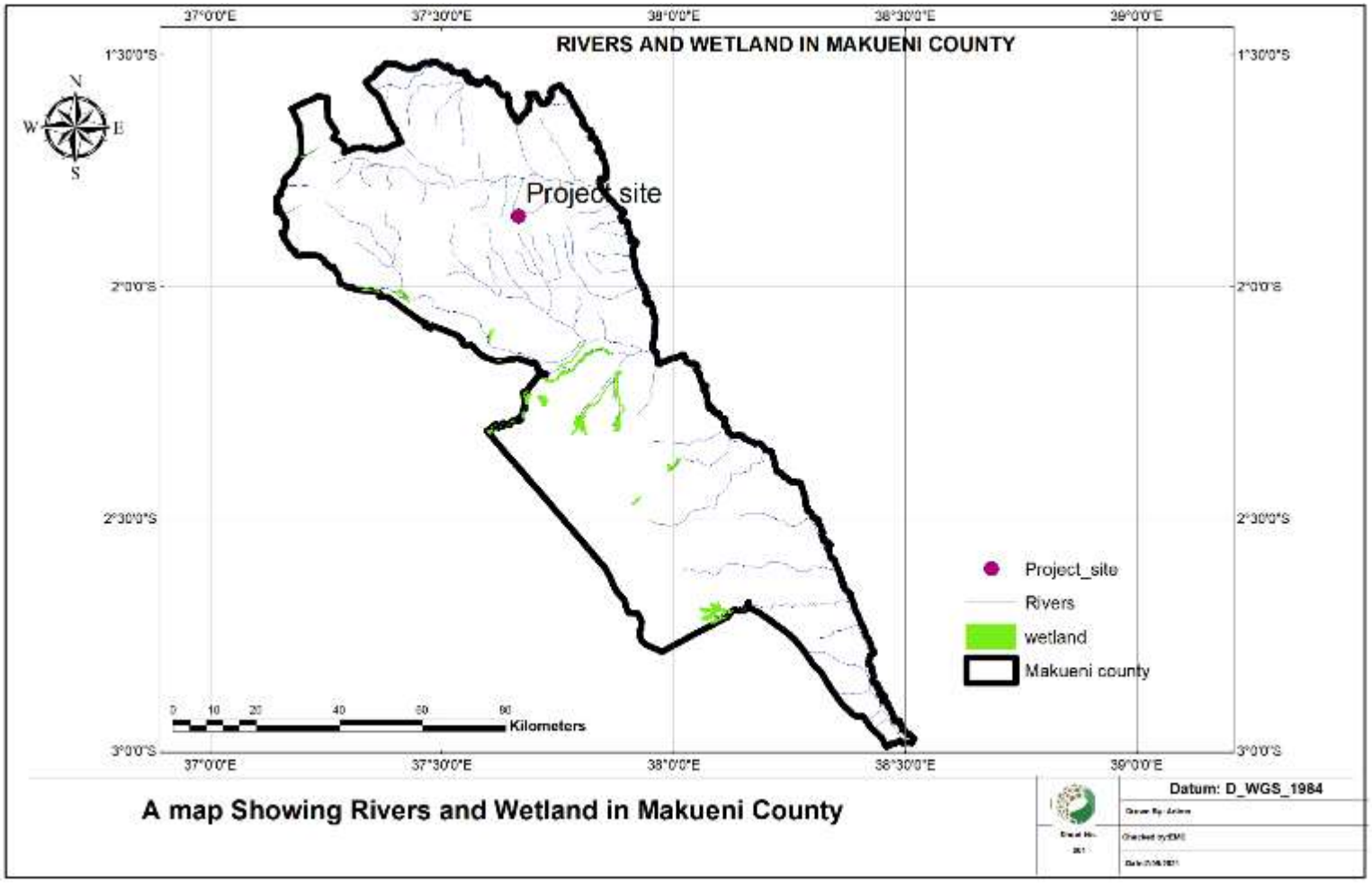


Figure 5-7: Rivers and wetlands in project area.

5.1.1.7 Biological Environment

Fauna

Historically the area had a wide variety of wild animals. These include the Elephants, African Buffalo, Grey Duiker, Black backed jackal, lesser kudu, spotted hyena, olive baboon. The animals are concentrated there due to increasing human settlement and agricultural activities. There have been cases of human wildlife conflicts involving the Hippos and crocodiles, the baboons and velvet monkeys are a nuisance as they are notorious crop raiders. Hyrax and squirrels can be observed all over the area. The fish in the area are mainly found are Common Carp Cyprinuscarpie, Claris spp, Barbusspp, Momyrusspp, Labeospp and the eel anguliaanguila.

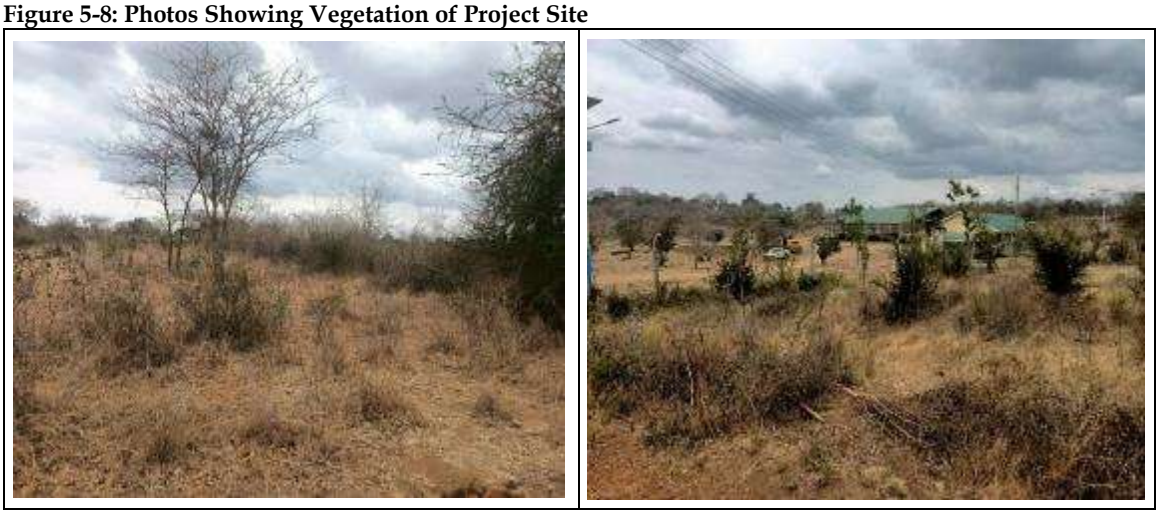
Flora

Among the major notable plant species include:

- Grasses–Chlorisgayana, Common star grass and Themedathriandra,
- Poisonous weeds–Solanumincanum and Daturastramonium,
- Acacia species–Acacia tortilis, Acacia melifera and Acacia Karki
- Shrubs–Banalities aegypttica and Lantana kamara,
- Horticultural crops like pawpaw, mangoes, maize, oranges, and bananas among others,
- Indigenous trees like Croton megalocarpus and exotic trees.

The County has a total of 5 gazetted forests and 4 un-gazetted forest areas covering 25 km^2 and 5 km2 respectively. In addition, it seems efforts in encouraging landowners to plant trees for farm forest or other noise with close 30% willingly do it. Key forest products in the region include timber, poles, fence posts, charcoal, and wood carvings. The five gazetted forests (Nthangu, Mbooni, Makuli, Kibwezi and Kilungu) are estimated to produce over 3,000m3 of timber in addition to volumes of firewood every year. Makueni county has been undergoing massive agro-forestry and the results are visible, though the tree species are mainly exotic. Successful zones in this regard include Mavindini, Wote, Kathonzweni, Nguu, Mbooni, Kilome and Kaiti among others.

Figure 5-8: Photos Showing Vegetation of Project Site



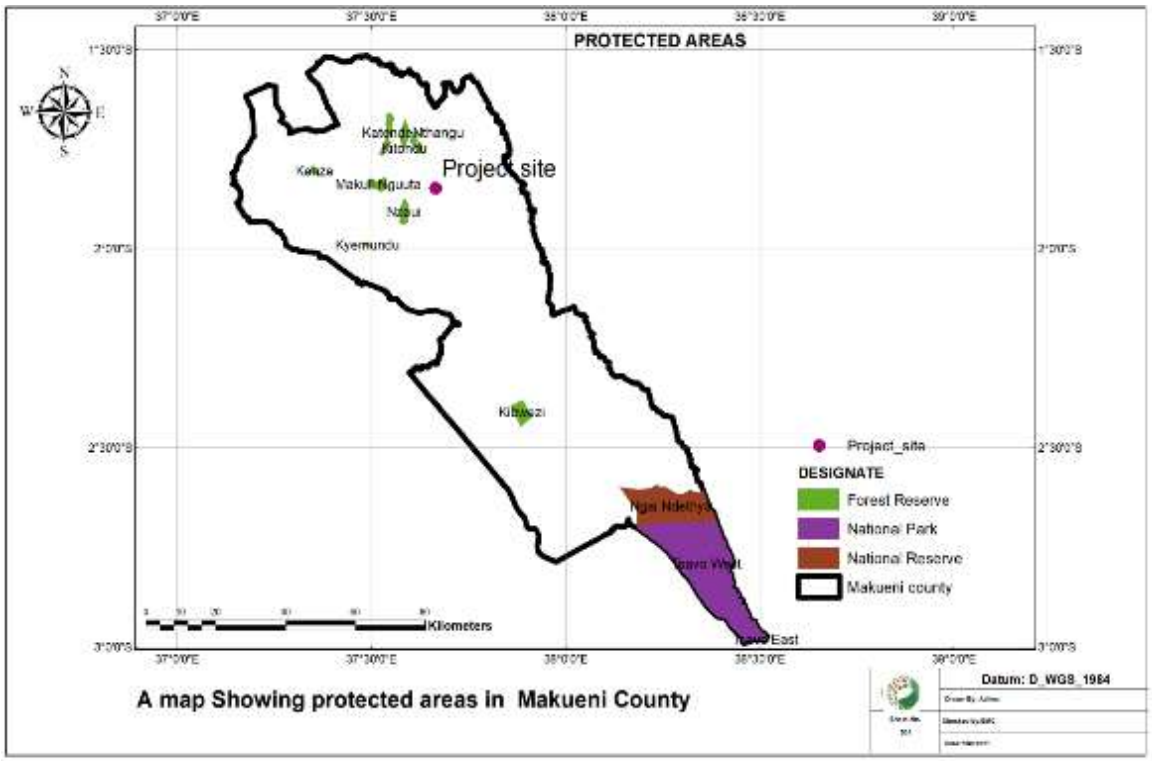


Figure 5-9: Protected areas in Makueni County

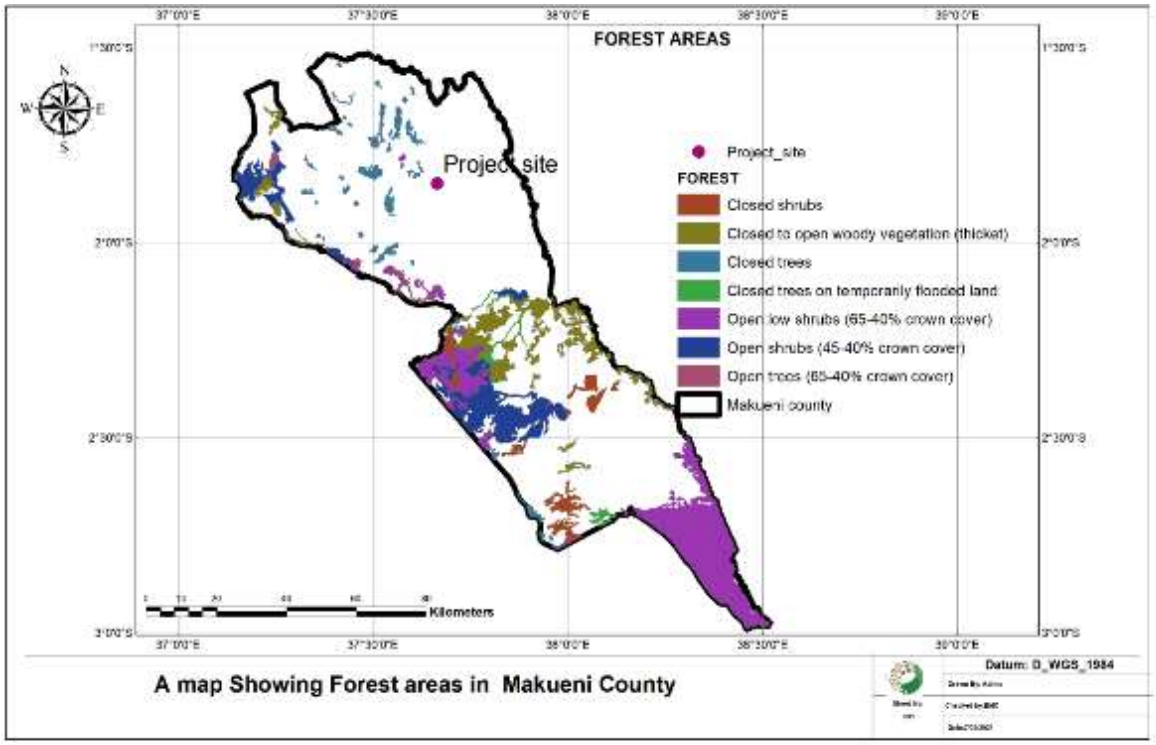


Figure 5-10: Forest areas in Makueni County

5.1.2 Socio Economic Baseline

5.1.2.1 Population and Demography

Makueni is a multi-ethnic County with the dominant community being the Akamba who form approximately 98.1 % of the population. According to the 2019 population census, the County had a total population of 987,633.

5.1.2.2 Land Tenure and Land Use

Land use

The site is situated in a rural area called Kwa Kathoka. Kwa Kathoka area is dominated by mixed sparse agricultural (crop and livstock production) land use. There are mixed land use of a commercial and resdential at Kwa Kathoka market center which is about 0.63 km from the project. At the center there are shops, dispensery, a police station and schools. Wote Makindu road is about 1km from the site connected by a earth road that is motorable but dusty in dry season.

The current land use land cover at the site is a bush land at the site dominated by shrubs and a few trees. To the west within the broader of ATC land there are conference facilty/training center, admnistration offices, fruit collection centre and various agrcultural deonstration fields/plots and fish priduction demonstration facility. There is an agricultural mechanization center south of the site and futher south its bodered by farms and residence. The north of the site is also dominated by farmlands and homesteads.

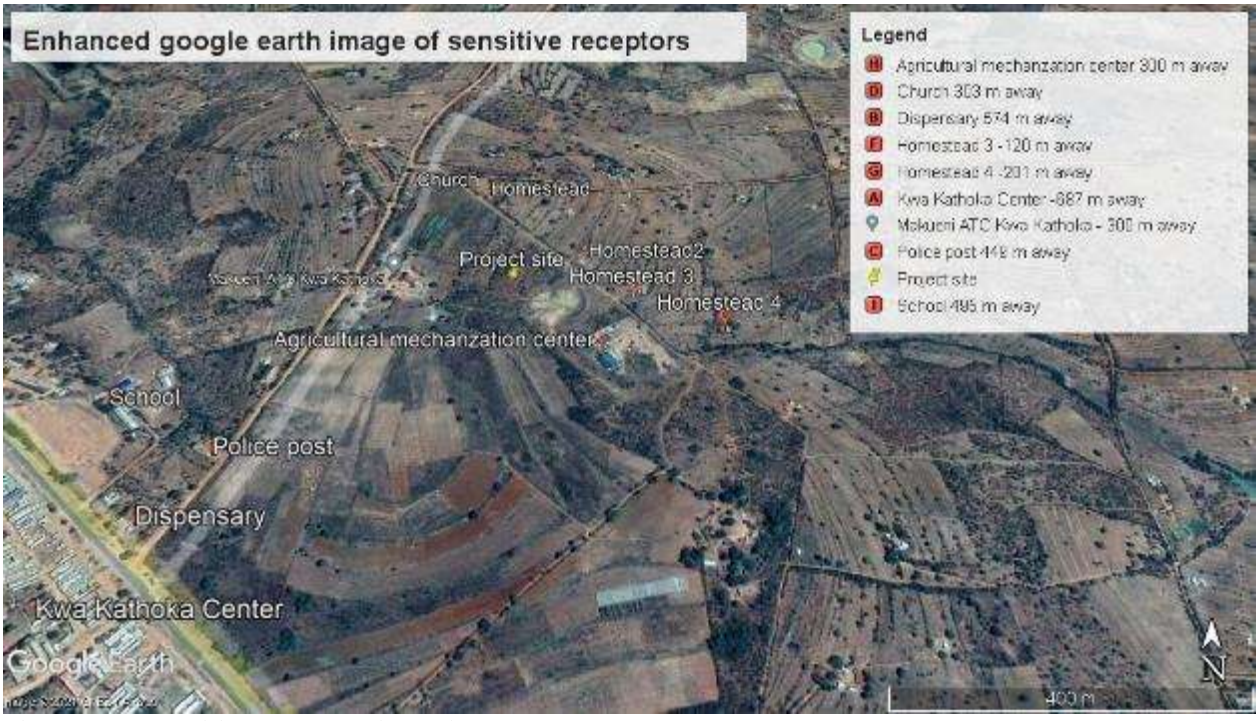


Figure 5-11: Sensitive Receptors in project area

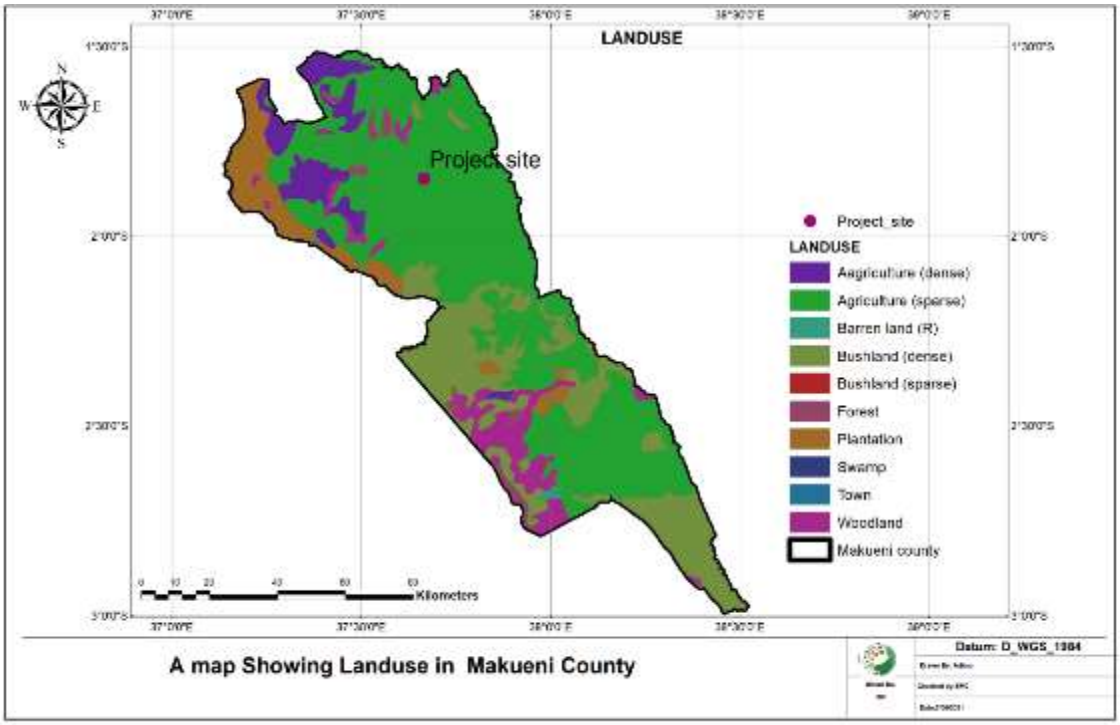


Figure 5-12: Map showing Landuse in Makueni County

5.1.2.3 Education

Only 21% of Makueni County residents have a secondary level of education or above. Makueni constituency has the highest share of residents with a secondary level of education or above at 23%. This is 6 percentage points above Kibwezi East constituency, which has the lowest share of residents with a secondary level of education or above. Makueni constituency is 2 percentage points above the county average. Wote ward has the highest share of residents with a secondary level of education or above at 37%. This is almost three times Masongaleni ward, which has the lowest share of residents with a secondary level of education or above. Wote ward is 16 percentage points above the county average. A total of 17% of Makueni County residents have no formal education. Kibwezi East constituency has the highest share of residents with no formal education at 18%.

Figure 5-13: Sample school in the project area

5.1.2.4 Health

The health sector has played a major role in ensuring that most of the County's population can access affordable healthcare services. There is Makueni level five Hospital, six level four hospitals at Kilungu, Makindu, Mbooni, Kibwezi, Mukaa and Nzaui. The County also has 21 level three hospitals, 113 dispensaries and eleven private clinics. Most of the public health institutions lack sufficient drugs, equipment, means of transportation and health personnel. The bed capacity in the County stands at 616 and doctor population ratio is 1:22,712 which is below the accepted standards. There are nine VCTs and 138 counselors in the County which need to be increased to accommodate the population. The average household distance to health facility is six Kilometers which is way below the national recommended distance of four Kilometers. The current average Morbidity rate in the County is 33.3 percent which higher than the national average of 24.7 percent. Malaria is the most common disease in the County with a prevalence rate of51.1 percent followed by flu (12.7 percent) and stomach-ache (5 percent). Other common disease includes upper and lower respiratory diseases (3.3 percent) and diarrhea (2.5 percent).

Figure 5-14: Local dispensary in the project area

5.1.2.5 Poverty, Income and Employment

The County experiences high levels of poverty which currently stands at 64.3 per cent according to Kenya Integrated and Household Budget Survey (KIHBS) 2006. The poor in the County are the people who earn less than 1$ per day and have less access to basic needs such as food, shelter, clothing, health, water, and education. About three-quarters of the people are poor and live below the poverty line. The majority of the poor are women, children and people living with disabilities. Poverty is most severe amongst the women due to, inequality, limited access to and ownership of land, lack of income generating opportunities, isolation in essential economic services and decision making. Poverty in the County has led to migration to the urban centers by the youthful productive population. It has also led to high malnutrition levels, high dependency ratio and high school dropout rates. Poverty in the County is most severe in the dry areas of Kathonzweni, Kithuki, Kitise Nguu and Kalawa. There are also small pockets of poverty in other areas

of the County. This situation has been aggravated by the HIV/AIDS epidemic, harsh climatic conditions and deteriorating agricultural production.

5.1.2.6 Livelihoods

Agriculture is the main source of income in the County. It accounts for seventy-eight per cent of the total household income followed by wage employment at ten percentage while rural and urban self-employment contribute eight and four per cent respectively. Due to the arid nature of the County, agriculture which is the main economic activity has been performing poorly.

Figure 5-15: Shopping Center at Kwa Thoka adjascent to the project area

The County has a total arable land of 5,042.69 km^2 which is 74 percent of the total area. A total of 1,762.71 km^2 is non-arable accounting for 21.9 percent of the total area. Part of the 2,023 Ha of land that Konza Technology City lies in the County. There are no water masses or industrial area in the County while the urban area accounts for only 7.4 percent of the total area. Most of the land is used for agricultural purposes since most people depend on agriculture and livestock for their livelihood. The County has potential in horticulture and dairy farming especially the hilly parts of Kilungu and Mbooni west sub counties. The lowlands are used for livestock keeping, cotton and fruit production. Fruits grown are mainly mangoes, pawpaw, and oranges. These areas include Kathonzweni, Mbooni East, Nzaui and Makueni sub counties. There is an upcoming fruit processing plant at Wote town to process the fruits as well as a ginnery for cotton processing. This will go a long way in value addition for these products.

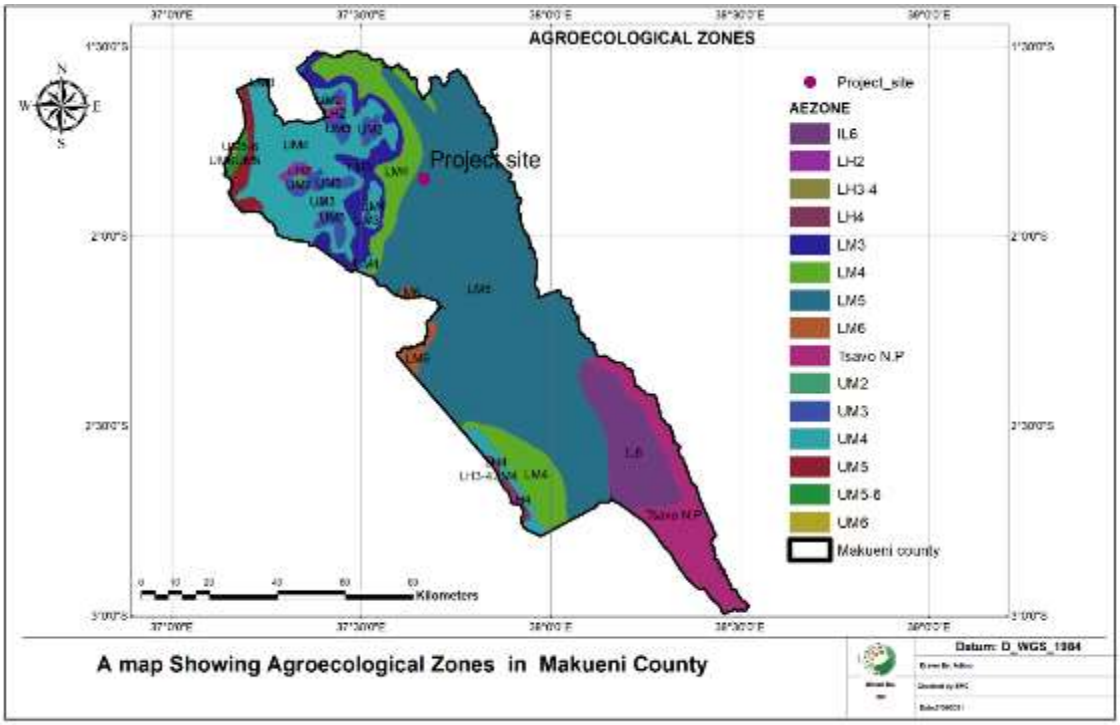


Figure 5-16: Agro-ecologial zones

5.1.2.7 Energy

Only 1% of residents in Makueni County use liquefied petroleum gas (LPG), and 3% use paraffin. 85% use fire- wood and 11% use charcoal. Firewood is the major source of cooking fuel accounting for 84.8 per cent of households, followed by charcoal at 11.1per cent. Paraffin is the most used source of energy for lighting in the households at 69 per cent followed by electricity and solar at 5.9 per cent and 3.8 per cent respectively.

5.1.2.8 Water and Sanitation

Athi is the biggest river in the County. There are other semi-permanent rivers such as Kibwezi and Kiboko rivers. There are four protected springs and 117 boreholes. Households with piped water are 12671 and 27752 households have access to potable water. There are 289 water pans and 159 surface dams. The water demand in the County is 22,113m^3/day and the developed sources have an average production of 13,607m3/day. There are two major rivers; Athi which is permanent and Thwake which is semi-permanent. Other big rivers include Kaiti, Muuoni and Kikuu all of which are seasonal. There are 278 earth dams with a storage capacity of 3,265,543m^3 while the sand dams are 118. There are four protected springs and 117 boreholes. All the major towns lack sewerage facilities, and the sanitation condition is worsened by water shortage. The local community has however embraced the use of toilets and currently about 80 per cent of the households have access to pit latrines.

5.1.2.9 Tourism and Recreation

The County shares part of the famous Tsavo National Park which is considered as one of the world's biodiversity strongholds. Tourism activities are mainly confined within the

park which is rich in diverse wildlife which include the famous 'big five' consisting of Maasai lion, black rhino, Cape buffalo, red elephant and leopard. The park is also home to a great variety of bird life such as the black kite, crowned crane, lovebird and the sacred Ibis. To support tourism there are three one-star hotels situated in Wote and Mtito Andei. There is a need to invest in more tourism class hotels in the County.

5.1.2.10 Trade and Industry

The County has limited industries mainly due to limited natural resources, location from major urban centres and low level of investment. The two main industries include cotton ginnery and a bakery. However, there are light industries especially in the jua kali sector which produce for the local market. This includes dye making from tree barks and roots, *ciondo*, mats, baskets, and wooden carvings.

