Ministry of Water, Sanitation and Irrigation

CONDITIONAL LIQUIDITY SUPPORT GRANT (CLSG) II PROJECT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) PROJECT REPORT

The construction of 4.8km HDPE, DN 90, 0.7km DN 63, creation of 7DMAs and GIS mapping

Mavoko Water and Sewerage Company (MAVWASCO) – Machakos County

DECEMBER 2024

PROPONENT	EIA LEAD EXPERT
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CERTIFICATION

This ESIA Report has been prepared in accordance with the Environmental Management and Coordination Act (EMCA) 1999 and the Environmental (Impact Assessment and Audit) Regulations 2003 for submission to the National Environment Management Authority (NEMA).

Proponent: Mavoko Water and Sewerage Company (MAVWASCO)

Activity: Preparation of Environmental Impact Assessment (ESIA) Study for the proposed construction of a new pipeline, 4.8km HDPE, DN 90, 0.7km DN 63 creation of 7 DMAs and GIS mapping for the DMAs

Report Title: Environmental Impact Assessment (ESIA) Study for the proposed Construction of 4.8km HDPE, DN 90, 0.7km DN 63 creation of 7nr DMAs and GIS mapping for the DMAs for Mavoko Water and Sewerage Company (MAVWASCO)

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Signed: _____ **Date:** 14/02/2025

ACRONYMS AND ABBREVIATIONS

CIDP	County Integrated Development Plan
CLSG	Conditional Liquidity Support Grant
DOSHS	Directorate of Occupational Safety and Health and Services
EIA	Environmental impact assessment
ESA	Environment Social Assessment
ESIA	Environmental and social impact assessment
ESMF	Environment and Social Management Framework
ESMMP	Environmental and Social Management Plan
FGD	Focus Group Meetings
GoK	Government of Kenya
GRM	Grievance Redress Mechanism
HASP	Health and Safety Plan
HIV/AIDS	Human Immuno-deficiency Virus
KNBS	Kenya National Bureau of Statistics
MAVWASCO	Mavoko Water & Sewerage Company Limited
MDG	Millennium Development Goal
MOWSI	Ministry of Water Sanitation and Irrigation
NEMA	National Environment Management Authority
NEP	National Environment Policy
NGO	Non-Governmental Organization
NLC	National Land Commission
OP	Operational Procedures
OS	Operational Safeguards
PAP	Project Affected Person
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SEA	Sexual Exploitation and Abuse
SMP	Social Management Plan
SGBV	Sexual and Gender Based Violence
STDs	Sexually Transmitted Diseases
ToR	Terms of Reference
VMGs	Vulnerable and Marginalized Groups
WASREB	Water Services Regulatory Board
WB	World Bank
WHO	World Health Organization
WRA	Water Resources Authority
WSDP	Water and Sanitation Development Project
WSP	Water Service Provider
WSTF	Water Sector Trust Fund
WTP	Water Treatment Plant

EXECUTIVE SUMMARY

1. Project Background

The Ministry of Water, Sanitation, and Irrigation (MoWS&I) is implementing the Water and Sanitation Development Project (WSDP) with a credit from the International Development Association (IDA) that aims at improving water supply and sanitation services in selected regions in Kenya through the Water Service Providers (WSPs). The Project Development Objective (PDO) is to improve water supply and sanitation services in select Coastal and Northeastern regions in Kenya and improve the financial performance of Water Service Providers (WSPs) affected by the COVID-19 pandemic. Mavoko Water and Sewerage Company (MAVWASCO) has been identified as one of the WSPs with potential to achieve financial recovery within a period of less than 12 months and therefore eligible to receive the support under the Conditional Liquidity Support Grant (CLSG) II Program.

Mavoko Water & Sewerage Company Limited (MAVWASCO) is a limited liability company by shares owned by the County Government of Machakos. The Water Services Provider (WSP) was established in 2006 under the now repealed Water ACT 2002. The Company is mandated to provide water and sewerage services within the Mavoko sub county and its environs. In line with the pursuit of its mandate, the company's core business is:

- Sourcing and distribution of water within its area of operation.
- Provision of sewerage services to the residents of Mavoko.
- Billing and revenue collection from the customers.
- Maintenance of water and sewerage infrastructure.

As per the 2019 population census, the area covered by MAVWASCO had a population of approximately 322,499 people. However, with population growth and migration resulting from the current development in residential and commercial properties, the population has significantly increased. The customer base in the area comprises domestic, institutional, commercial entities and industrial consumers.

Mavoko Sub - County covers an area of 693 km^2 stretching from KAPA/Airport area where it borders with Nairobi City County and covers Katani, Joska on Kangundo road through Muthwani-Lukenya, Makutano (Kyumbi) where it borders Machakos Municipality. It also covers Athi River Town and the Kapiti plains to the southwest towards Kitengela Town where it borders with Kajiado County. The Sub - County is divided into 6 electoral wards namely makadara, Athi River West, Mlolongo/katani, Kinanie Mathatani, Muthwani and KMC/Sofia Ward. Athi River town has inherent advantages, which have enabled it to attract many industries: it is favoured by good communication network; abundant flat land and proximity to Nairobi. The town is traversed by the main Mombasa-Nairobi Road, the Mombasa - Nairobi Standard Gauge Railway plus the existence of Jomo Kenyatta Airport, which is 20km away. Athi River Town is home to at least 400 manufacturing industries and factories, excluding those within the Athi River Export Processing Zone (EPZ). Among these industries, 40 are heavy manufacturing, with eight dedicated to cement production.

One of the priorities of the Kenya Government within the overall policy framework in the Kenya Vision 2030 is increasing accessibility to sustainable, quality, and affordable water services. In line with this objective and due to increased demand for water because of rapidly growing population, MAVWASCO has define a

strategic direction which will position the Company to deliver services more efficiently and effectively. The strategic themes include:

- Development of water sources.
- Management of non-revenue water.
- Expansion of water and sewerage infrastructure coverage.
- Improved customer service.
- Enhancing institutional capacity.

To deliver on the identified strategic themes, the Company has identified objectives that would enable it to fulfil its mission including:

- Increase water production.
- Reduction of non -revenue water.
- Increase water coverage.
- Increase sewer coverage.
- Achieve customer satisfaction level.
- Increase operational efficiency.
- Attract and retain qualified staff.
- Increase funding to MAVWASCO.
- Enhance good corporate governance.

Development of Water Sources

For MAVWASCO to meet the demand for water in its area of operation, it needs to increase water production as the current supply is inadequate. The company will seek to enhance production from the current sources and look for new sources of water.

Management of Non-Revenue Water

The company has experienced high levels of NRW compared to accepted benchmark. In the planning period therefore, the company intends to invest heavily in areas that will lead to reduction of both commercial and technical water losses.

Expansion of Water and Sewer Infrastructure Coverage

The current water and sewer coverage in MAVWASCO's area of operation is still very low. The company will need to rehabilitate the current infrastructure to make it more efficient and effective. In addition, the company will seek to expand infrastructure to cover the areas not served currently. Further, MAVWASCO plans to put in place pro-poor initiatives including setting up of public water points (PWPs)/kiosks to serve poor areas in the Company's area of jurisdiction.

Improved Customer Service MAVWASCO recognizes and values its customers and is committed to meeting their expectations through maintaining high standards of service delivery. To achieve this, the company will entrench a customer service culture aimed at ensuring excellent service to customers and stakeholders.

Enhancing Institutional Capacity

Adequate human resource capacity is key in ensuring that MAVWASCO achieves its mandate and meets the needs of its customers. As such an appropriate organizational structure needs to be put in place. In addition, the company will require to maintain qualified and skilled human resource. Further, the company needs to enhance employee performance management through implementation of the performance management system to enable effective monitoring of employee productivity and taking of corrective measures where possible. There will also be need to streamline the operations of the company by putting in place adequate facilities to promote efficiency and effectiveness. Good corporate governance helps organizations in improving economic efficiency and growth as well as enhancing stakeholder confidence. Thus, there is need to enhance corporate governance of the Company.

MAVWASCO has proposed the construction of new pipelines - 4.8km HDPE DN 90 & 0.7km DN 63, the creation of 7No. District Metered Areas (DMAs) and GIS mapping for the DMAs under the CLSG II Program to improve water supply services for the residents in Athi River Town. The implementation of such a development project will generate positive socio-economic benefits, but also adverse impacts to human community and environment. Thus, in compliance with the requirements of the Environmental Management and Coordination Act (EMCA) 1999, an Environmental and Social Impact Assessment (ESIA) should be prepared which will be approved by NEMA and the World Bank prior to the implementation of the project. The main aim of the ESIA study is to carry out an Environmental and Social Impact Assessment for the proposed project activities. This report presents the findings on the anticipated environmental and social impacts and makes recommendations on the relevant mitigation measures aimed to prevent and reduce adverse impacts. An Environmental and Social Management Plan (ESMP) has been formulated in this report to ensure that the proposed mitigation measures will be implemented effectively.

2. Project Description/Project Activities

Proposed Project Location

The proposed project is in Athi River Town, Mavoko Sub- County of Machakos County. The Town is located about 30 Km Southeast of Nairobi City and has experienced rapid growth in the recent past due to a number of factors including:

- Its administrative role as it is the headquarters of Mavoko Sub – County.
- Improved infrastructural development with the Standard Gauge Railway (SGR) train station being based in the town.
- Industrial activities that attract population to the area - the town hosts the Export Processing Zone (EPZ) and several factories in the cement and construction industry such as Bamburi
- Cement, ARM Cement, Blue Triangle Cement and Mabati Rolling Mills. There are also other notable companies within the town's outskirts such as Doshi Steel, Mabati Rolling Mills, Seed Co., Kapa Oil Refineries and Devki Steel.

The town's population as per 2019 census was 52,996 people.

Proposed Scope of Works

The summarized Scope of Works for the proposed project include:

- Construction of new pipelines - 4.8km HDPE DN 90 & 0.7km DN 63.

- Creation of 7No. District Metered Areas (DMAs) and GIS mapping for the DMAs.

The estimated cost of the proposed project is **KES 21,426,426**

The source of water for the proposed pipelines extension is the recently commissioned Mavoko Water Supply Project with a water production capacity of 12,000M^3/day.

According to the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019 the above interventions are Medium Risk projects that will require a Comprehensive Project Report (CPR) to be completed in accordance with the requirements of Part II of the Environmental (Impact Assessment and Audit) Regulations, 2003. Additionally, the identification and management of environmental and social issues associated with the proposed interventions is expected to be in accordance with the triggered World Bank Operational Policies to meet the lender's requirements.

3. Objectives of the ESIA study

The Environmental & Social Impact Assessment (ESIA) is expected to achieve the following objectives:

- Generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the project cycle.
- Communicate the results of the ESIA process for the proposed Project and the alternatives considered.
- Ensure that the impacts identified during the ESIA process are assessed.
- Present the mitigation and enhancement measures which will be implemented by the Project to manage impacts identified.
- Provide a record of comments and responses received from Interested and Affected Parties (I&APs) during the ESIA process.
- Facilitate an informed decision-making process by the relevant authorities.
- Recommend cost effective mitigation measures against the expected impacts.

4. Scope of the ESIA Study

The ESIA study has been undertaken by the Consultant with the intention of collecting enough and relevant information inherent to ensure the production of an appropriated ESIA document including an Environmental, Social Management and Monitoring Plan (ESMMP). The scope of the ESIA study is:

- Detailed Project's descriptions.
- Description of the Baseline Environment.
- Stakeholders Engagement.
- Description of the Relevant National and International Legislative and Institutional Regulatory Framework.
- Identify all potential significant environmental and social impacts of the proposed Project and recommend measures for mitigation.
- Cumulative Impact Assessment.
- Assessment of the Project's alternatives.
- Development of Environmental & Social Management & Monitoring plan to avoid, mitigate and where not possible, offset the identified impacts to ensure sustainability of the proposed Project.

5. Methodology utilized

The general methodology utilized has focused on:

- In-depth review of existing literature on the project.
- Field surveys conducted for gathering baseline conditions on physical, biological, and socio-economic environment.
- Observations for appreciation of impacts likely to be generated during project implementation.
- Consultations with different stakeholders and public for socioeconomic information and getting their opinions and expectations about the project.

6. Policy-Legal and Institutional Framework

The proposed project has undergone a comprehensive review of relevant national laws, policies, plans, and strategies, as well as international conventions to assess their applicability to the project and highlight their relevance. The national statutes and legislation that were reviewed include:

- Constitution of Kenya 2010
- Water Act, 2016
- Environmental Management and Coordination Act (EMCA), 1999
- Occupational Safety and Health Act (OSHA 2007)
- The Public Health Act
- Work Injury Benefit Act 2007
- Labour Relations Act 2012
- Climate Change Act of 2016
- Land Act, 2012
- The Environmental (Impact Assessment and Audit) Regulations, 2003
- Environmental Management and Coordination (Water Quality) Regulations, 2006
- Waste Management Regulations, 2006
- Noise and Excessive Vibration Pollution (Control) Regulations, 2009
- The Environmental Management and Coordination (Air Quality Regulations 2014)

The ESIA Study has considered the World Bank's Safeguards Policies (SPs), which aims to protect the environment and people from potential adverse impacts and ensure the sustainability of project outcomes.

Table 0-1: Applicable World Bank Operational Safety Policies

Safeguards Policies	Provision	Relevance to the Project
World Bank OP 4.01 on Environmental Assessment	Provides for environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making	An Environmental and Social Impact Assessment of the development/rehabilitation of water supply schemes will be carried out.

World Bank OP 4.12 on Involuntary Resettlement	The World Bank Involuntary Resettlement Policy OP 4.12 covers direct economic and social impacts that result from Bank-assisted investment projects.	The pipelines shall be installed along the provided wayleaves on the public roads. Social screening has been carried out on the total 5.5 km pipelines. All the proposed pipelines are within gated estates and the wayleaves within the estate roads are free of any encumbrances. Social screenings along the wayleaves for the proposed 5.5 Km pipelines have been undertaken through a transect walk and confirmed that the proposed project does not involve any resettlements of PAPs. There are no PAPS who are likely to suffer economic displacement. Consultations with the County Roads Department of Machakos have been done to establish the requirements for the necessary requirements to install pipelines on the residential estates' road reserves.
World Bank OP 4.11 on Physical Cultural Resources	Provides for measures to protect cultural heritage from the adverse impacts of project activities and support its preservation.	No physical cultural resources were identified within the project areas. However, the ESIA has provided chance find procedures to be adopted by the contractor during civil works.

International Conventions and Treaties

Kenya is signatory to several international conventions and treaties that would need to be adhered to in implementing this project and are geared towards environmental protection and conservation. Some of these include:

- International Convention on Biological Diversity (1992)
- Ramsar Convention 1971
- The United Nations Framework Convention on Climate Change (UNFCCC)
- Convention on the Elimination of all forms of Discrimination against Women (CEDAW)

7. Baseline Conditions in the Project Area

Under this chapter, physical and biological environmental conditions prevailing within the project's circumscription as well as socio-economic profile in the administrative entities covering the project were considered to understand the current conditions of the project areas.

Baseline Bio-Physical Environment:

The baseline bio-physical environment of the project area for the Project comprises various natural features and ecosystems. The following aspects provide an overview of the baseline bio-physical environment:

- Topography and Geology.
- Climate, Water Resources.
- Vegetation and Land Cover.
- Biodiversity.

Baseline Socio-Economic Environment:

The baseline socio-economic environment encompasses the social and economic aspects of the project area. The following elements provide an overview of the baseline socio-economic environment:

- Population and Settlements.
- Economy and Livelihoods.
- Infrastructure and Services.
- Social and Cultural Aspects.

8. Stakeholders and Public Consultations

As part of the ESIA preparation for the proposed Project, the consulting team conducted several stakeholder consultations to gather valuable input and address concerns. The Key Informant (KI) consultations and pubic baraza were held on 17/06/2024. The following is a summary of the consultations conducted with Key Informants:

Managing Director - MAVWASCO

The consulting team met with the MD of MAVWASCO to discuss the about the scope of the proposed project and implementation schedule. This meeting provided an opportunity to understand the activities to be undertaken during the implementation of the project.

Technical Manager – MAVWASCO

This engagement facilitated discussions on technical aspects, water management strategies, and the integration of the project within the existing water infrastructure under the management of the WSP.

Other Key Informants:

- Ward Administrator – Athi River Town Ward
- Mavoko Sub- County Water Officer
- Director – Roads Department (County Government of Machakos)
- KMC Estate Chairman
- Representatives of Graceland & Jam City Estates – Athi River Town
- Area Chief – Athi River Town Location
- Affected area Residents.

The discussions allowed for a deeper understanding of the area residents specific needs and concerns related to the water supply services. The consulting team gathered information from key informants who provided insights into the perceptions and expectations of the local population regarding the new water project. These informal discussions helped identify community priorities and concerns.

Table 0-2: Summary of outcome of the consultations with the KIs

	Key informant interviewed	Summary of remarks
1	Managing Director - MAVWASCO	• The proposed project will increase water supply coverage by extending the pipelines to unserved areas within the 3 target estates (KMC, Graceland & Jam City) in Athi River Town.

2	Technical Manager - MAVWASCO	• The recently completed Mavoko Water Supply Project water source has a designed production capacity of 12,000m3/day with good quality water. Currently, water is supplied to a few households and the proposed pipeline extension will allow additional connections.
3	Commercial Manager - MAVWASCO	• With increased water supply coverage through the pipeline extensions, revenue generation will increase.
4	Sub-County Water Officer (Mavoko Sub-County)	• The proposed interventions will increase water supply the estates which have had severe water scarcity for many years.
5	Sub-County public Health officer (Mavoko Sub-County)	• The officer acknowledged prevalence of diarrhea and dysentery as the most common waterborne diseases within the sub-county since several residents in the Sub-County consume untreated water from streams and shallow wells.
6	Director – Roads Department (County Government of Machakos)	• Noted that the proposed pipelines are within gated residential estates. • The County Government is responsible for estate roads and the Roads Department works in conjunction with the Planning department to ensures that developers provide adequate wayleaves along the estate roads for utility services. • The proponent (MAVWASCO) will be required to install the pipelines within the provided wayleaves and ensure that the installation depths and ground restorations measures are adhered to. • Pipeline indicator marker posts should be fixed to indicate the actual alignment of pipelines.
7	Kenya Meat Commission (KMC) Estate - Chairman	• The estate has been experienced severe water shortages due to dilapidated water distribution network. • The residents depend on water delivered by water bowsers and the cost is exorbitant. • The quality of water from private vendors is suspect and the residents are at risk of water borne diseases. • The KMC Estate and the neighbouring communities will benefit from the proposed pipelines extensions. • The Management of KMC has authorized MAVWASCO to install water distribution pipelines within the KMC land.
8	Representatives of Graceland & Jam City Estates – Athi River Town	• The project is long overdue since the residents have suffered for a long time. The availability of water in their homesteads will save the money that they have been using to buy water from water tankers vendors who charge them exorbitant rates. They get the water from boreholes sources with poor water quality.
9	Ward Administrator – Athi River Town	• There will be clean and safe water accessibility, and this will reduce the incidences of diarrhea among children.

10	Chief - Athi River Town Location	• Locals will benefit from employment opportunities during construction of the project.

Area residents:

Consultations were conducted with local area residents including existing and potential beneficiaries of the proposed project. The consultation meeting was organized by the area Assistant chief in consultation with the Ward Administrator and was held on the 17/06/2024 at Athi River Town and was attended by 26 participants. The purpose of these consultations was to ensure that the concerns and perspectives of those directly affected by the project were considered. The stakeholder consultations played a crucial role in the ESIA process, enabling the consulting team to understand the diverse perspectives, address concerns, and incorporate local knowledge and expectations into the environmental and social management planning of the proposed Project. The outcome of this meeting is summarized below:

- Residents within the proposed project areas were aware of the project but they did not know more details about it. After the representatives from MAVWASCO and the ESIA consultant explained to the residents the project's components, objectives, positive advantages and adverse impacts to be mitigated, scope and implementation schedule, they have accepted and acknowledged the considerable importance of the project for their development.
- Local residents look forward to the speedy implementation of the proposed project which will solve their water problems after many years of waiting.
- Unskilled labour will be sourced from within members of the local community. Local community members with skills in various trades will also be considered to the extent of their qualifications.
- Traders in the area who deal with construction materials (sand, ballast, cement, HDPE pipes, reinforcement steel) hoped that they will benefit during the implementation of the project.
- With increased supply of water, MAVWASCO need to expand sewerage services to take care of the anticipated increase in wastewater generation.

9. Potential Environmental and Social impacts

Environmental and Social Screening

Environmental and Social Screening has been undertaken to determine the potential environmental and social impacts. The impacts of the proposed project were assessed through project site visits and the following:

- Evaluation of the design and proposed construction activities, materials and methodology.
- One on one interviews with key stakeholders and proposed project beneficiaries were applied in the determining location of pipeline available way leaves especially in areas where there are no settlements and general opinions of the people.
- Discussion with the area residents on the potential impacts related to project implementation activities and corresponding mitigation measures.

Positive Impacts

The positive impacts that the proposed project will bring are summarized in the table below:

Table 0-3 Summary of positive impact

Phase	Positive Impacts
Construction	• Creation of employment and business opportunities.

	• Skill development through on job training during construction of the Project. • Improvement of household incomes. • The proposed project does not involve any resettlements of PAPs. • No impacts are anticipated to people's assets and sources of livelihood due to the entire 5.5 Km pipelines will be within gated estates' road reserves with no encumbrances.
Operational	• Improved accessibility to clean and reliable water Supply. • Improved hygiene and sanitation in the Project areas. • Reduced cases of water related diseases. • Increased land & property values in the Project areas. • Improved revenue for Mavoko Water and Sewerage Company.

Negative Impacts

Below is a summary of the significant risks and impacts identified, and their proposed mitigation measures:

Table 0-4 Summary of negative impacts and mitigation matrix

Risk/Impact	Mitigation Measure(s)
Loss of Vegetation during excavations for pipelines	- Contractor will ensure that the removal of vegetation is done only when it cannot be avoided and restricted at the pipeline alignment only. - Site rehabilitation and revegetation (wherever possible) of areas cleared for construction works to aid natural regeneration, following construction.
Elevated Noise and Vibration Levels	- Minimize noise at the site and in the surrounding areas through proper servicing and maintaining machinery such as generators and other heavy-duty equipment to reduce noise generation. - Provision of appropriate PPE to construction workers exposed to excessive noise.
Elevated Air Emissions (Dust and Exhaust Fumes)	- Dust suppressive agents such as water will be used particularly at the works site during dry season. - Excavated soils will be compacted to reduce the amount of dust spreading by wind to the neighbouring environment, settlements and other establishments. - Provision of dust masks to the workers and other people visiting the site while planning removal of the materials for disposal.
Soil Erosion	- Limiting excavation works to the dry season when heavy downpours are least likely to occur. - Excavation must not exceed the dimension specifications stipulated in the detailed engineering design. - Backfilling must be carried out accordingly, preferably using the excavated materials while organic soil will be properly stored and reused for landscaping and site rehabilitation/restoration. - Land bared for trench-digging must be revegetated by shallow root plants.
Littering from Improper Solid and Liquid Wastes Disposal	- Development and implementation of a waste management plan (WMP). - Promotion of appropriate inventory practices to minimize waste quantities, reuse, recovery and recycling practices.

	- Solid waste from construction, operation and decommissioning activities is to be collected, sorted and disposed of accordingly, in designated dump sites approved by the County Government. - Used oil, lubricants, cleaning materials, etc., from the maintenance of vehicles and machinery are collected in holding tanks for disposal of at an approved hazardous waste site.
Accidental Spills, Leakages and Contaminations	- All storage containers will be properly sealed and monitored to avoid any possible spillage; contaminated sites will be cleaned promptly. - Regular inspection and maintenance of vehicles and generators shall continue to be done to control oil spillage and leakages. - Ensure that spills and leaks are immediately addressed alongside other - related contaminated material and disposed of appropriately.
Occupational Health and Safety Risks (Construction Workers)	- Establishment of a Health and Safety Management Plan (HSMP) to guide safe execution of all construction activities. - All labourers exposed to vehicle traffic and construction operations are to be provided with personal protective equipment (PPE) and enforcement for use of the same by all workers while on sites be made. - Controlled access to construction sites with warning signs around perimeter or along dug trenches for pipes. - Educate and create awareness to workers and surrounding communities on safety. - Well-stocked first aid kits (administered by a trained first aider) shall be made available at all strategic locations in the works areas.
Community Health, Safety and Security Risks	- Isolate the construction site from public and unauthorized person for public safety purposes. - Effective safety and warning measures should be taken to reduce accidents. - Mandatory training of drivers, machinery/equipment operators and workers in safety issues related to their activities. - All works sites should be provided with first aid equipment in addition to accessing emergency medical facilities within the shortest period possible.
Handling of Hazardous Materials (oils, paints solar panels & batteries).	- All hazardous products and waste should be labeled and handled properly to avoid contact with the ground. - Material handling to be done by trained and qualified staff. - Disposal of wastes to done at designated and approved sites.
Labour influx into the project area	- Local communities within the Project area should be given priority in the employment opportunities. The - Contractor will prepare a labour management plan to guide this process of employing locals. - Use of manual labour during excavation and construction works where possible to ensure more employment of locals and hence ensure Project support throughout the construction process. - Gender considerations: equal opportunities shall be provided for both females and males for all jobs that can be done by either gender.
Exploitation of workers by the Contractor's management.	- Contractor to develop an employment policy in line with International Labour Standards and the local labour administration requirements.
Exposure to HIV/AIDS and Transmission of Other STIs/STDs	- Voluntary counselling and testing (VCT) on HIV/AIDS, STDs, awareness Campaigns. - Advocating precautionary campaigns on STDs particularly on HIV/AIDS to construction workers and to the local communities.

	- Risk assessment and preventive measures against communicable Disease.
Gender-Based Violence, Harassment and Vulnerable Segments	- Protection against sexual exploitation and abuse (PSEA) including codes of conducts and ongoing sensitization of staff on responsibilities related to the conduct and consequences of noncompliance. - Ensure equitable distribution of employment opportunities between men and women. - Establishing gender help desk at the construction yard/site/camps and ensuring adequate and transparent referral mechanisms are in place for reported cases at the community level related to the project implementation.

The proposed installation of pipeline installations will be on the wayleaves along public roads within residential estates in Athi River Town with no encumbrances or business activities that would be affected during the implementation of the proposed project. This has been confirmed through social screening along the proposed 5.5 Km pipelines in addition to consultations with the Machakos County Roads Department who are responsible for the residential estates' roads. Throughout the implementation of the project, the risks/negative impacts will be monitored and managed as detailed in the Environmental, Social Management & Monitoring Plan (ESMMP). Overall, the positive/beneficial impacts of the project outweigh the temporary and short term environmental and social impacts that will result.

10. Environmental and Social Management & Monitoring Plan (ESMMP)

The ESIA study has identified some minor negative social and environmental impacts of the sub-project but also socio- economic benefits to the communities. The potential negative impacts will be minimized through the implementation and rigid monitoring of the recommendations as set out in the ESMMP. The Environmental and Social Management Plan (ESMMP) has addressed the environmental and social safeguards issues arising during the implementation of the project and the post construction maintenance period. The ESMMP will be the guidance document to be continually referred to during the construction, maintenance, and operation phases of the project. The ESMP should therefore be included in bidding documents and compliance clearly emphasized in the contract documents.

The contractor will be required to fully comply with implementation of the ESMP. The contractor will be required to submit a detailed Construction Environmental & Social Management Plan (C-ESMP), which comply with the ESMP, prior to mobilization to the construction sites. The Contractors will also be required to prepare constructions Method Statements that will be task-specific after undertaking specific risk assessments. Among the Key Staff of the Contractor will be an Environmental and Social Safeguard officer with the necessary qualifications and experience to manage the implementation of ESMP. The Contractor's E&S officer will full time and site based during the implementation of the Project. Among the key responsibilities of the Contractor's E&S officer will include:

- Managing the implementation of ESMP with strict compliance of the provisions.
- Preparation of regular progress reports (weekly, monthly or quarterly) as applicable, on the implementation of ESIA including incidents reports and mitigations.

The Project Proponent (MAVWASCO) shall ensure that the implementation of the Environmental and Social Management Plan (ESMP) is effectively executed and that adequate resources have been provided.

MAVWASCO have an Environmental and Social Safeguards Officer within its establishment who will be responsible for supervision and monitoring for compliance of the ESMP implementation and reporting.
The responsibilities of MAVWASCO will include:

- Responsible for day-to-day coordination and implementation of the project & ESMP.
- Ensure the grievance committees are established and working.
- Monitor the ESMP implementation.

Roles of the proponent's Environmental and Social Safeguards Officer:

- Ensure compliance to proposed ESMP by the contractor.
- Ensure review of ESMP is up to date.
- Carry out periodic audits of the ESMP to ensure that its performance is as expected.
- Preparation and submission of ESMP implementation Reports.

Monitoring of the ESMP implementation will include site inspections, reporting and photographic documentation designed to assess and record the contractor's compliance with the ESMP and other applicable regulations. It is also anticipated that additional inspections would be required in response to complaints and issues raised by local communities.

11. Project Affected Persons

The are **NO** Project Affected Persons (PAPs) since proposed pipelines extensions shall be installed on the wayleaves along public roads. Some sections of the pipelines will be installed within the Kenya Meat Commission (KMC) land. KMC, which is a public enterprise has provided a consent letter to permitting the installation of the pipelines (Attached as Appendix IV in the Report).

12. Project Alternatives

These alternatives included the selected area, design, and construction techniques, as well as the no-project alternative. The purpose of considering these alternatives was to evaluate the socio-economic importance of the project, its location within Athi River Town, and the adherence to water infrastructure construction standards.

Selected Area:

Different potential areas for implementing the project were evaluated. Factors such as proximity to the water source, accessibility, terrain characteristics, and socio-economic considerations were considered. The selected area was determined based on these factors to ensure efficient water supply, minimal environmental impact, and maximum benefit to the target communities.

No-Project Alternative:

The no-project alternative was also assessed as part of the evaluation process. This alternative considers the scenario where the proposed Project is not implemented. The potential consequences, such as the continued lack of access to safe drinking water, socio-economic implications, and environmental impact, were evaluated to highlight the necessity and importance of the project.
Based on the evaluation of these alternatives, the preferred option was selected i.e to implement the proposed construction of new pipelines - 4.8km HDPE DN 90 & 0.7km DN 63, the creation of 7No. District Metered Areas (DMAs) and GIS mapping for the DMAs. The selected areas ensure optimal water supply and

distribution to the target communities while minimizing environmental impact. The chosen design and construction techniques adhere to established standards to ensure the sustainability and longevity of the infrastructure. The project's socio-economic significance, location within Athi River Town, and the need for improved water infrastructure were key factors that justified the selection of the preferred alternatives.

Rejected alternatives, if any, would have been assessed based on their feasibility, environmental impact, cost-effectiveness, and alignment with project objectives. These alternatives did not meet the desired criteria or were deemed less suitable compared to the selected options.

13. Conclusion & Recommendations

Conclusion

The result of the ESIA study has indicated that there are no significant and permanent negative impacts likely to be generated by activities of the proposed project. All potential negative impacts identified are either short-term or may be easily and safely mitigated. The overall positive impacts of water provision to the residents, weighed against the potential negative impacts make this project positive overall. Most of the envisaged negative impacts can only cause damage to the physical environment and/or human health only if mitigation measures are not implemented as recommended in this ESIA Study Report. To address the possible negative environmental impacts, the ESIA Study has developed a comprehensive environmental management and monitoring plan that will ensure environmentally sustainable development.

Recommendations

- The project is recommended for implementation provided that the mitigation measures identified in the study for the potential negative impacts are implemented, the recommendations will also form part of NEMA License that will be issued for the Project.

- A Provisional Budget of **KES 1,530,000** that is required for implementation of mitigation measures of potential negative environmental should be included in the Project Implementation costs

TABLE OF CONTENTS

CERTIFICATION ..... Error! Bookmark not defined.
ACRONYMS AND ABBREVIATIONS i
EXECUTIVE SUMMARY iii
I INTRODUCTION 1
1.1. Project background 1
T Program. 1
1.2 Justification for the ESIA 3
1.3 Objectives of the ESIA study 3
1.4 scope of the ESIA study 4
1.5 Approach and methodology of the study 4
PROJECT DESCRIPTIONS 8
2.1 Project area description 8
2.2 Proposed project objectives 9
2.3 Description of the proposed project's construction activities 10
2.4 Materials for the construction works 12
2.5 Anticipated waste material and by-products 12
2.6 Labour 12
2.7 Construction machines/equipment 13
3.1 Policy Framework 14
3.2 Legal framework 17
3.3 Institutional structure of the water sector 21
3.4 Institutional Environmental policy framework 22
3.5 Sectoral integration 24
3.6 World Bank operational procedures 24
3.7 The World Bank Safeguards 24
3.8 Relevant International Conventions and Treaties 27
3.9 Harmonization of both WB and GoK requirements for social and environmental sustainability 28
3.10. Project implementation institutional structure 29
Overview 30
4.1 Project location 30
4.2 Environmental baseline conditions 30
4.3 Socio-economic survey 32
5 PUBLIC PARTICIPATION AND CONSULTATIONS 37
5.1. Introduction 37
5.2. Stakeholders and public consultations objectives 37
5.3 THE CONSULTATIVE PROCESS ADOPTED 38
5.4 key informant interviews 38
5.5 Project area community consultations 39
6 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES 45
6.1 Introduction 45
6.2. Types of impacts 45
6.3 Concepts in impact significance assessment 46
6.4 Significance of impacts 47
6.5 Potential impacts identification and assessment 48
6.6 Positive impact during construction phase 49
6.7 Positive impacts during operation phase 49

6.8 Negative impacts during construction phase..... 50
7 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 56
8 ENVIRONMENTAL AND SOCIAL MONITORING PLAN (ESMoP) 62
8.1 Overview..... 62
8.2 Purpose and objectives of ESMoP 62
8.3 Auditing of Environmental and Social Management and Monitoring PLAN (ESMMP) 65
8.4 Management Responsibility of ESMMP 65
9.1 Purpose of the Chance Finds Procedure..... 67
10 GRIEVANCE REDRESS MECHANISM (GRM) 69
10.1 Introduction..... 69
10.2 Potential Grievances..... 69
10.3 Objective of a Grievances Redress Mechanism..... 69
10.4 Guiding Principles for an effective Grievance Redress Mechanism..... 70
10.5 The Proposed Grievance Structure 70
11 CONCLUSION AND RECOMMENDATIONS..... 72
11.1 Conclusion 72
11.2 Recommendations..... 72
REFERENCES & ANNEXES 74

I INTRODUCTION

1.1. Project background

The Ministry of Water, Sanitation, and Irrigation (MoWS&I) is implementing the Water and Sanitation Development Project (WSDP) with a credit from the International Development Association (IDA) that aims at improving water supply and sanitation services in selected regions in Kenya through the Water Service Providers (WSPs). The Project Development Objective (PDO) is to improve water supply and sanitation services in select Coastal and Northeastern regions in Kenya and improve the financial performance of Water Service Providers (WSPs) affected by the COVID-19 pandemic. Mavoko Water and Sewerage Company (MAVWASCO) has been identified as one of the WSPs with potential to achieve financial recovery within a period of less than 12 months and therefore eligible to receive the support under the Conditional Liquidity Support Grant (CLSG) II Program.

Mavoko Water & Sewerage Company Limited (MAVWASCO) is a limited liability company by shares owned by the County Government of Machakos. The Water Services Provider (WSP) was established in 2006 under the now repealed Water ACT 2002. The Company is mandated to provide water and sewerage services within the Mavoko sub county and its environs. In line with the pursuit of its mandate, the company's core business is:

- Sourcing and distribution of water within its area of operation.
- Provision of sewerage services to the residents of Mavoko.
- Billing and revenue collection from the customers.
- Maintenance of water and sewerage infrastructure.

As per the 2019 population census, the area covered by MAVWASCO had a population of approximately 322,499 people. However, with population growth and migration resulting from the current development in residential and commercial properties, the population has significantly increased. The customer base in the area comprises domestic, institutional, commercial entities and industrial consumers.

Mavoko Sub - County covers an area of 693 km^2 stretching from KAPA/Airport area where it borders with Nairobi City County and covers Katani, Joska on Kangundo road through Muthwani-Lukenya, Makutano (Kyumbi) where it borders Machakos Municipality. It also covers Athi River Town and the Kapiti plains to the southwest towards Kitengela Town where it borders with Kajiado County. The Sub - County is divided into 6 electoral wards namely makadara, Athi River West, Mlolongo/katani, Kinanie Mathatani, Muthwani and KMC/Sofia Ward. Athi River town has inherent advantages, which have enabled it to attract many industries: it is favoured by good communication network; abundant flat land and proximity to Nairobi. The town is traversed by the main Mombasa-Nairobi Road, the Mombasa - Nairobi Standard Gauge Railway plus the existence of Jomo Kenyatta Airport, which is 20km away. Athi River Town is home to at least 400 manufacturing industries and factories, excluding those within the Athi River Export Processing Zone (EPZ). Among these industries, 40 are heavy manufacturing, with eight dedicated to cement production.

One of the priorities of the Kenya Government within the overall policy framework in the Kenya Vision 2030 is increasing accessibility to sustainable, quality, and affordable water services. In line with this objective

and due to increased demand for water because of rapidly growing population, MAVWASCO has define a strategic direction which will position the Company to deliver services more efficiently and effectively. The strategic themes include:

- Development of water sources.
- Management of non-revenue water.
- Expansion of water and sewerage infrastructure coverage.
- Improved customer service.
- Enhancing institutional capacity.

To deliver on the identified strategic themes, the Company has identified objectives that would enable it to fulfil its mission including:

- Increase water production.
- Reduction of non -revenue water.
- Increase water coverage.
- Increase sewer coverage.
- Achieve customer satisfaction level.
- Increase operational efficiency.
- Attract and retain qualified staff.
- Increase funding to MAVWASCO.
- Enhance good corporate governance.

Development of Water Sources

For MAVWASCO to satisfy the demand for water in its area of operation, it needs to increase water production as the current supply is inadequate. The company will seek to enhance production from the current sources and look for new sources of water.

Management of Non-Revenue Water

The company has experienced high levels of NRW compared to accepted benchmark. In the planning period therefore, the company intends to invest heavily in areas that will lead to reduction of both commercial and technical water losses.

Expansion of Water and Sewer Infrastructure Coverage

The current water and sewer coverage in MAVWASCO's area of operation is still very low. The company will need to rehabilitate the current infrastructure to make it more efficient and effective. In addition, the company will seek to expand infrastructure to cover the areas not served currently. Further, MAVWASCO plans to put in place pro-poor initiatives including setting up of public water points (PWPs)/kiosks to serve poor areas in the Company's area of jurisdiction.

Improved Customer Service

MAVWASCO recognizes and values its customers and is committed to meeting their expectations through maintaining high standards of service delivery. To achieve this, the company will entrench a customer service culture aimed at ensuring excellent service to customers and stakeholders.

Enhancing Institutional Capacity

Adequate human resource capacity is key in ensuring that MAVWASCO achieves its mandate and meets the needs of its customers. As such an appropriate organizational structure needs to be put in place. In addition, the company will require to maintain qualified and skilled human resource. Further, the company needs to enhance employee performance management through implementation of the performance management system to enable effective monitoring of employee productivity and taking of corrective measures where possible. There will also be need to streamline the operations of the company by putting in place adequate facilities to promote efficiency and effectiveness. Good corporate governance helps organizations in improving economic efficiency and growth as well as enhancing stakeholder confidence. Thus, there's need to enhance corporate governance of the Company.

MAVWASCO has proposed the construction of new pipelines - 4.8km HDPE DN 90 & 0.7km DN 63, the creation of 7No. District Metered Areas (DMAs) and GIS mapping for the DMAs under the CLSG II Program to improve water supply services for the residents in Athi River Town. The implementation of such a development project will generate positive socio-economic benefits, but also adverse impacts to human community and environment. Thus, in compliance with the requirements of the Environmental Management and Coordination Act (EMCA) 1999, an Environmental and Social Impact Assessment (ESIA) should be prepared which will be approved by NEMA and the World Bank prior to the implementation of the project. The main aim of the ESIA study is to carry out an Environmental and Social Impact Assessment for the proposed project activities. This report presents the findings on the anticipated environmental and social impacts and makes recommendations on the relevant mitigation measures aimed to prevent and reduce adverse impacts. An Environmental and Social Management Plan (ESMP) has been formulated in this report to ensure that the proposed mitigation measures will be implemented effectively.

1.2 Justification for the ESIA

The proposed project is classified as a medium risk based on NEMA Public Notice on ESIA and Legal Notice No. 31 thus requiring Comprehensive Project Report (CPR) and categorized by the World Bank as category 2 with moderate risk operations likely to cause adverse environmental and social impacts and readily minimized by applying appropriate management and mitigation measures. It is against this backdrop that this ESIA was undertaken in accordance with the regulations and guidelines set out by the National Environmental Management Authority (NEMA), and the World Bank's Safeguard Policies. The ESIA done was to determine the status of the environment, environmental considerations for the project in the design phase, operation phase and the decommissioning phase.

1.3 Objectives of the ESIA study

The Environmental & Social Impact Assessment (ESIA) is expected to achieve the following objectives:

- Generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the project cycle.
- Communicate the results of the ESIA process for the Proposed Water Supply Project and alternatives considered.
- Ensure that the impacts identified during the ESIA process are assessed.
- Present the mitigation and enhancement measures which will be implemented by the Project to manage impacts identified.
- Provide a record of comments and responses received from Interested and Affected Parties (I&APs) during the ESIA process.
- Facilitate an informed decision-making process by the relevant authorities.
- Recommend cost effective mitigation measures against the expected impacts.

1.4 scope of the ESIA study

The ESIA study has been undertaken by the Consultant with the intention of collecting enough and relevant information inherent to ensure the production of an appropriated ESIA document including an Environmental and Social Management Plan (ESMP). The scope of the ESIA study is:

- To identify all potential significant environmental and social impacts of the proposed Project and recommend measures for mitigation.
- To assess and predict the potential impacts during site preparation, construction, and operational phases of the project.
- To verify compliance with environmental regulations.
- To generate baseline data for monitoring and evaluation of how well the mitigationmeasures will be implemented during the project cycle.
- To allow for public participation.
- To give an Environmental and Social Management Plan to mitigate the identifiedimpacts to ensure sustainability of the proposed Project.
- To recommend cost effective measures to be implemented to mitigate against theexpected impacts.