5.1.2.11 Transport Infrastructure and Network

The County has a total road network of 3,203.5 Km of which 453.8Kms is bitumen, 555.2Kms gravel, and 2,198.6Kms surface roads. The main roads in the County are Katumani-Wote-Makindu road, Masii-Mbumbuni road Salama-Kikoko and Mombasa road. The bitumen roads are in fairly good condition but most of the gravel and surface roads are in poor state which makes them impassable during rain seasons. The County is traversed by a railway line which covers 140 kms. Major railway stations are Makindu, Kibwezi, Mtito-Andei and Emali. The County has one airstrip situated in Makindu.

Figure 5-17: Road and Transportation System within the project area

6 STAKEHOLDERS CONSULTATIONS

This chapter provides a description of the main stakeholders of relevance to the Project and a summary of stakeholder engagement activities undertaken during the preparation of the ESIA.

6.1 Stakeholder Engagement Principles

Eni Kenya B.V. understands that effective stakeholder engagement and public consultation is a cornerstone of successful Project development, and is committed to free, prior, and informed engagement with stakeholders throughout the Project lifecycle. The key principles guiding Eni B.V. Kenya's approach to stakeholder engagement on this Project are:

- To be open and transparent with stakeholders.
- To be accountable and willing to accept responsibility as a corporate citizen and to account for impacts associated with the Project activities.
- To have a relationship with stakeholders that is based on trust and a mutual commitment to acting in good faith.
- To respect stakeholders' interests, opinions, and aspirations.
- To work collaboratively and cooperatively with stakeholders to find solutions that meet common interests.
- To be responsive and to coherently respond in good time to stakeholders.
- To be pro-active and to act in anticipation of the need for information or potential issues.
- To engage with stakeholders such that they feel they are treated fairly, and their issues and concerns are afforded fair consideration.
- To be inclusive and accessible to stakeholders so that they feel able to participate; to receive and understand information; and to be heard
- To engage stakeholders using culturally appropriate languages and formats and techniques, in accessible locations, considering mobility, literacy and disability challenges, and in a timely manner to ensure meaningful consultations.

6.2 Stakeholder Engagement Objectives

The objectives of this stakeholder engagement were as follows;

- To identify and map all relevant stakeholders, their context, interests and concerns;
- To establish a two-way dialogue to understand concerns, management options and external perspectives;
- To promote and secure participation of stakeholders by building their capacity for informed participation with special attention given to vulnerable stakeholders in key decision making;
- To build and maintain trust between stakeholders;
- To support the resolution of emerging tension and maintain the project's social license to operate;
- To manage stakeholders' expectations;
- To facilitate the collection of quality primary and secondary information relevant; to the project processes including monitoring;
- To triangulate data collected and analysis done to inform decision making;

- To document information disclosed and public consultation efforts;
- To comply with regulations and requirements on disclosure and consultation;
- To provide information about the project and its potential impacts to those interested in or affected by the project, and solicit their opinion in this regard;
- To identify additional impacts/issues and possible mitigation measures;
- To inform the process of developing appropriate mitigation measures and facilitate consideration of alternatives and trade-offs (if any);
- To reduce chances of conflict through early identification of contentious issues;
- To ensure transparency and accountability of decision-making; and
- To increase public confidence in the project.

6.3 Stakeholder Mapping and Identification

Stakeholders include individuals or groups that may influence or be impacted by the Project, as described in **Box 6-1** below.

Box 6-1: Definition of a Stakeholder

Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses."

The level of interest and impact of any given group of stakeholders is dependent on a number of factors including level of authority, socio-economic context, influence, education and cultural factors. Stakeholder identification began at Project inception and planning and has continued through the various stages of the Project development.

Stakeholders identified to date represent the organizations and individuals who may be directly or indirectly (positively or negatively) affected by the Project or who may have an effect on how the Project is implemented. Stakeholders identified for inclusion in engagement activities meet one of the following criteria:

- Have an interest in the Project;
- Would potentially be impacted by or have an influence on the Project (negatively or positively); and/or,
- Could provide commentary on issues and concerns related to the Project.

6.4 Approach and Methods of Stakeholder Engagement

Below is a summary of the approaches and strategies adopted throughout the stakeholder consultation exercise.

6.4.1 Mobilization

- **Introduction letters:** Eni Kenya B.V. provided the consulting team with official letters of introduction informing all stakeholders about the proposed project,

introducing the ESIA consultant, informing about the planned consultation activities and requesting them to support the consultants wherever possible.

- **Mobilisation through local administration:** Eni Kenya B.V. and the consulting team visited the offices of the local administrators and informed them about the proposed project and the upcoming consultation activities. Other than information sharing, these meetings were aimed at requesting the administrators to further mobilise the concerned stakeholders. Local administrators consulted included the local chief and assistant chief.
- **Mobilisation by phone and emails:** Other key stakeholders who were not available due to conflicting obligations were contacted either through email or by phone. This mainly applied to custodians of relevant data and literature for the ESIA study.
- **Confirmation of appointments:** Prior to the appointment dates, the ESIA consultant reconfirmed the appointments by contacting the focal persons at each venue at least one day prior to the meeting to verify whether the proposed schedule was still valid for the expected audience.

6.4.2 Focused Group Discussions and Public Barazas

Stakeholders were further consulted in two ways; through public barazas where members of the community were called to a meeting with the agenda of discussing the proposed Project and through Focus Group Discussions (FGDs), where different groups were isolated and interviewed in a culturally appropriate setting. The FGD groups included women, youth and men. The views and recommendations expressed during the consultation meetings were incorporated in the ESIA report. Generally, the result of the participation showed support for the proposed project, with the community looking forward to the anticipated socio-economic developments associated with the project.

Figure 6-1: Public baraza meeting in Kambi Mawe Chief's Office, Wote Makueni County

Figure 6-2: Public baraza meeting expressing their views at Kambi Mawe,Wote Makueni County

Figure 6-3: Focused Group Discussion with Makueni Fruit Processors Cooperative Wote Town Makueni County

Figure 6-4: Mavindini and Kitise Farmers expressing their views

Table 6-1 presents an overview of the main stakeholder groups of relevance to the Project.

Table 6-1: Overview of stakeholder groups

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders
National Government	Key Ministries National Regulatory bodies Government Agencies	National government are responsible for establishing policy, granting permits or other approvals for the Project, and monitoring and enforcing compliance with Kenyan Law throughout all stages of the Project life cycle.	County Commissioner, Makueni County Deputy County Commissioner, Makueni sub county Chief and Assistant Chiefs in affected location and sub location
County Government	County Governments	County Governments are responsible for approval of development plans	Governor of Makueni County
Parastatals	Government funded private enterprises in charge of managing specific activities.	Parastatals may have land or other assets which could be affected by the Project.	Kenya Agricultural and Livestock Research Organisation (KALRO).
Communities	Project affected communities adjacent to the proposed facility.	Households and communities that may be directly or indirectly affected by the proposed Project and its activities.	Directly and indirectly affected community members. Affected community members and infrastructures

Table 6-2: Consultations Venues, Dates and Number of Participants

Consultations Venues, Dates and Number of Participants				
DATES	**VENUE**	**NO. OF PARTICIPANTS**	**MALE**	**FEMALES**
24th August 2021	NEMA County Office-Wote	03	03	00
24th August 2021	Makueni County Commissioner's office–Wote	03	03	00
24th August 2021	Makueni County Director of Cooperatives office – Wote	03	02	01
24th August 2021	Makueni County-Chief Officer's Agriculture and Livestock office	03	03	00
24th August 2021	Makueni County-Chief Officer's office – Environment	03	02	01
24th August 2021	Deputy County Commissioner's office – Makueni sub county	03	03	00
24th August 2021	Kikumini location chief's office	03	03	00
30th August 2021	Kambi Mawe Assistant Chiefs office – Public Baraza	34	24	10
01 September 2021	Mavindini Multipurpose Co-operatives Society	16	14	02
01 September 2021	Makueni Fruits Value Chain- Kathonzweni Church	20	14	06
01 September 2021	Makueni County Fruit Processors Co-Operative Society-Wote Catholic Church	14	12	02

02 September 2021	Malili-Kyale fruits farmers Co-operatives Society- Makindu	12	09	03
02 September 2021	Katika Joint Farmers' Co-operative Society-Kanzokea Chiefs Camp	10	07	03
02 September 2021	Kitise Farmers' Co-operative Society	14	10	04
03 September 2021	Ngwata Farmers' Co-operative Society	14	10	04
03 September 2021	Kamagro Co-operative Society	10	08	02

Table 6-3: Issues and Responses

CONTACT PERSON	ISSUES/ OBSERVATIONS	RESPONSES
Abdishakur Abdisalam NEMA county officer	▪ NEMA expects to receive a comprehensive ESIA report ▪ Nema will review the report once submitted. This will take at most 21 working days ▪ NEMA indicates that this will be considered a project report.	The consultants took note of these guidelines and committed to compiling a comprehensive report.
Alex Nthiwa Position: Chief Officer (Dept. Lands, Mining, Physical Planning and Urban Development)	▪ The county government officials confirmed that a section of county land had been set aside to be leased or donated to the proponent for constructing the facility. ▪ County government official wanted to know if there will be employment opportunities, and what would be the criteria for employment. Particularly, they wanted to know if local people would be given priority whenever opportunities arose.	The consultants informed them that the proponent will put in place a labour recruitment plan to guide all matters touching on employment
Dr. Martin Mboloi Position: Chief Officer Agriculture and Livestock	▪ He noted that his department had been in discussion with the proponent's agricultural experts and exchanged ideas on how to implement the project successfully.	The officials were informed that indeed the project proponent would consider this request and plan according in consultation with county government.
Eng. Josephat Musyoki Position: Chief Officer-Energy and Public Works	▪ The county official urged that the proponent ensure that they procure any required material or equipment from the surrounding locality whenever this was practical.	The consultants informed them that the proponent will put in place a labour recruitment plan to guide all matters touching on employment
Emmily Kivindyo Position: County Director of Cooperatives	▪ Advised the proponent to work closely with county agricultural extension officers when interacting with farmers as they have valuable knowledge ▪ The officials inquired about the nature of benefits that communities would receive from the project as part of CSR. They indicated their desire to partner with the project proponent in implementing such activities.	This was taken note of by the consultants who responded that the requests would be forwarded to the proponent through the report. The consultants informed them that the

	- The official were concerned about social impacts such as the increase of instances of SGBV, SH, child labour and the spread of HIV/AIDs - It is good to note that the proponent will be interacting with farmers through the various farmers cooperatives operating in the county	contractor is obligated to take the necessary measures and put in place appropriate plans and policies to safeguard the community from any anticipated social impacts. These will include a HIV/AIDs prevention and awareness plan, a sexual harassment policy a GBV prevention plan etc. during construction. The proponent would ensure that the plans continue to be in effect during operation of the facility.
Name: Mary Mbenge Position: Chief Officer Environment	- Advised the proponent to regularly contact the director's office in order to get updates on these farmer cooperatives. - Affirmed the importance of ensuring the project does not impact the environment negatively. - Requests the proponent to interact regularly with the county environment department	The consultants took note of these and will incorporate in the report.
Name: Simon Kuria Position: Director Kenya Agriculture and Livestock Research Organization	- The government officer assured the team that he did not anticipate any impacts that would be peculiar to KALRO. - Discussions have been held between KALRO and the proponent touching especially on the variety of castor seeds to be distributed to farmers for planting.	This was noted by the consultants
Name: Michael Kitengee Position Principal Makueni Agriculture Training Centre	- Indicated that the ATC is happy that the proposed facility is to be constructed next to it. - Requested that the facility proposed have regular contacts with the ATC to share experiences and advise. - Emphasized the need for the proponent to include county agriculture extension officers. These officers possess good knowledge of farming culture that will prove useful to the project.	These views were noted by the consultants and shared with the proponent.
Maalim Mohamed Position: County Commissioner Joel Mwangola Position: Deputy County commissioner–Makueni sub-County	- The national government is aware of the proposed project. - The County Commissioner expects to be regularly updated on the progress - Ensure that jobs generated will benefit local community	The consultants took note of these views

Name: Hollings Mutisya Position: Senior Chief– Kikumini location		

Table 6-4: Summary of Concerns raised by the Project-Affected Persons

Theme	Comments and Issues	Response
Waste Generation	Stakeholders were concerned about waste generation and methods of waste disposal during project implementation.	EMC consultants/ENI assured community members that a waste management system will be put in place that would comply with regulations during construction and the operation phase of the facility. Further they were informed that expected waste i.e. press-cake would be converted to make animal feeds and fertilizer.
Noise and Vibration	Questions concerning potential air and sound pollution arising from excessive noise and vibration were raised by community members	The consultants informed the stakeholders that the project will be using up to date technologies to improve efficiencies to reduce noise and vibrations and further mitigation measures will be recommended in the ESMP. These mitigation measures would be implemented during construction and continue in the operation phase. Regular monitoring of compliance will be done.
Water Quality	The community raised concerns on impact of the project on water quality. They stated that water resources may be contaminated by project waste rendering it unfit for human consumption. They were also concerned about over abstraction during project implementation.	The consultants informed the community that the ESIA will propose a wastewater management system as part of the ESMP. Stakeholders were also informed that the project had taken into account the estimated water usage for the project and made plans for alternative water sources to ensure adequacy of water for the project without depleting local resources.
Biodiversity	Stakeholders wanted to know whether the project proponent had taken into account the impact of cutting down trees on the facility site. Further, there was concern that farmers would stop growing other crops or bring more land under cultivation by cutting down trees in order to grow croton and castor to the detriment of other traditional crops leading to loss of biodiversity. There is also some concern that a proposed crop (castor) has leaves that at times are affected by pests which affect small stock (goats) when ingested.	The consultants responded that the proposed site is 3.3 acres which is mostly natural bush. Bush clearance will be minimal. As to risk of cutting down trees by potential producers of castor, this will not occur as the client through county extension officers will advocate for intercropping thus ensuring no loss of biodiversity occurs. Eni, with advice from KALRO, other agencies and expert advice from farmers with local knowledge will find ways of eradicating this pest. The project places great emphasis on the enhancement of the Croton by promoting its cultivation and in fact largely compensating for the cutting of bushes at the construction site

Air Pollution	Some of the stakeholders feared that the project will generate emissions and generate dust leading to air pollution during construction and at operation phase of facility.	The consultants informed the members that the project will be using up to date technologies to improve efficiencies to reduce emissions and mitigation measures will be put in place to reduce emissions in line with national air quality regulations and international best practice. Periodic monitoring will be undertaken to ensure compliance.
Employment	Community members inquired whether there will be employment opportunities and what would be the criteria for gaining access to such opportunities. They decried an ongoing pattern of contractors hiring persons who do not reside in their localities to carry out tasks that locals are capable of doing and requested that, in this project, they be given first priority whenever employment opportunities arise. Female participants were especially concerned that they would not be given opportunities to work in the project because of societal perceptions that they are physically weak and are exclusively responsible for domestic affairs. In addition to this, they fore shadowed possibility of rise in incidences of children dropping out of school to take up paid labour in the project.	The consultants informed stakeholders that they have incorporated the development of a Community Engagement Plan and a Labour Recruitment Plan in the ESIA. These plans will cover all employment issues ranging from recruitment, dismissal, hours of work, non-discrimination, child labour, fair remuneration and grievance management. Stakeholders were however cautioned that where specialist skills are required for the project and the skills are not locally available, specialist would be hired from other jurisdictions through a competitive process.
Social impacts	It was a concern of the community members that the proposed project will increase the population in the project area and its surroundings which could lead to socio-cultural diversification and cultural contamination There were fears that with the increase in population, there will be an increase in the spread of HIV and AIDS, teenage pregnancies, drug and alcohol abuse and prostitution. Further they stated that enhanced economic status particularly among the women and youth would lead to increased occurrences of SGBV. Concerns were also raised about competition for limited resources due to population influx. This would	The consultants and the clients' team informed the community that it will put in place sufficient safeguards to mitigate such incidences through for instance, developing and implementing a grievance redress mechanism; putting in place a sexual harassment policy and a HIV/AIDs prevention and awareness plan. A workers' code of conduct will also be instituted to ensure employees at the facility act in an appropriate manner at all times.

	particularly manifest in inadequate housing and shortage of water supply.	
Operatinalisation	The committee members wanted to know when the plant will be operational.	Eni informed the committee that the Plant is projected to be ready in March 2022.
Feedstock Quantity	The farmer group members wanted to know the quantity of seed crops that the factory will need for its operations.	The consultants /ENI informed the members that the proposed facility is projecting 25 metric tons of seed to be pressed per day.
Feedstock Input	The farmer group members wanted to know if Eni will provide seeds to farmers or whether the farmer groups will source seeds by themselves?	Eni responded in the affirmative, they would provide initial seeds that have been selected/approved by government agencies e.g., KALRO.
Brokers	The farmer group members wanted clarification on the issue of middlemen since this has been a great challenge to farmers. It is their perception that middlemen/ brokers undercut them thus reducing their incomes/ livelihoods markedly.	The client informed the farmer group members that they will have a direct contact/contract with the farmers cooperatives which will help in doing away with middlemen who exploit farmers.
Pricing	The farmer groups wanted confirmation from the client about the price per kilo for their produce.	The team reassured the committee that the price is still being worked on and they will provide suitable/competitive prices for their produce
Market	The farmer group members stated that such projects have been mooted in the past, unfortunately they are left with nowhere to sell their produce once such ventures do not succeed. They wanted assurances that this would not occur for the proposed project	ENI assured the farmers representatives' that will have readily available market for their products for the long term once the facility will be operational.

7 ANALYSIS OF PROJECT ALTERNATIVES

This chapter describes the analysis of technically and financially feasible alternatives considered in the development of the Project and provide documentation of the rationale for selecting a particular option. The purpose of the alternatives analysis is to identify feasible alternatives that could improve the sustainability of the Project's design, construction and operation.

7.1 No Project Alternative

The project area is virgin ground for the agro-processing industry and the Eni BV project will be first large scale agro processing project in Makueni. The project will provide opportunities for socio-economic development and growth within the Wote. This will come about as a result of land lease payments, out grower programs, job opportunities, business opportunities, community development activities etc. Infrastructural development within the project area will contribute towards improving the standard of living and improve the social conditions within the related communities. National benefits will be realized through the socio-economic improvement of the project area as well as the through the exportation of the products. The implementation of the agri-hub will therefore have far reaching benefits to the project area and Kenya as a whole, which would not be realized if the project were not to be implemented.

Eni Kenya B.V.'s decision to implement the project in an environmentally sustainable manner will have greater benefits for the local communities and Kenya as a whole, than not implementing the project and maintaining the existing bio-physical, socio-economic, and physical conditions at the site.

7.2 Alternative Site

The current site was considered suitable due to it's the following reasons:

- Favourable topographical conditions for the plant construction
- Land affordability (leased by County Government)
- Proximity to ATC thereby offering opportunities for synergies with ATC for offering training services to farmers

An alternative site approximately 200m and adjacent to the current site was considered and rejected due to the following reasons:

- Less favourbale topographical conditions for the plant construction
- Preliminary site reports
- Extensive professional consultation with KALRO.

Another site was considered at Makindu town agricultural showground approximately 70 kms from the current site. The site was rejected due to the following:

- Unfavourbale topographical conditions for the plant construction
- Site is far off to the sources of raw material (ginneries)
- Extensive cost that could be incurred in transportation of materials.

7.3 Alternative Construction Materials

The proposed project will be constructed using modern, locally, and internationally accepted materials to achieve public health, safety, and environmental aesthetic requirements. Equipment that saves energy and water will be given first priority without compromising on cost or availability factors. The concrete pillars and walls will be made using locally sourced stones, cement, sand, metal bars and fittings that meet the Kenya Bureau of Standards requirements. Heavy use of timber during construction is discouraged because of destruction of forests. The exotic species would be preferred to indigenous species in the construction where need will arise. However, the building methods and technologies to be used will require very little timber.

7.4 Alternative Feed Stock

The feedstocks for oil extraction for energy purposes are majorly classified into four main categories. The four classifications of feedstocks for biodiesel synthesis and oil content present in various feedstocks are shown in **figure 7-1** below. The parameters like oil content and overall cultivation yield of agricultural land are the key parameters to consider any new feedstock of biodiesel synthesis.

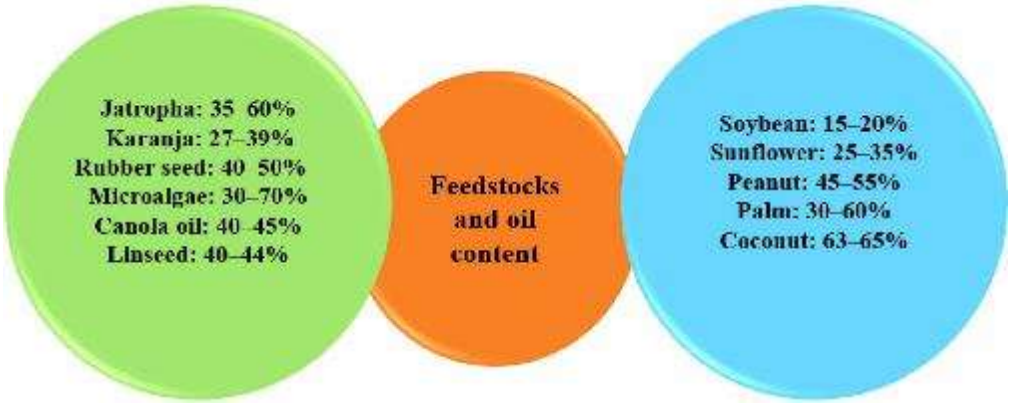


Figure 7-1: The oil content of feedstocks for biodiesel synthesis

First Generation Feedstocks

The first-generation feedstocks are considered as readily available sources to produce biodiesel. The edible oils include palm, coconut, olive, mustard, soybean, rapeseed, and sunflower oil. The application of edible oils over the years has affected the supply, since this practice affects the food market globally, destabilizing the availability and prices. Therefore, edible oils are too costly to be used for fuel production since they have a high demand for food. Hence, the world may face the 'food vs. fuel' soon if the use of first-generation feedstocks for biodiesel synthesis continues. Their applicability to synthesize biodiesel can cause an increase in the cost of both biodiesel and oils. The process has negative effects on the environment due to its demands for a larger area of land for feedstock cultivation. This causes deforestation especially in tropical regions, supplying greater than 75% of palm oil supply to the world. Continuation of this practice for biodiesel synthesis would damage flora and fauna, with influences culminating in weather changes.

Second-generation feedstocks

The second-generation feedstocks are available in large amounts in nature because of the lack of competition with food. The growth rate and yield of seeds of non-edible oil plant are much lesser. The non-edible oils-producing plants have an excellent vegetative growing capacity, but the quantity of seeds obtained from a single plant is very minimal.

7.5 Alternative Oil Extraction Technology

The extraction of oil is the most important step in biodiesel synthesis. In oil extraction, physical, chemical, or enzymatic treatments are applied to the plant to recover the oil. The major products include crude oil and cakes of the already-used plant. The cake produced in this step is not used in further processing.

a) Mechanical Extraction

In mechanical extraction of oil, manual ram pressing, or engine driven screw pressing is used. Engine-driven screw has an efficiency of 68–80% of the oil content, while manual pressing can give the efficiency of 60–65%. After mechanical pressing, filtration and degumming are used to recover the oil. The challenge of using mechanical pressing is the only application for specific seeds. However, pre-treatment procedures enhanced the recovery of oil for screw presses, giving 89% efficiency in a single pass and 91% for a double pass. This is the preferred option.

b) Steam Distillation

Steam distillation is a removal process that is applicable for the extraction of oil from temperature-sensitive plants containing aromatic compounds. Without applying the maceration, plant material containing oil is introduced in the setup, exposed to steam. The steam passes through the charged feed, as presented in **Figure 7-2** below.

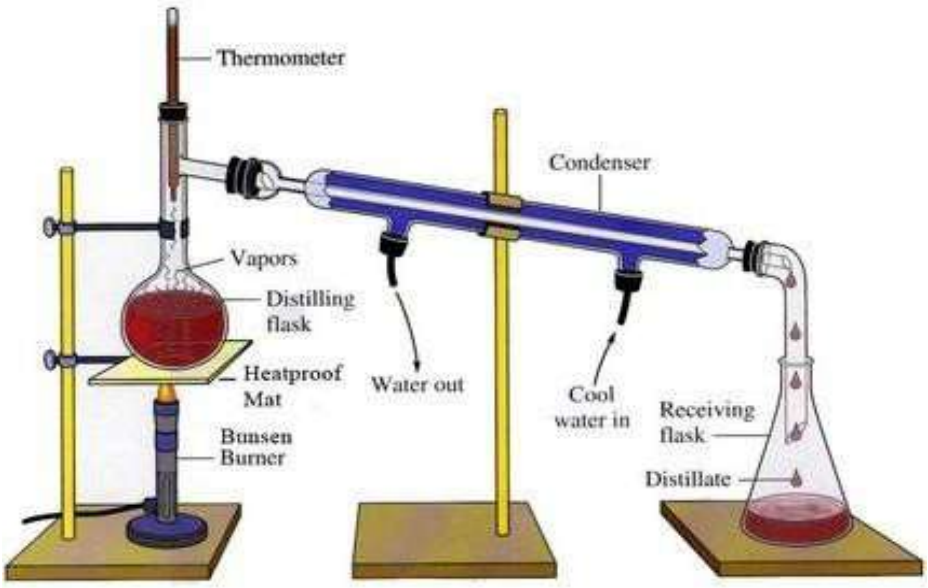


Figure 7-2: Apparatus for performing steam distillation.

The steam distillation system produces a product consisting of vapor and crude oil, which can be taken off after removal of vapors. This method can also be followed under pressure variance based on the nature of plant material and the problem of recovering oil at the room temperature. The process has the advantages of low thermal deterioration since the operating temperature does not exceed 100^0C. However, this process has some limitations i.e., raw material required for the extraction must be evenly distributed for greater recovery of oil. A different predicament related to this process is that cold feed is charged. Until the temperature of the whole feed charged approaches the steam tempera- ture being introduced, the wetting process continues. This process requires higher capital investment and when low market value products are produced, and the investment costs may require several years for a full recovery. This alternative was rejected.

c) Solvent Extraction

A Soxhlet extractor is a laboratory-scale unit developed in 1879. The process requires a small amount of solvent to extract a higher amount of the targeted compound. It promotes solid and liquid to recover the desired compounds from the solid matrix using a suspension of a matrix into the refluxing solvent. The solid matrix is kept in a space that continuously receives the solvent by the condensation of its vapors moving through the distillation arm. After achieving a certain value, the liquid is taken from the cavity by a siphon moving back into the distillation chamber. The extraction process has some limitations such as the increase in time required, such as several hours or days. The enhanced temperature of the system for a long time causes the thermal degradation of the material of construction of distillation flask. The procedure is not in favor of the environment due to possible pollution problems occurring due to the use of flammable and toxic solvents. In addition, the process can be used for the recovery of tiny and finely divided solid samples. This alternative was rejected.

d) Chemical Leaching

This is the process of recovery of a component from a solid feedstock using a solvent. Several factors affect the chemical leaching process such as the size of a particle, type of the liquid used, temperature, and mixing speed of the system. Small particle size is used to allow the interfacial area between the feedstock and the solvent. The viscosity of the solvent must be lower to promote free circulation. Temperature is also the significant parameter influencing the rate of extraction, the solubility of the oil rises with temperature increase. Rate of mixing is also one of the factors affecting the process, since it promotes the rate of diffusion, consequently enhancing the material transfer from the surface of the particle. This alternative was rejected.

e) Enzymatic Oil Extraction

Enzymatic oil extraction is a feasible process used for oil recovery. The method utilizes suitable enzymes to extract the oil from seeds. Although the process is proving its potential, the application of this technology is still facing limitations such as higher cost of enzymes, higher incubation time, and the need for de-emulsification during downstream processing.