1.5 Approach and methodology of the study

This ESIA study has followed procedures stipulated in the NEMA EMCA Regulations establishing the list of projects that must undergo an ESIA study, compliance with the World Bank's Environmental and Social safeguards procedures as well as General Guidelines and Procedures for Environment Impact Assessment. The study has adopted the following approach:

a) Scoping study/ preliminary assessment.
b) Review of secondary data on baseline information.
c) Review of Policies, Laws, and Regulations.
d) Review of meetings and consultations with stakeholders.
e) Field surveys along the entire project sites, to gather information and collect data on various aspects of the project sites.

1.5.1 Preliminary Assessment/ Scoping Study

A scoping study has been done involving consultation with MAVWASCO's senior Technical staff, local business community and other affected Athi River Town residents. The scoping exercise entailed a preliminary visit to the various project sites for the following reasons:

- Sites reconnaissance to understand the spatial coverage of the project.
- Identification of the likely stakeholders who will be involved in the public consultations, affected or benefitting from project activities.
- Preliminary findings of the existing environment (physical, biological and socio-cultural environment).
- Preliminary predictions of likely positive and adverse impacts.
- Establishing clear boundaries of the study and focus on the relevant issues concerning the study.

1.5.2 Consultation with stakeholders

Involvement of Stakeholders

The study applied different participatory methods, namely:

(i) Exchange with one-to-one key informant.

(ii) Official meetings with MAVWASCO's senior Technical staff.

(iii) Public consultative meetings in the Project areas.

The consultations were first undertaken with MAVWASCO's senior Technical staff (MD & the Technical Manager) in order to get the details of the proposed project activities. Stakeholders have been informed about components and planned activities of the project, the advantages and potential impacts likely to be encountered and proposed mitigation measures. The Consultant has offered to them an opportunity to express their concerns, raising their opinions and worries through questions. Any issue raised by one individual or a group of people was cross-checked by discussing it with other individuals or groups.

1.5.3 Baseline information gathered on the Project

Information on the physical, biological, socio-economic environment, institutional and legal framework were collected from various sources, namely:

- Concept design of the project.
- Literature review of published and miscellaneous documents.
- Field observations in project's areas.
- Consultations with selected stakeholders and discussions with MAVWASCO's senior Technical staff for getting expert opinions.

Field data / information collection

The Consultant accompanied by MAVWASCO technical team conducted field surveys to capture a broad picture of the prevailing situation at the sites. Among the activities performed include:

- Appraisal of physical and environmental conditions of the project sites and sensitive areas likely to be impacted by project activities.

- Baseline data on climate, topography, soils, drainage/hydrology, flora and fauna etc… have been recorded.
- Appraisal of land use at adjacent areas dedicated to infrastructures construction and assessment of other relevant socio-economic parameters.
- Understanding the detailed project description through comparison of the field survey and the preliminary technical study.
- Collecting opinions and point of views of residents about the proposed project, their expectations and concerns in relation to positive and adverse impacts likely to be generated by implementation of the project and on proposed mitigation measures.

1. 5.4 Impacts identification and assessment

The environmental and social impacts identification and assessment was done by superimposing project elements onto the existing environmental conditions of the project site. Environmental impacts were then identified, their significance assessed and mitigation/enhancement measures proposed in order to properly eliminate or reduce negative environmental and social impacts, and suggest remedial measures for positive impacts. The identification and evaluation of impacts was based on qualitative criteria, and thus the importance of each impact was assessed against the following:

- The degree of sensitivity.
- The occurrence.

The degree of sensitivity or intensity of the environmental and social impact corresponds in this case to the relative importance of the disturbance / alteration induced by a project activity on an environmental or social component. The degree of sensitivity of the impact can be very high, high or low. Regarding the occurrence criterion, this is the probability of the occurrence of the impact over the entire period during which the activity is carried out. In this case, the occurrence is either very limited, limited or permanent for the entire duration of the activity. The assessment criteria and ratings for determining the impact significance are as following:

(i) **Nature or status of the impact:** the type of the effect the activity would have on the environment that can be:

- Positive: has a benefit to the holistic environment
- Negative: has a cost to the holistic environment
- Neutral: has no cost or benefit

(ii) Duration of the impact: the lifetime of the impact:

- Short term: less than 2 years
- Short to medium: 2 to 5 years
- Medium term: 6 to 25 years
- Long term: 26 to 45 years
- Permanent: 46 years or more

(iii) Extent or scale of the impact: the distance from the source that impacts may be experienced:

- Site specific: within the site boundary
- Local: affects immediate surroundings areas
- Regional: extends substantially beyond the site boundary

- National: affects country

(iv) Reversibility of the impact: to what degree its influence on the relevant environment can be negated:

- Completely reversible: reverses with minimal rehabilitation and negligible residual effects
- Reversible: requires mitigation and rehabilitation to ensure reversibility
- Irreversible: cannot be rehabilitated completely/ rehabilitation not viable

(v) Intensity or magnitude of the impact: severity of the negative and magnitude of positive impacts:

- Low: little effect- negligible disturbance/benefit
- Low to moderate: effects observable-environmental impacts reversible with time
- Moderate: effects observable-impacts reversible with rehabilitation
- Moderate to high: extensive effects – irreversible alteration to the environment
- High: extensive permanent effects with irreversible alteration

(vi)The probability of the impact: describes the likelihood of the impact occurring:

- Unlikely: less than 15 % sure of an impact occurring
- Possible: between 15% and 40 % sure of an impact occurring
- Probable: between 40 % and 60 % sure that the impact will occur
- Highly probable: between 60 % and 85 % sure that the impact will occur
- Definite: Over 85 % sure that the impact will occur

1.5.5 ESIA Study Report Structure

This ESIA Study Report is organized in 10 Sections:

1- Introduction
2 - Project description
3 - Policy, Legal and Institutional Framework.
4 - Environmental and Social Baseline Conditions
5 - Public Participation and Consultations
6 - Environmental and Social Impacts and Mitigation Measures
7 - Environmental and Social Management Plan (ESMP)
8 - Environmental and Social Monitoring Plan (ESMoP)
9 - Chance Find Procedures
10 - Grievance Redress Mechanism (GRM)
11 - Conclusion and recommendations
References & Annexes

1.5.6 Public Disclosure of the ESIA

This ESIA provides for the below listed provisions with regards to public disclosure:

i. In accordance with EMCA 1999 Cap 385 and World Bank OP 4.01, the Project Proponent in this case MAVWASCO will ensure that the Results of Public Consultations including ESIA area disclosed on NEMA, World Bank, WSTF & MAVWASCO websites.
ii. The Report will also be made available at the Mavoko Sub-County & Athi River Ward Offices, Machakos County, for ease of access by the Project's interested parties at location level.
iii. At completion of the Project construction works, the EIA/EA Audit Regulations of 2003 requires the Project proponent to undertake a closeout audit after completion of the project and undertake an initial Environment Audit (EA) immediately after commissioning of the project.

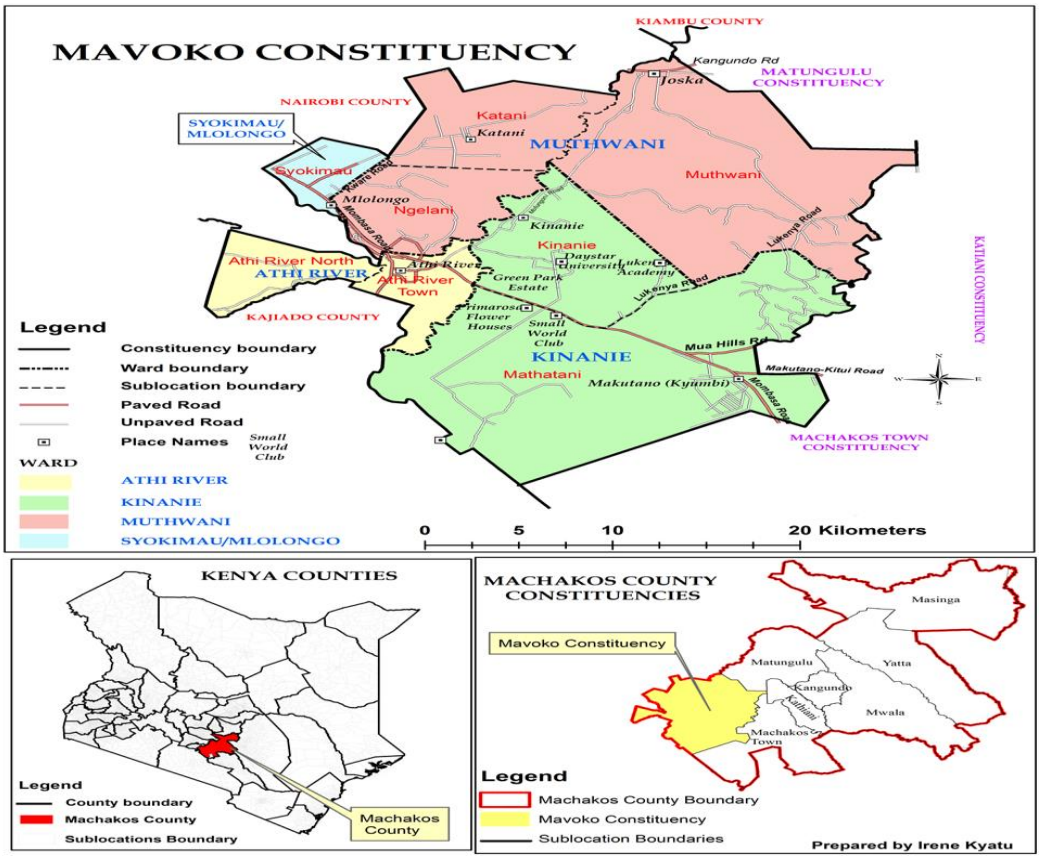
PROJECT DESCRIPTION

2.1 Project area description

Mavoko Sub - County covers an area of 693 km² stretching from KAPA/Airport area where it borders with Nairobi City County and covers Katani, Joska on Kangundo road through Muthwani-Lukenya, Makutano (Kyumbi) where it borders Machakos Municipality. It also covers Athi River Town and the Kapiti plains to the southwest towards Kitengela Town where it borders with Kajiado County. The Sub - County is divided into 6 electoral wards namely Makadara, Athi River Town, Mlolongo/katani, Kinanie Mathatani, Muthwani and KMC/Sofia Wards. Athi River Town has inherent advantages, which have enabled it to attract many industries: it is favoured by good communication network; abundant flat land and proximity to Nairobi. The town is traversed by the main Mombasa-Nairobi Road, the Mombasa - Nairobi Standard Gauge Railway plus the existence of Jomo Kenyatta Airport, which is 20km away. Athi River Town is home to at least 400 manufacturing industries and factories, excluding those within the Athi River Export Processing Zone (EPZ). Among these industries, 40 are heavy manufacturing, with eight dedicated to cement production.

2.1.1 Project location

The proposed project is located in Athi River Town, Mavoko Sub- County of Machakos County (10 25' 34'S 360 58' 28.5 E"). The Town is located about 30 Km Southeast of Nairobi City and can be accessed using the Nairobi – Mombasa highway.



Location of Mavoko Sub- County



Proposed water distribution within KMC Estate

2.1.2 Existing Athi River Town Water Supply System

The National Government through the Belgium Government, County Government of Machakos and MAVWASCO has developed the Mavoko Water Supply Project with a design capacity of 12,000 m^3/day. Athi River Town and its environs is supplied with about 7,000 m3/day from this source with the balance of about 5,000m3 supplied to the Mlolongo, Syokimau and Katani areas. Other water sources include supply from Nairobi City Water & Sewerage Company, the Athi River EPZA Water Supply System, boreholes and the Kasuitu & KMC dams. The supplied water is of good quality for domestic consumption. Although the availability of water has significantly improved following the commissioning of Mavoko Water Supply Project, existing water distribution network is limited and therefore the need to extend last mile water connections pipelines under the proposed Project.

2.2 Proposed project objectives

The principal objective of the project is to improve access to clean water supply in the targeted areas within Athi River Town mainly Graceland and Jam-City residential areas. The other objective is the creation of 7No. District Metered Areas (DMAs) and GIS mapping for the DMAs within the water distribution network in Athi River Town. The creation of DMAs will contribute to the reduction of Un-accounted for Water

(UFW) and Non – Revenue Water (NRW) thereby increasing revenue for MAVWASCO. Overall, proposed Project will contribute to enhanced hygiene and sanitation of the residents, hence reducing water borne diseases and contribute to alleviation poverty within the area through improvement of socio-economic activities. The reduction of NRW will and increased revenues will improve on the operational sustainability of MAVWASCO.




Parts of Graceland and Jam-City Estates area where water is to be supplied.



An existing borehole within the Kenya Meat Commission Houses (KMC) Estate in Athi River Town where residents of Graceland & Jam- City Estates get their water presently.

2.3 Description of the proposed project's construction activities

The summarized Scope of Works for the proposed project include:

- Construction of new pipelines - 4.8km HDPE DN 90 & 0.7km DN 63.
- Creation of 7No. District Metered Areas (DMAs) and GIS mapping for the DMAs.

2.3.1 Mobilization site preparation works

The proposed Project sites will be prepared for constructions. This will involve construction of contractor's camps, mobilization of workers & construction equipment and transportation of construction materials. The contractor will also utilize human labour where necessary to create employment to the local residents especially the youth.

2.3.2 Storage of materials

Construction materials will be stored on sites. Bulky materials such as stones, ballast, sand and steel will be carefully piled at designated areas on the sites. To avoid piling large quantities of materials on site, the contractor will order bulky materials such as sand, gravel and building stones on need basis.

2.3.3 Installation of water pipelines

The distribution network is designed to cover a total length of about 5.5 kilometers, exclusively using HDPE pipes. HDPE pipes are selected for their flexibility, corrosion resistance, and ease of installation, making them suitable for the distribution of treated water to various areas within Athi River Town and its environs. The installed pipelines will be of varying diameter of 0D 63-90mm complete with all fittings. MAVWASCO has identified priority pipeline routes that best suit the terrain and intended goal of reaching as many people as possible through individual connections as well as communal water points where necessary. Through field site visits and the use of topographic maps and engineering designs, the following was established to have been adhered in the designs for the aligning of the proposed distribution pipeline extensions:

- The distribution pipelines will be installed within the available road reserves or public open spaces to ensure easy accessibility for maintenance. Pipeline routes walk inspections have been conducted which has established that the wayleaves are free of encumbrances.
- The adopted pipeline routes allow for easy access to the pipelines and does not interfere with the existing infrastructure.

The installation of pipelines will involve various activities such as excavation of trenches, installation of the pipelines and backfilling of trenches. The construction activities will also include the installation of pipelines valves & fittings, pressure testing and sterilization of the installed pipelines. The project activities during operations will include the maintenance of pipelines and attending to blockages and breakages along the pipelines and other necessary repairs for the water supply scheme infrastructure.

2.3.4 Installation of Air Valves and Wash Outs for the pipelines

The number of high and low points within the pipelines have been kept at minimum in the pipeline profile design to keep the number of air-valves and washout as low as possible. A number of air valves and washouts are proposed for incorporation within the existing network to mitigate the issue of rampant airlocks.

2.3.5 Installation of zonal and consumer water meters

The Creation of the District Metered Areas (DMAs) will involve the installation of zonal and consumer water meters within the water distribution system. The meters complete with associated fittings will be installed inside chambers with lockable covers.

2.3.6 Construction of Valves & Meter Chambers

The construction of new pipelines - 4.8km HDPE DN 90 & 0.7km DN 63, the creation of 7No. District Metered Areas (DMAs) Project includes the construction of various types of inspection chambers to enhance the functionality and maintenance of the water supply infrastructure. The project entails the construction of air-release chambers, which release air pockets within the pipeline system to optimize water flow. Additionally, washout chambers will be built to provide access points for pipeline flushing and cleaning, ensuring water quality is maintained. Control valve chambers will house valves to regulate water flow and pressure. A number of section valve chambers will be constructed to allow for segmenting the system during maintenance or repairs. Valve chambers will connect the existing water supply system with the new system, ensuring seamless integration. These inspection chambers contribute to the overall reliability, efficiency, and longevity of the proposed water supply system, providing sustainable and high-quality water supply to the communities it serves. In additional, Chambers will be constructed to house the zonal and consumers water meters for the creation of the proposed 7No. District Metered Areas (DMAs) within the water supply distribution system.

2.4 Materials for the construction works

This will include:

- HDPE, Steel and uPVC pipes
- Steel valves & fittings
- HDPE valves & fittings
- Bulk and consumer water meter
- Sand, aggregate, cement, water for concrete works on the various chambers

2.5 Anticipated waste material and by-products

Wastes Generated during Construction Phase:

- **Construction Debris:** During the construction phase, there will be various types of construction debris, such as concrete, bricks, stones, and wood waste among others.
- **Excavated Soil:** Depending on the nature of the project, excavation activities may generate large amounts of soil waste.
- **Packaging Waste:** Construction materials, equipment, and supplies are often delivered in packaging that can contribute to waste generation.
- **Chemical Waste:** Construction activities may involve the use of various chemicals, including solvents, paints, adhesives, and lubricants.

2.6 Labour

The project will require both skilled and unskilled labour during construction and operation phases of the project. Workers (e.g., masons, supervisor, and un-skilled laborers) are expected daily to be working at the project sites. Most workers will be sourced locally, although a few skilled workers may be hired elsewhere for highly technical works. The entire recruitment process of the workers will be managed by the contractor in accordance with Kenya labor laws following guidance of the Labour Influx Plan. Normal working hours are

planned to be from around 08:00-17:00 from Monday to Saturday. Works outside of normal working hours will be sought from the relevant local authorities.

2.7 Construction machines/equipment

Some of the main construction machines required for construction activities include:

- Backhoe excavators
- Compressors
- Welding equipment
- Concrete mixers
- HDPE pipe fusion equipment
- Pipelines pressure testing equipment
- De-watering pumps

2.8 Proposed Project Costs

The estimated cost of the proposed project is KES 21,426,426

	Component	**Approx. Cost (KES**
1	Pipelines extensions to KMC, Graceland & Jam City Estates	10,000,101
2	Creation of 7 DMAs & GIS System for Gimu, Sidai Village, Embakasi, KMC, Acacia, Sofia, & Ngei Areas	11,426,325
	Total	**21,426,426**

The Detailed BOQ is included in this ESIA Study Report as **ANNEX V.**

3 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

The activities of the proposed project are regulated by several legal instruments and policies, the main ones being the Environmental Management and Coordination Act (EMC 1999, which sets the requirements and procedures for obtaining operating licenses and permits. This chapter highlights the specific sections of both national and international legal and institutional framework which will enable the proponent, MAVWASCO, to be compliant with the law and attain the set standards.

3.1 Policy Framework

The Republic of Kenya has a policy, legal and administrative framework for environmental and social management. The broad objectives of the policy are: -

- To ensure optimal use of natural resources while improving environmental quality.
- To conserve natural resources such that the resources meet the needs of the present without jeopardizing future generations in enjoying the same.
- To develop awareness that inculcates environmental stewardship among the citizenship of the country.
- To integrate environmental conservation and socio-economic aspects in the development process.
- To ensure that national environmental and social goals contribute to international obligations on environmental management and social integrity.
- To achieve the above policy objectives, it is directive that appropriate reviews and evaluations of all forms of developmental project plans and operations are carried out to ensure compliance with the environmental policy and legal frameworks.

The following section provides details of the relevant policies in the country:

3.1.1 The Kenya Vision 2030

Kenya Vision 2030 is the current national development blueprint for period 2008 to 2030. The objective of the vision 2030 is to transform Kenya into a middle-income country with a consistent annual growth of 10 % by the year 2030". One of the aims of the vision is to make Kenya to be a nation that has a clean, secure, and sustainable environment by 2030. This will be achieved through promoting environmental conservation to better support the economic pillar.

Developing and improving basic infrastructure and services namely will achieve Kenya's transformation into a middle-income country: roads, streetlights, storm water drains, footpaths, and water and sanitation facilities among others. Improving pollution and waste management through the application of the right economic incentives in development initiatives is critical.

Relevance

This Project aims at improving access to clean water supply in the targeted areas in 3 residential estates (KMC, Graceland & Jam City) in Athi River Town. The project will offer an opportunity for the local community to empower themselves economically through securing employment and service provision during the construction and operation phases of the Project.

3.1.2 National Environment Policy (NEP), 2013

Sessional Paper No. 6 of 1999 on Environment and Development since adoption by parliament in 1999 has been in use and influenced the formation of EMCA in 1999 with 2015 amendments but has since been surpassed by time and is therefore under revision to comprehensively cover areas that were previously left out to augment it. The revised draft of the National Environmental Policy, dated April 2012, sets out important provisions relating to the management of ecosystems and the sustainable use of natural resources, and recognizes that natural systems are under intense pressure from human activities particularly for critical ecosystems including forests, grasslands and arid and semi-arid lands. The objectives of the Policy include developing an integrated approach to Environmental management, strengthening the legal and institutional framework for effective coordination, and promoting environmental management tools.

Relevance

The Project shall implement the Environmental and Social Management and Monitoring Plan (ESMMP) to mitigate the impacts of the resulting impacts during the construction and operational phases of the Project; this will ensure that the sensitive ecosystems are not destabilized by the subsequent Project activities.

3.1.3 The National Water Policy of 2021

The Sessional Paper No. 1 of 2021 was developed in line with the mandate, vision and mission of the Ministry responsible for water affairs in Kenya. The National Water Policy of 2021 build on the achievements of the water sector reforms that commenced with the enactment of the Water Act, 2002, which were based on the principles outlined in the Sessional Paper No. 1 of 1999 on National Policy on Water Resources Management and Development. Therefore, the Policy aims at moving the water sector to the next level of development to contribute to the National Goals, and realization of the Sustainable Development Goals.

The Government of Kenya is committed to ensuring the progressive realization of the human rights to water, and reasonable standards of sanitation through taking steps to protect, respect and fulfil these rights, as required by the Constitution. This is in addition to realization of the human right to a clean environment. This Policy takes into account the need for Kenya, at both levels of government, to take steps, through this Policy, law, institutional mandates, planning and financing, in order to secure universal coverage of the entire population through access to water, and sanitation in accordance with constitutional standards The Government of Kenya is committed to ensuring the progressive realization of the human rights to water, and reasonable standards of sanitation through taking steps to protect, respect and fulfil these rights, as required by the Constitution. This is in addition to realization of the human right to a clean environment. This Sessional Paper considers the need for Kenya, at both levels of government, to take steps, through this Policy, law, institutional mandates, planning and financing, to secure universal coverage of the entire population through access to water, and sanitation in accordance with constitutional standards.

Relevance

The proposed water supply project will comply with this Policy by improving and upgrading water supply networks within the target areas for sustainable access to potable water.

3.1.4 National Climate Change Response Strategy of 2010

The strategy paper recognizes that Kenya is a water scarce Country and offers a variety of strategies for ensuring that the resource is utilized in ways that recognize that it is a finite resource. The strategy paper also argues that interventions in the water sector should take a participatory approach involving different water users including gender groups, socioeconomic groups, planners and policy makers in water resource management.

Relevance

There is need to conserve water and reduce water wastages. The ESIA has proposed measures to be complied with during the proposed Project's operation by MAVASCO to reduce o water loses that through illegal connections and leakages.

3.1.5 Public Health Policy

The public health policy calls upon the project proponents to ensure that buildings are adequately provided with utilities so that they are fit for human habitation.

Relevance

The Contractor's site office must be provided with all amenities/utilities that are essential for safeguarding public health for all people using the facilities.

3.1.6 Occupational Health and Safety Policy

This policy is intended to protect safety and health of workers in workplaces.

Relevance

The proposed Project will provide employment opportunities to many workers in various categories during construction and operation. The contractor will be expected to comply with the requirements of this policy when engaging workers in various construction activities. The environmental management provides mitigation measures that can be undertaken to ensure compliance with the requirements of this policy.

3.1.7 HIV/AIDS Policy

The policy identifies HIV/AIDS as a global crisis that constitutes one of the most formidable challenges to development and social progress. The Pandemic heavily affects the Kenyan economy through loss of skilled and experienced manpower due to deaths, loss of man hours due to prolonged illnesses, absenteeism, reduced performance, increased stress, stigma, discrimination and loss of institutional memories, among others.

Relevance

- Due to the large number of workers who will be involved in the project and the associated social issues with projects of such as scale, HIV/AIDS has been considered as one of the potential impacts, but adequate mitigation measures have also been proposed to that effect. These mitigations include voluntary counselling and testing (VCT) on HIV/AIDS, STDs and awareness campaigns.

3.1.8 Gender Policy

The overall goal of this Policy Framework is to mainstream gender concerns in the national development process to improve the social, legal/civic, economic, and cultural conditions of women, men, girls, and boys in Kenya. An important priority is to ensure that all ministerial strategies and their performance frameworks integrate gender equality objectives and indicators and identify actions for tackling inequality. In addition, each program will develop integrated gender equality strategies at the initiative level in priority areas. Within selected interventions, the policy will also scale-up specific initiatives to advance gender equality.

Relevance

This policy will be referred to during Project implementation especially during hiring of staff to be involved in the project, procuring of suppliers and sub consultants and sub-contractors to the project. The construction Contractor shall be expected to consider men, women and the youth for employment and business opportunities arising during the implementation of the proposed project.

3.2 Legal framework

3.2.1 Constitution of Kenya

Article 42 of the Bill of Rights of the Kenyan Constitution provides that 'every Kenyan has the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures. Further, Article 70 states that if a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed, or threatened, the person may apply to a court for redress.

Relevance

The Constitution of Kenya provides for sound management and sustainable development of all of Kenya's Projects, both public and private investments. It also calls for the duty given to the Project proponent to cooperate with State organs and other persons to protect and conserve the environment as mentioned in Part II.

The proponent should ensure compliance with the constitution in so far as equitable sharing of the available water resources, within the supply areas without discrimination. Further, the proposed Project should ensure the sustainability of livelihoods and biological resources within the project areas are protected. Any development proposals should also be cognizant of the increased powers under the Constitution given to communities and individuals to enforce their rights through legal redress.

3.2.2 The Environment Management and Co-ordination Act, 1999

The Act provides for the establishment of a legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto. Just as in the New Constitution, Part II of EMCA confers to every person the right to a clean and healthy environment and to its judicial enforcement. The new Constitution and EMCA therefore obligates the project's Executing Agency and

Contractor to work in a clean environment and not to contravene the right of any person within its zone of influence, to this entitlement.

EMCA has provided for the development of several subsidiary legislations and guidelines, which govern environmental management and are relevant to the project implementation. These include:

i. The Environmental (Impact Assessment and Audit) Regulations, 2009 Legal Notice No. 101.
ii. The Environmental Management and Coordination (Waste Management) Regulations, 2006 Legal Notice No. 121.
iii. The Environmental Management and Coordination (Water Quality) Regulations, 2006 Legal Notice No. 120.
iv. The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 Legal Notice No. 61.
v. The Environmental Management and Coordination (Air Quality Regulations 2014)
vi. The Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006 Legal Notice No. 160.
vii. Environmental Management and Coordination (Wetlands, Riverbanks, Lake Shores and Sea Shore Management) Regulation, 2009.
viii. The Environmental Management and Coordination (Controlled Substances) Regulations, 2007 Legal Notice No. 73.

Relevance to the Project

The EMCA and the above listed regulations will form the main statutory instruments which will guide the implementation of the project so that any likely adverse impacts that could be caused by the project are promptly mitigated as recommended in this study.

3.2.3 Water Act 2016

The Water Act 2002 was amended in the year 2016 to align to the Kenyan Constitution 2010, the Act vest the responsibility of developing water and Sanitation infrastructure (sewerage and water supply) to the water service boards and ownership and management to the WSPs that acts as the agent for the board Section 73 of the Water Act allows a person with a license to supply water (licensee) to make regulations for purposes of protecting against degradation of sources of water, which he is authorized to take. Under the Act, the licensee could be a local authority; a private Trust or an individual and the law will apply accordingly under the supervision of the Regulatory Board. Section 75 and sub-section 1 of the Water Act allows a licensee for water supply to construct and maintain drains, sewers, and other works for intercepting, treating or disposing of any foul water arising or flowing upon land for preventing water belonging to the licensee or which he is authorized to take for supply from being polluted. However, if the proposed works will affect or is likely to affect any body of water in the catchment, the licensee shall obtain consent from the Water Resources Management Authority. Section 76 states that no person shall discharge any trade effluent from any trade premises into sewers of a licensee without the consent of the licensee upon application indicating the nature and composition of the effluent, maximum quantity anticipated, flow rate of the effluent and any other information deemed necessary. The consent shall be issued on conditions including the payment rates for the discharge as may be provided under section 77 of the same Act.

Relevance to the Project

This Act will be relevant during construction of the project whereby the contractor will be required from time to time ensure that Project activities do not pollute water resources in the project area. The Contractor will also be required to comply with the effluent discharge requirements during construction of the project, which will require that the contractor obtain relevant permits from Water Resource Authority (WRA) on case-by-case basis when required.

3.2.4 County Government Act No. 17 of 2012

Part II of the Act empowers the county government to oversee function described in Article 186 of the constitution, (county roads, water and Sanitation, Health). Part XI of the Act vest the responsibility of planning and development facilitation to the County Government with collaboration with the National Government.

Relevance to the Project

The project will be implemented by Mavoko Water & Sewerage Company Limited (MAVWASCO) which is a water utility, wholly owned by Machakos County Government. The Project once complete will be managed by MAVWASCO for operations and maintenance. This Legislation calls for effective and coordinated public participation during the planning of public projects. The ESIA study has complied with this Legislation through consultations with relevant National & County Governments Departments and the other Project's stakeholders including the target beneficiaries.

3.2.5 Physical and Land Use Planning Act 2019

Section 56 of the said Act empowers the County Governments to reserve and maintain all land planned for open spaces, parks, urban forests and green belts as well as land assigned for public social amenities. The Project identified will be implemented as provided by Machakos County Government and Land Use Plan for Urban areas.

Relevance to the Project

As the Act directs, regulates, and harmonizes development and use of land in the Country. The proposed pipelines extensions have been designed within the public road reserves (wayleaves for public utilities). This was to avoid cases of acquisition of private property and resettlement complications. Any issues that may be encountered with will be dealt with on a case-by-case basis.

3.2.6 Occupational Health and Safety Act (OSHA 2007)

This legislation provides for protection of workers during construction and operation phases. It is tailored at implementation of the EHS plan in compliance with the relevant sections of this Act. The ESMP prepared under this assessment has provided for specific health and safety aspects to be complied with during implementation of the project.

Relevance to the Project

The Act provides EHS guidelines which shall be followed by both the contractor and supervising consultant during implementation of the project to avoid injuries and even loss of life to workers and neighbouring community.

3.2.7 The Public Health Act (Cap 242)

Part IX section 115 of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires Local Authorities to take all lawful, necessary, and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable for injurious or dangerous to human health. Such nuisance or conditions are defined under section 118 and include nuisances caused by accumulation of materials or refuse which in the opinion of the medical officer of health is likely to harbour rats or other vermin.

Relevance to the Project

The Act provides guideline to the contractor on how he shall manage all wastes (Liquid and Solid Wastes) emanating from the project in a way not to cause nuisance to the community. This Act, during construction shall be read alongside the Waste Management Regulations of EMCA 2015 for utmost compliance.

3.2.8 Work Injury Benefits Act, (WIBA 2007)

This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes. An employee is a person who has been employed for wages or a salary under a contract and includes apprentice or indentured learner.

Relevance to the Project

The proposed project will adhere to the provisions of this act throughout the construction period of the project.

3.2.9 Land Act, 2012 (Revised 2016)

It is the substantive law governing land in Kenya and provides legal regime over administration of public and private lands. It also provides for the acquisition of land for public benefit. The government has the powers under this Act to acquire land for projects, which are intended to benefit the public.

Relevance to the Project

The proposed Project will be implemented within the existing road reserves. Therefore, no land will be acquired.

3.2.10 Labour Relations Act 2012

An Act of Parliament to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations or federations, to promote sound labour relations through the protection and promotion of freedom of association.

Relevance to the Project

This act will be applied by labour force on site in addressing disputes related to working conditions.

3.2.11 Sexual Offences Act, 2006

An Act of Parliament that makes provision about sexual offences aims at prevention and the protection of all persons from harm from unlawful sexual acts and for connected purposes. Section 15, 17 and 18 focuses mainly on sexual offenses on the children.

Relevance to the Project

This law will govern the code of conduct of the Contractor's staff and provide repercussions of any wrongdoing. The labour management plan will ensure that sexual rights are protected.

3.3 Institutional structure of the water sector

The Water Act 2016 aligns Water Services Management to the Kenyan Constitution 2010.The Ministry of water, sanitation & Irrigation is responsible for policy development, sector co-ordination, monitoring, and supervision to ensure effective Water and Sewerage Services in the Country, sustainability of Water Resources and development of Water resources for irrigation, commercial, industrial, power generation and other uses. The Ministry executes its mandate through the following sector institutions:

3.3.1 Water Sector Trust Fund

This body assists in the financing of the provision of Water Services to areas of Kenya, which are without adequate water services. This shall include providing financing support to improved water services towards:

a) Capital investment to community water schemes in underserved areas.
b) Capacity building activities and initiative among communities.
c) Water services activities outlined in the Water Services Strategic Plan as prioritized by the Government.
d) Awareness creation and information dissemination regarding community management of water services.
e) Active community participation in the management of water services.

3.3.2 Water Services Regulatory Board (WASREB)

Section 70 of the Water Act 2016 provides for establishment of Water Services Regulatory Board, this assessment assumes that the current Water Services Regulatory Authority (WASREB) will assume the roles proposed in the Water Act 2016. The regulatory Board is responsible for the regulation of the water and sewerage services in partnership with the people of Kenya. The mandate of the regulator covers the following key areas:

i. Regulating the provision of water and sewerage services including licensing, quality assurance, and issuance of guidelines for tariffs, prices and disputes resolution.
ii. Overseeing the implementation of policies and strategies relating to provision of water services licensing of Water Services Boards and approving their appointed Water Services Providers,

iii. Monitoring the performance of the Water Services Boards and Water Services Providers,
iv. Establish the procedure of customer complaints,
v. Inform the public on the sector performance,
vi. Gives advice to the Minister in charge of water affairs.

3.3.3 Water Resources Authority (WRA)

Section 11 of the Water Act 2016 provides for establishment of Water Resources Authority, this assessment assumes that the current Water Resources Authority (WRA) will assume the roles proposed in the Water Act 2016. The authority is responsible for sustainable management of the Nations Water Resources:

i. Implementation of policies and strategies relating to management of water resources.
ii. Develop principles, guidelines, and procedures for the allocation of water.
iii. Development of Catchments level management strategies including appointment of catchments area advisory committees.
iv. Regulate and protect water resources quality from adverse impact.
v. Classify, monitor and allocate water resources.

3.3.4 Water Works Development Agencies (WWDAs)

Section 65 of the Water Act 2016 provides for establishment of Water Works Development Agencies (WWDAs). The WWDAs are responsible planning and development of water and sewerage services infrastructure in their areas of jurisdiction. In Machakos County, the relevant WWDA is the Tanathi Water Works Development Agency (TAWWDA), which is mandated to:

i. Develop the facilities, prepare business plans and performance targets.
ii. Planning for efficient and economical provision of Water and sewerage services within their areas of jurisdiction.

3.3.5 Water Services Providers (WSPs)

The Kenyan Constitution Article 186 and 187 and corresponding further schedule item 11(b) mandates the county government to oversee Water and Sanitation in their respective counties. The County Government Act of 2012-part II provides a more elaborate interpretation of the function. They have vested this mandate to Water Service Providers, which are utilities or water companies. They are County Government owned but have been commercialized to improve performance and run like business within a context of efficiency, operational and financial autonomy, accountability and strategic, but minor investment.

3.4 Institutional Environmental policy framework

3.4.1 National Environmental Management Authority (NEMA)

The government established the National Environmental Management Authority (NEMA) as the supreme regulatory and advisory bodies on environmental management in Kenya under EMCA 1999. NEMA is charged with the responsibility of coordinating and supervising the various environmental management activities being undertaken by other statutory organs. NEMA also ensures that environmental management is integrated into development policies, programs, plans and projects.

3.4.2 County Environmental Committees

The County Environmental Committees also contribute to decentralized environmental management and enable the participation of local communities. These environmental committees consist of the following:

i. Representatives from all the ministries.
ii. Representatives from local authorities within the county.
iii. Two farmers / pastoral representatives.
iv. Two representatives from NGOs involved in environmental management in the county.

3.4.3 Public Complaints Committee on Environment

The Public Complaints Committee (PCC) is established under Section 31 of EMCA. The PCC is concerned with the investigation of complaints relating to environmental damage and degradation generally. The PCC has powers to investigate complaints against any person or even against NEMA or on its own motion investigate any suspected case of environmental degradation. The PCC is required by law to submit reports of its findings and recommendations to NEC. The law, however, is weak in that it does not provide PCC with the mandate to see its recommendations carried through. Further, NEC is not specifically required to do anything regarding the reports submitted by the PCC and will often note and adopt the same without any further follow up action. So far, the PCC has experienced challenges such as failure to honour summons, hostility between parties, hostility directed at PCC investigators, lack of understanding of EMCA and abdication of duty by Lead Agencies.

3.4.4 Standards and Enforcement Review Committee

The Standards and Enforcement Review Committee (SERC) is a committee of NEMA and is established under Section 70 of EMCA. This is a technical Committee responsible for formulation of environmental standards, methods of analysis, inspection, monitoring, and technical advice on necessary mitigation measures. The Permanent Secretary under the Minister is the Chairman of the Standard and Enforcement Review Committee. The members of the SERC are set out in the third schedule to EMCA. They consist of representatives of various relevant government ministries and parastatals that are Lead Agencies as well as those responsible for matters such as economic planning and national development, finance, labour, public works, law and law enforcement, etc. Other members are drawn from public universities, and other government institutions.

3.4.5 National Environmental Tribunal (NET)

The NET is established under Section 125 of EMCA for the purpose of hearing appeals from administrative decisions by organs responsible for enforcement of environmental standards. An appeal may be lodged by a project proponent upon denial of an EIA License or by a local community upon the grant of an EIA License to a project proponent. NEMA may also refer to any matter that involves a point of law or is of unusual importance or complexity to NET for direction. The proceedings of NET are not as stringent as those in a court of law and NET shall not be bound by the rules of evidence as set out in the Evidence Act. Upon the making of an award, NET's mandate ends there as it does not have the power to enforce its awards. EMCA provides that any person aggrieved by a decision or award of NET may within 30 days appeal to the High Court.

3.4.6 Land and Environment Court

The new constitutional dispensation has provided for the creation of land and environment courts for specific handling of land and environmental related disputes and grievances.

3.5 Sectoral integration

This integration encourages provision of sustainable development and a healthy environment to all Kenyans. The key functions of NEMA through the NEC include policy direction, setting national goals and objectives and determining policies and priorities for the protection of the environment, promotion of cooperation among public departments, local authorities, private sector, non-governmental organizations and such other organizations engaged in environmental protection programs and performing such other functions as contained in the act. Other stakeholder authorities include Machakos County, Ministry of Water, Sanitation, and Irrigation, WSTF and the local community.

3.6 World Bank operational procedures

Like in any project financed by, or with financial participation of, the World Bank, the environmental and social safeguards as defined in the Bank's Operational Procedures will be respected for the purposes of this project implementation. The World Bank classifies its projects into three Environmental Assessment categories according to the likely impacts on the environment they will have. This classification is as below:
Category A: The proposed project is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. For a Category A project, the Proponent is responsible for preparing an EIA report.

Category B: The proposed project has potential adverse environmental impacts on human populations or environmentally important areas such as wetlands, forests, grasslands, and other natural habitats - but these are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases, mitigation measures can be designed more readily than for Category A projects. Like Category A the environmental assessment examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

Category C: The proposed project is likely to have minimal or no adverse environmental impacts. Beyond screening, no further environmental assessment action is required for a Category C project.

This Project has been categorized as B.

3.7 The World Bank Safeguards

3.7.1 OP/BP 4.01 (Environmental Assessment)

The World Bank has well-established environmental assessment procedures, which apply to its lending activities and to the projects undertaken by borrowing countries, to ensure that development projects are sustainable and environmentally sound. Although its operational policies and requirements vary in certain

respects, the World Bank follows a relatively standard procedure for the preparation and approval of an environmental assessment study, which:

i. Identifies and assesses potential risks and benefits based on proposed activities, relevant site features, consideration of natural/human environment, social and trans-boundary issues.
ii. Compares environmental pros and cons of feasible alternatives.
iii. Recommends measures to eliminate, offset, or reduce adverse environmental impacts to acceptable levels (sitting, design, technology offsets).
iv. Proposes monitoring indicators to implement mitigation measures.
v. Describes institutional framework for environmental management and proposes relevant capacity building needs.

Relevance to the Project

An Environmental and Social Impact Assessment (ESIA) Study shall be carried out on this Project.

3.7.2 OP/BP 4.04 (Natural Habitats)

The policy is designed to promote environmentally sustainable development by supporting the protection, conservation, maintenance and rehabilitation of natural habitats and their functions. The policy seeks to ensure that World Bank-supported infrastructure and other development projects consider the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water areas where most of the native plant and animal species are still present).

Relevance to the Project

This project has no notable interaction with notable natural habitats apart from limited localized riverine aquatic systems.

3.7.3 OP/BP 4.11 (Physical Cultural Resources)

This policy is meant to assist in preserving physical cultural resources including the movable or immovable (above or below ground, or under water) objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance including sites and unique natural values. Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The objective of this policy is to avoid or mitigate adverse impacts on physical cultural resources from development projects.

Relevance to the Project

There are no cultural features at the site. However, a chance to find cultural features during construction analysis has been discussed under the section on Impacts and mitigation measures.