The implementation of techniques such as affinity chromatography and perfusion chromatography makes the downstream processing easier, while the immobi- lization of enzymes minimizes the enzyme losses and overall cost. However, enzymes immobilization causes the reduction of reaction rates due to steric hindrance. Moreover, the application of solvents such as n-hexane increases the production of wastewater and release of volatile organic matter, besides n-hexane flammability and toxicity. This requires the use of a substitute extraction process such as an aqueous enzymatic oil system along with ultrasonication pre-treatment. This alternative was rejected.

f) Supercritical Fluid Extraction

The application of supercritical fluids is extensive to extract metal cations and oils. The use of carbon dioxide is most common for supercritical extraction of essential oils due to its low critical temperature and pressure conditions. Moreover, CO_2 is non-toxic and non-flammable and is available at low cost in highly pure form. It can be completely removed from the extract in a much easier way. The non-polar nature of CO_2 limits its applicability for the extraction of non-polar analytes. Supercritical extraction uses CO_2 as the supercritical solvent but the application of co-solvents like methanol or ethanol is recommended to add according to the nature of extracted analytes. Polyphenols can be separated using pure supercritical CO_2 at elevated pressures after that unsaturated fatty acids can be recovered by adding the co-solvent (ethanol). The process is faster since the extraction process takes place on the phenomena of diffusion, which concludes that high diffusivities at supercritical conditions lead to favoring the rate of extraction. However, the need for high pressures limits the application of supercritical fluid extraction in comparison with conventional technologies.

Table 7-1: Advantages and Disadvantages of Alternative Technologies.

Technology	Advanatge	Disadvantage
Mechanical Extraction	• It has enhanced oil extraction efficiency (68–80%) as compared to manual pressing. • The pre-heating in mechanical extraction can increase the efficieny up to 91%	• This technique is applicable for the oil extraction from limited type of seeds.
Steam Distilation	• This method can be used for oil extractions from the plants that are not temperature sensitive • Low thermal degradation is observed	• The process requires equal distribution of extraction • It requires high capital investment and low value product is obtained • Continuous wetting is needed to supply the cold temperature feed into the system
Solvent Extraction	• Agitation during the solvent extraction promotes the removal of targeted compound. This technique is cheaper and easier to handle	• The use of this technology is not in favour of sustainable environment due to the use of toxic and flammable solvents

Enzymatic Extraction	• It is one of the sustainable process used for oil extraction due to the no negative effect on the environment.	• It requires high cost of enzyme and incubation time and requires de-emulsifciation during downstream operations
Supercritical Fluid Extraction	• The higher extraction takes place at supercritical conditions due to the enhance solubility with solvents. • The use of CO_2 as a solvent makes it cheaper prcess due to easier availability and non-flammability of CO_2.	• High temperatures and pressure required in supercritical technique increases the overall cost

7.6 Alternative Energy Source

The principal source of energy during operational phase of the project will be from Kenya Power and Lighting Company (KPLC). The electricity main was picked as a major source of power as it provides the clean and less costly power alternative which is also environmentally friendly. The use of a generator was analyzed against but was only considered for use during periods of power outages (back up). Other alternatives would be the use of renewable sources of energy such as solar and wind energy. However, these would require a substantial capital investment for the project and was therefore not considered.

7.7 Alternative Water Source

a) Borehole

The use of borehole for water supply was analyzed against connecting to a local water supply utility company and buying of disposable water bottles for domestic use. The use of a borehole was preferred for the project operations and domestic use as an alternative which seemed to be cheaper and appropriate.

b) Surface Water

The nearest water source to the site is Thwake, Thange and Kambu rivers all of which are tributaries of Athi River which could provide water supply all year round. Majority of the residents along the river course downstream to Indian Ocean depends on its supply for domestic and agricultural purposes. Abstracting water from the river would therefore partially infringe on the downstream residents from obtaining sufficient water supply especially during erratic weather conditions. This method was therefore expunged from consideration as the design process already envisioned ground water and pipeline as the alternative sources.

c) Piped Water

The project site is located in an area serviced by Wote Water and Sewerage Company (WOWASCO) which renders easy connection to the proposed project. A decentralized sewage management and disposal system may not provide a better option than the existing connection to sewer main considering the presence of other businesses in the immediate

adjacent properties. The supply is however erratic and unreliable only pumped once per week and only considered for domestic use (drinking) during the construction and operation since it is a fresh water supply.

8 ASSESSMENT OF POTENTIAL RISK AND IMPACTS

This chapter presents the assessment of the issues likely to arise as a result of implementation of the proposed project and possible mitigation measures. For each issue, the analysis is based on its nature, the predicted impact, extent, duration, intensity and probability, and the stakeholders and/or values affected.

8.1 Beneficial Impacts

8.1.1 Pre-Construction Phase

8.1.1.1 Employment

The construction activities will provide employment opportunities–directly and indirectly–to skilled as well as unskilled manpower primarily to local manpower. During construction, the project will be beneficial through creation of employment opportunities for the local communities. The income, thus enhanced, of the local skilled and unskilled work force would also bring out a multiplier effect to other sectors of the economy.

8.1.1.2 Local Material Supplies

Another positive impact of the project involves local material sourcing mainly sale of materials for use in the project. Some of these can be expected to be sourced locally and the rest through importation. It is expected that the project will generate new income revenues for the local population across the County in harvesting and transportation of sands, ballast, stones, concrete/wooden poles, and gravel. The new income revenues received will create demand for other goods and services causing a trickledown effect to the entire economy.

8.1.2 Operation Phase

8.1.2.1 Employment

The operation activities will provide employment opportunities–directly and indirectly–to skilled as well as unskilled manpower primarily to local manpower. During operation, the project will be beneficial through creation of employment opportunities for the local communities. The income, thus enhanced, of the local skilled and unskilled work force would also bring out a multiplier effect to other sectors of the economy.

8.1.2.2 Local Economic Growth

Farmers groups, cooperatives, industries which will be engaged in the supply of raw materials (plant seeds/feedstock) will receive payment for their products and will in effect spur the local economy.

8.1.2.3 Environmental Benefits

The proposed project will contribute to reduction in Green House Gaseous (GHGs) emissions. Plants absorbs carbon dioxide from the atmosphere when its plant matter base (biomass) is grown. The carbon dioxide is then released back into the atmosphere when the fuel is burnt. The combustion of petrol and diesel produces many different types of local air pollutants. It is anticipated that bio-based fuels can provide an estimated 80% reduction in overall CO_2 life cycle emissions compared to fossil fuels.

8.2 Adverse Impacts

Following a scoping process, this impact assessment was focused on interactions between the Project activities and various resources/receptors that could result in significant impacts.

8.2.1.1 Pre-Construction Phase

8.2.1.1.1 Land Acquisition Impacts

This construction will lead to loss of land owned by the County Government of Makueni. There are no families or encroachers on the land that will be leased to Eni Kenya B.V. by the County Government of Makueni.

Table 8-1: Pre-Mitigation Impact Assessment

Impact **Loss of livelihoods and household income as a result of temporary land take and loss of access to land during construction**					
Impact Nature	Negative	Positive	Neutral		
	The land take will not lead to loss of livelihoods because the land is owned by the Makueni County Government and is not encroached.				
Impact Type	Direct	Indirect	Induced		
	Loss of use by Makueni County Government				
Impact Duration	Long Term	Short Term	Long Term	Permanent	
	Through out the project lease period hence permanent				
Impact Extent	Local	Regional	International		
	Impact limited to the Study Area				
Impact Scale	Total land required for the project in the construction phase (3.362 acres).				
Frequency	The impact is expected to be permanent until project decommissioning phase.				
Impact Magnitude	Positive	Negligible	**Small**	Medium	Large
	Based on the parameters above and the embedded measures in place to minimize land take and land clearance the magnitude is considered small.				
Resource/ Receptor Sensitivity	Low	Medium	High		
	The sensitivity of the receptors is considered low considering the land is owned by Makueni County Government with no encroachers depending on it as a source of livelihood.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the magnitude is small and sensitivity is low, the impact on livelihoods and household income during construction activities is considered of low significance.				

8.2.2 Construction Phase

8.2.2.1.1 Construction Air Pollution Impacts

Air pollution during construction include gaseous and dust emissions which may have an impact on air quality. Project activities that have potential to impact air quality include emissions of air pollutants from temporary power generators, construction equipment and vehicles. The construction activities will entail the use of motorized machinery and vehicles which will lead to air pollution which will impact human health and the environment in general. Pollutants from motorised equipment during construction will include:

1. CO – Carbon monoxide;
2. CO_2 - Carbon dioxide;

3. NO_X– Nitrogen oxides including NO_2 - nitrogen dioxide and NO – nitric oxide.
4. PM10 – fine particulate matter including soot/black; and
5. Sulphur dioxide (SO_2): SO_2 is of concern because of its impacts on health and vegetation.
6. Dust is defined as all particulate matter up to 75 μm in diameter and comprising both suspended and deposited dust, whereas PM10 is a mass fraction of airborne particles of diameter 10μm or less. Dust and PM10 emissions arise from a number of sources, so both construction activities and emissions from vehicles associated with the construction site need to be considered.

Construction vehicles are generally fueled with diesel, and thus, SO_2, PM, NO_X, VOC, and CO emissions are expected to occur on the site. In addition to these mobile source emissions, there will be also stationary emissions from the activities in the sub-station and maybe camp site (if decided upon by contractor). These emissions will be mostly due to power generations in diesel generators if used. Most site equipment (excavators, diggers, etc.) can be considered as similar to medium or heavy-duty trucks. Vehicles are used for the transport of materials and equipment on and off site.

The above pollutants are only likely to be significant where coal or heavy fuel oil are in use. As these fuels will not be used for the Project, significant impacts on air quality from these pollutants are therefore considered unlikely. The above pollutants are of concern due to the adverse effects on human health and natural ecosystems in the local environment.

Construction activities will also create dust in particular where vehicles are using unpaved roads close to properties and agricultural areas. Dust emitted from excavation, earth moving, loading, handling, and transportation of materials. Dust deposition from road traffic is not likely to be a more significant issue than exhaust emissions, the roads used by construction vehicles are paved. The construction has the potential to cause emissions of dust Total Suspended Particles (TSP) from land clearing, earthworks, movement of vehicles over unpaved surfaces and roads, handling of friable materials etc. These sources have the potential to increase ambient concentrations of particulate matter, resulting in nuisance at nearby settlements and to affect crops and natural vegetation through dust deposition.

Table 8-2: WB and WHO reference standards and guidelines for NOx PM, Sox.

Parameter	WHO Air Quality Guidelines
Sulphur Dioxide, SO_2	20 μg/m^3
Nitrogen Oxides, NOx as NO_2	200 μg/m^3 (1hr)
Suspended Particulate Matter	200 μg/m^3
PM10	100 μg/m^3
PM2.5	25 μg/m^3
Ozone	100 μg/m^3

Impact Assessment

Exhaust Emissions

No detailed traffic data is available at this stage. However, the numbers of Heavy-Duty Vehicles (HDV) and Light Duty Vehicles (LDVs) are expected to be well below the

thresholds for potentially significant impacts. On this basis, the magnitude of impacts associated road traffic exhaust emissions are predicted to be **Negligible**. Combined with the Medium and Low receptor sensitivities identified the overall significance of impacts is Negligible.

Dust and PM10

There are the potential for impacts to arise from:

- Construction traffic on roads;
- Earthworks;
- Trackout[1]

The Project will require earthworks on the site. These works will include stripping vegetation on site, excavations etc. Due to the scale of these activities, the Magnitude is Negligible.

The exact number of HDVs that will be generated is unknown. However, this is expected to range from 2 to 5 HDVs per day category using site roads. On this basis, the magnitude of trackout is low. Combined with the Medium and Low receptor sensitivities identified the significance of unmitigated impacts are:

- Traffic on unpaved roads are **Minor** where there are receptors within 50m of unpaved roads used by construction traffic, or the haul route;
- Earthworks are **Moderate** where there are receptors within 350m of locations where earthworks are being undertaken, including stripping and excavations.
- Construction activities are **Negligible**; and
- Trackout are **Minor** at receptors within 50m of routes used to access the construction route where these are within 500m of the access point to the route or construction site.

On this basis there is a need for mitigation to be implemented to reduce dust emissions/impacts.

Table 8-3: Pre-Mitigation Impact Assessment

Impact	**Degradation of the Airshed during Construction**			
Impact Nature	Negative	Positive	Neutral	
	Increase in airborne pollution.			
Impact Type	Direct	Indirect	Induced	
	Impact is a result as a direct interaction between project activities and the environment along the footprint of the project.			
Impact Duration	Temporary	Short Term	Long Term	Permanent
	The impact is expected to be temporary as emissions arise throughout the construction phase only.			
	Local	Regional	International	

[1] Track-out or carry-out is dirt, mud or other debris tracked onto a paved road surface or area accessible to the public by a vehicle.

Impact Extent	The impact will arise locally in the footprint of the project and immediate surrounds. Impacts will also arise further afield close to unpaved public roads used to access the work sites during construction.				
Impact Scale	The impact is considered as small (local) scale.				
Frequency	Intermittent impacts will typically only arise during working hours.				
Likelihood	Inevitable				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered small.				
Resource/ Receptor Sensitivity	Low	Medium	High		
	The sensitivity of human receptors is Low. The receptors of agricultural activities is Low.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Dust emissions have the potentially to have Minor significant impacts at nearby sensitive human receptors.				

Mitigation Measures

Mitigation measures are split into general considerations for all construction activities, and specific mitigation measures for traffic on unpaved roads, earthworks and track-out. As general measures for all locations:

- Develop a Dust Management Plan;
- Record all dust and air quality complaints, identify cause(s), take appropriate measures;
- Undertake monitoring close to dusty activities, noting that this may be daily visual inspections, or passive/active monitoring
- Undertake inspections to ensure compliance with the Dust Management Plan;
- Plan potentially dusty activities so that these are located as far from receptors as feasible;
- Erect solid screens if feasible around stockpiles
- Avoid run off of mud and water and maintain drains in a clean state;
- Remove dusty materials form site as soon as possible if not being re-used. If being re-used, cover;
- Impose speed limits on haul routes and in construction compound to reduce dust generation;
- Minimise drop heights when loading stockpiles or transferring materials; and
- Avoid waste or vegetation burning.

For traffic on unpaved roads:

- Undertake watering to attenuate dust near sensitive receptors. The duration and frequency of this should be set out in the **Dust Management Plan** and will consider water availability and any stakeholder grievances; and

For earthworks:

- Revegetate exposed areas as soon as feasible
- Cover stockpiles if feasible;
- Expose the minimum area required for the works and undertake; and exposure on a staged basis to minimise dust blow.

For trackout:

- Where trackout is onto paved roads, use wet road cleaning methods to remove dirt and mud build up;
- Avoid dry sweeping of large areas; and
- Where feasible, undertake wheel washing and vehicle clean down prior to accessing public roads.

Operation Air Pollution Impacts

Air pollution during operation will include dust and particulate emissions that will be generated from the oil extraction activities, movement of trucks in and out of the plant (bringing raw materials and shipping oil) and use of generators during power outages. The pollutants include Carbon Dioxide (CO_2), Volatile Organic Compounds (VOC), carbon monoxide (CO), Nitrogen Oxides (NO_2) and particulate matter (PM). The significance of the impacts on air quality from the decommissioning activities is considered minor. The numbers of trucks in and out of the plant are expected to be well below the thresholds for any significant impact associated with traffic exhaust emissions. The case is the same for emissions associated with the use of the standby power generators. The oil extraction processes will also generate particulates and dust of insignificant impacts. The impact on air quality is predicted to be negligible.

Decommissioning Air Pollution Impacts

Air pollution during decommissioning include gaseous and dust emissions from temporary power generators, equipment, and vehicles. The pollutants include Carbon Dioxide (CO_2), Volatile Organic Compounds (VOC), carbon monoxide (CO), Nitrogen Oxides (NO_2) and particulate matter (PM). Excavation, earth moving, loading, handling and transportation of materials will also give rise to fugitive dust. The significance of the impacts on air quality from the decommissioning activities is considered minor. The numbers of vehicles and mobile equipment are expected to be well below the thresholds for any significant impact associated with traffic exhaust emissions. The traffic management plan developed during construction will be used during this phase. The impact on air quality is predicted to be negligible.

Residual Impact

The residual impacts associated with road traffic exhaust emissions are **Negligible**. With the implementation of suitable mitigation and with adequate monitoring, residual impacts associated with dust and PM10 from construction activities are **Negligible**.

Table 8-4: Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Road Traffic Exhaust Emissions	Construction	Negligible	Negligible
Dust and PM 10 from construction activities.	Construction	Negligible	Negligible

8.2.2.1.2 Noise Emission and Vibration Impacts

Potential noise impacts may arise as a result of the construction activities. There will be risks and impact of noise and vibration resulting from the construction equipment and machinery on people. Potential sources of noise and vibration during construction will include clearing and grubbing, excavations, earthmoving, construction traffic etc. Construction activities and equipment are not expected to result in significant levels of vibration. Equipment that might cause high levels of vibration (such as impact piling or vibratory compaction) will not be used. Blasting as a construction activity will not occur. The equipment used in construction will generate minimum noise during construction of and will not adversely affect communities and fauna.

Baseline Conditions

The ambient noise environment at settlements in the area is influenced by activities within settlements including people activities, animals (such as birds), occasional cars, vegetation blowing in the wind, and weather (wind, rain). The noise baseline survey conducted for the ESIA determined that daytime noise levels, LAeq, were generally low and in the range 35 to 41 dB. Noise monitoring was not carried out during the night as significant night-time noise effects from the construction and operation of the Project are not expected.

A sound power level of 105 dB (A) has been assumed for the noisiest phase of construction, which is expected to be foundation works. This includes a concrete mixer truck, a tracked mobile crane, a compressor, and a poker vibrator working simultaneously.

When assessing effects from noise, impact significance is not determined in the same way that it is for most other technical disciplines i.e., using a matrix of impact magnitude and receptor sensitivity. Consideration of receptor sensitivity is made at the start of the assessment, and impacts are only assessed where sensitive receptors are identified. Receptor sensitivity is represented by impact criteria determined by reference to appropriate standards or guidelines. The significance of an impact is derived from the impact magnitude but takes account of other factors such as the duration of the impact and the design of the receptor.

IFC and World Bank Group General EHS Guidelines provide guidance on acceptable noise levels based on WHO standards and these are set out in **Table 8-5.**

Table 8-5: IFC/World Bank Group Noise Level Guidelines

	Maximum Allowable Ambient Noise Levels, LAeq,1hr, dBA Free field	
	Daytime	Night-time
	07:00 – 22:00	22:00 – 07:00
Residential, institutional, educational	55	45
Industrial, commercial	70	70

The project site is not within close proximity of key sensitive receptors including educational and health facilities as well as residential areas and therefore, the emissions from the construction activities are not expected to significantly affect such sensitive

receptors. There is a school, police station, market centre and dispensary about 500m from the project site.

Impact Assessment

Construction

There will be noise and vibrations generated during the construction phase, but it will be typical of any construction site. The noise impact during construction is expected to be negative and short-term. The major receptors are expected to be the construction workers as well as any immediate neighbouring residential premises (2). Sources of noise will be trucks and the off-road vehicles in transit, use of compressor to break hard ground. Impacts of noise include noise-induced hearing loss for the workers and nuisance for the affected residential areas. The sensitive receptors close to the project site are outlined in Figure 5-11 section 5.1.2.2.

Table 8-6: Pre-Mitigation Impact Assessment

Impact	**Noise during Construction**				
Impact Nature	Negative	Positive	Neutral		
	Elevated noise levels from operation of construction and decommissioning equipment.				
Impact Type	Direct	Indirect	Induced		
	Impact is a result of noise generated by construction and decomissioning activities.				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	Impacts are expected to be short term (during the construction and decommissioning phase) at any individual NSR				
Impact Extent	Local	Regional	International		
	The impact will be limited to the NSRs within the immediate surrounds of each tower worksite.				
Impact Scale	Local				
Frequency	Impacts may occur during daytime periods over a short-term duration at each tower worksite.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered negligible to small.				
Resource/ Receptor Sensitivity	Low	Medium	High		
	Dwellings are considered to have a high sensitivity to noise.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is small to negligible and the sensitivity is low, the overall significance is considered to be negligible to minor.				

Operation

During the operational phase, noise impacts is expected to be minimal with the major receptors expected to be the workers in the plant.

Mitigation

Mitigation measures are set out below, which have been assumed for the base case assessment. They are assumed to result in a 5 dB (A) reduction in the overall noise from construction plant teams. The following standard mitigation measures will be employed:

- Siting noisy equipment as far away as possible from Noise Senstive Receptors (NSRs), and use of barriers (e.g., acoustic sheds or partitions) to reduce the level of construction noise at receptors wherever practicable
- Where practicable noisy equipment will be orientated to face away from the nearest NSRs
- Working hours for significant noise generating construction work 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
- Where practicable, stationary equipment will be located in an acoustically treated enclosure
- For machines with fitted enclosures, doors and door seals will be checked to ensure they are in good working order; also, that the doors close properly against the seals
- Throttle settings will be reduced, and equipment and plant turned off, when not being used
- Equipment will be regularly inspected and maintained to ensure it is in good working order. The condition of mufflers will also be checked; and
- Fitting of mufflers or silencers of the type recommended by manufacturers

Decommissioning Noise Emission and Vibration Impacts

Potential sources of noise and vibration include excavations, earth moving and traffic. The equipment generates noise levels below values that will adversely affect communities and fauna. To further minimize exposure to noise, work will be carried out during the day only. The significance of the noise impacts during decommissioning has been rated as negligible.

Residual Impact

Standard mitigation measures listed above have been assumed for the base case noise assessment. No impacts above small are predicted and therefore no further mitigation is required. Consequently, the residual impacts are the same as those presented above.

Table 8-7: Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Noise from construction activities affecting nearby dwellings	Construction	Negligible-Minor	Negligible

8.2.2.1.3 Soil Erosion and Contamination Impacts

Construction activities will have direct physical impacts to soil. Possible direct physical impacts to soil include erosion resulting from activities such as excavation of foundations and clearing of vegetation.

The excavation of soil for the construction will disrupt the soil cohesion and may result in surplus soil due to the use of concrete for the foundation. If not properly restored or managed, this soil may erode and wash into nearby surface water bodies adversely impacting these. Any temporary soil stockpiles established during construction of infrastructure will be at risk of erosion from wind and rainfall. Impacts to soil from unplanned events, such as accidental release of hazardous materials is discussed elsewhere.

Baseline Conditions
The potential for soil erosion to occur during the construction phase is based on a number of factors including the type and physical properties of soil, the topographic slope, the vegetation cover, and the nature and duration of construction activities which disrupt the soil. The proposed site is characterized by deep red sandy alluvium soil type as reflected in the baseline description chapter.

Impact Assessment
The excavations will have a direct negative effect on soil cohesion, thereby increasing the risk of erosion along the entire footprint of the project. The impact is likely to occur, but the extent of the impact is likely to be limited to the footprint of the activities, particularly the construction and site (i.e., local extent).

The impacts of construction activities on soil erosion are anticipated to last for the duration of the construction phase only (i.e., short term). Given the sub tropical location of the Project and the nature of vegetation present, it is anticipated that cleared areas will revegetate naturally and relatively quickly (assuming rainfall patterns similar to the current averages persist), minimizing the risk of erosion.

During construction there is the potential for spills of fuels and oils during construction activities, fueling, maintenance of machinery and vehicles. Spills have the potential to affect terrestrial environments and could lead to the deterioration of soil, water, and sediment quality. This could lead to knock on effects for flora and fauna and local community users.

If hazardous materials such as fuel were to be released to the soil and surface water resources, this would be limited to the local extent, depending on the volume spilt and rate of spillage. Within the Project AoI there are limited surface water resources such as streams and rivers which could be impacted if the spill were to occur within proximity of the resource.

Likelihood: -Incidental spills of fuels are infrequent but do occur; most frequently due to malfunction of handling systems, poor practice of workers and force majeure. Spills are most likely to occur during refilling and transportation of substances. Large releases of hazardous materials are rare, and it is considered unlikely that a spill would occur of emergency scale.

Operational Phase
Following reinstatement, no significant soil erosion is anticipated.

Significance of Impacts: -For impacts to soils, the spatial scale is considered to be local. The impact is short term and is a direct negative impact. The overall magnitude is considered to be low.

Table 8-8: Pre-Mitigation Impact Assessment

Impact	**Soil Erosion during Construction**				
Impact Nature	Negative	Positive	Neutral		
	Loss of soil cohesion contributing to erosion.				
Impact Type	Direct	Indirect	Induced		
	Impact is a result as a direct interaction between project activities and soil along the footprint of the project.				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	The impact is expected to be short term, however in the case of serious erosion the impacts may be experienced long term.				
Impact Extent	Local	Regional	International		
	The impact will be limited to the footprint of the project and immediate surrounds.				
Impact Scale	The impact is considered as small (local) scale.				
Frequency	Continuous				
Likelihood	Possible				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered small.				
Resource/Receptor Sensitivity	Low	Medium	High		
	The sensitivity of the soil on the site to erosion is considered to be medium to high.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is small and the sensitivity is medium to low, the overall significance is considered to be minor.				

Mitigation

The following mitigation measures will be implemented to minimize the potential for soil erosion:

- Vegetation clearing and topsoil disturbance will be minimized.
- Sheet erosion of soil shall be prevented where necessary through the use of sandbags, diversion berms, culverts, or other physical means.
- Topsoil shall be stockpiled separate from subsoil. Stockpiles shall not exceed 2 m height, shall be located away from drainage lines, shall be protected from rain and wind erosion, and shall not be contaminated. Wherever possible construction work will take place during the dry season.
- Topsoil shall be reinstated only in areas located outside the Agri Hub fence.
- Accelerated erosion from storm events during construction shall be minimised through managing storm water runoff (e.g., velocity control measures).
- Soil backfilled into excavations shall be replaced in the order of removal in order to preserve the soil profile.

Decommissioning Soil Erosion and Contamination Impacts

Decommissioning activities will have direct physical impacts to soil including erosion resulting from excavation to remove the strutures. This will disrupt the soil cohesion and also will result in surplus soil extracted from the foundation. The removed soil will be backfilled into the excavations in the order of removal to preserve the soil profile. Given the sub tropical location of the Project and the nature of vegetation present, it is anticipated that cleared areas will revegetate naturally and relatively quickly. There is also the potential for spills (e.g., of fuels and oils from fueling, maintenance of machinery and vehicles),

these have the potential to affect terrestrial environments and could lead to the deterioration of soil, water and sediment quality, the extent of this will be limited to the project site. The overall magnitude is considered to be **minor**. The mitigation measures employed during construction, will be used to mitigate this impact.

Residual Impact

The implementation of the proposed mitigation measures reduces the significance of the residual impact to negligible to minor on the project site.

Table 8-9. Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Loss of soil resources due to erosion	Construction	Negligible-Minor	Negligible to minor

8.2.2.1.4 Surface Water Quality Impacts

Construction activities can have significant effects on the surface water resources within the AoI and good environmental management, including control of runoff, sediments, storage of fuels and good practice should be followed. Project activities will interact with water resources in the following ways:

- There will be direct interaction during clearing and construction near to or in surface water bodies.
- There will be indirect interaction in the case of erosion of soils into water bodies.
- In addition, if vegetation and soil clearing are not properly managed, there is the potential for soils to run into water bodies and increased sediment load. This in turn may have a detrimental effect on water quality and affect surface water users.

During the construction, water will be required for construction process, cleaning of the vehicles and equipment, keeping down construction dust impacts among others. The potential impacts and risk of the project relating to surface water supply are:

- Stresses on local water resources from construction water abstractions from surface and/or ground water; and
- Potential indirect effects from water demand caused by local population expansion due to in-migration.
- Overall raw water supply requirements for the construction of will be very low and necessary during concrete mixing only and keeping down the dust.

Baseline Conditions

The number of water courses present along the project route are limited, with only a seaseonal river present at a distance of approximately 500m from the project site.

Construction Phase

Below are risks and impacts on surface water that are likely to be encountered as a result of the project during the construction phase:

1. The construction of the project may cause temporary disturbances and negative effects on surface water resources.

2. Stockpile and other materials may enter any other surface water resources near to the Project site where there are inadequate containment measures. Such surface runoff may carry sediments or harmful wastes, and these may collect in rivers or any other surface water resources and therefore there will be negative impacts on water quality.
3. In the project site there may be storage areas for chemicals, fuels, oils, etc., used for construction activities including refueling of vehicles. These materials must be stored according to the regulatory requirements, including the related regulation. Otherwise, there may be risk of leakage of all chemicals to the surface water resources, and so there may be impact on water quality.
4. In addition, all chemicals, fuels, oils etc. used for construction activities must be handled, transported, and used according to related regulation and procedures. Otherwise, there may be risk of spill of these by accidents etc. Therefore, there may be impact on water quality.
5. There may also be risks of pollution from the uncontrolled runoff or accidental spillage of fuels and lubricants, or from the inadequate or unsafe disposal of wastewater from construction site.
6. Land cleared during the construction will have a direct negative effect on surface water quality by increasing the turbidity and concentration of total dissolved/ suspended solids, with potentially adverse effects on river biota.