3.7.4 OP/BP 4.12 (Involuntary Resettlement)

The policy states that "Where large-scale of population displacement is unavoidable, a detailed resettlement plan, timetable, and budget are required. Resettlement plans should be built around a development strategy and package aimed at improving or at least restoring the economic base for those relocated. Experience indicates that cash compensation alone is normally inadequate. Voluntary settlement may form part of a resettlement plan, provided measures to address the special circumstances of involuntary resettlers are included. Preference should be given to land-based resettlement strategies for people dislocated from agricultural settings. If suitable land is unavailable, non-land-based strategies built around opportunities for employment or self-employment may be used".

Relevance to the Project

Not Triggered. The proposed project is on public land reserved for the water pipelines.

3.7.5 OP/BP 4.36 (Forests)

The policy on forest safeguards seeks to realize the potential of forests to reduce poverty in sustainable manner, integrate forests effectively into sustainable economic development and protect the vital local and global environmental services and values of forests. Among the principles is to screen as early as possible for potential impacts on forest health and quality and on the rights and welfare of the people who depend on them.

Relevance to the Project

Not applicable. The proposed project site has no forest.

Relevance to the Project

Not applicable. There are no known indigenous people living at the proposed project sites.

Table 3.1: Applicability of WB OPs

OP	Title	Comments
4.01	Environmental Assessment	Triggered. This project falls under category B as per the World Bank OP 4.01 and an environmental and social impact assessment has been undertaken as part of the project preparation to ensure the design, construction, operation and decommissioning phase mitigate the significant adverse environmental and social impacts.
4.04	Natural Habitats	Not applicable. There are no significant natural habitats on the site of the proposed project.
4.09	Pest Management	Not applicable. There are no pests at the proposed project site.
4.11	Physical Cultural Resources	Applicable. Site visits and inventories have not indicated the presence of any cultural (historical, archaeological) sites in the sample settlements. However, to manage "chance finds" an appropriate procedure is included in this report. Such procedure to be followed by contractors during the construction phase.

4.12	Involuntary Resettlement	Not Triggered. The proposed project sites are located within public land with no encumbrances.
4.36	Forests	Not applicable. The proposed project site has no forest.
7.60	Projects in Disputed Areas	Not applicable. The proposed project sites are located within public land with no encumbrances.

3.8 Relevant International Conventions and Treaties

Conventions are agreements that are legally binding on states that have become parties to them. Kenya is signatory to several international conventions and treaties that would need to be adhered to in implementing this project and are geared towards environmental protection and conservation. Some of these include:

3.8.1. International Convention on Biological Diversity (1992)

The convention promotes the protection of ecosystems and natural habitats, respects the traditional lifestyles of indigenous communities, and promotes the sustainable use of resources.

Relevance to the Project

The Contractor will adhere to this Convention during the clearing of pipelines routes and excavations works for pipe laying.

3.8.2. Ramsar Convention 1971

The convection governs wetlands of international importance. The convention was entered into force in Kenya in 1990 and it governs Lake Nakuru, Lake Baringo, and Lake Natron, which is a shared ecosystem between Kenya and Tanzania. Kenya is therefore committed to avoid degradation of wetlands under its jurisdiction. Kenya has also ratified the Agreement of the Conservation of Eurasian Migratory Water Birds (2001) and the African Convention on the Conservation of Nature and Natural Resources (1968), the Convention on International Trade in Endangered Species of Wildlife Fauna and Flora (CITES) 1973 which prohibits trade in species such as Dugongs and in Ivory.

Relevance to the Project

The proponent will need to ensure that these important conventions are not violated during construction, operation or decommissioning of the proposed projects.

3.8.3. The United Nations Framework Convention on Climate Change (UNFCCC)

This is an international environmental treaty produced at the United Nations Conference on Environment and Development (UNCED), informally known as the Earth Summit, held in Rio de Janeiro from 3rd to 14th June 1992. The objective of the treaty is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The treaty itself sets no mandatory limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. In that sense, the treaty is considered legally non-binding. Instead, the treaty provides for updates (called "protocols") that would set mandatory emission limits. The principal update is the Kyoto Protocol, which has become much better known than the UNFCCC itself.

Relevance to the Project

This Convention is relevant due girls from sexual exploitation and abuse. Universal Declaration of Human Rights (Article 7), the UN Charter (Articles 1, 13, 55, and 76) and the International Covenant on Civil and Political Rights (Article 24) reaffirm to the significance of climate change on existing water sources and water resources management.

3.8.4 Convention on the Elimination of all forms of Discrimination against Women (CEDAW)

The Convention on the Elimination of all forms of Discrimination against Women (CEDAW) places explicit obligations on states to protect women and the freedoms and rights of all children, including internally displaced children. Gender balance should be given priority when hiring employees for the project implementation. Children should not be engaged in any form of employment.

Relevance to the Project

This Convention will be applicable in the employment of construction workers to avoid discrimination against any gender and hiring of children.

3.9 Harmonization of both WB and GoK requirements for social and environmental sustainability

The World Bank (WB) and Government of Kenya (GoK) require that Projects of such nature are subjected to environmental and social impact assessment as stipulated under EMCA Cap 387 and its tools; the same process simultaneously fully resolves requirements of OP 4.01 generally, both requirements are aligned in principle and objective in that:

- Both require Environmental Assessment before project implementation leading to development of comprehensive Environmental and social Management plans to guide resolution of social and environmental impacts as anticipated.
- While OP 4.01 of World Bank stipulates different scales of Project Report for different category of projects, EMCA requires Project Report for all sizes of projects, which are required to be scoped as relevant.
- Where EMCA requires consultation of Lead Agencies comprising of relevant sectors with legal mandate under GoK laws, the WB has equivalent safeguards for specific interests.
- The Bank requires that stakeholder consultations be undertaken during planning, implementation, and operation phases of the project, which is equivalent to the statutory annual environmental audits at the operation phase of projects in Kenya.

The understanding of this Project Report study is that pursuit of an in-depth **Project Report** process as stipulated by EMCA Cap 387 is adequate to address all World Bank requirements in the OP. This is a major guiding principle in this study. Therefore, in keeping with this trend, public consultation has been done to the stakeholders, and their comments have been incorporated in the final Environmental Assessment and final design of the project. In addition, the Environmental Assessment report will be made publicly available to all stakeholders through disclosure at the project's proponent website, NEMA, and WB website, as well as copy of the report available at the project site.

3.10. Project implementation institutional structure

3.10.1 Mavoko Water & Sewerage Company Limited (MAVWASCO)

MAVWASCO will be the Project's proponent and shall therefore ensure that the implementation of the Environmental and Social Management Plan (ESMP) is effectively executed and with adequate resources provided. MAVWASCO have an Environmental and Social Safeguards Officer within its establishment who will be responsible for supervision and monitoring for compliance of the ESMP implementation and reporting.

The responsibilities of MAVWASCO will include:

- Responsible for day-to-day coordination.
- and implementation of the project.
- Oversee the contractor's work.
- Ensure the grievance committees are established and working.
- Monitor the ESMP implementation.

Roles of the proponent's Environmental and Social Safeguards Officer:

- Ensure compliance to proposed ESMP by the contractor.
- Ensure review of ESMP is up to date.
- Carry out periodic audits of the ESMP to ensure that its performance is as expected.
- Preparation and submission of ESMP implementation Reports.

3.10.2 The Contractor

The contractor will be required to fully comply with implementation of the ESMP. The contractor will be required to submit a detailed Construction Environmental & Social Management Plan (C-ESMP), which comply with the ESMP, prior to mobilization on the construction site. The Contractor should establish, implement, and maintain procedures to identify potential emergency situations and potential accidents that can have an impact on the environment, surrounding communities, the employees, and/or the public.

Among the Key Staff of the Contractor will be an Environmental and Social Safeguard officer with the necessary qualifications and experience to manage the implementation of ESMP. The Contractors will also be required to prepare constructions Method Statements that will be task-specific after undertaking specific risk assessments.

Contractor's Responsibilities:

- ESMP Implementing contractor for the project.
- To ensure strict compliance of environmental specifications in the ESMP.

4 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

Overview

Machakos County is strategically located as it borders seven Counties, to the north it is bordered by Embu, Murang'a and Kiambu Counties, to the west Nairobi and Kajiado Counties, to the south Makueni County and to the east Kitui County. Agriculture is the main economic activity in the County, which is largely semi-arid. Most of the crops grown include maize, beans, fruits, vegetables and drought-resistant crops such as sorghum and millet. The County also plays host to the open-air market concept with major market days where large amounts of produce are traded. The County is well endowed with mineral resources that are valuable inputs to building and construction industries. The large deposits of sand, limestone and granite have attracted major cement factories in Kenya.

4.1 Project location

The proposed project area is found in Athi River town, the headquarters of Mavoko Sub County. Mavoko Sub County covers an area of 693 Km2 extending from bordering Nairobi County to the West and North, Machakos Sub County on the East and Kajiado County to the South. Athi River Town is at the junction of the Nairobi–Mombasa and Nairobi–Namanga Highways. The town also sits at the confluence of the Mbagathi and Kitengela Rivers which join to form Athi River, the second largest drainage system in the Country and from which it derives its name.

4.2 Environmental baseline conditions

4.2.1 Topography and Drainage

The upper Machakos and Nairobi's main drainage follows the regional slope of the volcanic rocks towards the east, while subsidiary internal drainage into the Rift region is confined to the western part. Major plains which comprising mainly the Athi plains and the northern section of the Kapiti plain, extend westwards, rising from 1493 m at the Athi River to 1829 m in the faulted region near Ngong. The Kirichwa Valley Tuffs lying to the east of the highway function like a sponge and the contact between them and the underlying impermeable phonolite thus forms a perfect aquifer so much so that several channels containing water occur beneath Athi River region.

4.2.2 Geology and Soils

4.2.2.1 Geology

Athi River area predominantly comprises of tertiary rocks (Ngong volcanic) overlaying pre-Cambrian basement rocks, which is exposed in small area in upper reaches of the Kitengela River. In the north, from Nairobi national park and eastwards are the Nairobi phonolites, in the west are the Mbagathi Phonolite Trachytes and to the East are Athi tuffs. These rocky basements are usually very important for providing strong foundations for buildings.

4.2.2.2 Soils

The soils on the proposed Project sites are black cotton, commonly associated with the Athi Kapiti Plains and are prone to waterlogging during rainy seasons. The soils covering the area have greatly been influenced

by the underlying basement rock system. Most parts of the area are covered by thin black cotton soils which is a great impediment to urban development and construction.

4.2.3 Surface Hydrology and Groundwater

The proposed Project sites lie within the drainage basins of Athi River. Kitengela River is a tributary of Athi River. Water supply in the project area is unreliable since Kitengela River is seasonal which is in the north part of the proposed project site. Rainfall is inadequate and unreliable; water from the permanent rivers and dams is not fully harnessed. Ground water resources are low and saline because of the basement rock systems.

4.2.4 Climate

Mavoko has a tropical climate, with rainy months from March to May and October to December, with approximately 118 days of rain in the year and a mean annual precipitation of 1015 mm. According to the UN-Habitat, the mean annual temperatures in Mavoko are in the range of 20-22 degrees Celsius while the maximum relative humidity rarely exceeds 80% during the day. The temperatures can peak to 33 degrees Celsius during the hot and dry seasons. The area thus provides ideal bioclimatic conditions for human settlement; however indoor cooling may be necessary during the hot and dry season of the year. There are two rainy seasons, but rainfall can be moderate. The cloudiest part of the year is just after the first rainy season, when, until September, conditions are usually overcast.

4.2.5 Flora/Fauna

4.2.5.1 Flora

Natural vegetation at the proposed Project sites is mostly shrubs and dry grass due to the dry weather conditions. The vegetation within the proposed site does not merit special conservation status since it is of least biological and cultural importance. However, the proponent will implement a landscaping plan upon completion of construction, and it is recommended that indigenous tree species be utilized.

4.2.5.2 Fauna

The Athi-Kapiti ecosystem (consisting of the Nairobi National Park and southern Maasai land) which is next to site but supports a large population of wildlife (more than 20 species) that includes long distance migratory species such as the wildebeests and zebras. The Maasai community of Kitengela have witnessed dramatic and rapid changes in the ecology since enacting subdivision of their communal lands into private plots. From observations made during an extensive survey of areas bordering Nairobi National Park in the South, it was observed that the Kitengela corridor and the Kapiti plains wildlife dispersal area are now virtually blocked to wildlife migration and dispersal. Development, including the rapid growth of Nairobi and the progressive fencing of land, has drastically reduced the extent of that former ecosystem, and the numbers of large mammals, both wild and domesticated, it can support. Since the mid 1980's these pastoral and rich wildlife areas have progressively being partitioned and fenced off, reducing their accessibility to livestock and wildlife.

4.2.6 Infrastructure and Transport

The proposed development is in one of the upcoming locations for residential development in Kenya: 27.88km from Nairobi's central business district using the upgraded Mombasa Road. This provides good transport

accessibility which is key to success in Mavoko's rapidly expanding environment. Additional road network to the proposed development is among the works that will be implemented for the said project. The matatus leading to the project site can be found at Railways Bus stop matatu No. 110 to Kitengela or Athi River town.

4.3 Socio-economic survey

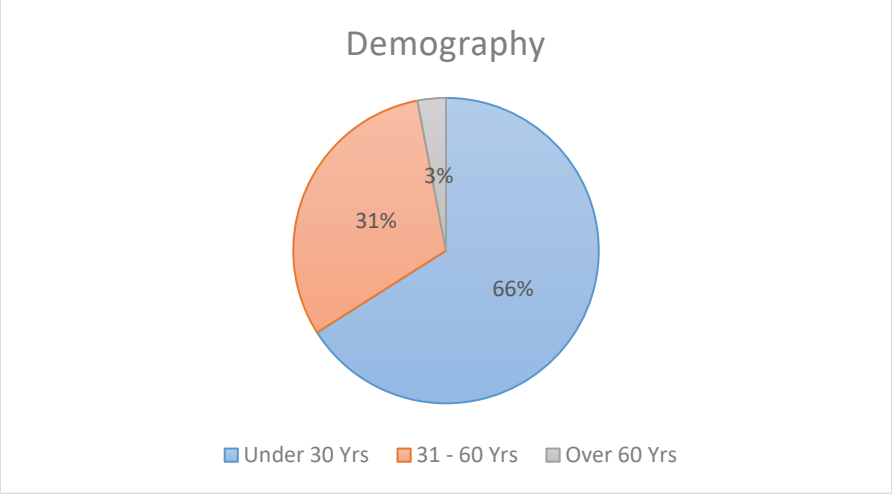
This process involved economic and social survey conducted on both the Project Affected Persons and general community through direct interactions with the local communities and other stakeholders and through questionnaire administration. A quantitative survey was conducted using structured questionnaire and it was designed to generate the required information. The information was used to answer questions related to status of social and economic parameters within the project site including, the availability or lack of social service facilities, existing levels of access to education, health, potable water and related services, local market prices as well as agricultural production and productivity, all of which were useful in valuation of assets and computation of compensation rates. A series of consultations were held using both formal and informal meetings with carefully selected members of the communities and all PAPs. The purpose of this survey was to identify types of impact and accordingly categorize displaced persons, develop entitlements, and prepare resettlement plan for each family.

The following information about each family was collected:

- Human resource base of each family.
- Economic status of each individual member of the family.
- Ownership of property – movable and immovable.
- Property including lands, structures, trees, and houses either occupied or owned with tenancy rights or even as encroachers or those de-facto in possession.
- Means of livelihood due to stagnation of developmental activities soon after the project, loss of property, loss of access to clientele, loss of jobs due to physical re-location, loss of gainful employment, loss of access to income generating resources.
- Community life, community properties and resource base, community amenities and services, socio-cultural value.
- Loss of habitats and lands, degradation of land and water resources, environmental degradation, adverse impact on health etc. as an after effect of the proposed Project.

4.3.1 Demography

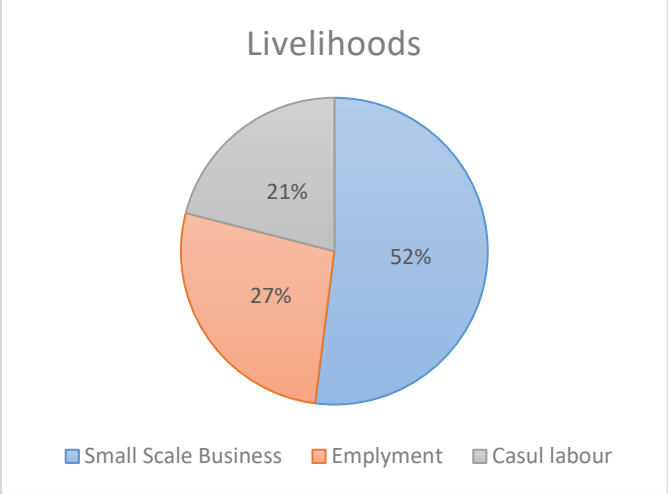
According to the 2019 Kenya Population and Housing census the total population of the Mavoko- Sub County is 322,499 with 164,322males and 158,172 females. The population of Athi River Town as per the 2019 census was 52,996 people which is still growing due to its proximity to the capital city of Nairobi and influx of workers due to the many industries located in the town. Data obtained from the socio-economic survey indicated that majority of the proposed Project's area residents fall under the age of 30years (66%) followed by respondents in the age bracket of 31-60years (31%). Only about 3% are above the age of 60years. This implies that the population found in the Project area are largely economically active.



4.3.2 Livelihoods

Coming from a heritage of agriculture, Mavoko is quickly transforming from a ranching to industrial and commercial area, which are the main sources of employment. There are approximately 160 light and heavy industries including 6 cement factories and the Export Processing Zone Authority enterprises. The quick transformation of Mavoko is driven by the available land and proximity to Nairobi and its strategic location along the main traffic roads connecting Tanzania with Mombasa at the coast. Correspondingly, the population structure is mixed and includes, but is not limited to, impoverished slum dwellers, pastoral and agricultural communities, a commuting working class and a growing wealthy upper middle class, mainly gravitating from nearby Nairobi, as well as manufacturing companies.

The Study team carried out administration of the socio-economic questionnaires to establish the livelihood activities within the project area. Majority of the respondents (52%) are engaged in commercial and business enterprises while 27% are in employment. 21% of the respondents are engaged in casual labour including the Jua kali sector.



4.3.3 Health

The most common diseases in the area are malaria, flu, diarrhea, HIV/AIDS, and tuberculosis. In recent years there has been a notable increase in respiratory diseases, which is likely to be the result of high levels

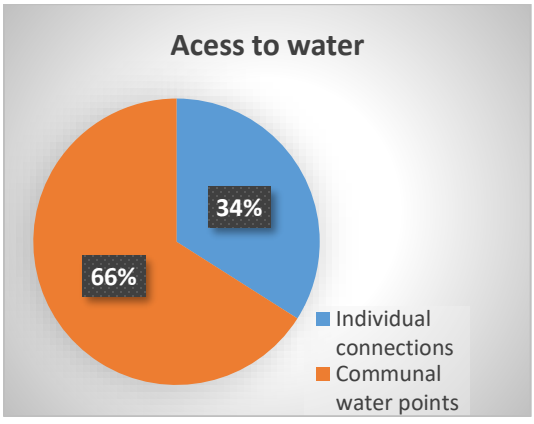
of air pollution and dust from the area's industries. The middle- and high-income groups rely on the town's private clinics, whereas the poorer groups are forced to use the government-run health clinic only for outpatients.

4.3.4 Water Supply

Athi River Town and its environs is supplied with about 7,000 m3/day from the Mavoko Water Supply system with other sources including supply from Nairobi City Water & Sewerage Company, the Athi River EPZA Water Supply Systems, private boreholes and the Kasuitu & KMC dams. The supplied water is of good quality for domestic consumption. Although the availability of water has significantly improved following the commissioning of Mavoko Water Supply Project, existing water distribution network is limited and therefore the need to extend last mile water connections pipelines under the proposed Project. About 34% of the respondents indicated to having individual water connections while the rest rely on communal water points.

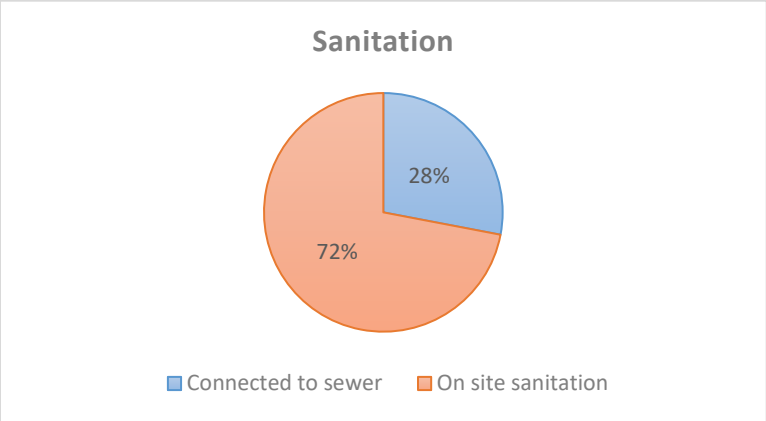


A Communal water kiosk within the proposed Project area.



4.3.5 Sanitation

Only about 28% of the residents of Athi River Town are connected to the MAVWASCO & EPZA sewerage systems. The rest of the residents depend on onsite wastewater disposal system (septic tanks & bio digesters) and pit latrines.

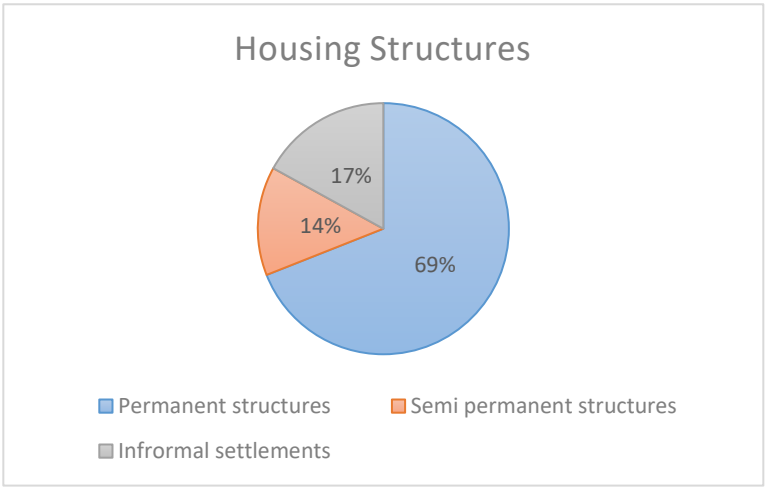


4.3.6 Storm Water Drainage and Effluents Management

The topography of Athi River Town is such that there is a gentle slope southward towards a seasonal storm drain flowing towards River Athi. The storm water therefore drains naturally into the stream on the southern side of the factory. The area is therefore not prone to floods making it habitable.

4.3.7 Housing Structures

Majority of the project area respondents live in permanent houses (69%) while 14% live in semi-permanent houses. This shows that the project area communities are mostly urbanized and higher livelihood status. Temporary informal housing structures (slums) also form significant 17% of the housing structures found in the Project area.



4.3.8 Transport

Athi River Town is located about 30 Km from Nairobi's central business district using the upgraded Mombasa Road. The Standard Gauge Railway (SGR) train has a modern station based in the town. This provides good transport accessibility which is key to success in Town's rapidly expanding environment.

4.3.9 Electricity and Telephone Services

The area is served with electricity power line serving the area. The area is also well served by the Telkom, Safaricom and Airtel telephone providers. The project site is closer to Kenya power and Company national grind.

4.3.10 Level of Education

Great inequalities exist in teaching standards and facilities between government-run and private schools. There are few government-run primary schools and secondary schools, these are overcrowded and in need of upgrading as the conditions in many of them are substandard. In contrast, there are many private schools demonstrating that private education is a lucrative business in Athi River Town. High transport and tuition fees mean that many families cannot afford to send their children to higher education institutions. There is a need to upgrade existing educational facilities and to improve accessibility by the poor, for instance by establishing more government-run schools. Majority of the respondents within the project area are literate and have passed through formal education. 38% of the respondents had attained secondary school level of education, 34% had attained college level of education and a further 28% had attained primary education.

4.3.11 Source of Energy

The Kenya Power and Lighting Company provide electricity throughout Kenya. Athi River Town has relatively high energy consumption levels due to the number of large industries in the area, many of which operate 24 hours per day. The government is promoting alternative sources of energy, such as solar energy, especially to new developers as Mavoko enjoys year-round sunlight. Most slums are without electricity and use paraffin lamps, tin lamps, batteries and candles for lighting, and kerosene or charcoal for cooking, which harm the environment, cause air pollution and respiratory diseases.

5 PUBLIC PARTICIPATION AND CONSULTATIONS

5.1. Introduction

The overall objective of the exercise is to involve citizens in project formulation and implementation at the local level. More specifically, the objective is to put in place a durable system of intra-community co-operation through collective action, which creates communal discussion forums for the implementation of development activities. The foregoing is particularly pertinent in the context of Article 35 of the Constitution of Kenya which, provides that 'every citizen has the right of access to information held by the state; and information held by another person and required for the exercise or protection of any right or fundamental freedom'. For instance, a question would arise about a project such the construction of new pipelines and how it affects the local people's right to a clean and healthy environment enshrined in Article 42 of the Constitution of Kenya. This was determined inter alia through subjecting the project to public participation and consultation that is the subject of this chapter.

The Environmental Management and Coordination Act (EMCA) of 1999, calls for effective stakeholder participation and public consultation in the ESIA Study process. EMCA requires a project proponent to seek the views of persons/communities that may be affected by the project to be consulted, at least explain project potential impacts, and obtain oral/written comments, which will be included in the ESIA for implementation by the proponent. Consultation and participation is a process through which stakeholders influence and share control over development initiatives, and participate in decisions on resources that affect them. It is a two-way process where the executing agencies, policy makers, beneficiaries and affected persons discuss and share their concerns in a project process. According to the World Bank's policies, project affected persons and host communities are to be meaningfully consulted early in the planning process and encouraged to participate in all stages up to the implementation of the project. During ESIA scoping and sites visits, consultations were held with representatives of KMC, Graceland and Jam City estates, water consumers and residents within the project areas, local leaders (Chief & Assistant Chief), and the Project's Proponent senior officers. The stakeholders and public consultations were carried out in accordance with the provisions of EMCA which has established the list of projects to be the subject of an environmental impact study, instructions, conditions, and procedures to carry out the environmental impact assessment.

5.2. Stakeholders and public consultations objectives

The principal objective of these consultations is to inform, consult and involve the stakeholders at different levels concerned by the project to ascertain their sensitivity to the project (acceptance, reluctance, nature of fears and requirements), the needs of the actors and their recommendations in view of good environmental performance of the project. The specific objectives of the ESIA stakeholders and public consultations process are:

- Identification of significant impacts.
- Identification of public's interest and values.
- Identification of priorities for assessment.
- Encouraging public understanding of the proposed project.
- The public can contribute local knowledge and values to the prediction, evaluation and mitigation of impacts.

- Improvement in quality and acceptability of ESIA Report.
- Public comments on acceptability of project impacts.
- Public evaluate impacts that occur and support project environmental management processes.
- Provide a platform for future consultation by:
    - Reducing conflict through early identification of contentious issues.
    - Improving transparency and accountability of decision making.
    - Facilitating participation to increase public confidence in the ESIA process.
    - Identifying stakeholders with who further dialogue will be constructive in subsequent stages of the project.

5.3 THE CONSULTATIVE PROCESS ADOPTED

The environmental survey team recognized the significance of the assignment findings to intended project users and in this regard, considered active involvement of all potential project stakeholders. To attain this objective, the consultant adopted a participatory approach in the identification of environmental and social impacts that are related to the project cycle. The stakeholder Analysis involved the following process:

- Identification and Mapping of Key Stakeholders.
- Defining the mode of consultation and engagement.

Several methods were used to engage stakeholders in the process of capturing their views, issues and concerns on the proposed project during data collection. The levels of project stakeholder engagement during data collection approaches and procedures were through household questionnaire data collection, key informant interview with selected leaders and through community meeting in Athi River Town on 17/06/2024.

5.4 key informant interviews

The key informant consultations were conducted on 17th June 2024. The method used to carry out consultations took into consideration the profile of the stakeholders, type of information desired and level of engagement. Each primary key stakeholder was visited at their offices. There was a session of introduction followed by a brief on the prosed project before the views of the stakeholder were sought through an interactive interview session. Key informants were provided with a Key Informant Questionnaire to fill. The outcome of the interviews is summarized in Table 5-1

Table 5.1: Summary of Key Informant Interview

	Key informant interviewed	Summary of remarks
1	Managing Director - MAVWASCO	The proposed project will increase water supply coverage by extending the pipelines to unserved areas within the 3 target estates (KMC, Graceland & Jam City) in Athi River Town.
2	Technical Manager - MAVWASCO	The recently completed Mavoko Water Supply Project water source has a designed production capacity of 12,000m^3/day with good quality water. Currently, water is supplied to a few households and the proposed pipeline extension will allow additional connections.
3	Commercial Manager - MAVWASCO	With increased water supply coverage through the pipeline extensions, revenue generation will increase.

4	Sub-County Water Officer (Mavoko Sub-County)	The proposed interventions will increase water supply the estates which have had severe water scarcity for many years.
5	Sub-County public Health officer (Mavoko Sub-County)	The officer acknowledged prevalence of diarrhea and dysentery as the most common waterborne diseases within the sub-county since several residents in the Sub-County consume untreated water from streams and shallow wells.
6	Director – Roads Department (County Government of Machakos)	• Noted that the proposed pipelines are within gated residential estates. • The County Government is responsible for estate roads and the Roads Department works in conjunction with the Planning department to ensures that developers provide adequate wayleaves along the estate roads for utility services. • The proponent (MAVWASCO) will be required to install the pipelines within the provided wayleaves and ensure that the installation depths and ground restorations measures are adhered to. • Pipeline indicator marker posts should be fixed to indicate the actual alignment of pipelines.
7	Kenya Meat Commission (KMC) Estate - Chairman	• The estate has been experienced severe water shortages due to dilapidated water distribution network. • The residents depend on water delivered by water bowsers and the cost is exorbitant. • The quality of water from private vendors is suspect and the residents are at risk of water borne diseases. • The KMC Estate and the neighbouring communities will benefit from the proposed pipelines extensions. • The Management of KMC has authorized MAVWASCO to install water distribution pipelines within the KMC land.
8	Representatives of Graceland & Jam City Estates – Athi River Town	The project is long overdue since the residents have suffered for a long time. The availability of water in their homesteads will save the money that they have been using to buy water from water tankers vendors who charge them exorbitant rates. They get the water from boreholes sources with poor water quality.
9	Ward Administrator – Athi River Town	There will be clean and safe water accessibility, and this will reduce the incidences of diarrhea among children.
10	Chief - Athi River Town Location	Locals will benefit from employment opportunities during construction of the project.

5.5 Project area community consultations

The community consultation was held in addition to Key informant interviews and household survey as a means of seeking the opinion of community members regarding the proposed project. The consultation

meeting was organized by the area Assistant chief in consultation with the Ward Administrator and was held on the 17/06/2024 at Athi River Town. The number of participants in this meeting was 26.

Although most the pipelines extension works will be carried out along the public road reserves, there are various encroachments by small scale traders such as vegetables/fruits sellers, Boda Boda riders waiting sheds and car washes. The consultations identified some residents who will likely be affected by the project activities, which include the excavations for pipelines installations and construction of valve chambers. The main objective of the public consultations with the affected project area residents was to gather information on their concerns, perceptions, reactions, and fears of the livelihood changes to be brought about because of the proposed Project implementation. Other specific objectives were the following:

- Explain the proposed project's scope of works and the construction activities in details to the local people.
- Gathering information on socio- economic and environmental information on the community and project sites.

During the presentation session, the residents were given detailed information about the project by the consultant team. The presentation highlighted the project background, components, objectives, expected upcoming activities, potential socio-economic and environmental impacts. After the presentations the community was given opportunity to give their views, comments and queries. The general point of view expressed by local community was that the project is really needed in their living environment. Questions were answered, clarifications offered and their recommendations recorded.



Public Consultation meeting at Athi River Town (17/06/2024

5.5.1 Summary of Issues Raised during local community consultative meeting and the responses provided

There were several issues that were raised by the community with responses provided on the concerns as captured in Table 5-2:

Table 5.2: Summary of issues raised during public consultation and responses provided

Issues raised	Response provided to raised issue
Residents within the proposed project areas were aware of the project but they didn't know more details about it.	After the representatives from MAVWASCO and the ESIA consultant explained to the residents the project's components, objectives, positive advantages and adverse impacts to be mitigated, scope and implementation schedule, they have accepted and acknowledged the considerable importance of the project for their development.
There is likelihood of vegetation being cleared during the process of construction.	Any tree affected during the construction activities shall be replanted by the contractor.
Waste management issues may arise due to inadequate waste collection facilities and this may lead to outbreak of diseases.	The contractor to provide waste pins and empty to appropriate designated area. Sensitize workers not to throw solid wastes haphazardly
Moral issues may occur because of labour coming from outside and money circulating in the local area.	Parents, local leaders, and Government officers including MAVWASCO as well as the Contractor shall sensitize the local community on the importance of morality and bringing the culprits to book. Use of local labour to avoid influx of workers that can spread immoral issues will be given high priority.
Use of machines by the contractor to avoid hiring of local laborers	The contractor will be requested to use local work force as much as is practical and only use machine where necessary.
Temporal loss of income for small scale traders (vegetable & fruit vendors) with temporary structures along the proposed pipeline installation works.	Pipeline installations will be along the road reserves with no encumbrances. Excavations of trenches for pipelines installations and backfilling for any section will be done on the same day to enhance safety.
Provision of labour during the installation of pipelines	Residents shall be given priorities during recruitment of workers.
Water availability for all the residents	All the residents along the proposed pipeline extensions are encouraged to apply for individual water connections to their homes and business premises. However, those without individual connections shall obtain water from the water kiosks.
Exorbitant cost for new connections and monthly water bills	The cost of new connections and monthly water bills will be as approved by WASREB.
Issue of water shortages and rationing	It is acknowledged that the available water sources are inadequate, and some level of rationing shall be applied. Residents were advised to have some water storage capacity in their homes.

Which will be the benefits expected by the residents from the new project?	Project benefits were explained and identified as: - Access to clean water which will enhance and promote hygiene and sanitation to the residents. - The project is in areas with various institutions including public & private schools, a public Health Centre, religious institutions and small-scale business premises which will benefit from the installed pipeline extensions. - Improved wellbeing of households.
The residents wanted to know what measures the company (MAVWASCO) is planning to put in place to bring down cost of water.	The technical manager informed residents that the water tariff guidelines are provided by WASREB based on various factors. He explained that the company is incorporating climate proof and cost effective in its operations for instance use of solar powered pumps. This will significantly reduce cost of pumping water which will lead to a reduction in water tariffs.
Residents wanted to know how the company is planning to ensure the pipeline is secure.	Residents were informed that according to the design the pipes will be laid in road reserves thereby avoiding private property. The way leave will clearly be marked to keep off encroachers. Also, the pipes will be buried deep enough to avoid breakages which might occur when the pipes are on the surface.
Residents wanted to know if they will get any employment opportunities during project implementation	ESIA team informed residents that during construction phase, the contactor will source some skilled and semi-skilled labour from the community to supplement his staff when such opportunities are available. However, all the unskilled labour will be sourced locally. Residents were further advised to liaise with the office of the chief and present their request for jobs in an orderly manner for consideration once the construction activities commence.
Resident wanted to know the expected commencement date of the project.	Resident were informed that the project will commence immediately after all the necessary designs have been done and required licenses issued including the EIA license. They were further informed that the project was urgent and should start this year (2024)
Residents requested for more water kiosks to be constructed	Residents were informed that 2 No. water kiosks within the area that will be rehabilitated and operationalized once the pipelines have been installed. They were further informed that the primary objective of the company is to provide clean safe drinking water within homesteads and at the public water kiosks.

5.5.2 Other Issues raised by participants during the public participation meeting

Some of the issues raised by the residents within the proposed Project area are as below:

1. Emily Odero – Vegetable vendor

There is need for a meeting with those whose properties will be affected by the proposed project so that an agreement on the compensation process is reached.

- *The proposed pipelines will be installed along the existing road reserves with no encumbrances.*

2. Pastor Michael

The youth in this area do not have jobs, will the project engage the local youths during construction process or labour will be imported from elsewhere.

- *Unskilled labour will be sourced from within members of the local community. Local community members with skills in various trades will also be considered to the extent of their qualifications.*

3. Evans Kioko – Building Artisan

Will the construction process be machine or human labour based?

- *The Contractor will consider manual labour when possible.*

***4.* Mamile Murubo**

Mr. Murubo wanted to know whether there will be compensation for houses and land. He also wanted to know when the project will start.

- *The project will be implemented along the main road and within existing wayleaves where present pipelines are located. Buildings will therefore not be affected.*

5. Maurice Mumo

The proponent (MAVWASCO) should work with the local people closely so as to win their support.

- *The proponent is always willing to work with members of the local community to ensure that project implementation run smoothly and this will continue even in this project.*

6. Boniface Maina _ Businessman

Mr. Maina is in support of the project but would like businessmen to be informed in advance of construction plan so as not to make losses. He would also like the damages caused to be rectified by the proponent.

- *There will be no damages of property during the installation of pipelines since the works will be on the road reserves with no encumbrances.*

7. Dan Ochieng

Mr. Ochieng is supportive of the project. He however would like the proponent to put up water kiosks to benefit those who may not be able to make house connections.

- *The present project will involve construction of the main line. Last mile connection will be done by MAVWASCO. Installation of water kiosks will be considered.*

8. Judith Mwania

Judith wanted to know the source of water and whether it will serve all households within the area. She also wanted to know whether the water will get into the houses and how much it will cost.

- *The Source of water is the recently commissioned Belgium Mavoko Water Supply Project. The present project will involve construction of the main line and does not include the component of household connections.*

9. Samuel Kaloki

Mr. Kaloki wanted to know how soon the project will commence. He however affirmed his unwavering support for the project.

- *The project will commence as soon as feasibility study is finalised, designs prepared and tender awarded to successful contractor. This may take about 3 months from the date of the meeting.*

10. Jane Mwanzia

She wanted to know how deep the trenches will be and whether the line will follow a specific route along the road or it will pass through some homes. She also wanted to know security measures that have been put in place to ensure that the pipes are not vandalized and whether there will be a system that alerts MAVWASCO of any leakages.

- *The trenches will not be very deep and the pipeline will run along the road to avoid destruction of private properties. The community should ensure that nobody vandalizes project infrastructure as this may interfere with availability of water to community members. Only water that meets standard quality will be provided to the consumers.*

11. Sarah Kimani

Wanted to know whether the community will have daily access to water after completion of the project.

- *It is intention of the proponent (MAVWASCO) that water be available to consumers on a daily basis.*

12. Roseline Otieno

Ms Otieno expressed her unhappiness because they were not consulted during the design phase before a decision was reached for water to be taken to Graceland and Jam City areas but not to other equally deserving areas.

- *Project design is based on several factors and these inform where various project infrastructures are to be located. Altitude of an area plays a very significant role in projects where water is to flow by gravity.*

13. Margaret Kitemi

Ms Margaret wanted to know what will be used in digging the trenches. She also wanted to know whether there will be employment opportunities for the locals.

- *Trenches will be dug using hand tools and local labour will be used in this activity.*

14 .Mr. Benjamin Kilonzo – Youth Leader

He expressed strong desire that the contractor should recruit manual labour from the project route as much as possible for an enhanced acceptability and ownership of the project by the local communities.

- *The Contractor will be encouraged to hire local labour as much as possible particularly the unskilled and Semi- skilled workers.*

6 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

6.1 Introduction

The objective of the identification and assessment of impacts is to provide accurate information on the effects of activity execution to human beings and environment in general, which will allow the competent authority to take decision as whether the activity will be authorized subject to mitigate proposed measures or rejected. Impacts are defined as the changes in an environmental parameter that result from undertaking an activity. These changes are the difference between effects on an environmental parameter where the activity is undertaken compared to that where the activity is not undertaken and occur over a specific period and within a defined area.

This section entails assessment of impacts of the proposed Project. The proposed project has potential to cause positive as well as adverse impacts on the biophysical and socio-economic environment. The magnitude of potential impacts will vary between the phases of project implementation. The assessment of the project impacts given below is for the proposed Project which comprise the construction of main infrastructures namely: pipelines installations, solar power unit, water kiosks, fencing and valve chambers.

During all phases of the project implementation, MAVWASCO in collaboration with the contractor shall implement all measures necessary to avoid undesirable adverse environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in the Environmental and Social Management Plan. More specifically, the contractors shall ensure that the negative impacts are minimized, mitigated or avoided.

6.2. Types of impacts

Different types of impacts may occur from the implementation of this type of project, which may be positive or negative, and can be categorized as being either direct (primary), indirect (secondary) or cumulative.

6.2.1 Direct impacts

Direct impacts are impacts that caused directly by the activity and generally occur at the same time and at the place of the activity (for example, dust generation excavation activities). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

6.2.2 Indirect impacts

Indirect impacts are induced changes that may occur because of the activity (for example the use of water from a natural source at the activity will reduce the capacity for supply to other users). These types of impacts include all the potential impacts that either does not manifest immediately when the activity is undertaken, or which occur at a different place because of the activity.

6.2.3 Cumulative impacts

Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities

(for example, removal of vegetation may cause soil erosion, leading to excessive sediments in receiving stream, leading to reduced sunlight penetrating the water and thus reducing dissolved oxygen in the water and adversely affecting aquatic life and water quality). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

6.3 Concepts in impact significance assessment

Terminology used in characterizing the type, extent, duration, scale, and frequency of each impact assessment is summarized in Table 6.1. The terminology and designations are provided to ensure consistency when these characteristics are described in an impact assessment deliverable.