The volume of soil like to be disturbed by proposed project activities is likely to be ***minor*** and therefore the extent of the impacts from sediment addition to the nearby seasonal river is considered to be local. Owing to the subtropical location of the project and the high probability that cleared areas will revegetate naturally thereby limiting erosion, the duration of this impact is anticipated to be short term.

The nature of the construction activities renders the erosion of soil and subsequent siltation on the seasonal river possible. The ***small*** magnitude of this impact on surface water quality and the *low* sensitivity of the river to increased turbidity means the significance of this impact is assessed as ***minor***.

Table 8-10: Pre-Mitigation Impact Assessment

Impact	**Siltation of surface water**			
Impact Nature	Negative	Positive	Neutral	
	Eroded soil entering surface water bodies.			
Impact Type	Direct	Indirect	Induced	
	Impact is a result as a direct interaction between project activities and the environment along the footprint of the project.			
Impact Duration	Temporary	Short Term	Long Term	Permanent
	The impact is expected to be short term, however in the case of serious erosion the impacts of siltation of surface water may be experienced long term (into the operational phase).			
Impact Extent	Local	Regional	International	
	The impact will be limited to the footprint of the project and immediate surrounds. The dilution of sediments in the river will render this impact negligible at the regional scale.			
Impact Scale	The impact is considered as small (local) scale.			
Frequency	Intermittent			

Likelihood	Possible				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered small.				
Resource/ Receptor Sensitivity	Low		Medium		High
	The sensitivity of the seasonal river close to the site to siltation is considered to be medium to low.				
Impact Significance	Negligible		Minor	Moderate	Major
	Considering the impact magnitude is small and the sensitivity is medium to low, the overall significance is considered to be minor.				

Operation Phase

Once constructed, no direct disturbance of surface water bodies is anticipated.

Mitigation

The mitigation measures listed for soil management above are also applicable to surface water quality. In addition, the following mitigation measures will be implemented to minimise the potential for siltation of surface water:

- All wastewater which may be contaminated with oily substances must be managed in accordance with an appropriate waste management plan and no hydrocarbon-contaminated water may be discharged to the environment; and
- Domestic wastewater shall be treated and disposed of in accordance with an approved waste management plan.

Decommissioning Surface Water Quality Impacts

Decommissioning activities could have significant effects on the surface water resources along the project route. The impact will be limited to the footprint of the project and immediate surrounds. Good environmental management, including control of runoff, sediments should be followed. The volume of soil to be disturbed by proposed project activities is projected to be **minor** and extent of the impacts from sediment addition to water bodies is considered to be local. The mitigation measures employed during construction, will be used to mitigate this impact.

Residual Impact

The implementation of the proposed mitigation measures reduces the significance of the residual impact to ***negligible*** to ***minor***.

Table 8-11: Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Availability and quality of water	Construction	Minor	Negligible to minor

8.2.2.1.5 Impact on Flora and Vegetation

According to data from the survey carried out for the ESIA, the project site has no considerable biodiversity. The impact of the project on flora on the project site will be direct and permanent in nature since trees and vegetation will be removed to clear the site and erect the plant.

Baseline Conditions

The baseline conditions on site reflects the vegetation is dominated by grasses and shrubs. There are no protected areas (e.g., national parks or forest reserves) within approximately 10 km distance from the site. The vegetation cover around most of the site has been largely modified to give room for anthropogenic activities. Moreover, flora and vegetation in cultivated areas are unlikely to have any conservational significance.

Impact Assessment

Construction Phase

Disturbance will also occur due to construction activities which will generate noise, vibration, and human and vehicle presence. However, these impacts are likely to be temporary and short-lived impacts. Based on the available data it is not expected that the above-mentioned aspects will result in negative impacts on any sensitive species.

This direct impact is permanent since the tree and shrub vegetation will be removed toon site. The impact is direct and negative, resulting from the vegetation removal and disturbance during the construction phase. The magnitude of the impact is considered to be low. Based on the analysis provided above, the impact of vegetation removal, habitat fragmentation and degradation will be a ***low*** negative impact pre-mitigation (*Table 8-16).*

Table 8-12: Pre-Mitigation Impact Assessment

Impact	**Flora and Vegetation during Construction**				
Impact Nature	Negative	Positive	Neutral		
	Disturbance to vegetation and habitat loss during construction				
Impact Type	Direct	Indirect	Induced		
	Impact is as a result of a direct interaction between the project (i.e., construction activities) and the existing vegetation on project site				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	The effect is considered permanent as the areas where vegetation will be removed for the construction.				
Impact Extent	Local	Regional	International		
	Impact is limited to AoI				
Impact Scale	The impact is considered low in scale because the project site is devoid of any significant vegetation and general area has been modified thus there is a decreased risk of impacts to vegetation in these areas.				
Frequency	Once off				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
Resource/ Receptor Sensitivity/Value/ Importance*	Low	Medium	High		
	The project is not located in any sensitive ecosystem and is within an already modified habitat				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is low and the sensitivity is low, the overall significance is considered to be of minor significance.				

Operation Phase

During the operational phase there is the potential for impacts on vegetation and flora as a result of the existence of the project. Due to the inexistence of surrounding protected areas nor sensitive habitats the impact of the operation is expected to have a low sensitivity. The impact is directly negative, will be permanent during the project life period. The extent of the impact is restricted to the Project site and therefore local in nature. The magnitude of the impact is considered to be small. Based on the analysis provided above, the impact of direct loss of vegetation and flora and degradation and fragmentation of habitat will be of ***minor*** significance pre-mitigation.

Table 8-13: Pre-Mitigation Impact Assessment

Impact	**Flora and Vegetation during Operations**				
Impact Nature	Negative	Positive	Neutral		
	No impact				
Impact Type	Direct	Indirect	Neutral		
	No impact				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	No impact				
Impact Extent	Local	Regional	International		
	Impact is limited to AoI				
Impact Scale	The impact is considered low scale as most of the impacts related to vegetation removal occurred during the construction phase.				
Frequency	Once off				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
Resource/ Receptor Sensitivity/Value/ Importance*	Low	Medium	High		
	The sensitivity is considered low as most of the major impacts on the vegetation and flora will occur during the construction phase.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is small and the sensitivity is low, the overall significance is considered to be of minor significance.				

Mitigation

The following standard mitigation measures will be employed:

- Where impact avoidance is not possible, existing indigenous vegetation must be kept intact, where possible. Vegetation will be removed only as absolutely necessary.
- Whenever possible, all damaged areas shall be reinstated and rehabilitated upon completion of the contract to as near pre-construction conditions as possible.

Decommissioning Impact on Flora and Vegetation

The impacts on flora and vegetation will be **minor** and temporary impacts as the decommissioning work will take place on areas already modified site. It is not expected that the activities will result in negative impacts on any sensitive species. Based on the analysis provided above, the impact of vegetation removal, habitat fragmentation and degradation will be **negligible**.

Residual Impact

The impact significance is low after mitigation measures during construction and low post mitigation for operations. With the proposed mitigation measure the residual negative impacts on flora are assessed to be of a low magnitude.

Table 8-14: Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Disturbance to vegetation and habitat loss	Construction	Low	Minor

8.2.2.1.6 Impacts on Fauna

The natural environment has been largely transformed and modified with no natural fauna of any importance. The habitats within the site are primarily modified and are considered to have a low sensitivity.

Baseline Conditions

The natural environment has been largely transformed. The site is modified and has no natural vegetation of importance.

Impact Assessment

Construction Phase

During construction, fauna within the near surrounds of the development area will be disturbed due to noise, vibration, and human and vehicle presence. Disturbance impacts during construction are likely to be temporary and short lived. Based on the survey carried out for the ESIA, it is not expected that there will be any sensitive species in the Project area of international or local importance.

The habitat within the site is primarily modified and are considered to have a low sensitivity. The impact is direct and negative; resulting from the land take and disturbance during construction. The extent of the impact is presented is restricted to the site and therefore local in nature. The magnitude of the impact is considered to be low. Based on the analysis provided above, the impact of direct loss and degradation of habitat will be a **Minor** negative impact pre-mitigation.

Table 8-15: Pre-Mitigation Impact Assessment

Impact	**Avifauna during Construction**			
Impact Nature	Negative	Positive	Neutral	
	Disturbance to fauna species and loss of habitat as a result of the degradation to environment during construction.			
Impact Type	Direct	Indirect	Induced	
	Impact is as a result of a direct interaction between the project (i.e. construction activities) and the fauna population in project site			
Impact Duration	Temporary	Short Term	Long Term	Permanent
	The effect is considered temporary as it will only occur during the construction period			
Impact Extent	Local	Regional	International	
	Impact is limited to AoI (local)			

Impact Scale	The impact is considered low scale and only in the project.				
Frequency	Once off				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
Resource/ Receptor Sensitivity/Value/ Importance*	Low	Medium	High		
	The sensitivity is considered low due to the disturbed and modified habitats in project site.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is medium and the sensitivity is low, the overall significance is considered to be of minor significance.				

Operation Phase

During the operational phase there is the no significant impacts expected on fauna populations. The extent of the impact is restricted to the site and therefore local in nature. The magnitude of the impact is considered to be low. Based on the analysis provided above, the impact of direct loss and degradation of habitat will be of Minor significance pre-mitigation.

Table 8-16: Pre-Mitigation Impact Assessment

Impact	**Fauna during Operations**				
Impact Nature	Negative	Positive	Neutral		
	No Impact				
Impact Type	Direct	Indirect	Nuetral		
	No Imapct				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	The impact is considered temporary				
Impact Extent	Local	Regional	International		
	Impact is limited to the Project AoI (loca)				
Impact Scale	The impact is considered low in scale.				
Frequency	The frequency zero				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	No Impact				
Resource/ Receptor Sensitivity	Low	Medium	High		
	The sensitivity is considered low				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the magnitude of the impact is small and the sensitivity is low the overall significance is considered to be of minor significance				

The following mitigation measures are recommended during operations:

- All areas disturbed by construction activities shall be landscaped and rehabilitated.

Decommissioning Impacts on Fauna

The impacts on fauna will be **minor** and temporary impacts as the decommissioning work will take place on areas already modified by the infrastructure. The modified areas have low sensitivity with no natural fauna of unique importance or conservational significance. The impact of direct loss of fauna and degradation of habitat will be **negligible**

Residual Impact

The impact significance is **Negligible** after mitigation measures during construction and **Minor** post mitigation for operations. There will be some habitat loss as a result of the construction, however the habitat is modified and not expected to have conservational value.

Table 8-17: Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Disturbance to fauna species and degradation to environment during construction	Construction	Minor	Negligible

8.2.2.1.7 Solid and Liquid Waste Impacts

Improper waste management procedures or lack of mitigation measures during construction, phase of the Project may result in adverse environmental and social impacts on: -

- Storm water quality and thus water quality in the water bodies in project area;
- Surface water quality;
- Ground water quality;
- Soil quality;
- Ecological receptors or human health.

The different types of wastes and sources that are likely to be generated from the construction are described below.

a) Recyclable and Reusable Waste

The types of recyclable and reusable wastes to be generated on site during the construction period include among others: -

Box 8-1: Recyclable and reusable waste

1. Waste metal
2. Waste plastic
3. Waste glass
4. Wastepaper (packaging material)
5. Clean containers, drums, bins etc.

b) Excavation Waste

The greatest volume of excavated material will arise from the construction activities of the Project during civil works associated with construction. The excavated materials will be re-used immediately as back fill material.

c) Wastewater

Water will be required for the construction works, dust suppression, mixing of concrete and washing of construction equipment among others.

d) Hazardous Waste

The construction activities will generate hazardous wastes which may adversely impact on the local environment due to handling, storage, transport and disposal. These include, oil, grease etc. During the construction period, waste oil will result from the maintenance of machines, equipment and construction vehicles.

Impact Assessment

Direct and indirect disposal of waste oils to the receiving environment is likely to adversely impact on the environment and human health. Without mitigation measures, it is anticipated that there will be potential moderate to minor adverse impacts during construction and moderate adverse impacts during the operations periods. Wastewater if discharged indiscriminately into the environment, will lead to risks and impacts on water bodies, soil, vegetation, fisheries, and human health.

Table 8-18: Pre-Mitigation Impact Assessment

Impact	**Waste generation and hazards during Construction**				
Impact Nature	Negative	Positive	Neutral		
	Disposal of waste to the receiving environment is likely to adversely impact on the environment and human health.				
Impact Type	Direct	Indirect	Induced		
	Waste generated from the used materials during construction and operation activities that could cause land and groundwater contamination if spilled or not handled, stored and disposed of correctly.				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	The impact is considered to be temporary for the duration of the construction phase.				
Impact Extent	Local	Regional	International		
	Impact limited to the Study Area (local)				
Impact Scale	The impact is considered as small scale since it is local to the construction area.				
Frequency	The frequency is considered to be occasional considering that the construction activities are localized.				
	Positive	Negligible	Small	Medium	Large
Impact	**Waste generation and hazards during Operation**				
Impact Magnitude	Based on the parameters above and considering the embedded measures, the magnitude is considered to be small.				
Resource/Receptor Sensitivity	Low	Medium	High		
	The sensitivity of the of the potential receptors- land and ground water is High				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the magnitude is small and sensitivity is moderate, the impact on the land and water resources during construction is considered to be of **moderate** significance.				

Mitigation

The following mitigation measures should be employed to reduce any impacts on associated with waste generation.

- A Waste Management Plan must be prepared prior to commencement of construction by the contractor.

Operation Solid and Liquid Waste Impacts

Solid and liquid wastes generated during this project phase will include sewerage wastes (from workers on site), waste effluent from cleaning/washing of seeds, husks from the seeds among others. The sewerage wastes will be chanelled into the soak pits that will be constructed for management of sanitary wastes. Solid wastes including kitchen and office wastes as well as husks from the seeds will be disposed by a NEMA registered waste agent and press-cake, a by product of the oil extraction process will be converted to make animal feeds and organic fertilizer.

Decommissioning Solid and Liquid Waste Impacts

Solid and liquid waste will be generated during this phase of the project and include plastic, cables, metal, wood, glass, wastewater etc. excavated materials will be re-used immediately as back fill material. To mitigate any residual impact, the waste management plan used during construction will be implemented.

Residual Impact

The impact significance is **Negligible** after mitigation measures during construction and **Minor** post mitigation for operations.

Table 8-19: Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Poor waste disposal	Construction	Minor	Negligible
Poor waste disposal	Operation	Minor	Minor

8.2.2.1.8 Landscape and Visual Amenity Risks and Impacts

Visual Impacts refers mainly to the changes to the visual character of landscape views resulting from: obstruction of existing views; removal of screening elements thereby exposing viewers to unsightly views; the introduction of new elements into the views of the visual receptors and intrusion of foreign elements into the view shed of landscape features. The construction activities will have an impact on the visual character of the landscape due to:

- Clearance of vegetation on site
- Presence of construction vehicles and equipment
- Worker presence and activity; and
- Dust emissions resulting from construction activities and traffic.

Table 8-20: Potential Impacts to Landscape and Visual Amenity

Construction Phase	Operation Phase
Presence of construction vehicles and work force	Presence of extraction plant Permanent clearance of vegetation

Baseline Conditions

The local settings of the landscape are mainly characterized by the presence of open space plantations and cultivation areas.

Impact Assessment

Construction Phase

As per the current settings of the project area, the proposed project will cause minimal change to people's existing views. Despite the direct and negative impact of additional construction vehicles on site, it will be temporary and local. The small magnitude on visual amenity and the low sensitivity of the receptors means the significance of this impact is assessed as negligible. Based on the analysis provided above, the visual impact and change of landscape will be of minor significance.

Table 8-21. Pre-Mitigation Impact Assessment

Impact	**Visual Amenity during Construction**				
Impact Nature	Negative	Positive	Neutral		
	Change in visual amenity				
Impact Type	Direct	Indirect	Induced		
	Impact is a result as a direct interaction between project activities and local views				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	The impact duration will be temporary				
Impact Extent	Local	Regional	International		
	The impact will be limited to the immediate surroundings of the construction site.				
Impact Scale	The impact is considered as small (local) scale.				
Frequency	Continuous				
Likelihood	Possible				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered small.				
Resource/ Receptor Sensitivity	Low	Medium	High		
	The area has mainly modified environment with no relevant scenic views'/locations				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is small and the sensitivity is low, the overall significance is considered to be Negligible.				

Operation Phase

Based on the analysis provided above, the visual impact and change of landscape will be of ***minor*** significance.

Table 8-22: Pre-Mitigation Impact Assessment

Impact	**Visual Amenity during Operations**			
Impact Nature	Negative	Positive	Neutral	
	Change in visual character			
Impact Type	Direct	Indirect	Induced	
	Impact is as a result of a direct interaction between the project and surrounding residents and land users			
Impact Duration	Temporary	Short Term	Long Term	Permanent
	The impact duration will be permanent throughout the project life.			
Impact Extent	Local	Regional	International	
	The view shed experience is limited to few kilometres			
Impact Scale	The impact is considered as local scale.			

Frequency	Likely				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is expected to be medium				
Resource/ Receptor Sensitivity	Low	Medium	High		
	The area has mainly modified environment with no relevant scenic views' locations				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the magnitude is medium and the sensitivity is low the overall significance is considered to be minor				

Mitigation

Specific recommended measures as best practices include:

- Any excavated or cut and fill areas will be landscaped and revegetated
- No debris or waste materials will be left at the work sites, good housekeeping on site to avoid litter and minimise waste
- Night lighting of sites should be minimized within requirements of safety and efficiency
- Ongoing rehabilitation of cleared areas to minimise visual scarring and maintenance clearing will be kept to the absolute minimum and should not extend beyond the project site

Residual Impact

Considering the nature of the construction activities, the foreseen mitigation measures are able to furtherly reduce the impacts avoiding an alteration of the view shed experience. For the operational phase, the nature of the project features is limiting the possibility to greatly reduce the potential impacts.

Table 8-23. Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Visual impact	Construction	Minor	Negligible
Visual impact	Operation	Minor	Negligible

8.2.2.1.9 Worker's Health and Safety and Workers Management

The construction is likely to attract workers from within the project area and outside of the project area. The total number of work force cannot be estimated at this point and will be provided by the contractor. The total work force is going to be skilled and unskilled and sourced from project locality and outside of locality including internationally depending on the skill sets desired. The workers required by the contractor may include among others: -

a) Engineers-Skilled Experts (civil, mechanical, electrical) etc.
b) Supervisors, Inspectors Foreman and Operators –Skilled Experts;
c) Technicians (inspectorate, welders, masons, steel fixers, drivers etc.)- –Skilled Experts; and
d) Unskilled-flagmen, diggers, cleaning, security, mixing, watering, help team.

The construction activities will also entail engagement of a contractor. Workers' rights including occupational health and safety may be abused hence adverse impact and may include exposure to accidents and injuries, loss of man-hours, labour abuses and to ensure fair treatment, remuneration and working conditions. These issues should be considered not only for those who are directly employed by the proponent but also its contractors (including sub-contractors) and within the supply chain. The Project could potentially lead to work force-related social and health issues throughout the life cycle of the Project if worker management and rights do not meet Kenyan law or international best practice. The potential for occupational health and safety incidents throughout the life cycle of the project is higher during construction phase.

Table 8-24 presents the potentially significant impacts associated with occupational health and safety and worker management during the construction and operation phases. The potential for occupational health and safety incidents throughout the life cycle of the project is higher during construction phase.

Table 8-24: Potential Impacts on Occupational Health and Safety and Worker Management

Construction Phase	Operation Phase
Impacts on workers' health and safety, in particular from road accidents, slip, and trip and falls hazards during construction. Impacts on workers' rights from violations of labour laws in particular with respect to enforcement of health and safety measures by the employer such as the use of appropriate PPEs during construction. Workers are likely to be exposed to work related risks during the construction phase of the project. Typical activities include clearance of vegetated areas, excavation work, working at height. The above activities could expose workers to injuries and even fatalities when for instance those working at height fall, towers collapse, objects fall on workers, electrocution etc. Similarly, the storage and disposal of hazardous waste and materials generated during the construction may also pose a hazard to the health of the workforce if not handled properly.	Impacts on worker's rights from lack of enforcement of health and safety measures by the employer such as the use of appropriate PPEs during operation.

Baseline Conditions

Relevant baseline conditions that may potentially influence impacts are summarized as follows:

1. There is adequate public health coverage in the County and the majority of the population have access to County/GoK subsidized health services.
2. Settlement level key informants reported that the distance to health centres from these settlements varies between 0 and 2 km.
3. Enforcement of health and safety laws and standards in Kenya is expected to be limited, which contributes to high incidence of accidents on construction sites.

Impact Assessment

Construction

Worker's Health and Safety and Labour Rights

Typical activities for the construction include clearance of vegetated areas on site, excavation work, mechanical and electrical works etc. Considering that construction was identified as one of the sectors of employment (formal and informal) the locally hired work force may have some experience in traditional/basic construction activities such as excavation works. However, work practices and consideration for health and safety may fall short of international standards and best practice, such as the use of personal protective equipment (PPE), which will increase the severity of hazards to which the workforce are exposed.

Similarly, the storage and disposal of hazardous waste and materials generated from the use of materials during the construction may also pose a hazard to the health of the work force if not handled properly. Equipment and worker transport may also result in road accidents in the absence of a proper traffic management plan or if traffic safety rules are not enforced.

During construction, the direct interaction between the Project and the workforce if not managed properly, will result in negative impacts on the workers' working conditions and potentially permanent impacts on their health and safety. The impact is considered short-term and continuous over the months construction phase resulting in a medium impact magnitude. Since contractors are expected to operate according to international standards and considering the level of prior training of the workforce, receptor sensitivity is considered medium. Therefore, the impact is of ***moderate*** significance.

Table 8-25: Pre-Mitigation Impact Assessment

Impact	**Workers Health and Safety and Rights during Construction**			
Impact Nature	Negative	Positive	Neutral	
	Poor planning, non-compliance with health and safety best practice and labour rights can result in injuries or fatalities.			
Impact Type	Direct	Indirect	Induced	
	Resulting from a direct interaction between the Project (i.e., increased project traffic, working at height, open excavations,) and the workforce.			
Impact Duration	Temporary	Short Term	Long Term	Permanent
	Injuries and fatalities could have permanent impacts on workers and their families.			
Impact Extent	Local	Regional	International	
	The workforce will be primarily contracted from project area			
Impact Scale	The impact scale is therefore medium.			
Frequency	The frequency is considered to be infrequent as the workforce and drivers are expected to be trained and the employer is expected to enforce the use of PPEs and health and safety measures.			
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the parameters above and considering the embedded measures in place the magnitude is considered to be medium.			
	Low	Medium	High	

Resource/ Receptor Sensitivity	The sensitivity of the receptors (workforce working on site) is considered medium as some workers may not be aware of their rights.			
Impact Significance	Negligible	Minor	Moderate	Major
	Since the magnitude is considered medium and sensitivity is medium, the impact on workers' health and safety during construction activities is considered to be of moderate significance.			

Operations

Similar to the construction phase, the operation phase may also lead to occupational health and safety issues in particular with respect to operational risks by workers in terms of OHS.

Decommissioning Phase: Worker's Health and Safety and Labour Rights

Typical activities for the decommissioning include excavation work, dismantling of the structures. During these activities, the use of personal protective equipment (PPE), will greatly manage the severity of hazards to which the workforce is exposed. The traffic management plan will also be used to manage road accidents. The impact is considered short-term and medium over the decommissioning phase. Since contractors are expected to operate according to international standards and are in possession of prior EHS training, the impact is of **moderate** significance.

8.2.2.1.10 Community Health and Safety Impacts

The presence of the Project could affect the health, safety and well being of the communities on AoI. Increased Project-related traffic, civil works for site preparation including site clearance and excavation work, change to the environment due to increased noise, decreased air quality, in-appropriate waste handling or disposal, and accidental leaks and spills, and the presence of the Project workforce all present potential hazards for the health and safety of local communities.

Construction activities are likely to expose the local communities to health and safety related risks. Local community members could be exposed to accidents which could lead to injuries or fatalities. Further external workers could bring with them communicable diseases including sexually transmitted diseases (STDs) that could be passed on to local communities. The Corona Virus Diesease (COVID-19) pandemic is also a communical dieases that could be transmitted by workers on the sitr during construction and operation to the local communities.

Table 8-26 presents the potentially significant community health, safety and security impacts that may occur during the construction and operation phases.

Table 8-26. Potential Impacts on Community Health and Safety

Construction Phase	Operation Phase
Potential impacts on community safety, in particular road accidents. Environmental health: changes to the environment due to increased noise and vibrations, decreased air quality and, inadequate management of waste. Impact from workers presence and potential interaction with local populations.	Potential spread of COVID-19 during the construction as a result of increased interaction of workers on site and local community members.

Potential spread of COVID-19 during the construction as a result of increased interaction of workers on site and local community members.	

Residual Impacts

The significance of the residual impacts on community health and safety after the implementation of mitigation measures is presented in **Table 8-27** below.

Table 8-27: Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Community Safety (Road Accidents, Site Trespass, spread of COVID-19)	Construction	Moderate	Minor
Environmental Health (Nosie and Air)	Operation	Moderate	Minor
Interaction with Project Workforce	Operation	Moderate	Minor

As stated previously, the Project during its lifetime will be subject to local labour laws and international standards with respect to the responsibility of the employer to safeguard the health and safety of its employees. The Project is therefore expected to abide by these regulations and develop and implement appropriate health and safety measures covering the operations phase including the use of PPE by the workforce. As stated for the construction phase, compliance with Eni's EHSS policy aimed at safeguarding the health and safety of its employees and subcontractors will additionally help prevent potential labour abuses and reduce the risk of health and safety incidents. Finally, all contractor contracts include explicit reference to the need to abide by Kenyan law and Eni's standards and policies in relation to health and safety.

Any health and safety and labour rights related impact during the operations phase will be limited to a small number of workers and will be permanent over the operation phase. The magnitude is therefore considered small. Receptor sensitivity is considered low as most workers will be permanent skilled workers. Therefore, the impact is of ***minor*** significance.

Table 8-28: Pre-Mitigation Impact Assessment

Impact	**Workers Health and Safety and Rights during Operations**			
Impact Nature	Negative	Positive	Neutral	
	Poor planning, non-compliance with health and safety best practice and labour rights can result in injuries or fatalities.			
Impact Type	Direct	Indirect	Induced	
	Resulting from a direct interaction between the Project (i.e. increased project traffic, working at height, open excavations) and the workforce.			
Impact Duration	Temporary	Short Term	Long Term	Permanent
	Injuries and fatalities could have permanent impacts on workers and their families.			
Impact Extent	Local	Regional	International	
	The workforce will be primarily contracted from and other Counties in Kenya as well as from other countries for some higher skilled jobs.			
Impact Scale	The impact scale is considered small during operations as the workforce size will be reduced and maintenance activities will be periodic.			

Frequency	The impact is considered to be continous. The workforce is expected to be trained and the employer is expected to enforce the use of PPEs and health and safety measures. Lessons learned from the construction phase are expected to enhance the safety conditions and thus reducing the frequency of safety incidents during the operation and maintenance phase.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the parameters above, and the embedded measures in place, the magnitude is considered small.				
Resource/ Receptor Sensitivity/Value/ Importance*	Low	Medium	High		
	The sensitivity of the receptors is considered low as workers will be mostly skilled permanent employees.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the magnitude is medium and sensitivity is low, the impact on workers' health and safety during operations activities is considered to be of Moderate significance.				

Mitigation Measures

The following mitigation measures will be implemented during the construction phase to reduce any impacts on workers' health and safety and labour rights. Eni will develop and implement a Workers Health and Safety Management System covering all contractors including the following measures:

- Eni will require contractors to develop Human Resources Policy, which will outline worker rights to be included in all contracts including restrictions on working hours in line with applicable ILO standards, compensation including consideration of overtime, holidays etc.
- Eni will require its contractors to put in place policies in line with national legislation and applicable international legislation and Eni Code of Conduct and Policies.
- Eni will establish contractual clauses to be embedded in the contracts of the EPC that require adherence to Kenyan law and international standards to be upheld related to worker rights and providing the contractor and Eni with the right of audit.
- Eni require that contractors 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.
- Pre-employment medical assessments will 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 a pre-employment medical assessment include a safer working environment, reduction in workplace injuries, minimised downtime, matching the capacity of the employee with the role, and overall recruitment cost and risk reduction.
- Eni will ensure that training on health and safety measures is provided to all construction workers prior to starting to work on the Project and that supervisors have adequate experience to deliver on their responsibilities.
- Eni will implement regular health and safety checks and audits of Workers, contractors 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.

- Eni will develop and implement a Workers Grievance Mechanism for the Project workforce including contractors and subcontractors.
- Eni will ensure that facilities and work sites are designed and maintained such that robust barriers are in place to prevent accidents.
- Eni will ensure that its Code of Conduct is followed to regulate the performance and behaviour of all workers, including provision for disciplinary action for anti-social behaviour and non-compliance with health and safety regulations such as lack of use of PPE.
- Eni will ensure that adequate clean water, adequate food, and access to medical care is provided to all workers on the worksite.
- Eni will develop and implement a Traffic Management Plan covering aspect such as vehicle safety, driver, and passenger behaviour, use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations.
- Eni will develop a Waste Management Plan for the construction phase with clear guidelines for the safe storage and disposal of hazardous waste and handling of hazardous materials.
- Recruitment will be undertaken in collaboration with local authorities and local agencies. Eni will put in place measures to ensure no employee or job applicant is discriminated against on the basis of his or her gender, marital status, nationality, age, religion or sexual orientation.

During the operation phase, Eni will implement the following measures:
The Workers' Health and Safety Management System will be extended to the operation phase and adapted to address relevant aspects, including the following measures:

1. Identification and provision of appropriate PPE, training, and monitoring, as well as ongoing safety checks and safety audits.
2. Prohibiting 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.
3. Ensuring that training on health and safety measures is provided to all operation workers prior to starting to work on the Project.
4. Eni will undertake compliance monitoring of labour rights. KPIs will be developed around worker rights, discrimination and management, workforce grievance mechanism and monitoring of outcomes.
5. Implementing a Workers Grievance Mechanism for the Project workforce.
6. Establishing a procedure for the recording and analysis of lessons learned and implementation of additional actions to avoid or minimize occupational health and safety risks.
7. Eni will develop a Waste Management Plan for the operation phase with clear guidelines for the safe storage and disposal of hazardous waste and handling of hazardous materials.

8. Eni will put in place measures to ensure no employee or job applicant is discriminated against on the basis of his or her gender, marital status, nationality, age, religion or sexual orientation.

Residual Impacts

The implementation of mitigation measures will contribute to reducing occupational health and safety risks and the risk of labour rights abuses significantly. However, the risk of potential accidents still exists and may potentially lead to injuries or fatalities for the workforce during construction and operation. This risk will be short-term during the construction phase and long-term during operations. With the implementation of mitigation measures the remaining impact significance is considered minor significance during construction and negligible during operation. In fact, during operations, knowledge and lessons learned in terms of health and safety and labour rights during the construction phase may extend to the operation phase and contribute to strengthening local knowledge and practices in Kenya.

Table 8-29: Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Worker health and safety and labour rights	Construction	Moderate	Minor
Worker health and safety and labour rights	Operation	Moderate	Minor

Impact on Community Safety related to Road Traffic, Site Trespass Activities

During construction there will be an increase in traffic movements of heavy machinery and light vehicles on site and in access roads leading to the site. This will include trucks transporting construction material, excavation machinery, etc. which is expected to increase the risk of road traffic accidents and potential injuries or fatalities to other road users or pedestrians. The increase in movement of vehicles during the construction phase may result in greater disturbance and decreased wellbeing for those communities closest to the tower site working areas and along transportation routes and access roads.

The project site will be fenced during construction activities hence the risk of trespass is low during the day and at night (security officers will be stationed on site). Trespassing on site could result in accidents leading to injuries or even fatalities, especially due to the presence of machinery, and open excavations, which could at times be partly filled with water. Young people, elders and children are most at risk of being injured.

During operation, there will be increased traffic movements of trucks bringing raw materials and tanktainers shipping the finished product to Mombasa which is expected to increase the risk of road traffic accidents and potential injuries or fatalities to other road users or pedestrians. The increase in movement of vehicles during the operation phase may result in greater disturbance and decreased wellbeing for those communities closest to the tower site working areas and along transportation routes and access roads.

Contractor will also be required to operate according to best international practice. However, considering the potential risk posed to communities, the magnitude is considered medium. Receptor sensitivity is also rated as medium, resulting in moderate impact significance.

Table 8-30: Pre-Mitigation Impact Assessment

Impact	**Community Safety**				
Impact Nature	Negative	Positive	Neutral		
	Increased traffic during the construction period may result in increased risk to road traffic accidents and the presence of unfenced site working areas near settlements may result in trespassing and potential injuries.				
Impact Type	Direct	Indirect	Induced		
	Impact that result from a direct interaction between the Project (i.e. increased traffic, unfenced tower work sites) and the local population.				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
Impact Extent	Local	Regional	International		
	Beyond the project AoI especially the transportation of raw materials and finished product				
Impact Scale	The impact is considered as medium scale				
Frequency	The frequency is considered to be continuous during the construction and operation phase.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the parameters above, the magnitude is considered to be medium considering the potential consequence of accidents.				
Resource/ Receptor Sensitivity	Low	Medium	High		
	The sensitivity of the receptors (local population and road users including vehicle users, pedestrians and cyclists) is considered medium, as contractors will ensure that construction activities are undertaken in compliance with international standards.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the magnitude and sensitivity are medium, the impact on the community safety during construction activities is considered to be of moderate significance.				

Impact on Environmental Health for Communities

During the construction phase, activities will result in changes to the physical environment, with the potential to affect the health and welfare of communities. There will be temporary increases in dust during the duration of the construction phase, which will be mostly localised to the r site working areas and access roads. These are likely to result in increased disturbance and decreased wellbeing especially for residents closest to construction site and along unpaved access roads. There are no impacts on local air quality over the long term and therefore unlikely to result in a recordable increase in respiratory diseases in the population.

Similarly, the construction is likely to result in temporary increased noise levels for residents close to the site working area. The increase in noise is likely to result in disturbance and decreased wellbeing for those closest to the construction activities. However, this will be limited to construction hours and sleep disturbance is unlikely assuming construction work will be undertaken during daytime hours.

Project construction will also entail some temporary, localized, ground works that will generate vibrations. Depending on the soil characteristics and on the distance to the nearest building, these activities could produce vibrations for houses in the vicinity. Impacts could range from the level of temporary nuisance and disturbance, with no actual damage to buildings.

Waste production as a result of the construction and operation activities is unlikely to impact on the health of communities since most of the waste will be placed in the appropriate covered waste containers, and transported periodically to licensed dumpsites, and therefore opportunities for communities to come into contact with waste will be minimal.

Eni will reinstate and rehabilitate construction site including repairing any damage caused as part of the construction activities.

The impacts on environmental health during construction are temporary in nature for the duration of the construction phase. Considering the temporary nature of the works and the sequential approach, the magnitude is considered medium.

Receptor sensitivity is also considered medium as receptors will include children, old people and others that may be susceptible to changes to environmental quality. The impact significance is therefore considered moderate.

Table 8-31: Pre-Mitigation Impact Assessment

Impact	**Environmental Health**				
Impact Nature	Negative	Positive	Neutral		
	Construction activities have the potential to impact on environmental health which may translate into decreased localized air quality and increase in noise emission and associated disturbance.				
Impact Type	Direct	Indirect	Induced		
	Impacts that result from a direct interaction between the Project (i.e. air and noise emissions, vibrations, changes into visual environment and generation of waste) and the population on AoI				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	The effect is considered temporary since it is expected to be limited to the duration of construction activities.				
Impact Extent	Local	Regional	International		
	Impact limited to the Study Area and surrounding access roads				
Impact Scale	The impact is considered medium.				
Frequency	The frequency is considered to be occasional.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the parameters above, the magnitude is considered to be medium.				
Resource/ Receptor Sensitivity	Low	Medium	High		
	Receptor sensitivity is considered medium as receptors may experience disturbance and decreased well-being.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering both the magnitude and receptor sensitivity are medium, the impact on the community health due to environmental changes during construction activities is considered of moderate significance.				

Potential Interactions with Project Workforce

Indirectly, results of the development activities might affect population growth. It is predicted that the following demographic processes will take place:

1. **In-migration:** People from other areas will move to the area in search of new opportunities. The opportunities may not be directly in the project; they could be in-coming to conduct business as a result of the project.
2. **Presence of temporary workers:** It is not expected that the area will experience substantial labor influx.

Without mitigation, the primary impact of in-migration will be an increase in population, physical expansion of project affected areas and informal development.

1. The potential for unplanned and uncontrolled growth could lead to issues surrounding safety, sanitation, and service delivery.
2. Where in-migrants compete directly against local people, especially for unskilled jobs, it may result in tension, and possible aggression, between job seekers within the affected areas, and the country more widely.
3. In-migration can also lead to negative social change and an erosion of cultural values, as migrants bring in different cultural norms and values and attitudes to traditional leadership systems.
4. An influx of in-migrants is likely to lead to an increase in communicable diseases such as TB, HIV/AIDS and other sexually transmitted diseases, COVID-19 exacerbated by increased pressure on health care facilities and the possible introduction of new diseases.
5. Influx of in-migrants is likely to lead to the risk of GBV (SEA and SH).

The Project workforce may be housed in open or closed accommodation camps. Interaction with nearby communities is therefore very likely and could potentially lead to an increased transmission of communicable diseases and sexually transmitted diseases within these communities. This is a particular risk in relation to communities located close to worker camps where the potential for interaction is highest. The project will not establish workers camp for the construction works.

In addition, considering that HIV/AIDS prevalence in Kenya as of 2018 was approximately 4.7% among adults aged 15–49 years old, transmission of HIV may also occur. Prostitution may also be an issue considering the low levels of employment opportunities, and it is possible that some women in settlements close to the construction area may resort to prostitution for short term economic gain.

Based on the above, interaction between Project workforce and local communities in the Study Area is considered very likely during the construction phase. Receptor sensitivity is considered high as the low levels of employment opportunities might encourage prostitution and transmission of STDs and communicable diseases. This results in a moderate impact significance.

Table 8-32: Pre-Mitigation Impact Assessment

Impact	Interaction with Project Workforce

Impact Nature	Negative	Positive	Neutral		
	The presence of Project Workforce will lead to interaction with the local communities which will potentially result in increased transmission of communicable diseases and sexually transmitted diseases.				
Impact Type	Direct	Indirect	Induced		
	Impacts that result from a direct interaction between the Project workforce and the population in the project AoI.				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	The effect is considered short term as it is expected to last throughout the construction period.				
Impact Extent	Local	Regional	International		
	Impact limited to the Study Area and nearby urban centres.				
Impact Scale	Moderate				
Frequency	The frequency is considered to be continuous throughout the construction phase.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the parameters above, the magnitude is considered small since work forces is small.				
Resource/ Receptor Sensitivity	Low	Medium	High		
	Receptor sensitivity is considered high. The low levels of employment opportunities might encourage prostitution and transmission of STDs, and children and the elderly are considered particularly vulnerable to the transmission of communicable diseases.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Since impact magnitude is considered small and receptor sensitivity is high, the impact on community health due to interactions with the Project Workforce during construction activities is considered of moderate significance.				

Mitigation Measures

The following mitigation measures will be implemented during the construction phase to reduce any impacts on community health and safety.

- Ensure any trucking companies employed to work on the Project will have policies around health screening of their workers in line with Project requirements.
- Ensure all workers including contractors and subcontractors receive education on symptoms of communicable diseases of concern and STDs.
- Ensure all the COVID-19 protocols by the Ministry of Health are adhered to including social distancing, use of masks, hand washing, and use of sanitizers and vaccination of workers
- Provide access to health care for those injured by its activities.
- Ensure that work sites are fenced and that signs are put up around work fronts and construction sites advising people of the risks associated with trespass. When work fronts are less than 100 metres from a community or house, employ security guards from the local community to prevent trespass.
- Eni will extend the Worker Code of Conduct to include guidelines on worker – community interactions and will provide training on the worker code of conduct to all employees including contractors and subcontractors as part of the induction process.
- Eni will implement a Community Grievance Mechanism.
- Eni will develop and implement a Traffic Management Plan covering aspect such as vehicle safety, driver, and passenger behaviour, use of drugs and

alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations

Decommissioning Phase: Community Health and Safety Impacts

Increased Project-related traffic for site decommissioning will cause change to the environment due to increased noise, decreased air quality, waste handling or disposal, accidental leaks and spills, and the presence of the Project workforce all present potential hazards for the health and safety of local communities. The Community engagement plans, mechanisms and associated measures used during construction and operation will also be used in this phase.

8.2.2.1.11 Gender-Based Violence

An influx of in-migrants may also lead to Gender-Based Violence (GBV) (Sexual Exploitation and Abuse (SEA) and Workplace Sexual Harrassment (SEA) in the workplace, although the project is not expected to have a large influx of workers, the in-migration may increase the demand for sex work. Furthermore, higher wages for workers in a community can lead to an increase in transactional sex. The risk of incidents of sex between laborers and minors, even when it is not transactional, can also increase. The Project may create changes in the project affected communities and can cause shifts in power dynamics between the community members and within households. Male jealousy, a key driver of GBV, can be triggered by labor influx on a project when workers are believed to be interacting with community women.

Mitigation Measures

The following mitigation measures will be implemented during the pre-construction, construction and decommissioning phases to mitigate the risk of GBV-SEA/SH.

- Eni will extend the Worker Code of Conduct to include guidelines on worker-community interactions and will provide training on the worker code of conduct to all employees including contractors and subcontractors as part of the induction process.
- Community sensitization including disseminating information on GBV (SEA and SH) risks and management protocols.
- Implementing a GBV-SEA/SH management plan to mitigate and respond to GBV cases, including a GRM that is sensitive and confidential.

8.2.2.1.12 Violence against Children

The recruitment of children under the age of 18 during the construction is a potential risk and considered VAC. Based on current conditions in the sector it is assessed that the risk of child or forced labor is negligible, and already managed through national legislation and the proponent's corporate requirement.

Mitigation Measures

The following mitigation measures will be implemented during the construction phase to reduce any impacts on VAC.

- Eni will extend the Worker Code of Conduct to include guidelines on worker – community interactions and will provide training on the worker code of conduct to all employees including contractors as part of the induction process.
- Preparing and implementing a child protection plan
- Employing persons aged 18+ years (in accordance with the labour laws of Kenya).

Residual Impacts

The significance of the residual impacts on community health and safety after the implementation of mitigation measures is presented in **Table 8-33** below.

Table 8-33: Residual Impact Significance

Impact	Project Phase	Significance (Pre-Mitigation)	Residual Impact Significance (Post Mitigation)
Community Safety (Road Accidents, Site Trespass, spread of COVID-19)	Construction	Moderate	Minor

As stated previously, the Project during its lifetime will be subject to local labour laws and international standards with respect to the responsibility of the employer to safeguard the health and safety of the community during construction, operation and decomissioning. Any community health and safety impact during the operations phase will be limited and unlikely to have any significant impacts on the community health. The magnitude is therefore considered small. Receptor sensitivity is considered low as the project operational processes have little interaction with the community activities and actions. Therefore, the impact is of ***minor*** significance.

8.2.2.1.13 Archaeology and Cultural Heritage Impacts

Baseline assessments have not identified cultural heritage sites on the proposed site and thus no valuable tangible cultural heritage structures and resources are likely to be impacted by the project. There were no cultural heritage and archaeological sites identified in the area. Further, there are no graves or cemeteries identified during the ESIA study. During the construction activities there will be the need to improve access to some of the areas for vehicle. The removal of vegetation might uncover cultural sites which can only be removed by the appropriate governmental structures and consultation with the traditional authorities. The potential impacts are likely to be temporary and short term and most of these can be avoided during the vegetation removal process. Based on the baseline data it is not expected that the planned activities will result in negative impacts over the existent cultural and archaeological sites.

Baseline Conditions

There are no cultural heritage and archaeological sites identified in the project site.

Impact Assessment

Construction Phase

Based on the baseline data it is not expected that the planned activities will result in negative impacts over the existent cultural and archaeological sites. As there are no grave sites

identified on site the likelihood of these impacts is low. The potential impact in case illegal grave sites are identified during the vegetation removal process, is direct and negative. The extent of the impact is presented is restricted to the project site and therefore local in nature. The magnitude of the impact is considered to be negligible.

Based on the analysis provided above, the impact of the project on cultural sites, will be a low negative impact pre-mitigation.

Table 8-33: Pre-Mitigation Impact Assessment

Impact	**Cultural Heritage during Construction**				
Impact Nature	Negative	Positive	Neutral		
	Disturbance to grave sites during vegetation removal and construction activities				
Impact Type	Direct	Indirect	Induced		
	Impact is as a result of a direct interaction between the project (i.e. construction activities) and potential cultural sites (e.g. grave sites) on site.				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	The effect is considered temporary as grave sites would be identified during the vegetation removal activities				
Impact Extent	Local	Regional	International		
	Impact is limited to AoI				
Impact Scale	The impact is considered to be of negligible scale.				
Frequency	Once off				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
Resource/ Receptor Sensitivity/Value/ Importance*	Low	Medium	High		
	The receptors can be identified in the early stages of the process (e.g. vegetation removal and opening accesses). The sensitivity is considered low.				
Impact Significance	Negligible	Minor	Moderate	Major	
	Considering the impact magnitude is negligible and the sensitivity is low, the overall significance is considered to be of negligible significance.				

Operation Phase

During the operational phase there are not expected potential impacts on the cultural heritage as a result of the existence of the project. **Table 8-34** reflects the non-applicability of the significance of impacts on cultural heritage during the operation phase.

Table 8-34: Pre-Mitigation Impact Assessment

Impact	**Cultural Heritage during Operations**				
Impact Nature	Negative	Positive	Neutral		
	There are no expected impacts during operation				
Impact Type	Direct	Indirect	Induced		
	N/A				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	N/A				
Impact Extent	Local	Regional	International		
	N/A				
Impact Scale	The impact is considered to be of negligible scale.				
Frequency	N/A				
Impact	Positive	Negligible	Small	Medium	Large

Magnitude				
Resource/ Receptor Sensitivity/Value/ Importance*	Low	Medium	High	
	N/A			
Impact Significance	Negligible	Minor	Moderate	Major
	N/A			

Mitigation

The following standard mitigation measures will be employed:

- Do not remove any cultural heritage including graves without prior consultation to the communities and fulfilling the legal requirements. Any removal of cultural heritage should be conducted by the best available techniques.
- Establish a grievance procedure to ensure community concerns are addressed.
- Develop a chance find procedure which will detail the appropriate course of action that must be followed for any relevant cultural heritage discoveries.

Residual Impact

The impact significance is negligible after mitigation measures during construction and no impacts are expected during operations. With the proposed mitigation measures, particularly the development of chance finding procedures the residual negative impacts on cultural resources are assessed to be of a low magnitude.

Table 8-35: Residual Impact Significance

Impact	Project Phase	Significance (Pre-mitigation)	Residual Impact Significance (Post-mitigation)
Damage of grave sites considered important by the local communities	Construction	Negligible	Negligible

8.2.2.1.14 Unplanned Events

The following section presents the assessment of impacts resulting from unplanned or non-routine events and those which are a result of accidents. These are different to impacts that would reasonably be predicted to occur in the normal course of activities (including the application of in-built control measures) during construction and operations. Unplanned and accidental events have the potential to occur during Project activities and therefore the evaluation of impacts for unplanned and accidental event takes into account the likelihood of the event occurring into the impact magnitude. Likelihood is determined as unlikely, possible, or likely based in professional judgement and quantitative information (statistical frequency) where available. Given the nature of Project activities, unplanned and accidental events relate to potential accidental spills of equipment fuel and oils and vehicle traffic accidents. If unplanned and accidental events did occur, there would be effects on the biophysical and social environment. The risks of unplanned and accidental events are described in this section.

Potential Impacts to Soil and Surface Water from Spill Events

During construction there is the potential for spills of fuels and oils during construction activities, maintenance of machinery and vehicles. Spills have the potential to affect

terrestrial environments and could lead to the deterioration of soil, water and sediment quality. This could lead to knock on effects for flora and fauna and local community users.

Impact Assessment

If hazardous materials such as fuel were to be released to the soil and surface water resources, this would be limited to the local extent, depending on the volume spilt and rate of spillage. Within the Project AoI there are no surface water resources such as streams which could be impacted if the spill were to occur within proximity of the resource.

Likelihood

Incidental spills of fuels are infrequent but do occur, most frequently due to malfunction of handling systems, poor practice of workers and force majeure. Spills are most likely to occur during refilling and transportation of substances. Large releases of hazardous materials are rare and it is considered unlikely that a spill would occur of emergency scale.

Significance of Impacts

For impacts to soils, the spatial scale is considered to be local. The impact could be long term and is a direct negative impact. The overall magnitude is considered to be medium.

Table 8-36: Potential Impacts from Spillages

Construction Phase	Operation Phase
Soil and surface water degradation due to fuel spills during construction activities	N/A

For surface water, the impact of the spill would be short to medium term as the release of fuel or oil is likely to be a discrete (i.e.: non-continuous) event and the effects on water quality naturally mitigated through dilution and natural attenuation. The magnitude of the impact is considered medium, and the potential impact is therefore of Low significance.

Table 8-37: Pre-Mitigation Impact Assessment

Impact	Accidental Fuel Spills on Soils				
Impact Nature	Negative	Positive	Neutral		
	Reduction in local soil quality as a result of spillage during maintenance of machinery, improper storage of hazardous materials, spillage.				
Impact Type	Direct	Indirect	Induced		
	Impact is a result as a direct interaction between project activities soil resources on the project site				
Impact Duration	Temporary	Short Term	Long Term	Permanent	
	The impact is long term due to time for remediation or natural attenuation expected for contaminated soils				
Impact Extent	Local	Regional	International		
	The impact will be limited to the AoI				
Impact Scale	The impact is considered as low in scale. If a spill occurs, it will be locally				
Frequency	Not Applicable				
Likelihood	Possible				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	Based on the above the impact magnitude is considered small				

Resource/ Receptor Sensitivity	Low	Medium	High	
	Areas around the project site include cultivated areas and therefore the significance is medium.			
Impact Significance	Negligible	Minor	Moderate	Major
	Considering the impact magnitude is medium and the sensitivity is medium the overall significance is considered to be moderate.			

Mitigations

The following management measures will be implemented in the Project's ESMP:

- The Project will maintain spill clean-up and response capability adequate for addressing spills during all phases of the Project. All spills will be immediately contained and cleaned up. Contaminated areas will be remediated, and post remediation verification will be carried out (involving sampling of water and/or soil).
- Refuelling of equipment and vehicles will be carried out in designated areas on hard standing ground to prevent seepage of any spillages to ground. Collection systems will be installed in these areas to manage any spills, fuels will be collected and either reused, treated by incineration, or removed by an authorised local contractor. Drip trays must be used when refuelling and servicing vehicles or equipment, where it is not on a hardstanding surface.
- Hazardous material storage will be on hard standing and impermeable surface and the bulk storage facility will be bunded. The Project will restrict storage and handling of hazardous materials and fuels to bunded areas of sufficient capacity to contain a release.
- Hydrocarbon spill clean-up kits shall be available at all locations where refuelling or maintenance of vehicles and equipment is done, and responsible people shall be trained in the use thereof.

Residual Impact

The impacts on soils are considered Minor post mitigation. Based on the surface water context, impacts on surface water will be of Minor significance post mitigation.

Table 8-38: Residual Impact Significance

Impact	Project Phase	Significance (Pre-mitigation)	Residual Impact Significance (Post-mitigation)
Reduction in local soil quality	Construction and Operation	Moderate	Minor
Reduction in surface water quality	Construction and Operation	Moderate	Minor

9 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This chapter presents the assessment of the issues likely to arise as a result of implementation of the proposed project and possible mitigation measures. For each issue, the analysis is based on its nature, the predicted impact, extent, duration, intensity and probability, and the stakeholders and/or values affected. In accordance with best practice, the analysis includes issues relating to the project's environmental and social sustainability.

9.1 Mitigation Measures

Box 9-1: Mitigation Hierarchy for the Planned Project Activities

Avoid at source: Reduce at source
Avoiding or reducing at source is essentially "designing" the project so that a feature causing an impact is designed out.

Abate on site
This involves adding something to the basic design to abate the impact for example, pollution controls fall in this category. This is often called end-of-pipe.

Abate at receptor
If an impact cannot be abated on-site, then measures can be implemented off-site an example of this would be to install double-glazed windows to minimize the impact of noise at a nearby residence.

Repair or Remedy
Some impacts involve unacceptable damage to a resource. Repair essentially involves restoration and re-instatement type measures.

9.2 Pre-Construction

The majority of mitigation measures and in particular mitigations to protect and enhance the physical environment are most effectively incorporated during the design phase. There are five key elements:

- Development of sustainable designs with the lowest possible environmental impact within the constraints of the project funding and the socio-economic setting.
- Incorporate the recommendations and requirements of the ESMP to be an integral part of the Bidding and Contract Documents thereby building in enforceable measures to protect the environmental and social matters throughout the construction phase.
- Development of stakeholder engagement plan or procedures
- Provide adequate grievance redress procedures to address the concerns of local people and stakeholders to ensure satisfactory resolution of any grievance arising from the project.

For each of the identified impacts, mitigation measures have been suggested in accordance with a general rule defining mitigation criteria as:

1. Avoidance of major impacts: major impacts are generally considered unacceptable, ones that would endure in the long-term or extend over a large area;
2. Reduction of major and moderate impacts to as low as reasonably practicable (ALARP) by planning, designing and controlling mitigation measures. This implies that mitigation measures will be applied until the limitations of cost effectiveness and practical application have been reached. The limitations are established by international practice;
3. Implementation of good practices for impacts rated as minor, in order to ensure that impacts are managed within good reason.

There will only be localized short-term impacts during construction due to the implementation of the civil works. Impacts have been addressed at the design stage by choosing engineering solutions that, as far as is possible, minimize the impacts during construction and operational phase. The impacts which could not be eliminated by the design, mostly impacts during construction, will be reduced or eliminated by mitigation and monitoring measures specified in the ESMP. These construction related impacts can be mitigated by (i) the contractors' work practices, especially those related to maintenance of access, methods of trench excavation, the storage of construction materials and cleanliness of the work sites; (ii) cooperation by the local authorities with the contractor in terms of traffic management and use of public space and utilities; (iii) project management's strict enforcement of the correct construction practices and standards; (iv) the incorporation of the mitigation measures identified in the ESIA into the bid documents and specifications; (v) public awareness including liaison at ward level shortly in advance of work in each work location; and (vi) close monitoring of the contractor's implementation of the required mitigation measures. Environmental impacts and proposed mitigation measures during project pre-construction, construction, operation, and decommissioning phases are described in the following sections.

9.3 Environmental and Social Management Plan

The ESIA includes an ESMP which details the mitigation measures, environmental monitoring activities, institutional responsibilities, and environmental management capacity building. During construction, the project management team will closely monitor the works contractors' environmental performance and overall ESMP implementation.