Table 6.1: Terminologies and Definitions Guiding Impact Assessment

Characteristic	Definition	Options and Definitions	
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect).	Direct	Impacts that result from a direct interaction between the Project and a resource/receptor (e.g., between occupation of a plot of land and the habitats which are affected).
		Indirect	Impacts that follow on from the direct interactions between the Project and its environment because of subsequent interactions within the environment (e.g., viability of a species population resulting from loss of part of a habitat as a result of the Project occupying a plot of land)
		Induced	Impacts that result from other activities (which are not part of the Project) that happen because of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).
		Cumulative	An additional impact that arises because of an impact from the project interacting or combining with an impact from another third party planned activity that is not considered to be part of the project's area of influence.
Extent	The 'reach' of the impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc.).	Local Regional International	Defined on a resource/receptor-specific basis

Duration	The time over which a resource / receptor is affected.	• Temporary • Short-term • Long-term • Permanent	Defined on a resource/receptor-specific basis
Scale	The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.)	No fixed options; intended to be a numerical value.	
Frequency	A measure of the constancy or periodicity of the impact	No fixed options; intended to be a numerical value	

6.4 Significance of impacts

The assessment determined significance of impacts based on magnitude of impact and sensitivity of receptors. Determination of impact magnitude is the degree of change that the impact is likely to impart upon the resource/receptor, based on its defined characteristics and demoted as either: **Negligible; Small; Medium; or Large** while sensitivity of the receptors to the impact was defined as either **low, medium, or high.** Based on the magnitude of impact and sensitivity/vulnerability/importance of resource/receptor, the significance of each impact is determined using the matrix shown in Table 6.2

Table 6.2: Significance Matrix

		SENSITIVITY OF THE RECEPTOR		
Magnitude of Impact		Low	Medium	High
	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Msjor

Negligible

An impact of negligible significance is one where a resource/receptor (including people) will not be affected in any way by a particular activity or the predicted effect is deemed round variations.

Minor

An impact of minor significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small (with or without mitigation) and/or the resource/receptor is of low sensitivity/ vulnerability/ importance.

Moderate

An impact of moderate significance has an impact magnitude that is within applicable standards but falls somewhere in the range from just above a minor impact to a level that may be just short of breaking a legal limit.

Major

An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors.

Likelihood

The likelihood of an unplanned event occurring is designated using a qualitative scale as described in the table below:

Table 6.3 Likelihood Qualitative Scale

Likelihood	Definition
Unlikely	The event is unlikely but may occur at some time during normal operating conditions
Possible	The event is likely to occur at some time during normal operating conditions.
Likely	The event will occur during normal operating conditions

Residual Impacts

Identification of residual impacts (i.e. after mitigation) and assessment of measures to offset/compensate for residual impacts, if any. The intention is to reduce all residual impacts to a level that is as low as reasonably practicable. The significance matrix applies universally to all receptors, and all impacts to these receptors, as the receptor-specific considerations are factored into the assignment of magnitude and sensitivity of the receptor. The Proposed Project will give rise to both potential positive and negative environmental impacts during the construction and operations phases.

6.5 Potential impacts identification and assessment

Potential impacts associated with the project were identified based on the qualitative information and data on cause-and-effect relationship. The identification considers the sources of impacts and relates them to the environmental or social characteristics and conditions; hence concluding if the source of impact affect or not the specific environmental or social components of the project activities. The impacts identification considers all stages of the project:

- Design and planning,
- Pre-construction,
- Construction,
- Operational and
- Decommissioning phases.

The methodology used for impacts assessment in this report is related to risk assessment:

(i) Whereby certain impacts to the environment are identified.

(ii) Risk evaluation (by using a stipulated assessment criteria whereby impacts are given a rating or weighting and obtaining an overall rating or significance of an impact) and

(iii) Risk management (relating directly to applicable mitigation measures to be implemented to manage a risk of an impact in the best interest of the project beneficiaries and surrounding communities.

6.6 Positive impact during construction phase

The proposed Project implementation will result in many social-economic benefits for the beneficiaries and surrounding communities of the project. In general, it is expected that the project will result in better access to safe drinking water and sanitation facilities leading to improved standards of living in terms of reduction of diseases, creation of temporary employment during construction and other economic development upon commissioning of the improved infrastructure. The following section highlights the potential positive socio-economic impacts likely to be generated by the project:

Employment Creation

- This improves general living standards. At construction stage workers will be deployed to help in construction of pipelines and associated works. This will include both skilled and unskilled personnel especially from the local population with approximately 300 direct and indirect jobs. As a minimum, the project will strive to achieve 90% unskilled and 60% skilled local labourers as the threshold.

Creation of markets for project construction materials:

- It was evident from the discussions with the community that there shall be creation of markets for project construction materials which should be sourced locally from those who can supply. The contractor shall therefore be required to float open tendering to the local community with an objective of identifying such suppliers.

No Project Affected Persons

There are **NO** Project Affected Persons (PAPs) since proposed pipelines extensions shall be installed on the wayleaves along public roads. Some sections of the pipelines will be installed within the Kenya Meat Commission (KMC) land. KMC, which is a public enterprise has provided a consent letter to permitting the installation of the pipelines (Attached as Appendix IV in the Report).

6.7 Positive impacts during operation phase

Positive project impacts during operation phase are summarized as follows:

- **Provision of clean water services**

- The Project's main aim is to provide clean treated and wholesome water to the residents of the target areas of KMC, Graceland & Jam City residential estates in Athi River Town, thereby ending perennial shortage of quality water.

- **Reduced Incidences of Water-Borne Diseases**

- Improved public hygiene and sanitation and at homes because of clean water availability has effect of reduced cases of water –borne diseases.

- **Accessibility water for domestic Use**

- The Project will ensure a reduction in the distance between the various households and the water collection points as compared to the long distances initially covered from the homesteads to water points.

- **Reduction in poverty levels of households**

- This will be because of the availability of reliable water for domestic use; households will therefore have more time to engage in other income-generating activities.

- **Employment**

- Opportunities will be created both directly for those working under the WSP due to increased water coverage and indirectly as businesses expand due to availability of water.

6.8 Negative impacts during construction phase

6.8.1 Clearing and loss of vegetation and other biodiversity

Through clearing of vegetation and soil excavations, there is loss of natural habitats and their biodiversity clearing the right of way and loss of microhabitats and their biodiversity.

Impact Characterization /Significance						
Direct	Negative	Short Term	Site Specific	Reversible	Moderate	Probable

Mitigation measures

- The soils excavated during laying of pipelines should immediately be used for back-filling to prevent it from being eroded during rainy season.
- The cleared sites should also be re vegetated to improve soil cover and minimize soil erosion and also improve on aesthetics of the project area.
- Landscaping and restoration of sites to their original state.

6.8.2 Impacts on Soils

The Project activities are likely to have minor impacts on soils, these impacts include:

- Destruction of soil structure due to topsoil excavations.
- Soil contamination caused by oils and fuel leaks from construction equipment.
- Soil erosion due to clearing of vegetation cover and trenching activities.

Impact Characterization /Significance					
Negative	Short Term	Site Specific	Reversible	Moderate	Probable

Mitigation measures

- The contractor to stick to clear delineation of the construction to minimise vegetation loss.
- Excavation works should be controlled so that land that is not required for the Project works is
- not disturbed.
- Excavated materials and excess earth should be kept at appropriate sites approved by the Supervising Engineer.
- Proper and compacted back filling of excavated areas.
- Planting of vegetation cover along the pipeline wayleaves after pipelines installations.

6.8.3 Dust and gaseous emissions

Emissions of dust and exhaust fumes will occur while opening trenches and by the operation of vehicles during the transport of building material and equipment. Clearance of sites and excavation will also cause dust emission. In addition, exhausts from trucks and construction machines will also have a certain impact on the air quality.

Impact Characterization /Significance						
Direct	Negative	Short Term	Local	Reversible	Moderate	Highly Probable

Mitigation measures

- Water the soil surface and any non-asphalted roads, especially in the dry season.
- Water the soil before starting to excavate and during and after burial of the pipeline.
- The storage and handling of spoil, subsoil, topsoil, and materials should be carefully managed to minimize the risk of wind-blown material and dust.
- Burning of any waste on site should be prohibited.
- Vehicle engines should not be left running unnecessarily.
- Regular and proper maintenance of vehicles and machinery.

6.8.4 Noise and vibration emissions

Noise and vibration during construction will be generated by the operation of heavy machines, heavy trucks, right of way preparation, soil stripping, trenching, pipe stringing, welding and laying and backfilling activities. Blasting may also be required in certain areas where rocky substrates prevent trenching by other means. These impacts are of temporary nature.

Impact Characterization /Significance						
Direct	Negative	Short Term	Local	Reversible	Low	Probable

Mitigation measures

- Restrict construction and operation of heavy machines to daylight.
- Ensure noise emissions are kept within the NEMA acceptable standards and inform communities on the noisy activities schedule.
- All vehicles and construction machinery shall have an efficient muffler design in accordance with the manufacturer's specifications. This also includes high noise generating handheld like power drills, saws, nail guns etc. The mufflers shall be well maintained and regularly tested with the results documented in the maintenance logs.
- Regular and effective equipment maintenance to ensure all machinery is in good working order and use does not generate excess noise/vibration.
- All vehicles and trucks should have valid Vehicle Inspection Certificates.

6.8.5 Pollution due to solid wastes

Solid wastes from the construction activities and worker's domestic waste can also have negative impacts on the environment. These wastes include construction debris such as plastics, stones, sand, gravel, timber, iron bar and human wastes and food leftovers. Non-hazardous solid waste generated at construction and decommissioning sites includes excess fill materials from excavation activities, scrap wood and metals, and small concrete spills.

Impact Characterization /Significance						
Direct	Negative	Short Term	Local	Reversible	Low to Moderate	Probable

Mitigation measures

- In addition to the implementation of waste prevention strategies, the total amount of waste may be significantly reduced through the implementation of recycling plan.
- All the solid waste should be collected; the biodegradable organic material composted properly on site for manure production and the non-biodegradable disposed of in a public landfill.
- A waste collection system will be in operation to handle solid wastes, oily rags, and used fuel and lube oil filters in a leak-proof container that will be stored and disposed off at the landfill site, to ensure effective management of solid wastes at the project site.

6.8.6 Accidental oil and fuel spills and leaks

The Project will involve use of oils and fuel for vehicles and construction equipment. In the event that these oils and fuel accidentally leak into the environment, they could result to significant contamination of soil, surface and underground water resources.

Impact Characterization /Significance						
Direct	Negative	Short Term	Local	Reversible	Low to Moderate	Probable

Mitigation measures

- Checking and regular vehicles and construction equipment.
- Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used.

6.8.7 Interference with the existing infrastructure and physical settings

The proposed project could result into the interruption of existing infrastructure such as access roads to residential estates and houses utility services such as internet cables and water pipelines.

Impact Characterization /Significance						
Direct	Negative	Short Term	Local	Reversible	Low to Moderate	Probable

Mitigation measures

- Liaisons with the relevant authorities and service providers to locate existing infrastructure before commencement of excavation works for pipe laying.

- Formal request for permission for a wayleave and laying the water pipeline should be sought from relevant roads authorities.

6.8.8 Workers, Community Health and Safety Risks during Construction

Construction workers are likely to have injuries and hazards at the construction works, unavoidably exposing them to occupational health and safety risks. The workers are also likely to be exposed to risk of accidents and injuries resulting from accidental falls, injuries from hand tools and construction equipment. The community in close proximity to the work sites could also affected through accidents caused by construction vehicles & equipment and falling into excavated but uncovered trenches.

Impact Characterization /Significance						
Direct	Negative	Short Term	Local	Reversible	Low to Moderate	Probable

Mitigation measures

- Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer and the Proponent's Environmental & Safety Officer.
- Provide induction training to all workers on tasks and the use of equipment and correct handling techniques.
- Provisions for shoring to walls (temporary buttresses) of deep trench excavations and other excavation with injury risks due to collapsing soils.
- For manual trench excavations, the separation distance from one worker to the other should be at least 3m.
- Construction workers, the supervision team and authorized visitors to construction sites to be provided with Personal Protective Equipment (PPEs) including gloves, gumboots, overalls and helmets. Use of PPE to be enforced by the Environmental & Safety Officer.
- Fully stocked First Aid Kits to be provided within the sites, camps and in all Project vehicles.
- Isolate the site for access by the local communities during the construction for their safety and health.
- Use of warning signage and tapes where the trenches are open and at other active construction sites.

6.8.9 HIV /AIDS & other communicable diseases

Indirect impacts on the community can be the introduction of new communicable diseases such as HIV/AIDS due to in-migration for job opportunities, poverty, and prostitution. The extent of disease transmission between the communities and in-migrants would depend on the level of interaction between the two, the workforce size and health status of the workforce and casual migrants, and their susceptibility to disease infection.

Impact Characterization /Significance						
Direct	Negative	Short Term	Local	Reversible	Low to Moderate	Probable

Mitigation measures

- The contractor at the time of Project implementation will develop appropriate training on potential spread and awareness materials for Information, Education, and sensitization of workers during project construction phase.
- Develop an intervention strategy compatible with the construction program to address success of the HIV/AIDS prevention and provide peer educators for sustainability in collaboration with other stakeholders.
- Integrate monitoring of HIV/AIDS preventive activities as part of the construction supervision. Basic knowledge, attitude and practices are among the parameters to be monitored, and particularly on provision of condoms, status testing and use of ARVs.

6.8.10 Labour influx and effects of Immigrant Workers

The project will need to employ labourers and although most of the unskilled and semi-skilled labour requirements could be filled locally (from within the project areas), congregation of potential labourers from outside the project areas is likely, as they seek employment opportunities. This has the potential to result in a strain on local social dynamics including increased competition for local social and health services, other goods and services, increased crime rates and illicit behaviour, social conflicts, and the risk of spread of communicable diseases. There may also arise complaints and dissatisfaction among the communities affected by the project if recruitment of workers is perceived to be biased and without local representation.

Impact Characterization /Significance						
Direct	Negative	Short Term	Local	Reversible	Low to Moderate	Probable

Mitigation measures

- Contractor should use the local workforce as much as possible (preference to local community members on skills locally available).
- Effective community engagement and strong grievance mechanisms on matters related to labour
- All workers to sign an employment contract including a Code of Conduct governing appropriate behaviour.
- The workforce should be sensitized to local social and cultural practices and be educated on the expected behaviour and conduct.
- Contractor should prepare and implement a gender action plan.

6.8.11 Child Labour

Due to provision of cheap labour and differentiation in bargaining power, the underage workers may be employed leading to exploitation.

Impact Characterization /Significance						
Direct	Negative	Short Term	Local	Reversible	Low	Probable

Mitigation measures

- The contractor will comply with national and international labour laws in recruiting construction staff.

- All workers will be required to produce their national identification cards to confirm their age.
- Ensure no children are employed on site in accordance with national labour laws. This can be done through incorporating prohibitive provisions in the code of conduct and having the recruitment policies that prohibits child labour.
- Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.

6.8.12 Sexual Exploitation and Abuse (SEA) & Gender-Based Violence (GBV)

Due to vulnerability of women, they could be taken advantage of in the Project workplace in order to receive what is due to them or favours. GBV incidences may increase due immoral behaviours arising from increased cash flows for the construction workers.

Impact Characterization /Significance						
Direct	Negative	Short Term	Local	Reversible	Low to Moderate	Probable

Mitigation measures

- Develop and implement code of conduct, signed by all workers.
- Provide training and awareness programs to project contractor's staff, and community members on GBV and sexual harassment prevention and reporting.
- Collaborate with local communities, leaders, and women's groups to address concerns related to GBV and sexual harassment.
- Collaborate with local law enforcement and authorities to address and prevent GBV incidents.
- Implement clear and confidential reporting mechanisms for any incidents of GBV or sexual harassment.
- Contractor should prepare and enforce a No Sexual Harassment and Non-Discrimination Policy.

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

7.1 Overview

This chapter captures the environmental and social management measures for the anticipated negative impacts. The ESMP capture the impacts, receptor, proposed mitigation measures, institution responsible for the mitigation, frequency, and the budget at construction and at operation stages. Preparation of the plan was informed and guided by the mitigation measures that were anticipated in the Environmental and Social Management Framework 2017 for the WSDP project. The Environmental and Social Management Plan aims to make this project conform with the applicable environmental legal requirements and to help all stakeholders to find their role and responsibility in the environmental preservation during the implementation of the present project. This Environmental and Social Management Plan completes the information given for the environmental impacts and the specific mitigation measures proposed in the previous sections. It proposes the institutional responsibilities for the implementation of the mitigation measures, the timing and indicates the source of implementation cost of proposed mitigation measures.

The contractor will be required to fully comply with implementation of the ESMP. The contractor will be required to submit a detailed Construction Environmental & Social Management Plan (C-ESMP), which comply with the ESMP, prior to mobilization to the construction sites. The Contractors will also be required to prepare constructions Method Statements that will be task-specific after undertaking specific risk assessments. Among the Key Staff of the Contractor will be an Environmental and Social Safeguard officer with the necessary qualifications and experience to manage the implementation of ESMP. The Contractor's E&S officer will full time and site based during the implementation of the Project. Among the key responsibilities of the Contractor's E&S officer will include:

- Managing the implementation of ESMP with strict compliance of the provisions.
- Preparation of regular progress reports (weekly, monthly or quarterly) as applicable, on the implementation of ESIA including incidents reports and mitigations.

The Project Proponent (MAVWASCO) shall ensure that the implementation of the Environmental and Social Management Plan (ESMP) is effectively executed and that adequate resources have been provided. MAVWASCO have an Environmental and Social Safeguards Officer within its establishment who will be responsible for supervision and monitoring for compliance of the ESMP implementation and reporting. The responsibilities of MAVWASCO will include:

- Responsible for day-to-day coordination and implementation of the project & ESMP.
- Ensure the grievance committees are established and working.
- Monitor the ESMP implementation.

Roles of the proponent's Environmental and Social Safeguards Officer:

- Ensure compliance to proposed ESMP by the contractor.
- Ensure review of ESMP is up to date.
- Carry out periodic audits of the ESMP to ensure that its performance is as expected.
- Preparation and submission of ESMP implementation Reports.

Monitoring of the ESMP implementation will include site inspections, reporting and photographic documentation designed to assess and record the contractor's compliance with the ESMP and other applicable regulations. It is also anticipated that additional inspections would be required in response to complaints and issues raised by local communities.

TABLE 7.1: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Project Activities	Potential Impacts	Recommended Mitigation Measures	Responsibility	Approx. Cost (KES)
During Construction Phase				
Excavation for installation of pipelines network, zonal & consumer water meters for DMAs and construction of valve/meter chambers.	**Clearing and loss of vegetation and other biodiversity -** Through clearing of vegetation and soil excavations, there is loss of natural habitats and their biodiversity clearing the right of way and loss of microhabitats and their biodiversity.	- The soils excavated during laying of pipelines should immediately be used for back-filling to prevent it from being eroded during rainy season. - The cleared sites should also be re vegetated to improve soil cover and minimize soil erosion and also improve on aesthetics of the project area. - Landscaping and restoration of sites to their original state.	Project Construction Contractor	275,000
	Impacts on Soils The Project activities are likely to have minor impacts on soils, these impacts include: - Destruction of soil structure due to topsoil excavations. - Soil contamination caused by oils and fuel leaks from construction equipment. - Soil erosion due to clearing of vegetation cover and trenching activities.	- The contractor to stick to clear delineation of the construction to minimize vegetation loss. - Excavation works should be controlled so that land that is not required for the Project works is not disturbed. - Excavated materials and excess earth should be kept at appropriate sites approved by the Supervising Engineer. - Proper and compacted back filling of excavated areas. - Planting of vegetation cover along the pipeline wayleaves after pipelines installations.	Project Construction Contractor	150,000
	Solid Wastes Generation from Construction activities - Construction activities at the work sites will generate some spoil material, solid wastes such as plastic containers, used tyres, metal parts, plastics and cables.	- Maximum reuse of excavated material. - Construction sites to have designated waste collection points and disposal to appropriately and approved sites. - Environmental Management, Health and Safety Training Programs to be conducted for Contractor's staff to create awareness on proper solid wastes management.	Project Construction Contractor	120,000
	Accidental oil and fuel spills and leaks - The Project will involve use of oils and fuel for vehicles and construction equipment. If these oils and fuel accidentally leak into the environment,	- Checking and regular vehicles and construction equipment. - Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used.	Project Construction Contractor	90,000

	they could result to significant contamination of soil, surface and underground water resources.			
	Interference with the existing infrastructure and physical settings - The proposed project could result into the interruption of existing infrastructure such as access roads to residential estates and houses utility services such as internet cables and water pipelines.	- Liaisons with the relevant authorities and service providers to locate existing infrastructure before commencement of excavation works for pipe laying. - Formal request for permission for a wayleave and laying the water pipeline should be sought from relevant roads authorities.	Project Construction Contractor	300,000
	Noise Pollution and Vibrations - Construction of the proposed project will result in noise emissions because of the machines that will be used (excavation equipment etc.) and construction vehicles delivering materials to site.	- Best available work practices will be employed on-site to minimize occupational noise levels - All construction equipment will be regularly inspected and maintained in good working condition. - Provision of earmuffs for those working with noise producing equipment.	Project Construction Contractor	50,000
	Dust Emissions - Dust will be emitted during excavation and related earthworks.	- Strict measures are to be applied for the handling of construction materials in powder form such as cement, lime, concrete additives, etc. and for the disposal of the packaging. - Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present. - Minimizing the number of motorized vehicles on use. - Wet all active construction areas as and when necessary. - Vehicle speeds be limited to a maximum of 30Km/hr. - A monitoring and evaluation program for air quality shall be implemented and reported on throughout the construction phase cycle.	Project Construction Contractor	100,000
	Workers, Community Health and Safety Risks during Construction - Construction workers and the communities are likely to have injuries and hazards at the construction works, unavoidably exposing them to occupational health and safety risks.	- Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer and the Proponent's Environmental & Safety Officer. - Construction workers, the supervision team and authorized visitors to construction sites to be provided with Personal Protective	Project Construction Contractor	200,000