Table 9-1. Environmental and Social Management Plan

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
Pre-Construction Phase				
Land Acquisition	-Permanent loss of land	Land is acquired via lease and did not involve involuntary displacement. Land owned by Makueni County Government and not encroached.	Eni Kenya B.V.	**Eni Kenya B.V.**

Table 9-2.Environmental and Social Management Plan

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
Construction Phase				
A1. Construction Air Impacts	Impact on sensitive receptors Impact on workers' health and safety Impact on community health and safety Impact on flora and fauna	**A1-1:** Develop a Dust Management Plan; **A1-2:** Record all dust and air quality complaints, identify cause(s), take appropriate measures **A1-3:** Liaise with local communities to forewarn of potentially dusty activities; **A1-4:** Undertake monitoring close to dusty activities, noting that this may be daily visual inspections, or passive/active monitoring **A1-5:** Undertake inspections to ensure compliance with the Dust Management Plan; **A1-6:** Plan potentially dusty activities so that these are located as far from receptors as feasible **A1-7:** Erect solid screens if feasible around stockpiles and concrete batching; **A1-8:** Avoid run off of mud and water and maintain drains in a clean state; **A1-9:** Remove dusty materials form site as soon as possible if not being re-used. If being re-used, cover or vegetate if possible; **A1-10:** Impose speed limits on haul routes and in construction compounds to reduce dust generation; **A1-11:** Minimise drop heights when loading stockpiles or transferring materials; and **A1-12:** Avoid waste or vegetation burning.	Contractors' Cost	**Eni Kenya B.V.**

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
		For traffic on unpaved roads: **A1-13:** Undertake watering to attenuate dust near sensitive receptors. The duration and frequency of this should be set out in the Dust Management Plan and will consider water availability and any stakeholder grievances; and	Contractors' Cost	**Eni Kenya B.V.**
		For earthworks: **A1-14:** Revegetate exposed areas as soon as feasible **A1-15:** Revegetate or cover stockpiles if feasible; **A1-16:** Expose the minimum area required for the works and undertake; and exposure on a staged basis to minimise dust blow	Contractors' Cost	**Eni Kenya B.V.**
		For track out: **A1-17**: Where track out is onto paved roads, use wet road cleaning methods to remove dirt and mud build up; **A1-18:** Avoid dry sweeping of large areas; and **A1-19:** Where feasible, undertake wheel washing and vehicle clean down prior to accessing public roads.	Contractors' Cost	**Eni Kenya B.V.**
A2. Noise and Vibration Impacts	Impact on sensitive receptors Impact on workers' health and safety Impact on community health and safety Impact on fauna	**A2-1:** Siting noisy plant and equipment as far away as possible from NSRs, and use of barriers (e.g., site huts, acoustic sheds or partitions) to reduce the level of construction noise at receptors wherever practicable; **A2-2:** Where practicable noisy equipment will be orientated to face away from the nearest NSRs; **A2-3:** Working hours for significant noise generating construction work (including works required to upgrade existing access roads or create new ones), will be daytime only;	Contractors' Cost	**Eni Kenya B.V.**
		A2-4: Alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric-controlled units, will be used, where practicable;	Contractors' Cost	**Eni Kenya B.V.**
		A2-5: Where practicable, stationary equipment will be located in an acoustically treated enclosure	Contractors' Cost	**Eni Kenya B.V.**
		A2-6: For machines with fitted enclosures, doors and door seals will be checked to ensure they are in good working order; also, that the doors close properly against the seals;	Contractors' Cost	**Eni Kenya B.V.**
		A2-7: Throttle settings will be reduced, and equipment and plant turned off, when not being used;	Contractors' Cost	**Eni Kenya B.V.**

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
		A2-8: Equipment will be regularly inspected and maintained to ensure it is in good working order. The condition of mufflers will also be checked; and **A2-9:** Fitting of mufflers or silencers of the type recommended by manufacturers		
A3. Soil erosion and contamination impacts	Impacts on water quality (sediment run-off/contamination) leading to deterioration of quality. Deteriorated water quality will impact on fauna if consumed. Deteriorated water quality will impact on community health if consumed.	**A3-1:** Vegetation clearing, and topsoil disturbance will be minimized. **A3-2:** Sheet erosion of soil shall be prevented where necessary through the use of sandbags, diversion berms, culverts, or other physical means. **A3-3:** Topsoil shall be stockpiled separate from subsoil. Stockpiles shall not exceed 2 m height, shall be located away from drainage lines, shall be protected from rain and wind erosion, and shall not be contaminated. Wherever possible construction work will take place during the dry season.	Contractors' Cost	**Eni Kenya B.V.**
		A3-4: Topsoil shall be evenly spread across the cleared areas when reinstated. **A3-5:** Accelerated erosion from storm events during construction shall be minimised through managing storm water runoff (e.g., velocity control measures).	Contractors' Cost	**Eni Kenya B.V.**
		A3-6: Soil backfilled into excavations shall be replaced in the order of removal in order to preserve the soil profile.	Contractors' Cost	**Eni Kenya B.V.**
		A3-7: Spread mulch generated from indigenous cleared vegetation across exposed soils after construction.	Contractors' Cost	**Eni Kenya B.V.**
A4. Surface Water Quality Impacts	Impacts on water quality (sediment run-off/contamination) leading to deterioration of quality. Deteriorated water quality will impact on fauna if consumed. Deteriorated water quality will impact on community health if consumed.	**A4-1:** Activities shall be conducted >100m away from water bodies	Contractors' Cost	**Eni Kenya B.V.**
		A4-2: All wastewater which may be contaminated with oily substances must be managed in accordance with an appropriate waste management plan and no hydrocarbon-contaminated water may be discharged to the environment.	Contractors' Cost	**Eni Kenya B.V.**
		A4-3: Domestic wastewater shall be treated and disposed of in accordance with an approved waste management plan. Park vehicles preferably on paved platforms	Contractors' Cost	**Eni Kenya B.V.**

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
A5. Impact on Flora and Vegetation	Loss of biodiversity	**A5-1:** Avoidance of impacts should be prioritized. Where impact avoidance is not possible, existing indigenous vegetation must be kept intact, where possible. Vegetation will be removed only as absolutely necessary.	Contractors' Cost	**Eni Kenya B.V.**
		A5-2: Rivers, watercourses and other water bodies shall be kept clear of felled trees, vegetation cuttings and organic waste and debris from clearing.	Contractors' Cost	**Eni Kenya B.V.**
		A5-3: Alien invasive vegetation should be removed immediately and disposed of properly, at a licensed waste disposal facility as necessary;	Contractors' Cost	**Eni Kenya B.V.**
		A5-4: Materials and equipment should not be delivered to the site prematurely, as this could result in need for laydown or storage areas and additional areas being cleared or affected unnecessarily	Contractors' Cost	**Eni Kenya B.V.**
		A5-5: Whenever possible, all damaged areas shall be reinstated and rehabilitated upon completion of the contract to as near pre-construction conditions as possible	Contractors' Cost	**Eni Kenya B.V.**
A6. Impact on Fauna	-Disturbance due to noise, vibrations, and vehicle presence.	**A6-1:** All areas disturbed by construction activities shall be landscaped and rehabilitated.	Contractors' Cost	**Eni Kenya B.V.**
A7: Solid and Liquid Waste Impacts	-Impact on storm water quality and thus water quality in the water bodies in project areas -Impact on soil quality -Impact on surface water quality; -Impact on ground water quality; and -Impact on ecological receptors or human health	**A7-1:** The Contractor should prepare a Solid Waste Management Plan.	Contractors' Cost	**Eni Kenya B.V**

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
A8: Landscape & Visual amenities risks	-Impacts on aesthetics of the surroundings with the possibility to affect the neighbouring residents.	**A8-1:** Any excavated or cut and fill areas will be landscaped and revegetated. **A8-2**: No debris or waste materials will be left at the work sites, good housekeeping on site to avoid litter and minimise waste **A8-3:** Ongoing rehabilitation of cleared areas to minimise visual scarring		**Eni Kenya B.V**
A9: Worker's Health and Safety and Workers Management	-Workers are likely to be exposed to work related risks during the construction phase of the project.	**A9-1**: Eni's Human Resources Policy, outlines worker rights to be included in all contracts including restrictions on working hours in line with applicable ILO standards, compensation including consideration of overtime, holidays etc.	Contractors' Cost	**Eni Kenya B.V**
		A9-2: Eni' will require its contractors to put in place policies in line with national legislation and applicable international legislation and Eni's Code of Conduct and Policies.	Contractors' Cost	**Eni Kenya B.V**
		A9-3: Eni'will establish contractual clauses to be embedded in the contracts of the contractors that require adherence to Kenyan law and international standards to be upheld related to worker rights and providing the contractor and Eni with the right of audit.	Contractors' Cost	**Eni Kenya B.V**
		A9-4: Pre-employment medical assessments will 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 a pre-employment medical assessment include a safer working environment, reduction in workplace injuries, minimised downtime, matching the capacity of the employee with the role, and overall recruitment cost and risk reduction. **A9-5:** Eni will ensure that training on health and safety measures is provided to all construction workers prior to starting to work on the Project and that supervisors have adequate experience to deliver on their responsibilities. **A9-6**: Eni will implement regular health and safety checks and audits of Workers, contractors and subcontractors and implementing sanctions in case of breaches of nationals **A9-7:** Eni will develop and implement a Workers Grievance Mechanism for the Project workforce including contractors and subcontractor's 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. **A9-8:** Eni'will 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.		**Eni Kenya B.V**

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
		A9-:9 Eni will ensure that facilities and work sites are designed and maintained such that robust barriers are in place to prevent accidents. **A9-10**: Eni will ensure that its Code of Conduct is followed to regulate the performance and behaviour of all workers, including provision for disciplinary action for anti-social behaviour and non-compliance with health and safety regulations such as lack of use of PPE. **A9-11:** Eni will ensure that adequate clean water, adequate food and access to medical care is provided to all workers on the worksite and at accommodation.		
A10: Community Health and Safety Impacts	-Increased noise decreased air quality, inappropriate waste handling or disposal, and accidental leaks and spills, debris and movement of heavy equipment may pose a safety risk to the general public. -Potential impacts on community safety, in particular road accidents, trespass on the sites, and demining activities potentially resulting in accidents leading to injuries or fatalities. ~ Environmental health: changes to the environment due to increased noise and vibrations, decreased air quality and, inadequate management of waste.	**A10-1:** Eni will develop and monitor the implementation of a Community Health and Safety Management Plan which will include the following measures: • Ensure all workers including contractors and subcontractors undergo pre-employment screening and regular health screening including voluntary screening for STDs. • Ensure any trucking companies employed to work on the Project will have policies around health screening of their workers in line with Project requirements. • Ensure all workers including contractors receive education on symptoms of communicable diseases of concern and STDs. • Provide access to health care for those injured by its activities. • Ensure that work sites are fenced and that signs are put up around work fronts and construction sites advising people of the risks associated with trespass.	Contractors' Cost	**Eni Kenya B.V** **Eni Kenya B.V** **Eni Kenya B.V** **Eni Kenya B.V**
		A10-2: • Contractor will extend the Worker Code of Conduct to include guidelines on worker–community interactions and will provide training on the worker code of conduct to all employees including contractors and subcontractors as part of the induction process. • Contractor will provide primary health care and first aid at site to avoid pressure on local healthcare infrastructures. • Eni will implement a Community Grievance Mechanism. • Contractor will develop and implement a Traffic Management Plan covering aspect such as vehicle safety, driver and passenger behaviour,	Contractors' Cost	**Eni Kenya B.V**

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
	~ Impact from workers presence and potential interaction with local populations	use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations		
A11: Gender-based violence at the community level	-Gender-based violence at the community level -Sexual Exploitation and Abuse -Transactionnel sex. -Shift in power dynamics in the community or family. -Abusive behavior among project-related staff	**A11-1:** Contractor will extend the Worker Code of Conduct to include guidelines on worker –community interactions and will provide training on the worker code of conduct to all employees including contractors and subcontractors as part of the induction process.	Contractors' Cost	**Eni Kenya B.V**
A12: Violation of children rights by contractor and labour force on site	-Violation of children rights by contractor and labour force on site (e.g., child labour, sexual relations with minors etc.)	**A12-1:**. Contractor will extend the Worker Code of Conduct to include guidelines on worker –community interactions and will provide training on the worker code of conduct to all employees including contractors and subcontractors as part of the induction process. **A12-2**: Prepare and implement a child protection plan and monitoring the employment register, **A12-3:** Employing persons aged 18+ years	Contractor's cost	**Eni Kenya B.V**
A13: Archaeology and Cultural Heritage Impacts	-Restriction to access cultural sites. -Destruction of cultural sites during construction or operations	**A13-1:** Consult community when any community issue arises in order to engage traditional forms of community leadership. Develop stakeholder engagement procedures to guide consultations. **A13-2:** Do not remove any cultural heritage including graves without prior consultation to the communities and fulfilling the legal requirements. Any removal of cultural heritage should be conducted by the best available techniques. **A13-3:** Establish a grievance procedure to ensure community concerns are addressed. **A13-4:** Develop a chance find procedure which will detail the appropriate course of action that must be followed for any relevant cultural heritage discoveries.	Contractors' Cost	**Eni Kenya B.V.**

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
A16: Unplanned Events	-Impacts to soil and surface water from spill events	**A16-1:** Hazardous material storage will be on hard standing and impermeable surface and the bulk storage facility will be bunded. **A16-2:** Hydrocarbon spill clean-up kits shall be available at all locations where refuelling or maintenance of vehicles and equipment is done, and responsible people shall be trained in the use thereof.	Contractors' Cost	Contractor

Table 9-3. **Environmental and Social Management Plan**

PHASE/ IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
Operations Phase				
B1: Worker's Health and Safety and Workers Management	Potential impacts to workers health and safety -respect for labour rights	**B1-1-1**Provide PPEs to all workers (gloves, masks, earmuff, boots, coveralls) etc. **B1-2** Ensure there is a First Aid Kit in facility **B1-3** Ensure fire extinguishers are avialbel in strategic locations in the facility **B-1-4** Provide training for workers on use of fire fighting equipment **B-1-5** Ensure emergency exits are clearly labelled	**Eni Kenya B.V**	**Eni Kenya B.V**
B2: Solid and Liquid Waste Impacts	-Impact on soil quality -Impact on surface water quality; -Impact on ground water quality;	**B 2-1:** Ensure waste receptors are available in strategic points in the plant. **B 2 -2**. Recycle wastes **B 2-3**: Ensure wastes are disposed by a registered NEMA	**Eni Kenya B.V**	**Eni Kenya B.V**
B3: Unplanned Events	-Impacts to soil and surface water from spill events	**B1-1:** Hazardous material storage will be on hard standing and impermeable surface and the bulk storage facility will be bunded. **B1-2:** Spill clean-up kits shall be available at all locations where refuelling or maintenance of vehicles and equipment is done, and responsible people shall be trained in the use thereof.	**Eni Kenya B.V**	**Eni Kenya B.V**

Table 9-4: Environmental and Social Management Plan

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
Decommissioning Phase				
C1. Demolition Air Impacts	Impact on sensitive receptors	**C1-1:** Develop a Dust Management Plan;	Contractors' Cost	Contractor

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
	Impact on workers' health and safety Impact on community health and safety Impact on flora and fauna	**C1-2:** Record all dust and air quality complaints, identify cause(s), take appropriate measures **C1-3:** Liaise with local communities to forewarn of potentially dusty activities; **C1-4:** Undertake monitoring close to dusty activities, noting that this may be daily visual inspections, or passive/active monitoring **C1-5:** Undertake inspections to ensure compliance with the Dust Management Plan; **C1-6:** Plan potentially dusty activities so that these are located as far from receptors as feasible **C1-7:** Erect solid screens if feasible around stockpiles; **C1-8:** Avoid run off of mud and water and maintain drains in a clean state; **C1-9:** Remove dusty materials form site as soon as possible if not being re-used. If being re-used, cover or vegetate if possible; **C1-10:** Impose speed limits on haul routes and in compounds to reduce dust generation; **C1-11:** Minimise drop heights when loading stockpiles or transferring materials; and **C1-12:** Avoid waste or vegetation burning.		
		For traffic on unpaved roads: **C1-13:** Undertake watering to attenuate dust near sensitive receptors. The duration and frequency of this should be set out in the Dust Management Plan and will consider water availability and any stakeholder grievances; and **C1-14:** On unpaved roads in use for more than 1 month, consider use of surface and sealants to reduce the use of water and water trucks. Use of lignin-based sealants recommended due to low environmental toxicity.	Contractors' Cost	Contractor
		For earthworks: **C1-15:** Revegetate exposed areas as soon as feasible **C1-16:** Revegetate or cover stockpiles if feasible; **C1-17:** Expose the minimum area required for the works and undertake; and exposure on a staged basis to minimise dust blow	Contractors' Cost	Contractor
		For track out: **C1-18**: Where track out is onto paved roads, use wet road cleaning methods to remove dirt and mud build up;	Contractors' Cost	Contractor

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
		C1-19: Avoid dry sweeping of large areas; and **C1-20:** Where feasible, undertake wheel washing and vehicle clean down prior to accessing public roads.		
C2. Demolition Noise and Vibration Impacts	Impact on sensitive receptors Impact on workers' health and safety Impact on community health and safety Impact on fauna	**C2-1:** Siting noisy plant and equipment as far away as possible from NSRs, and use of barriers (e.g., site huts, acoustic sheds or partitions) to reduce the level of decommissioning noise at receptors wherever practicable; **C2-2:** Where practicable noisy equipment will be orientated to face away from the nearest NSRs; **C2-3:** Working hours for significant noise generating decommissioning work (including works required to upgrade existing access roads or create new ones), will be daytime only;	Contractors' Cost	Contractor
		C2-4: Alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric-controlled units, will be used, where practicable;	Contractors' Cost	Contractor
		C2-5: Where practicable, stationary equipment will be located in an acoustically treated enclosure	Contractors' Cost	Contractor
		C2-6: For machines with fitted enclosures, doors and door seals will be checked to ensure they are in good working order; also, that the doors close properly against the seals;	Contractors' Cost	Contractor
		C2-7: Throttle settings will be reduced, and equipment and plant turned off, when not being used; **C2-8:** Equipment will be regularly inspected and maintained to ensure it is in good working order. The condition of mufflers will also be checked; and **C2-9:** Fitting of mufflers or silencers of the type recommended by manufacturers	Contractors' Cost	Contractor
C3. Soil erosion and contamination impacts	Impacts on water quality (sediment run-off/contamination) leading to deterioration of quality.	**C3-1:** Vegetation clearing, and topsoil disturbance will be minimized. **C3-2:** Contour temporary and permanent access roads/laydown areas so as to minimise surface water runoff and erosion; **C3-3:** Sheet erosion of soil shall be prevented where necessary through the use of sandbags, diversion berms, culverts, or other physical means. **C3-4:** Topsoil shall be stockpiled separate from subsoil. Stockpiles shall not exceed 2 m height, shall be located away from drainage lines, shall be protected from rain and wind erosion, and shall not be contaminated.	Contractors' Cost	Contractor

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
	Deteriorated water quality will impact on fauna if consumed. Deteriorated water quality will impact on community health if consumed.	Wherever possible decommissioning work will take place during the dry season.		
		C3-5: Topsoil shall be evenly spread across the cleared areas when reinstated. **C3-6:** Accelerated erosion from storm events during decomissioning shall be minimised through managing storm water runoff (e.g., velocity control measures).	Contractors' Cost	Contractor
		C3-7: Soil backfilled into excavations shall be replaced in the order of removal in order to preserve the soil profile. Material (e.g., fuel or chemicals).	Contractors' Cost	Contractor
		C3-8: Spread mulch generated from indigenous cleared vegetation across exposed soils after decomissioning.	Contractors' Cost	Contractor
C4. Surface Water Quality Impacts	Impacts on water quality (sediment run-off/contamination) leading to deterioration of quality. Deteriorated water quality will impact on fauna if consumed. Deteriorated water quality will impact on community health if consumed.	**C4-1:** Activities shall be conducted >100m away from water bodies, except where crossings are required.	Contractors' Cost	Contractor
		C4-2: All wastewater which may be contaminated with oily substances must be managed in accordance with an appropriate waste management plan and no hydrocarbon-contaminated water may be discharged to the environment;	Contractors' Cost	Contractor
		C4-3: Domestic wastewater shall be treated and disposed of in accordance with an approved waste management plan. Park vehicles preferably on paved platforms	Contractors' Cost	Contractor
C5. Impact on Flora and Vegetation	Loss of biodiversity. Fragmentation of habitat.	**C5-1:** Avoidance of impacts should be prioritized, it is strongly recommended to closely/re-route follow the main road along the project area of influence Where impact avoidance is not possible, existing indigenous vegetation must be kept intact, where possible. Vegetation will be removed only as absolutely necessary.	Contractors' Cost	Contractor
		C5-2: Rivers, watercourses and other water bodies shall be kept clear of felled trees, vegetation cuttings and organic waste and debris from clearing;	Contractors' Cost	Contractor
		C5-3: Alien invasive vegetation should be removed immediately and disposed of properly, at a licensed waste disposal facility as necessary;	Contractors' Cost	Contractor

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
		C5-4: There should be no deviation from the access road position without prior discussions with the authorities; **C5-5:** Firewood collection by the project's employees should be strictly forbidden.	Contractors' Cost	Contractor
		C5-6: Rehabilitation of temporary decommissioning. sites and pioneer camps (if needed) should be done as swiftly as possible and always with suitable native grasses and other plants – construction of new camps is unlikely to happen;	Contractors' Cost	Contractor
		C5-8: Whenever possible, all damaged areas shall be reinstated and rehabilitated upon completion of the contract to as near pre-construction conditions as possible	Contractors' Cost	Contractor
		C5-8: Whenever possible, all damaged areas shall be reinstated and rehabilitated upon completion of the contract to as near pre-construction conditions as possible	Contractors' Cost	Contractor
C6. Impact on Fauna	-Disturbance due to noise, vibrations and vehicle presence.	**C6-1:** All areas disturbed by decommissioning activities shall be landscaped and rehabilitated; **C6-2:** Vegetation that does not grow high enough to cause interference with the overhead power lines, or cause a fire hazards, should not be trimmed or cut unless it is growing in the road access area	Contractors' Cost	Contractor
		C6-3: Speed of project vehicles should be controlled at a maximum limit of 40 km/h to minimise roadkill **C6-4:** No hunting by Project personnel is to be tolerated under any circumstances (this measure should be a part of worker codes of conduct)	Contractors' Cost	Contractor
		C6-5: Guidance shall be given to all staff that they are not allowed to harm any animals during any routine maintenance of the project's infrastructure. **C6-6:** No hunting by Project personnel is to be tolerated under any circumstances (this measure should be a part of worker codes of conduct)	Contractors' Cost	Contractor
C8: Solid and Liquid Waste Impacts	-Impact on storm water quality and thus water quality in the water bodies in project areas -Impact on soil quality -Impact on surface water quality;	**C8-1:** The Contractor should prepare a Solid Waste Management Plan.	Contractors' Cost	Contractor

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
	-Impact on ground water quality; and -Impact on ecological receptors or human health			
C10: Landscape & Visual amenities risks	-Impacts on aesthetics of the surroundings with the possibility to affect the neighbouring residents.	**C10-1:** Any excavated or cut and fill areas will be landscaped and revegetated; **C10-2**: No debris or waste materials will be left at the work sites, good housekeeping on site to avoid litter and minimise waste **C10-3:** Night lighting of sites should be minimized within requirements of safety and efficiency; **C10-5:** Ongoing rehabilitation of cleared areas to minimise visual scarring and maintenance clearing will be kept to the absolute minimum and should not extend beyond the corridor;		Contractor
C11: Worker's Health and Safety and Workers Management	-Workers are likely to be exposed to work related risks during the decommissioning phase of the project.	**C11-1**: Eni Kenya B.V. will develop a Human Resources Policy, which will outline worker rights to be included in all contracts including restrictions on working hours in line with applicable ILO standards, compensation including consideration of overtime, holidays etc.	Contractors' Cost	Contractor
		C11-2: Eni Kenya B.V. will require its contractors and subcontractors to put in place policies in line with national legislation and applicable international legislation and Eni Kenya B.V. Code of Conduct and Policies.	Contractors' Cost	Contractor
		C11-3: Eni Kenya B.V. will establish contractual clauses to be embedded in the contracts of the EPC and all sub-contractors that require adherence to Kenyan law and international standards to be upheld related to worker rights and providing the contractor and Eni Kenya B.V. with the right of audit.	Contractors' Cost	Contractor
		C11-4: Pre-employment medical assessments will 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 bents of conducting a pre-employment medical assessment include a safer working environment, reduction in workplace injuries, minimised downtime, matching the capacity of the employee with the role, and overall recruitment cost and risk reduction. **C11-5:** Eni Kenya B.V. will ensure that training on health and safety measures is provided to all workers prior to starting to work on the Project and that supervisors have adequate experience to deliver on their responsibilities.		Contractor

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
		C11-6: Eni Kenya B.V. will implement regular health and safety checks and audits of Workers, contractors and subcontractors and implementing sanctions in case of breaches of nationals **C11-7:** Eni Kenya B.V. will develop and implement a Workers Grievance Mechanism for the Project workforce including contractors and subcontractor's 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. **C11-8:** Eni Kenya B.V. will 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. **C11-:9** Eni Kenya B.V. will ensure that facilities and work sites are designed and maintained such that robust barriers are in place to prevent accidents. **C11-10**: Eni Kenya B.V. will ensure that its Code of Conduct is followed to regulate the performance and behaviour of all workers, including provision for disciplinary action for anti-social behaviour and non-compliance with health and safety regulations such as lack of use of PPE. **C11-11:** Eni Kenya B.V. will ensure that adequate clean water, adequate food and access to medical care is provided to all workers on the worksite and at accommodation.		
C12: Community Health and Safety Impacts	-Increased noise decreased air quality, inappropriate waste handling or disposal, and accidental leaks and spills, debris and movement of heavy equipment may pose a safety risk to the general public. -Potential impacts on community safety, in particular road accidents, trespass on the sites, and	**C12-1:** Eni Kenya B.V. will develop and monitor the implementation of a Community Health and Safety Management Plan which will include the following measures: • Ensure that all workers are housed in accommodation camps rather than in the local settlements in order to minimize interaction with local communities and related health and safety impacts. • Ensure all workers including contractors and subcontractors undergo pre-employment screening and regular health screening including voluntary screening for STDs. • Ensure any trucking companies employed to work on the Project will have policies around health screening of their workers in line with Project requirements. • Ensure all workers including contractors and subcontractors receive education on symptoms of communicable diseases of concern and STDs.	Contractors' Cost	Eni Kenya B.V. Eni Kenya B.V. Eni Kenya B.V. Eni Kenya B.V.

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
	demining activities potentially resulting in accidents leading to injuries or fatalities. ~ Environmental health: changes to the environment due to increased noise and vibrations, decreased air quality and, inadequate management of waste. ~ Impact from workers presence and potential interaction with local populations	• Provide access to health care for those injured by its activities. • Ensure that work sites are fenced and that signs are put up around work fronts and decommissioning. sites advising people of the risks associated with trespass. When work fronts are less than 100 metres from a community or house, employ security guards from the local community to prevent trespass. • Undertake a programme of stakeholder engagement and consultation to educate local communities of the risks of trespassing onto sites, the meaning of signs, and the dangers of playing on or near equipment or entering fenced areas.		
		C12-2:. • Eni Kenya B.V. will extend the Worker Code of Conduct to include guidelines on worker –community interactions and will provide training on the worker code of conduct to all employees including contractors and subcontractors as part of the induction process. • Eni Kenya B.V. will implement a Community Grievance Mechanism. • Eni Kenya B.V. will develop and implement a Traffic Management Plan covering aspect such as vehicle safety, driver and passenger behaviour, use of drugs and alcohol, operating hours, rest periods, community education on traffic safety and accident reporting and investigations	Contractors' Cost	Eni Kenya B.V.
C13: Gender-based violence at the community level	-Gender-based violence at the community level -Forced Early Marriages -Sexual Exploitation and Abuse -Transactional sex. -Shift in power dynamics in the community or family. -Abusive behavior among project-related staff	**C13-1:** Eni Kenya B.V. will extend the Worker Code of Conduct to include guidelines on worker –community interactions and will provide training on the worker code of conduct to all employees including contractors and subcontractors as part of the induction process. Establish a link between Eni Kenya B.V. activities or operations with, GBV cases at the community level such as domestic violence. This is to ensure that all GBV cases reported at the community level and resulting from or exacerbated by project operations are managed effectively.	Contractors' Cost	Eni Kenya B.V.

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
C14: Violation of children rights by contractor and labour force on site	-Violation of children rights by contractor and labour force on site (e.g., child labour, sexual relations with minors etc.)	**C14-1:** Eni Kenya B.V. will extend the Worker Code of Conduct to include guidelines on worker –community interactions and will provide training on the worker code of conduct to all employees including contractors and subcontractors as part of the induction process. **C 14-2:** Prepare and implament child protection strategy **C14-3**: Prepare and implement a child protection plan and monitoring the employment register, **C14-4:** Employing persons aged 18+ years	Contractor's cost	Contractor
C15: Archaeology and Cultural Heritage Impacts	-Restriction to access cultural sites. -Destruction of cultural sites during decommissioning.	**C15-1:** Consult community when any community issue arises in order to engage traditional forms of community leadership. Develop stakeholder engagement procedures to guide consultations. **C15-2:** Work with local community representatives to develop cultural awareness materials (that will cover key issues including the location and importance of all local cultural sites and other cultural sensitivities (graves). Develop stakeholder engagement procedures to guide consultations. **C15-3:** Should decommissioning. activity be required in proximity to existing graves, develop and implement working protocols in consultation with local traditional leaders. Develop stakeholder engagement procedures to guide consultations. **C15-4:** Do not remove any cultural heritage including graves without prior consultation to the communities and fulfilling the legal requirements. Any removal of cultural heritage should be conducted by the best available techniques. **C15-5:** Establish a grievance procedure to ensure community concerns are addressed. **C15-6:** Develop a chance find procedure which will detail the appropriate course of action that must be followed for any relevant cultural heritage discoveries.	Contractors' Cost	Contractor
C16: Unplanned Events	-Impacts to soil and surface water from spill events	**C16-1:** Develop a detailed Oil Spill Response Plan (OSRP) which includes community notifications of any significant spills that have the potential to affect communities. **C16-2:** Refuelling of equipment and vehicles will be carried out in designated areas on hard standing ground to prevent seepage of any spillages to ground. **C16-3:** Hazardous material storage will be on hard standing and impermeable surface and the bulk storage facility will be bunded.	Contractors' Cost	Contractor

IMPACT TYPE	POTENTIAL IMPACT	MITIGATION MEASURES	COST	RESPONSIBILITY
		C16-4: Hydrocarbon spill clean-up kits shall be available at all locations where refuelling or maintenance of vehicles and equipment is done, and responsible people shall be trained in the use thereof.		

Table 9-5: Environment and Social Monitoring Indicators

Project Activity/Aspect	Impact/Effect	Monitoring Indicator	Institutional Responsibility	
			Monitoring Responsibility	Frequency
A. Labour Influx	**A-1** Higher rates of violence, injury, **A-2** Alcohol and drug consumption and **A-3** Sexually transmitted diseases in the local population. **A-4** social conflicts within and between communities	Development/Implementation • HR Policy • Labour Influx Management Plan • GBV (SEA and SH) Manageent Plan Indicators • HR records on the percentage of local versus non-local employment. • Number/attendance records of Sensitization meetings held on GBV, SEA, HIV/AIDS and other STIs etc. • Review of training attendance records of capacity enhancement and transfer of knowledge that local personnel have received. • Code of conduct included in contracts • Established link between activities/operations with GBV at the community level such as domestic violence. This is to ensure that all GBV cases reported at the community level and resulting from or exacerbated by project operations are managed effectively.	HSE Manager Human Resource Manager Contractor/ Eni Kenya B.V.	• Prior to construction commencing for Local Content and Procurement Plan. • During construction and decomissioning phase for employment. • Quarterly for training-related measures.
B. Air Quality/ Atmospheric Conditions	**B-1** Dust Emissions associated with construction activities	Dust deposition in adjoining areas to be physically monitored using NEMA accredited labs to ensure compliance	Contractor/HSE	• At least once during excavation and casting

Project Activity/Aspect	Impact/Effect	Monitoring Indicator	Institutional Responsibility	
			Monitoring Responsibility	**Frequency**
C. Noise	**C-1** Noise from construction activities (*to be managed by equipment choice and arrangement of construction activities)*	• Part of the contractors' contract	Contractor	• Each schedule of construction activities
D. Soils	**D-1** Dumping of construction material outside the project construction footprint **D-2** Erosion and compaction **D-3** Contamination due to spill of civil construction material	• Visual checks at construction site • Visual inspection during casting	Contractor	• At least once
E. Ecology	**E-1** Disruption to existing flora and fauna **E-2** Loss of vegetation	• Number of revegetated areas. • % area of site cleared vs. remaining un-cleared land.	Contractor	• Continuous
F. Waste	**F-1** Accumulation of waste on site causing nuisances such as odor, pest control problems and general litter.	• Development of Waste Management Plan • Routine weekly checks of waste management arrangements should be undertaken.	Contractor	• Continuous
G. Traffic and Transport	**G-1** Increase in traffic	• Development/implementation of traffic management plan		• Continuous
H. Landscape and Visual Amenity	**H-1** Visual scarring of the landscape	Inspection on a daily basis	Contractor	Continuous throughout the construction phase

Project Activity/Aspect	Impact/Effect	Monitoring Indicator	Institutional Responsibility	
			Monitoring Responsibility	**Frequency**
I. Workers Heath, Safety and Labour Rights	**I-1** Workers health and safety Respect for labour rights	• Worker Health and Safety Management System • Human Resources Policy. • Traffic Management Plan • Verify contractual clauses of Contractor and all sub-contractors requiring adherence to Kenya law and international standards. • Records of incidents and accidents. • Record on training sessions and attendance on health and safety measures • Record of lessons learned to minimize occupational health and safety. • Code of Conduct document	Contractor	• Continuous (construction, operaton and decommissioning phase
J. Community Impacts	**J-1** Labour Influx *(Health impacts including risks of STDs, HIV/AIDS)* **J-2** Community expectation for local benefits	Development/Implementation • Labour influx Management Plan • GBV (SEA and SH) Management Plan • Number/attendance records (communities and workers) of sensitization meetings held on GBV (SEA and SH), HIV/AIDS and other STDs etc. • Review of training attendance records of capacity enhancement and transfer of knowledge that local personnel have received. • Code of conduct included in contracts • Established link between Eni Kenya B.V. activities or operations with GBV at the community level such as domestic violence. This is to ensure that all GBV cases reported at the community level and resulting from or exacerbated by project operations are managed effectively.	Contractor	Construction and decommissioning phase
	J-3 Violence against Children	• Policies against VAC in place • HR Policy • Records of employees with National ID card indicated	Contractor	Construction, operation and decommissioning phase

Project Activity/Aspect	Impact/Effect	Monitoring Indicator	Institutional Responsibility	
			Monitoring Responsibility	**Frequency**
	J-4 Gender Based Violence (SEA/SH)	• Policies against GBV (SEA/SH) in place • HR Policy • Attendance records of sensitization meetings held on GBV	Contractor	Continuous throughout the construction phase
K. Cultural Heritage	**K-1** Cultural and religious sensitivities maybe impacted by project	• Chance Find Procedures • Records of training on chance find procedures	Contractor	Continuous throughout the construction phase
L. Local amenities and infrastructure	**L-1** Pressure to local infrastructure from use of local resources	• Availability of grievance redress process • Number of grievances reported • Number of grievances resolved in a timely manner	Contractor	Continuous throughout the construction phase

9.3.1 Construction Environment and Social Management Plan

For an effective integration of environmental and social safeguards into the project implementation the Contractor will need to adopt this ESMP and prepare a comprehensive Construction Environment and Social Management Plan (C-ESMP) that will provide the key reference point for compliance. The environmental supervision will also adopt the C-ESMP. Construction Environment and Social Management Plan (C-ESMP) is an upgraded ESMP illustrating realities of the project works to be prepared by the Contractor. The Contractor is expected to finalize the Work Plan and upon approval, list the works items and for each item present practical actions that will be undertaken to realize achievement of the ESMP. The actions on works items should address environmental and social aspects associated with the works and in line with guidelines from the ESMP. Based on these ESMP outline, the Contractor will be instructed to develop a Construction Environment and Social Management Plan (C-ESMP) for the project.

9.3.2 Contractor

The Contractor will ensure that the established mitigation measures are integrated and implemented throughout the project works as per the C-ESMP. The Contractor will internalize the ESMP/C-ESMP, prepare monthly progress reports and implement instructions issued by the Supervision Consultant.

9.3.3 National Environment Management Authority

The National Environment Management Authority (NEMA) is responsible for ensuring environmental compliance in the country and has offices in Makueni County with staffing who will further ensure that the ESMP is implemented as part of their mandate, functions, and responsibilities. NEMA will undertake surveillance on the project implementation and review compliance performance based on the supervision monitoring reports.

10 CONCLUSIONS

This report presents a comprehensive environmental and social impact assessment for the proposed mechanical oil extraction plant from plant seeds and proposed measures for mitigating the adverse impacts while enhancing the positive ones during the phases of pre-construction, construction, operation, and decommissioning. An evaluation of the possible alternatives for the project activities was also performed.

The following conclusions have been arrived at regarding the proposed mechanical oil extraction plant from plant seeds. The anticipated benefits of the construction and operation and maintenance of the Project are immense.

The negative impacts identified in this ESIA during the planning, construction, operation, and decommissioning phase of the project, including waste generation, air pollution, noise pollution, occupational health and safety impacts, community health and safety impacts, traffic, labour influx and gender impacts will be limited to the project site and can be mitigated using the measures proposed in the ESMP as well as the preparation and implementation of C-ESMPs.

Based on the immense project benefits which have been stated above, and the identified negative impacts which can be mitigated in the proposed ESMP, we strongly contend that NEMA will find this ESIA study satisfactory and the project environmentally and socially viable to be permitted to take off.

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13 ANNEXES

13.1 ANNEX A. LIST OF PARTICIPANTS CONSULTED

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EMC Consultants

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR

AGRI HUB IN MAKUENI COUNTY

DATE: 02/09/2021 VENUE: Kanzokea - Chief Comp

KAKIKA JOINT FARMERS' COOPERATIVE SOCIETY

ATTENDANCE LIST

No	NAME	TELEPHONE	SIGNATURE
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14			

KAMAGRO GROUP

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR

AGRI HUB IN MAKUENI COUNTY

DATE: 03/09/2021 **VENUE..** KIBWEZI

KAMAGRO Co-operative Society

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12			
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Pg 2-3

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR

AGRI HUB IN MAKUENI COUNTY

DATE: 30th/08/2021 **VENUE** KAMBI MAWE ASSISTANT CHIEF'S CAMP - WOTÉ.

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EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR

AGRI HUB IN MAKUENI COUNTY

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ATTENDANCE LIST

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EMC Consultants

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR

AGRI HUB IN MAKUENI COUNTY

DATE: 30/8/2021 VENUE: KAMBI MAWE ASSISTANT CHIEF'S CAMP - WOTE

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4	Arnold Nyaga (ENI)	0793299259		ENI REP
5	Aggrey Adimo	0725783994		EMC
6	Mark Owuondo	0720320593		EMC
7				
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12				
13				
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EMC Consultants

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR

AGRI HUB IN MAKUENI COUNTY

DATE: 02/09/2021 VENUE... Kitise - C.B.D. Centre

ATTENDANCE LIST KITISE FARMERS' COOPERATIVE SOCIETY.

No	NAME	TELEPHONE	SIGNATURE
1	Joel Kyalloh Maithya	0725836038	
2	Benjamin Masaku Masyula	0704232171	
3	Francis M. Ndwo	0712064505	
4	Joseph Mwanthi	0720965869	
5	Margaret matulu	0707221620	matulu
6	JOSEPH M. MWADGHIGI	0769465306	
7	RAPHAEL M. KAVENDEZLAH	0743243966	
8	Justus Kitiva	0703 976656	
9	STEPHEN NDETI	0727607132	
10	KILMOI W. MBAKA	0721428618	
11	Serah Kilonzi	0716288081	
12	Elizabeth Mutunga	0703466795	
13	Tecla Muthoo	0798047030	
14	Japheth M Kiilu	0726138226	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR AGRI HUB IN MAKUENI COUNTY

STAKEHOLDER ENGAGEMENT ATTENDANCE LIST

DATE: 01/09/2021 MAVINDINI MULTIPURPOSE COOPERATIVE SOCIETY. **VENUE** MAVINDINI

No	NAME	DESIGNATION	TELEPHONE	EMAIL	SIGNATURE
1	~~ANNE~~ K. MASILIA	Weever.	0703375337		Kasivi
2	Federico Borelli				
3	Andrea Sacarello				
4	Mark Ormondo		0720320543		
5	Ronald Reagan.		0725058332		
6	Aggrey Adimo		0715-839994		
7					
8					
9					
10					

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR AGRI HUB IN MAKUENI COUNTY

STAKEHOLDER ENGAGEMENT ATTENDANCE LIST

MAVINDINI MULTIPURPOSE COOPERATIVE SOCIETY

DATE: 01/09/2021 VENUE: Mavindi - MAKUENI

No	NAME	DESIGNATION	TELEPHONE	EMAIL	SIGNATURE
1	FREDRICK Mulandi Mbindyo	MEMBER.	0717754750		[signature]
2	Samuel Mulisi	MEMBER.	07969451		[signature]
3	DAVID Mutisya		0736640275		[signature]
4	Thaddaeus M. Munyoki		0706625233		Thaddaeus
5	Francis M. Musyoka	Secretary	0784901180		[signature]
6	BENEDICT M. Musyoki	Chairman	0720853094		[signature]
7	BHETER K. MUASYA	Treasurer	0726730646	Bheter muasya1970@gmail	Bheter
8	RHODA M. MWANDIKI	WEAVER.	0717281998		[signature]
9	BENEDICTOR NGUKU	Weaver.	0713352002		[signature]
10	MONICAH KIGIVO	Weaver.	08 —		Monicah

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR AGRI HUB IN MAKUENI COUNTY

STAKEHOLDER ENGAGEMENT ATTENDANCE LIST

DATE: 01/09/2021

MAKUENI COUNTY FRUIT PROCESSORS COOPERATIVE SOCIETY LTD.

VENUE: Wote Town Catholic Church

No	NAME	DESIGNATION	TELEPHONE	EMAIL	SIGNATURE
1	Ronald Reagan	E.M.C Consultants	0729530110	reagan@emcconsultants.org	
2	Aggrey Adimo	EMC Consultant	0725783994	adimo@emcconsultant.org	
3	Mark Owuondo	EMC Consultants	0720320543	clay@emconsultants.org	
4	George Gachanja	ENI Kenya SA	0722210080	george.gachanja@external.eni.com	
5	Rosemary Mueni	Member	0707797212	N/A	
6	Federico Lorelli	AGRI DEV MNG	0708313086	federico.lorelli@eni.com	
7	JOSEPH KYAIHA	MCFP	0727784652	JosephNzaau@gmail	
8	Julius N. Nzili	MCFP	0712897660		
9	Michael Mumo	MCFP	0724780246	michaelmumo@gmail.com	
10	HENRY MALU	MCFP	0713817088	malu.henry@gmail.com	

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR AGRI HUB IN MAKUENI COUNTY

STAKEHOLDER ENGAGEMENT ATTENDANCE LIST

DATE: 01/09/2021 MAKUENI COUNTY FRUIT PROCESSORS COOPERATIVE SOCIETY LTD VENUE: Wote Town Catholic Church

No	NAME	DESIGNATION	TELEPHONE	EMAIL	SIGNATURE
1	Phyllis Nduva	Chairperson	0724224454	Katukyuvaelsa@gmail.com	
2	Gertrude Wavinya	Manager	0728578870	Gertrudewavinya00@gmail.com	
3	Arnold Nyaga	Sustainability and External Relations	0793299259	arnoldnyaga-mbvi@eni.com	
4	ANDREA SACCARELLO	ENI PROJECT MGR	0738833306	ANDREA.SACCARELLO@ENI.COM	
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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR AGRI HUB IN MAKUENI COUNTY

STAKEHOLDER ENGAGEMENT ATTENDANCE LIST

DATE: 02/09/2021

VENUE: Makindu – Nzau Cooperatives
MULILI - KYALE FRUITS FARMERS COOPERATIVE SOCIETY

No	NAME	TELEPHONE	EMAIL	SIGNATURE
1	ANN NTHENYA KIMANITHI	0790768779		
2	EVELYN KINYA	0711855533		
3	CHRISTOPHER M MUOKI	0726315529		
4	ANNA W MWENDWA	0742603110		ANNA
5	James Mutuoka Nzioka	0714042788		
6	TEDDY MUTUKU NDUNDA	0704354479		
7	Federico Borrelli	0748313086		
8	ANDREA SACCARELLO	0758883306		
9	Arnold Nyaga	0793299259		
10.	Aggrey Adimo			
11.	Mark Owuondo			
12.	Ronald Reagan			

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR AGRI HUB IN MAKUENI COUNTY

STAKEHOLDER ENGAGEMENT ATTENDANCE LIST

NGWATA FARMERS Co-operative Society

DATE: ..03/09/2021..... **VENUE**..Mbo Andei.....

No	NAME	DESIGNATION	TELEPHONE	EMAIL	SIGNATURE
1	Ronald Reagan	E.M.C	0739530110		
2	JOEL NGEWA	COMMITTEE	0725939711		
3	GILBERT MUTAVI	COMMITTEE	0716115828		
4	MILCAH M KIEMA	Treasure	0712553077		
5	Tuslus D. Ndambuki	SUPERVISION	0722448 658		
6	DAVID NYUNGU	V. CHAIR	0721480930	nyungudavid@gmail.com	
7	EDWARD K. KAMBUA	CHAIR PERSON SC	0700641818		
8	LUCY S. KIVA	Member S.C	0727242050		
9	Martin Mutua Mulwa	Chairman	0724145644		
10	CHRISTINE SILAPEI	CLERK	0716472470	christinekemoi@gmail.com	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR AGRI HUB IN MAKUENI COUNTY

STAKEHOLDER ENGAGEMENT ATTENDANCE LIST

MAKUENI FRUITS VALUE CHAIN

DATE: 01/09/2021

VENUE: KATHONZWENI CHURCH

No	NAME	DESIGNATION	TELEPHONE	EMAIL	SIGNATURE
1	Ronald Reegan	E.M.C Consultants	0739530110	rregan@emconsultants.org	[signature]
2	Aggrey Adimo	EMC Consultants	0725183994	adimo@emcconsultants.org	[signature]
3	Leonard Mawen	MFVCI	0721905714	lnawe52@gmail.com	[signature]
4	Margaret Kwame	M.F.V.C.I	0706571499	modongowerik@gmail.com	[signature]
5	Sammy Musembi	Smallholder Farmer	0712176255	musembimutiso2018@gmail.com	[signature]
6	Isaiah M. Wambua	MF-V-C-I	0728282[illegible]	[illegible]	[signature]
7	Joseph Metto	MFVCI	0721827758	josephmetto2@gmail.com	
8	Lawrence Nthumbi	S.H farmer	0114291163	Laurentchalya@gmail.com	[signature]
9	Elizabeth Muange	Small holder	0713541911	elizabeth@[illegible]	[signature]
10	Eunice Paul	Smallholder	0724410734	eunicewendipaul73@gmail.com	[signature]

Pg 1-2

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR AGRI HUB IN MAKUENI COUNTY

STAKEHOLDER ENGAGEMENT ATTENDANCE LIST

MAKUENI FRUITS VALUE CHAIN COOPERATIVE SOCIETY LTD

DATE: 01/09/2021 VENUE: KATHONZWENI CHURCH

No	NAME	DESIGNATION	TELEPHONE	EMAIL	SIGNATURE
1	DOROTHY KIOKO	Small hoder	0712368507	Mun Grocers Makueni	[signature]
2	ELIZABETH MBINDYO	small scale farmer	0723060789		[signature]
3	REGINA MUTWIWA	small scale farmer	0790889136		[signature]
4	Bonifiica Ndivo	Small Scale Far	0719178370		[signature]
5	Catherine Maingi	Small scale farmer	0728548961		[signature]
6	RODAH MUSEMBI	small scale farmer	0725269975		[signature]
7	Joel M Nzeli	Small farmer	0712797012		[signature]
8	MUSYOKA KIVATHI	SMALL FARMER	072022939[illegible]		[signature]
9	Stellamaris Ndinge Kioko	small farmer	0721175254		[signature]
10	MARTIN M MUTISO	Small farma	0728208021		[signature]

PG 2-2

13.2 ANNEX B. MINUTES OF CONSULTATION MEETINGS

Consultation Meeting with Kamagro Co-Operative Society- KIBWEZI- 03/09/2021

Present;

Co-Operative Society:

Patrick Kombo -Chair Person.

Christina Wambua-Manager

Rosemary Muema- Secretary

Susan Daniel- Member

Angelina Francis- Member

ENI /Consultant Team

Mr. Ronald Reagan – EMC Consultants
Mr. Aggrey Adimo- EMC Consultants
Mr. Mark Owuondo-EMC Consultants
Mr. Arnold Nyaga- ENI
Mr. Federico Borelli-ENI
Mr. Andrea Zuccarello-ENI

1. **Introduction**

This Consultation meeting took place in Kibwezi with Kamagro Co-operative Society in Makueni County. It was attended by major project stakeholders that is Kamagro Co-Operative Society Limited. The meeting commenced at 11:30am and was preceded by prayers led by Susan Daniel.

The Consultants/ ENI then introduced themselves to the assembled Stakeholders. The Stakeholders ware made aware of the intended project for Construction of a factory within the County which will be using crops like croton, Cotton and Castor to extract oil from them for oil processing. The consultants/Eni informed the baraza on the processes they would follow while carrying out the exercise.

Discussions

The Co-operative members present were urged to give their views on the project, which they did, a summary of the consultative exercise is tabled below;

Comments and Issues	Response
Susan Daniel-The Committee wanted confirmation from the client about the price per Kilo for their produce.	The team reassured the committee that the price is still being worked on and they will provide suitable prices for their produce.
Angelina Francis-The Committee members wanted a clarification on the issue of	The client ENI/EMC Consultants informed the committee members that they will have a direct

Middlemen since this has been a great challenge to farmers	contact/Contract with the farmers which will help in doing away with Middlemen who exploit farmers.
Christina Wambua-The Committee members wanted to know if ENI will provide seeds to farmers or what will happen.	The community members were reassured that the Client will provide seeds to farmers
Susan Wambua-The committee members wanted to know the quantity of seed crops that the factory will need for its operations	The Consultants /ENI informed the members that the proposed Plant will need 1500 Metric tons of seed to be crashed from farmers.
Beatrice Wambua-Questions concerning potential air and sound pollution arising from excessive noise and vibration also arose from community members	The Consultants informed the members that the project will be using up to date technologies to improve efficiencies to reduce noise and vibrations and further mitigation measures will be put in place.
Justus Ndinda-Community members enquired if there will be employment opportunities, and what would be the criteria for employment. They asked to be given first priority whenever employment opportunities arise.	The client informed the community members of their intention to hire locally whenever possible and further that there are plans to develop a community engagement plan which will cover all employment issues. However, he cautioned that where specialist skills are required for the project and the skills are not locally available, specialist would be hired from other jurisdictions
Nzau-The Committee members wanted to know if ENI will provide seeds to farmers or what will happen.	The community members were reassured that the Client will provide seeds to farmers
Christopher Mutinda-The Committee members wanted a clarification on the issue of Middlemen since this has been a great challenge to farmers	The client ENI/EMC Consultants informed the committee members that they will have a direct contact/Contract with the farmers which will help in doing away with Middlemen who exploit farmers.
Julias Nzili-The Committee wanted confirmation from the client about the price per Kilo for their produce.	The team reassured the committee that the price is still being worked on and they will provide suitable prices for their produce

Conclusion

The meeting ended at 1:30 pm with a word of prayer from the Julias Nzili. The community resolved to support the project to its conclusion and stressed the need for them to be involved in all aspects of the project.

Consultation Meeting with Katika Joint Farmers' Co-operative Society Kanzokea Chiefs Camp- 02/09/2021

Present;

Co-operative Society:

Richard Kituku-Chairperson.

Julias Mrithi-Secretary

Jones Mulwa- Secretary

Pauline Mutuku- Member

Rael Nyerere- Member

Michael Mululu-Member

Martin Mulwa-Member

ENI /Consultant Team

Mr. Ronald Reagan – EMC Consultants

Mr. Aggrey Adimo- EMC Consultants

Mr. Mark Owuondo-EMC Consultants

Mr. Arnold Nyaga- ENI

Mr. Federico Borelli-ENI

Mr. Andrea Zuccarello-ENI

1. **Introduction**

This Consultation meeting took place in Kanzokea Chiefs Compound in Makueni County with Katika Joint Farmers' Co-operative Society. It was attended by major project stakeholders i.e. Makueni County Fruit Processors Co-operative Society Limited. The meeting commenced at 2:00pm and was preceded by prayers from Joseph Maweu.

The Consultants/ ENI then introduced themselves to the assembled Stakeholders. The taken through the project by the Consultant and the client (ENI)

Discussions

The Co-operative members present were urged to give their views on the project, which they did, a summary of the consultative exercise is as in the table below;

Comments and Issues	Response
Joseph Maweu-Marketing of our produce has been a problem. How are you going to solve this?	The firm will provide ready market for the farmers produce.
Julias Mbithi-When will the plant be operational?	The plant should be operational by early next year.
Pauline Mutuku-It seems a lot of our trees will be cut to create space for the project. Will there be any compensation should this happen?	Bush clearance will be minimal and further that an offset programme would be Implemented to ensure tree cover is maintained
Rael Nyerere-What will be the pricing per Kg of our produce?	There is a team currently working on the pricing. Once they are through the information will be communicated to the public.

Conclusion

There being no any other business, the meeting ended at 16:00 pm with a word of prayer from the Rael Nyerere. The community resolved to support the project to its conclusion and stressed the need for them to be involved in all aspects of the project and the farmers well-being be considered at all aspects and be protected from brokers.

Consultation Meeting with Kitise Farmers' Co-Operative Society- KITISE CBO Center - 02/09/2021

Present;

Co-operative Society:

Joel Kyttholah Mathiayo-Chairperson.

Benjamin Masyulla- Secretary

Magreat Mutuku- Member

Stephen Ndeti- Member

Serah Kilonzi-Member

Elizabeth Mungulla-Member

Tecla Mutheu-Member

Japheth Kisulu-Member

Stephen Ndeti-Member

ENI /Consultant Team

Mr. Ronald Reagan – EMC Consultants

Mr. Aggrey Adimo- EMC Consultants

Mr. Mark Owuondo-EMC Consultants

Mr. Arnold Nyaga- ENI

Mr. Federico Borelli-ENI

Mr. Andrea Zuccarello-ENI

1. **Introduction**

This Consultation meeting took place in Kitise at the CBO Centre in Makueni County. It was attended by major project stakeholders, Kitise Farmers Co- operative Society Limited. The meeting commenced at 2:00 pm and was preceded by prayers led from Stephen Ndeti.

The Consultants/ ENI then introduced themselves to the assembled Stakeholders. The Stakeholders ware made aware of the intended project for construction of a factory within the County which will be using crops like croton, Cotton and Castor to extract oil from them for oil processing. The consultants/Eni informed the baraza on the processes they would follow while carrying out the exercise.

Discussions

The members present were urged to give their views on the project, which they did, a summary of the consultative exercise is tabled below;

Comments and Issues	Response
Joseph Mwangangi- How will the wastes that will be generated be disposed of?	There exist waste management systems which will be put in place. This will ensure that the wastes are handled in such a way that it is not released to the environment.
Justus Kivatima-When is the plant likely to be operational?	By early next year operations should begin.
Stephen Ndeti- It seems like a lot of trees will be cut to create space for the plant. Will there be some form of compensation to the owners?	Bush clearance will be very minimal and further that an offset programme would be implemented to ensure that the tree cover was maintained
Wilmot Mbaka- What amount of seed crops will the plant need for its smooth operations?	The Plant will need 1500 Metric tons of seed to be crashed from farmers.
Japheth Kisilu-How will you handle the air and sound pollution arising from excessive noise and vibration during operations?	The project will be using up to date technologies to improve efficiencies and to reduce noise and vibrations and further mitigation measures will be put in place.
Joseph Mwaniki-Will there be any job opportunities available for the locals?	We intent to hire locally whenever possible We will also develop community engagement plan which will handle all employment issues.
Raphael Kavendi-Will seeds be provided to the farmers?	Quality seeds will be provided to farmers.

Conclusion

The meeting ended at 3:30 pm with a word of prayer from the Phyllis Nduva. The community resolved to support the project to its conclusion and stressed the need for them to be involved in all aspects of the project.

Consultation Meeting with Makueni County Fruit Processors Co-operative Society- WOTE Catholic Church- 01/09/2021

Present;

Co-operative Society:
Phyllis Nduva-Chairperson.

Gertrude Wavinya-Manager

Rosemary Muema- Secretary

Joseph Kyatha- Member

Henry Mailu- Member

Michael Mululu-Member

Julias Nzili-Member

ENI /Consultant Team

Mr. Ronald Reagan – EMC Consultants
Mr. Aggrey Adimo- EMC Consultants
Mr. Mark Owuondo-EMC Consultants
Mr. Arnold Nyaga- ENI
Mr. Federico Borelli-ENI
Mr. Andrea Zuccarello-ENI

Introduction
This Consultation meeting took place in Wote town at the Catholic Church Compound in Makueni County. It was attended major project stakeholders i.e Makueni County Fruit Processors Co-operative Society Limited. The meeting commenced at 11:00 am and was preceded by prayers led by Rosemary Muema.

The Consultants/ ENI then introduced themselves to the meeting. The Stakeholders ware made aware of the intended project for construction of a factory within the county which will be using crops like croton, Cotton and Castor to extract oil from them for oil processing. The consultants/Eni informed the baraza on the processes they would follow while carrying out the exercise.

Discussions

The co-operative members present were urged to give their views on the project, which they did, a summary of the consultative exercise is tabled below;

Comments and Issues	Response
Joseph Kyatha: How will you handle the wastes that will be generated from the production process?	A waste management system will be put in place such that the wastes will be processed to make animal sand chicken feeds.
Rosemary Muema-When are you likely to commence operations?	The plant should be operational by early next year.
Mbugua Likoye: We are likely to experience a lot of trees being cut. Will there be any form of compensation to the owners?	Bush clearance will be minimal. An offset programme would also be implemented to ensure that the tree cover is maintained
Phyllis Nduva-How much of the seed crops will the plant need for its smooth operations	The proposed Plant will need 1500 Metric tons of seed to be crashed from farmers.
Charles Mutie-There will be a lot of air and noise pollution coming from the plant. How will the pollution issue be managed?	The Plant will employ the use of up to date technologies to improve efficiencies to reduce noise and vibrations Further mitigation measures will also be put in place.
Gertrude Wavinya-Will our young men around here get any employment opportunities?	We intent to hire locally whenever possible especially for jobs that do not require skills. We will also develop a community engagement plan which will cover all employment issues.
Phyllis Nduva-Will you provided seeds to farmers?	Yes the company will provided quality seeds to farmers

Conclusion

The meeting ended at 01:30 pm with a word of prayer from the Phyllis Nduva. The community resolved to support the project to its conclusion and stressed the need for them to be involved in all aspects of the project.

Consultation Meeting with Makueni County Fruit Processors Co-operative Society- Kathonzweni Catholic Church- 01/09/2021

Present;

Co-operative Society:

Lawrence Ngubi-Chairperson.

Millicent Wavinya-Member

Leonard Maweu- Secretary

Margret Kwame- Member

Joseph Metto- Member

Elizabeth Muange-Member

Eunice Paul-Member

ENI /Consultant Team

Mr. Ronald Reagan – EMC Consultants
Mr. Aggrey Adimo- EMC Consultants
Mr. Mark Owuondo-EMC Consultants
Mr. Arnold Nyaga- ENI
Mr. Federico Borelli-ENI
Mr. Andrea Zuccarello-ENI

Introduction

This Consultation meeting took place at the Catholic Church Compound in Kathonzweni Makueni County. It was attended major project stakeholders that is Makueni Fruit value chain. The meeting commenced at 03:00PM and was preceded by prayers led by Sammy Musembi.

The Consultants/ ENI then introduced themselves to the assembled Stakeholders. The Stakeholders ware made aware of the intended project for Construction of a factory within the County which will be using crops like croton, Cotton and Castor to extract oil from them for oil processing. The consultants/Eni informed the baraza on the processes they would follow while carrying out the exercise.

Discussions

The Co-operative members present were urged to give their views on the project, which they did, a summary of the consultative exercise is tabled below;

Comments and Issues	Response
Sammy Musembi- The committee here did not give their views on the project. They however, requested for another meeting to be held later after they have digested the information given to them about the project	The Consultant and ENI staff requested the members to communicate the day and date they are comfortable with so that a consultative meeting is held.

Conclusion

The meeting ended at 1:30 pm with a word of prayer from the Phyllis Nduva. The community resolved to support the project to its conclusion and stressed the need for them to be involved in all aspects of the project.

Consultation Meeting with Mavindini Multipurpose Co-operative Society- 01/09/2021

Present;

Co-operative Society:

Benedict Masuu-Chairperson.

Benther Muasya-Tresure

Samwel Mutisya - Secretary

Moicah Kitivo- Member

Henry Mailu- Member

Michael Mululu-Member

Rodha Mwaniki-Member

ENI /Consultant Team

Mr. Ronald Reagan – EMC Consultants
Mr. Aggrey Adimo- EMC Consultants
Mr. Mark Owuondo-EMC Consultants
Mr. Arnold Nyaga- ENI
Mr. Federico Borelli-ENI
Mr. Andrea Zuccarello-ENI

Introduction

This Consultation meeting took place at Mavindini in Makueni County. It was attended by major project stakeholders that is Mavindini Multipurpose Co-operative Society. The meeting commenced at 10:00am and was preceded by prayers led by the chairman Mr. Benedict Massu.

The Consultants/ ENI then introduced themselves to the assembled Stakeholders. The Stakeholders ware made aware of the intended project for Construction of a factory within the County which will be using crops like croton, Cotton and Castor to extract oil from them for oil processing. The consultants/Eni informed the baraza on the processes they would follow while carrying out the exercise.

Discussions

The Co-operative members present were urged to give their views on the project, which they did, a summary of the consultative exercise is tabled below;

Comments and Issues	Response
Betha Musya-How will you handle the wastes that will be generated from the plant?	EMC Consultants /ENI assured community members that a waste management system will be put in place such that they will be processed to make animal sand chicken feeds. .
Henry Mailu-When will operations commence?	Operations should commence early next year.
Benedict Massu-Will there be ready market for our farm produce?	There will be very ready market for the farm produce.
Henry Malu-What is the quantity of seeds that the plant will require to operate.	The proposed Plant will need 1500 Metric tons of seed to be crashed from farmers
Roda Mwaniki-Will farmers get seeds from the ENI?	Yes, ENI will provide quality seeds to the farmers.

Conclusion

The meeting ended at 11:30 am with a word of prayer from Betha Musya. The community resolved to support the project to its conclusion and stressed the need for them to be involved in all aspects of the project and farmers well-being to be taken care off.

Consultation Meeting with Ngwata Farmers' Co-operative Society- Mtito Andei 03/09/2021

Present;

Co-operative Society:

Edward Kiambua-Chairperson.

Joel Ngewa-Manager

Milca Kiema- Secretary

David Nyongu- Member

Lucy Kiva- Member

Christine Silapei-Member

Justus Ndambuki-Member

ENI /Consultant Team

Mr. Ronald Reagan – EMC Consultants
Mr. Aggrey Adimo- EMC Consultants
Mr. Mark Owuondo-EMC Consultants
Mr. Arnold Nyaga- ENI
Mr. Federico Borelli-ENI
Mr. Andrea Zuccarello-ENI

Introduction

This Consultation meeting took place in Ngwata town in Makueni County. It was attended major project stakeholders that is Ngwata Farmers' Co-operative Society Limited. The meeting commenced at 02:00PM and was preceded by prayers led by Rosemary Muema.

The Consultants/ ENI then introduced themselves to the assembled Stakeholders. The Stakeholders ware made aware of the intended project for Construction of a factory within the County which will be using crops like croton, Cotton and Castor to extract oil from them for oil processing. The consultants/Eni informed the baraza on the processes they would follow while carrying out the exercise.

Discussions

The Co-operative members present were urged to give their views on the project, which they did, a summary of the consultative exercise is tabled below;

Comments and Issues	Response
Joel Ngewa- Is this the first project ENI is doing in Makueni?	This is the first ever project in this County.
Justus Ndambuki-Will the Investor help in training farmers.	Farmers will be taken through training periodically.
Edward Kambua- What will happen to all the trees that will be cut to create space for the plant?	Bush clearance will be minimal and an offset programme would be implemented to ensure that the tree cover was maintained
Gilbert Mutiny-What amount of seed will the plant need for smooth operations?	The proposed Plant will need 1500 Metric tons of seed to be crashed from farmers.
Lucy Kiva-Will there be job opportunities for our young sons and daughters?	We intent to hire locally whenever possible. We will further develop a community engagement plan which will cover all employment issues.
Christine Silapei-Will you provide seeds to farmers?	Yes, The seeds will be provided to farmers.
Henry Mailu-How will you get rid of middle men who have spoilt businesses?	ENI will deal directly with the farmers. This will automatically get rid of the middle men
Julias Nzili-The Committee wanted confirmation from the client about the price per Kilo for their produce.	The price has not been determined yet but a communication will be made as soon as a decision on the same has been made.

Conclusion

The meeting ended at 3:45 pm with a word of prayer from the Lucy Kiva. The community resolved to support the project to its conclusion and stressed the need for them to be involved in all aspects of the project and farmers well-being to be taken care off from the brokers.

Consultation Meeting with Nzau –Malili-Kyale Fruit Farmers' Co-operative Society-MAKINDU- 02/09/2021

Present;

Co-operative Society:

Christopher Muoka-Chairperson.

James Muthoka-Manager

Everline Kinya- Secretary

Ann Nthenya- Member

ENI /Consultant Team

Mr. Ronald Reagan – EMC Consultants
Mr. Aggrey Adimo- EMC Consultants
Mr. Mark Owuondo-EMC Consultants
Mr. Arnold Nyaga- ENI
Mr. Federico Borelli-ENI
Mr. Andrea Zuccarello-ENI

Introduction

This Consultation meeting took place in Makindu in Makueni County. It was attended by major project stakeholders that is Malili-Kyale Fruits Farmers' co-operative Society Co-operative Society Limited. The meeting commenced at 10:30am and was preceded by prayers led by Ann Nthenya Kimathi.

The Consultants/ ENI then introduced themselves to the assembled Stakeholders. The Stakeholders ware made aware of the intended project for Construction of a factory within the County which will be using crops like croton, Cotton and Castor to extract oil from them for oil processing. The consultants/Eni informed the baraza on the processes they would follow while carrying out the exercise.

Discussions

The Co-operative members present were urged to give their views on the project, which they did, a summary of the consultative exercise is tabled below;

Comments and Issues	Response
Ann Nthenya-When will the plant start operations?	The plant will be operations by early next year.
Evelyn Kinya-The Committee members wanted to know if ENI will provide seeds to	ENI will provide seeds.

farmers or what will happen.	
Teddy Mutuku- The Committee wanted confirmation from the client about the price per Kilo for their produce.	The issue of the prices are still being discussed and once an agreement is reached, ENI will communicate to farmers.

Conclusion

The meeting ended at 11:20 am with a word of prayer from the Phyllis Nduva. The community resolved to support the project to its conclusion and stressed the need for them to be involved in all aspects of the project.

13.3 ANNEX C. SELECTED PHOTOGRAPHS

	
Roads leading to the project area	A tarmacked road in the project
	
A trading center in the project area	A worship center in Makueni
	
Farms within the project area	Power line to the project area
	
Farm produce within the project area	Stake holders having a discussion on the project

	
The consultant Taking part in the discussion	The client explaining the project to the cooperative memebers.
	
Farmers listening during the public meetings	Consultations on going
	
Stakeholder consultations ongoing	Chief of the area giving his speech

13.4 ANNEX D. QUESTIONNAIRE

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

eni

Project	AGRI_HUB – MAKUENI COUNTY, WOTE SUB COUNTY
Report	Environment Impact Assessment Project Report (ESIA) for Proposed Agri-Hub
Proponent	Eni Kenya B.V
Assignment	Stakeholder engagement through questionnaire administration
Stakeholders	County and National Administration, Institutions, NGOs/CBOs and Public.
County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Meshack Kyalo
Contacts of respondent	0725081624
Respondent classification (Institution / Individual)	Individual
Interviewer's Name	Jared Mutisya
ID Number Interviewer's	27518091
Interviewer's Contact	0725058331
Date of Interview	30/8/2021

1. INTRODUCTION

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The agricultural development project focuses on the development of sustainable oil crop cultivations - namely, low ILUC (indirect land use change) feedstock such as cover crops, castor in degraded lands, croton trees in agro-forestry systems, rotational oilseeds like brassica carinata and other non-edible oilseeds ("Agriculture Crops'') and other agro-industrial co-products such as cotton seeds, with the purpose of collecting seeds and subsequently extracting vegetable oil through aggregation and agro-processing hubs ("Agro Hubs").

The vegetable oil would then be used as feedstock for bio-refineries, in Kenya or abroad, in order to produce, among others, Hydro treated Vegetable Oil (HVO) and Sustainable Aviation Fuel (SAF).

EMCA 1999 Cap 387 revised in 2015 to align to the Kenyan Constitution 2010 provides in the second schedule that Project of such magnitude be subjected to an Environmental Impact Assessment Project Report Assessment (EIA).

Input from stakeholders during EIA process is important and is required during finalization of Project designs and also help in development of impacts mitigation measures presented in the environment management plan presented as a chapter in the EIA report.

You are among the stakeholders selected to be interviewed with the regards to the above described project. All the information provided in the questionnaire will be kept confidential. Thank you.

2. PROJECT CONSTRUCTION IMPACTS

What are some of the Project impacts anticipated during Project construction to **both Natural and Human Environment**[1] in your area ***(refer to footer below for an interpretation of natural and human environment, interviewer to guide the respondent)***

(a) General positive impacts during Project Construction Phase

This will bring Job Opportunities to youths, men, women, during project construction phase.

(b) General negative impacts during Project Construction Phase

The area is prone to dust, during construction phase the community will suffer a lot from dust which will be more from trucks and cars too and from the site.

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

This will bring ready made market to our products which are readily available within the region.

(d) General negative impacts during Project operation Phase

As community members we anticipate foreign culture will be imposed on us

[1] Example of natural environment could be soils, geology, topography, hydrology, flora and fauna while human environment could refer to peoples wellbeing including sources of livelihood, hygiene and sanitation, health, resettlement issues e.t.c

2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

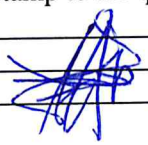
4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

The Project is good since our youths will have job opportunities both direct and indirect.

5. INTERVIEW AUTHENTICATION

Kindly sign or provide and official rubberstamp to the questionnaire



EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

eni

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Stakeholders	County and National Administration, Institutions, NGOs/CBOs and Public.
County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Anna Kalenda
Contacts of respondent	0714-467520
Respondent classification (Institution / Individual)	Individual
Interviewer's Name	
ID Number Interviewer's	
Interviewer's Contact	
Date of Interview	30/8/2021

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2. PROJECT CONSTRUCTION IMPACTS

What are some of the Project impacts anticipated during Project construction to **both Natural and Human Environment**[1] in your area ***(refer to footer below for an interpretation of natural and human environment, interviewer to guide the respondent)***

(a) General positive impacts during Project Construction Phase

(b) General negative impacts during Project Construction Phase

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

(d) General negative impacts during Project operation Phase

[1] Example of natural environment could be soils, geology, topography, hydrology, flora and fauna while human environment could refer to peoples wellbeing including sources of livelihood, hygiene and sanitation, health, resettlement issues e.t.c

2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

5. INTERVIEW AUTHENTICATION

Kindly sign or provide and official rubberstamp to the questionnaire

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

Project	AGRI_HUB – MAKUENI COUNTY, WOTE SUB COUNTY
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Proponent	Eni Kenya B.V
Assignment	Stakeholder engagement through questionnaire administration
Stakeholders	County and National Administration, Institutions, NGOs/CBOs and Public.
County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Alex Maryoka
Contacts of respondent	0710-370961
Respondent classification (Institution / Individual)	
Interviewer's Name	
ID Number Interviewer's	29191793
Interviewer's Contact	
Date of Interview	30/8/2021

1. INTRODUCTION

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You are among the stakeholders selected to be interviewed with the regards to the above described project. All the information provided in the questionnaire will be kept confidential. Thank you.

2. PROJECT CONSTRUCTION IMPACTS

What are some of the Project impacts anticipated during Project construction to **both Natural and Human Environment**[1] in your area ***(refer to footer below for an interpretation of natural and human environment, interviewer to guide the respondent)***

(a) General positive impacts during Project Construction Phase

Create Employment.

(b) General negative impacts during Project Construction Phase

Not Known.

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

Improve livelihood.

(d) General negative impacts during Project operation Phase

Impact on Air Quality.

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2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

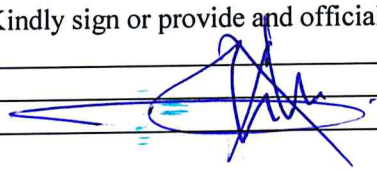
4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

I hope people will be employed mostly locals.

5. INTERVIEW AUTHENTICATION

Kindly sign or provide and official rubberstamp to the questionnaire



EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

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Proponent	Eni Kenya B.V
Assignment	Stakeholder engagement through questionnaire administration
Stakeholders	County and National Administration, Institutions, NGOs/CBOs and Public.
County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Peter Nyaga
Contacts of respondent	0701-431698
Respondent classification (Institution / Individual)	Individual.
Interviewer's Name	
ID Number Interviewer's	28161718
Interviewer's Contact	
Date of Interview	30/8/2021

1. INTRODUCTION

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What are some of the Project impacts anticipated during Project construction to **both Natural and Human Environment**[1] in your area ***(refer to footer below for an interpretation of natural and human environment, interviewer to guide the respondent)***

(a) General positive impacts during Project Construction Phase

Create Employment

(b) General negative impacts during Project Construction Phase

Increase level of dust.

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

economic growth — Employment

(d) General negative impacts during Project operation Phase

Dust.

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2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

N/A

5. INTERVIEW AUTHENTICATION

Kindly sign or provide and official rubberstamp to the questionnaire

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

Project	AGRI_HUB – MAKUENI COUNTY, WOTE SUB COUNTY
Report	Environment Impact Assessment Project Report (ESIA) for Proposed Agri-Hub
Proponent	Eni Kenya B.V
Assignment	Stakeholder engagement through questionnaire administration
Stakeholders	County and National Administration, Institutions, NGOs/CBOs and Public.
County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Kalew Ndeye.
Contacts of respondent	0714-012761
Respondent classification (Institution / Individual)	Individual.
Interviewer's Name	
ID Number Interviewer's	
Interviewer's Contact	
Date of Interview	

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2. PROJECT CONSTRUCTION IMPACTS

What are some of the Project impacts anticipated during Project construction to **both Natural and Human Environment**[1] in your area ***(refer to footer below for an interpretation of natural and human environment, interviewer to guide the respondent)***

(a) General positive impacts during Project Construction Phase

Create Jobs.

(b) General negative impacts during Project Construction Phase

hazardous Waste.

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

Economic Growth.

(d) General negative impacts during Project operation Phase

[1] Example of natural environment could be soils, geology, topography, hydrology, flora and fauna while human environment could refer to peoples wellbeing including sources of livelihood, hygiene and sanitation, health, resettlement issues e.t.c

2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

I hope the project will create employment.

5. INTERVIEW AUTHENTICATION

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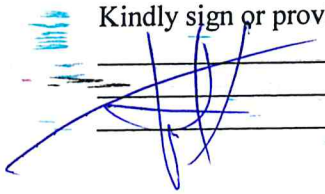

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County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Fredrick Mukuchi.
Contacts of respondent	0717-754780.
Respondent classification (Institution / Individual)	Individual.
Interviewer's Name	
ID Number Interviewer's	
Interviewer's Contact	
Date of Interview	01/09/2021

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(a) General positive impacts during Project Construction Phase

Employment.

(b) General negative impacts during Project Construction Phase

Hygiene and Sanitation Could be affected

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

Economic.

(d) General negative impacts during Project operation Phase

Dust

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2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

It will be a good Project because it will create employment.

5. INTERVIEW AUTHENTICATION

Kindly sign or provide and official rubberstamp to the questionnaire

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

Project	AGRI_HUB – MAKUENI COUNTY, WOTE SUB COUNTY
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Stakeholders	County and National Administration, Institutions, NGOs/CBOs and Public.
County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Samuel Mduti
Contacts of respondent	0716-694511.
Respondent classification (Institution / ~~Individual~~)	Individual
Interviewer's Name	
ID Number Interviewer's	22176185
Interviewer's Contact	
Date of Interview	6/09/2021

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What are some of the Project impacts anticipated during Project construction to **both Natural and Human Environment**[1] in your area ***(refer to footer below for an interpretation of natural and human environment, interviewer to guide the respondent)***

(a) General positive impacts during Project Construction Phase

Employment

(b) General negative impacts during Project Construction Phase

Resettlement Issues.

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

Economic Growth.

(d) General negative impacts during Project operation Phase

Dust

[1] Example of natural environment could be soils, geology, topography, hydrology, flora and fauna while human environment could refer to peoples wellbeing including sources of livelihood, hygiene and sanitation, health, resettlement issues e.t.c

2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

The project will create employment

5. INTERVIEW AUTHENTICATION

Kindly sign or provide and official rubberstamp to the questionnaire

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

eni

Project	AGRI_HUB – MAKUENI COUNTY, WOTE SUB COUNTY
Report	Environment Impact Assessment Project Report (ESIA) for Proposed Agri-Hub
Proponent	Eni Kenya B.V
Assignment	Stakeholder engagement through questionnaire administration
Stakeholders	County and National Administration, Institutions, NGOs/CBOs and Public.
County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Samuel Nzamu
Contacts of respondent	0736-648275
Respondent classification (Institution / Individual)	Individual
Interviewer's Name	
ID Number Interviewer's	6168800
Interviewer's Contact	
Date of Interview	21/09/2021

1. INTRODUCTION

Eni S.p.A. is an integrated energy company with a direct shareholding interest owned by the Italian Government, active in Kenya since 2013 in the upstream oil & gas sector through its affiliate **Eni Kenya B.V.**

Eni is strongly committed to play a pivotal role in the overall decarbonisation process and has set as its primary mission the promotion of a more rational use of fossil sources and a greater resources to renewable sources in co place with the provision of the Paris Agreement on Climate Change and the Sustainable Development Goals.

In July 2021, the Memorandum of Understanding (MOU) for the Co-operation and Development of Bio-Energy Projects in Kenya was signed between Eni and the Government of Kenya though Ministry of Petroleum and Mining to promote the decarbonization process to tackle climate change through new industrial models of fully-integrated circular economy along the whole bio-fuel production value chain.

The agricultural development project focuses on the development of sustainable oil crop cultivations - namely, low ILUC (indirect land use change) feedstock such as cover crops, castor in degraded lands, croton trees in agro-forestry systems, rotational oilseeds like brassica carinata and other non-edible oilseeds ("Agriculture Crops") and other agro-industrial co-products such as cotton seeds, with the purpose of collecting seeds and subsequently extracting vegetable oil through aggregation and agro-processing hubs ("Agro Hubs").

The vegetable oil would then be used as feedstock for bio-refineries, in Kenya or abroad, in order to produce, among others, Hydro treated Vegetable Oil (HVO) and Sustainable Aviation Fuel (SAF).

EMCA 1999 Cap 387 revised in 2015 to align to the Kenyan Constitution 2010 provides in the second schedule that Project of such magnitude be subjected to an Environmental Impact Assessment Project Report Assessment (EIA).

Input from stakeholders during EIA process is important and is required during finalization of Project designs and also help in development of impacts mitigation measures presented in the environment management plan presented as a chapter in the EIA report.

You are among the stakeholders selected to be interviewed with the regards to the above described project. All the information provided in the questionnaire will be kept confidential. Thank you.

2. PROJECT CONSTRUCTION IMPACTS

What are some of the Project impacts anticipated during Project construction to **both Natural and Human Environment**[1] in your area ***(refer to footer below for an interpretation of natural and human environment, interviewer to guide the respondent)***

(a) General positive impacts during Project Construction Phase

Project will create employment.

(b) General negative impacts during Project Construction Phase

Pollution due to dust.

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

It will bring about Economic growth.

(d) General negative impacts during Project operation Phase

Hygiene and Sanitation impacts

[1] Example of natural environment could be soils, geology, topography, hydrology, flora and fauna while human environment could refer to peoples wellbeing including sources of livelihood, hygiene and sanitation, health, resettlement issues e.t.c

2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

It is a good project that will benefit farmers'

5. INTERVIEW AUTHENTICATION

Kindly sign or provide and official rubberstamp to the questionnaire

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

Project	AGRI_HUB – MAKUENI COUNTY, WOTE SUB COUNTY
Report	Environment Impact Assessment Project Report (ESIA) for Proposed Agri-Hub
Proponent	Eni Kenya B.V
Assignment	Stakeholder engagement through questionnaire administration
Stakeholders	County and National Administration, Institutions, NGOs/CBOs and Public.
County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Thadeus Makeni.
Contacts of respondent	0706-695233
Respondent classification (Institution / Individual)	Individual.
Interviewer's Name	-
ID Number Interviewer's	57610
Interviewer's Contact	-
Date of Interview	01/09/2021

1. INTRODUCTION

Eni S.p.A. is an integrated energy company with a direct shareholding interest owned by the Italian Government, active in Kenya since 2013 in the upstream oil & gas sector through its affiliate **Eni Kenya B.V.**

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2. PROJECT CONSTRUCTION IMPACTS

What are some of the Project impacts anticipated during Project construction to **both Natural and Human Environment**[1] in your area ***(refer to footer below for an interpretation of natural and human environment, interviewer to guide the respondent)***

(a) General positive impacts during Project Construction Phase

Project will improve employment status.

(b) General negative impacts during Project Construction Phase

Project will cause dirt of dust pollution and Air

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

Project will bring Economic Growth.

(d) General negative impacts during Project operation Phase

[1] Example of natural environment could be soils, geology, topography, hydrology, flora and fauna while human environment could refer to peoples wellbeing including sources of livelihood, hygiene and sanitation, health, resettlement issues e.t.c

2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

I hope (project will Create Employment.

5. INTERVIEW AUTHENTICATION

Kindly sign or provide and official rubberstamp to the questionnaire

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

Project	AGRI_HUB – MAKUENI COUNTY, WOTE SUB COUNTY
Report	Environment Impact Assessment Project Report (ESIA) for Proposed Agri-Hub
Proponent	Eni Kenya B.V
Assignment	Stakeholder engagement through questionnaire administration
Stakeholders	County and National Administration, Institutions, NGOs/CBOs and Public.
County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Magdalene Kilonzo
Contacts of respondent	0721-534010
Respondent classification (Institution / Individual)	Individual.
Interviewer's Name	
ID Number Interviewer's	
Interviewer's Contact	
Date of Interview	01/09/2021

1. INTRODUCTION

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2. PROJECT CONSTRUCTION IMPACTS

What are some of the Project impacts anticipated during Project construction to **both Natural and Human Environment**[1] in your area ***(refer to footer below for an interpretation of natural and human environment, interviewer to guide the respondent)***

(a) General positive impacts during Project Construction Phase

Project will create Jobs for locals'

(b) General negative impacts during Project Construction Phase

N/A

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

Economic Growth'

(d) General negative impacts during Project operation Phase

[1] Example of natural environment could be soils, geology, topography, hydrology, flora and fauna while human environment could refer to peoples wellbeing including sources of livelihood, hygiene and sanitation, health, resettlement issues e.t.c

2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

The project will create jobs for the locals.

5. INTERVIEW AUTHENTICATION

Kindly sign or provide and official rubberstamp to the questionnaire

EMC Consultants
ENVIRONMENTAL KNOWLEDGE IN PRACTISE

Project	AGRI_HUB – MAKUENI COUNTY, WOTE SUB COUNTY
Report	Environment Impact Assessment Project Report (ESIA) for Proposed Agri-Hub
Proponent	Eni Kenya B.V
Assignment	Stakeholder engagement through questionnaire administration
Stakeholders	County and National Administration, Institutions, NGOs/CBOs and Public.
County	Makueni

INTERVIEW DETAILS

Name / Institution of respondent	Stella Kituva
Contacts of respondent	0743-761888
Respondent classification (Institution / Individual)	Individual.
Interviewer's Name	-
ID Number Interviewer's	-
Interviewer's Contact	-
Date of Interview	01/09/2021.

1. INTRODUCTION

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2. PROJECT CONSTRUCTION IMPACTS

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(a) General positive impacts during Project Construction Phase

Project will Create Employment.

(b) General negative impacts during Project Construction Phase

Project Can Cause Pollution.

3. PROJECT OPERATION IMPACTS

What are some of the Project impacts anticipated during Project operation to **both Natural and Human Environment**[2] in your area ***(refer to footer below for relevant impact categories, interviewer to guide the respondent)***

(c) General positive impacts during Project operation Phase

Economic growth.

(d) General negative impacts during Project operation Phase

N/A

[1] Example of natural environment could be soils, geology, topography, hydrology, flora and fauna while human environment could refer to peoples wellbeing including sources of livelihood, hygiene and sanitation, health, resettlement issues e.t.c

2 Example of operation Impacts could be issues related to, economic growth through creation of employment, hazardous waste, traffic, invasive species, labour influx e.t.c

4. RESPONDENT INDEPENDENT OPINION AND GENERAL COMMENT

What is your independent opinion and general comment with regards to the above mentioned Project?

5. INTERVIEW AUTHENTICATION

Kindly sign or provide and official rubberstamp to the questionnaire