	Equipment (PPEs) including gloves, gumboots, overalls and helmets. - Use of PPE to be enforced by the Environmental & Safety Officer. - Fully stocked First Aid Kits to be provided within the sites, camps and in all Project vehicles. - Isolate the site for access by the local communities during the construction for their safety and health. - Use of warning signage and tapes where the trenches are open and at other active construction sites.		
Labour influx and effects of immigrat workers -The project will need to employ labourers and although most of the unskilled and semi-skilled labour requirements could be filled locally (from within the project areas), congregation of potential labourers from outside the project areas is likely, as they seek employment opportunities.	- Contractor should use the local workforce as much as possible (preference to local community members on skills locally available). - Effective community engagement and strong grievance mechanisms on matters related to labour - All workers to sign an employment contract including a Code of Conduct governing appropriate behaviour. - The workforce should be sensitized to local social and cultural practices and be educated on the expected behaviour and conduct. - Contractor should prepare and implement a gender action plan.	Project Construction Contractor	Contractor's Cost
HIV /AIDS & other communicable diseases - Indirect impacts on the community can be the introduction of new communicable diseases such as HIV/AIDS due to in-migration for job opportunities, poverty, and prostitution.	- The contractor at the time of Project implementation will develop appropriate training on potential spread and awareness materials for Information, Education, and sensitization of workers during project construction phase. - Develop an intervention strategy compatible with the construction program to address success of the HIV/AIDS prevention and provide peer educators for sustainability in collaboration with other stakeholders. - Integrate monitoring of HIV/AIDS preventive activities as part of the construction supervision. Basic knowledge, attitude and practices are among the parameters to be monitored, and particularly on provision of condoms, status testing and use of ARVs.	Project Construction Contractor	100,000
Child Labour - Due to provision of cheap labour and differentiation in bargaining power, the underage workers may	- The contractor will comply with national and international labour laws in recruiting construction staff. - All workers will be required to produce their national identification cards to confirm their age.	Project Construction Contractor	Contractor's Cost

	be employed leading to exploitation.	- Ensure no children are employed on site in accordance with national labour laws. This can be done through incorporating prohibitive provisions in the code of conduct and having the recruitment policies that prohibits child labour. - Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.		
	Sexual Exploitation and Abuse (SEA) & Gender-Based Violence (GBV) - Due to vulnerability of women, they could be taken advantage of in the Project workplace in order to receive what is due to them or favours. GBV incidences may increase due immoral behaviours arising from increased cash flows for the construction workers.	- Develop and implement code of conduct, signed by all workers. - Provide training and awareness programs to project contractor's staff, and community members on GBV and sexual harassment prevention and reporting. - Collaborate with local communities, leaders, and women's groups to address concerns related to GBV and sexual harassment. - Collaborate with local law enforcement and authorities to address and prevent GBV incidents. - Implement clear and confidential reporting mechanisms for any incidents of GBV or sexual harassment. - Contractor should prepare and enforce a No Sexual Harassment and Non-Discrimination Policy.	Project Construction Contractor	145,000
Cost Estimates for the Construction Phase				**1,530,000**
OPERATIONAL PHASE				
Operations of the constructed project	Illegal connection to the new pipeline	- The project proponent will ensure that communities living along the pipeline route are adequately served with piped water. - The proponent will also conduct water balance studies and NRW audits to identify and plug points of water loss.		Proponent cost
	Generation of liquid and solid wastes	- The County Government of Machakos & MAVWASCO to expand the sewerage system in Athi River Town. - Solid wastes generated during repair and maintenance activities will be collected and disposed-off in designated manner.	County Government of Machakos MAVWASCO	Proponent cost
	Health and Safety Hazards	- Train all workers on Health, Safety and Environment (HSE) with an aim of improving awareness. - The proponent will erect appropriate safety signage during repair and maintenance activities.	MAVWASCO	Proponent cost

		- The proponent shall provide first-aid facilities for repair and maintenance staff.		
	Improved and reliable water supply for the residents of Athi River Town.	- Positive impact, no mitigation measures. - Improve customer experience through better water supply services. - Reduction of water outages/ rationing. - Expansion of coverage area.	MAVWASCO	-
	Increased reliability of water supply to the residents of Athi River Town.	- Positive impact, no mitigation measures. - Reduction of water outages/ rationing.	MAVWASCO	-

8 ENVIRONMENTAL AND SOCIAL MONITORING PLAN (ESMoP)

8.1 Overview

This chapter captures the environmental and social monitoring indicators for the anticipated negative impacts as highlighted in Table 8-1. The preparation of the plan was informed and guided by the indicators that were anticipated in WSDP project Environmental and Social Management Framework 2017. The institution responsibilities for implementation and supervision are presented in Section 3 of this report. The progress reports prepared, incorporating ESMP implementation status, shall be on monthly and quarterly basis. The client (MAVWASCO) through the project supervising engineer and social safeguards Specialist deployed for implementation supervision shall review the reports and submit to the World Bank. In addition to regular reporting, all ESHS incidents, accidents, dangerous occurrences including occupational diseases shall be promptly reported to the respective regulatory institution in the prescribed manner and template outlined in DOSH ML/DOSH/FORM 1 and further to the World Bank in line with the requirement of the Occupational Health and Safety Act (OSHA) 2007, EMCA CAP 387, and World Bank EHS guidelines. Investigation shall be conducted, and a corrective action plan developed for every reportable incident to prevent recurrence.

8.2 Purpose and objectives of ESMoP

The purpose of the Environmental and Social Monitoring Plan (ESMoP) for the proposed project is to initiate a mechanism for implementing mitigation measures for the potential negative environmental impacts and monitor the efficiency of these mitigation measures based on relevant environmental indicators. The Environmental and Social Mitigation and Management Plan has identified certain roles and responsibilities for different stakeholders for implementation, supervision and monitoring.

The objectives of the ESMoP therefore are:

- To ensure that the recommendations in the approved ESIA report are adhered to by the various institutions.

  To ensure that the environmental and social mitigation and their enhancement actions are well understood and communicated to all involved stakeholders.
- To ensure that the proposed environmental and social remedial measures are implemented during the project execution stage.
- To evaluate the effectiveness of environmental and social remedial measures.
- To evaluate the effectiveness of various evaluation techniques and procedures.
- To provide the Proponent and the relevant Lead Agencies with a framework to confirm Compliance with relevant laws and regulations.

Conversely, environmental monitoring provides feedback about the actual environmental impacts of the project. Monitoring results help judge the success of mitigation measures in protecting the environment. They are also used to ensure compliance with environmental standards, and to facilitate any needed project design or operational changes. A monitoring program, backed up by powers to ensure corrective action when the monitoring results show it necessary, is a proven way to ensure effective implementation of mitigation measures. By tracking the project's actual impacts, monitoring reduces the environmental risks associated with the project and allows for project modifications to be made where required.

TABLE 8-1: ENVIRONMENTAL AND SOCIAL MONITORING PLAN (ESMOP)

Activity	Location	Means of Monitoring	Frequency	Responsible Agency	
				Implemented by	Supervised by
Occupational Health and Safety	Construction site	- Visual inspection of first aid area, - Injury reporting mechanism, - WIBA insurance policy, - Appropriate use and wearing of PPE, - Training programs for workers, health and safety plan prepared for site, - Clean drinking watering points, - Safety training certificates, gloves, earplugs, safety boots, reflector jackets, drinking water, nose mask, helmet, overall, sanitation facilities.	Daily	Contractor	Project Supervising Engineer E&S Expert
Public health	Areas surrounding the construct ion site.	- Visual inspection of site for; safety signs at strategic places, - Cordoned off working sites to protect the public or unauthorized persons, usage of signs and warnings on sites with high risks. - Low speeding of construction vehicle and consideration of wind action. - No. of reported injuries and accidents and No. of grievances reported.	Weekly	Contractor	Project Supervising Engineer E&S Expert
Leakages and spills of greases, oil or fuel	Contractor's yard and construct ion site	- Visual inspection of hazardous waste leakage or spills to soils on site, - records of cutting pits for disposed off contaminated soils, - Developed site-specific incident management or response plan.	Weekly	Contractor	Project Supervising Engineer E&S Expert
Noise and vibrations	Construction site	- Use equipment with low noise levels or fitted with mufflers. - Visual inspection of site for use of PPE, - Use of soundproof materials, - Notices to public on noisy construction activities, restricting noisy activities daytime. - Regular measurement of noise levels through mobile phone gadgets.	Weekly	Contractor	Project Supervising Engineer E&S Expert
Air quality	Construction site and along construct ion vehicle movement routes	- Physical inspection of vehicles records to ensure meets emission requirements, - Use of masks while working in dusty conditions, - Shielding wind impacts during construction,	Daily	Contractor	Project Supervising Engineer

		- Low speed of construction vehicle, catalytic devices on vehicle and suppress dust.			
Waste generation	Construction sites	- Visual inspection of; sanitation facilities for human waste management, - Amount of waste correctly disposed, - Visual inspection of haphazard littering, - Practicing of waste avoidance, reduction, reuse and recycle, - Designated waste transfer stations onsite, - Documented approved waste dumping site, - Presence and compliance to implementations of site-specific waste management plan.	Monthly	Contractor	Project Supervising Engineer E&S Expert
Impacts on Soil	Construction sites	- Physical Inspection	Monthly	Contractor	Project Supervising Engineer E&S Expert
Impacts on water sources	Water sources	- Physical inspection - Chemical inspections	Monthly	Contractor	Project Supervising Engineer E&S Expert
Labour and employment related issues	Construction site and contractors' office	Physical counts and inspection of records on; - No. of locals employed on the project from the employment records. - No. of Grievance recorded from employees and how they were addressed resolved.	Weekly	Contractor	Project Supervising Engineer E&S Expert
Immigration of workers	Construction site and office	- Review of records - Interviews with staff and local community	Monthly	Contractor	Project Supervising Engineer E&S Expert
Gender Equity and Sexual Harassment	Construction sites	- Number of female employees - Number of male and female toilets - Complaints from female employees	Weekly	Contractor	Project Supervising Engineer E&S Expert
Damage to private property	Project area	- Review of records - Interviews with staff and local community	Daily	Contractor	Project Supervising Engineer

8.3 Auditing of Environmental and Social Management and Monitoring PLAN (ESMMP)

The contractor shall conduct regular audits to the ESMMP to ensure that the system for implementation of the ESMMP is operating effectively. The audit shall check that a procedure is in place to ensure that:

- The ESMMP being used is the up-to-date version.
- Variations to the ESMMP and non-compliance and corrective action are documented.
- Appropriate environmental training of personnel is undertaken.
- Emergency procedures are in place and effectively communicated to personnel.
- A register of major incidents (spills, injuries, complaints) is in place and other documentation related to the ESMMP.
- Ensure that appropriate corrective and preventive action is taken by the Contractor once instructions have been issued.

8.4 Management Responsibility of ESMMP

To ensure the sound development and effective implementation of the ESMMP, it will be necessary to identify and define the responsibilities and authority of the various persons and Organizations which will be involved in the project. The following entities shall be involved in the implementation of this ESMMP:

- Project Proponent (MAVWASCO).
- NEMA.
- Contractor.
- Works construction supervision team.

8.4.1 National Environment Management Authority (NEMA)

The responsibility of NEMA is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government of Kenya in the implementation of all policies relating to the environment.

8.4.2 The Contractor

The persons/firms contracted to lay the proposed water pipeline will be required to comply with the requirements of the ESMMP below and should form part of the contract documents.

8.4.3 Works Construction Supervisions Consultant

The sourced consultant will have to ensure that the proposed ESMMP is up to date and is being used by the contractor. Periodic audits of the ESMMP will have to be done to ensure that its performance is as expected.

8.4.4 County Government of Machakos

The relevant departmental officers in the above County government will be called upon where necessary during Project implementation to provide the necessary permits and advisory services to the Project implementers. The County Government of Machakos under the MAVWASCO will operate the Project once commissioned.

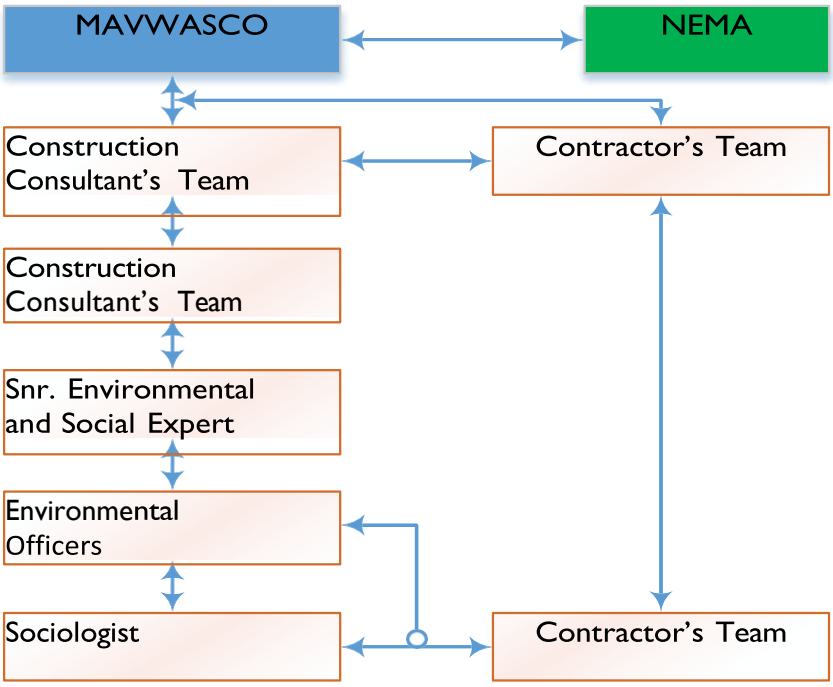


Figure 8.1: Administrative arrangement for the ESMMP

9 CHANCE FIND PROCEDURES

9.1 Purpose of the Chance Finds Procedure

The chance find procedure is a project-specific procedure that outlines actions required if previously unknown heritage resources, particularly archaeological resources, are encountered during project design, construction, or operation. It is a process that prevents chance finds from being disturbed until an assessment by a competent specialist is made and actions consistent with the requirements are implemented.

9.1.1 Responsibility

Mavoko Water & Sewerage Company (MAVWASCO) as the implementation institution is responsible for siting and designing the project to avoid significant damage to cultural heritage. When the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations, the client will implement chance find procedures established through the Social and Environmental Assessment. The client will not disturb any chance finds further until an Assessment by a competent specialist is made and actions consistent with the requirements of this Performance Standard are identified.

9.1.2. Scope of the Chance Finds Procedure

This procedure will be applicable to all activities conducted by the personnel, including contractors for the project that have the potential to uncover a heritage item/site. The procedure details the actions to be taken when a previously unidentified and potential heritage item/site is found during construction activities. Procedure outlines the roles and responsibilities and the response times required from both project staff, and any relevant heritage authority.

9.1.3. Induction/training

All personnel, especially those working on earth movements and excavations, are to be inducted on the identification of potential heritage items/sites and the relevant actions for them with regards to this procedure during the Project induction and regular toolbox talks.

9.1.4. Details on Chance Find Procedures

If any person/worker under the project discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction, the following steps shall be taken:

- Stop all works in the vicinity of the find, until a solution is found for the preservation of these artifacts, or advice from the relevant authorities is obtained from the National Museums of Kenya (NMK).
- Immediately notify the foreman. The foreman will then notify the Site engineer and the Environment Officer of the contractor.
- Record details in Incident Report and take photos of the find.
- Delineate the discovered site or area; secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities take over.

- Preliminary evaluation of the findings by archaeologists. The archaeologist must make a rapid assessment of the site or find to determine its importance. Based on this assessment the appropriate strategy can be implemented. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage such as aesthetic, historic, scientific or research, social and economic values of the find.
- Sites of minor significance (such as isolated or unclear features, and isolated finds) should be recorded immediately by the archaeologist, thus causing a minimum disruption to the work schedule of the Contractor. The results of all archaeological work must be reported to the NMK, once completed.
- In case of significant find the NMK, will be informed immediately and in writing within 7 days from the find.
- The onsite archaeologist provides NMK with photos, other information as relevant for identification and assessment of the significance of heritage items.
- The NMK will investigate the fact and provide response in writing.
- Decisions on how to handle the finding shall be taken by the responsible authorities which is NMK. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration, and salvage.
- Construction works could resume only after permission is granted from the responsible authorities.
- In case no response received, this will be considered as authorization to proceed with suspended construction works.

One of the main requirements of the procedure is record keeping. All finds must be registered. Photocopy of communication with decision making authorities, conclusions and recommendations/guidance, implementation reports are kept.

M**anagement options for archaeological site**:

- **Site avoidance:** If the boundaries of the site have been delineated attempt must be made to redesign the proposed development to avoid the site. (The fastest and most cost-effective management option).
- **Mitigation:** If it is not feasible to avoid the site through redesign, it will be necessary to sample it using data collection program prior to its loss. This could include surface collection and/or excavation. (The most expensive and time-consuming management option.).
- **Site Protection:** It may be possible to protect the site through the installation of barriers during the time of the development and/or possibly for a longer term. This could include the erection of high visibility fencing around the site or covering the site area with a geotextile and then capping it with fill. The exact prescription would be site- specific.

10 GRIEVANCE REDRESS MECHANISM (GRM)

10.1 Introduction

A key principle of any development is to prevent or minimize grievances rather than going through a redress process. This can be achieved through commitment to full participation and consultation of the stakeholders and establishing extensive communication and coordination between the affected communities, and the envisioned development. However, this does not always preclude grievances from arising. This ESIA process provides opportunities for the likely to be affected parties to air and articulate their queries, concerns, issues, complaints, dissatisfaction or sense of injustice or unfairness, and seek to have these resolved amicably, and in the shortest time possible. Affected parties should be able to file a grievance for any disagreeable decision, practice or activity, arising from proposed development. Therefore, a Grievance Redress Mechanism (GRM) as a mechanism, or set of procedures and processes, or organizational systems and resources, has been established to be used as a means to hear, address and resolve issues and complaints related to the proposed project implementation. The stakeholder input handled through these systems and procedures may be called grievances, complaints, feedback, or any other functionally relevant terminology or concept.

10.2 Potential Grievances

In practice, some of the possible grievances that can be anticipated or are most likely to occur during implementation of the project may include:

- Disagreement over opportunities offered to the community, for instance on job opportunities, loss of livelihoods, loss/decrease of business or income etc.
- Interruption of public, community, social or other services and infrastructure e.g., water.
- Damage to un-expropriated public / community assets such as roads

10.3 Objective of a Grievances Redress Mechanism

Essentially, GRMs are designed as a conduit for soliciting inquiries, inviting suggestions, and increasing participation in developments. The proposed GRM has been established to:

- Generate public and stakeholder awareness about the proposed project and its objectives.
- Increase stakeholder involvement in the Project implementation.
- Improve proposed project outcomes through timely resolution of issues and problems. (The GRM will contribute to timely achievement of the project's objectives).
- Provide feedback to different levels of the project performance i.e., providing management with practical suggestions/feedback.
- Act as an early warning mechanism / effective risk management tool to identify and resolve implementation problems in a timely and cost-effective manner.
- Build community relations / legitimacy among stakeholders; through creating and maintaining trust with affected persons and the stakeholders.
- Allow the development management team to be more accountable, transparent and responsive to stakeholders.
- Deter or curb fraud and corruption.

- Assess the effectiveness of the proponent's processes but also improve the operational processes and performance.

10.4 Guiding Principles for an effective Grievance Redress Mechanism

There are several guiding principles that drive the design of an effective GRM. GRMs that involve these principles are more likely to provide effective resolution of grievances. Some of the key GRM principles are as follows: -.

- Start early in the project cycle: GRM (or at least the lowest Level institution at PAP level should be put in place as early as possible, and later modified as need arises.
- Simple and Accessible: Should be known to the intended users and accessible to diverse members of the community, with multiple points of entry and access.
- Legitimate: Enabling trust from the stakeholders intended to use it
- Participatory and Inclusive: Should be developed in a participatory manner and include representatives from the main actors/categories relevant to the area.
- Contextualization and appropriateness (e.g., Cultural and Context Sensitive): Should be localized to ensure it's appropriate to the local context, keeping in line with local cultural or traditional structures for raising and resolving issues.
- Responsive, Timely, and Efficient: Should be responsive to the needs of all complainants, and resolutions should be reached in the soonest time possible to discourage lengthy suits that are time wasting.
- Transparency / fairness / impartiality: Users must be clearly informed on how they can access the mechanism and be given fair and impartial resolutions without fear of reprimand.
- Formalized: The mechanism needs to be formally established, predictable and well known, and not ad hoc. It needs rules for addressing grievances, holds regular meetings/deliberations on specific and well-known days to discuss the issues. Clearly laid out and expected timetable for key process milestones is essential.
- Appropriate Protection: The mechanism should prevent retribution and should not impede access to other remedies such as legal reprieve.

10.5 The Proposed Grievance Structure

This ESIA proposes a four (4) - tier grievance redress mechanism:

- Community / Stakeholders Level
- Management Level – project Implementation Team
- Water Sector Trust Fund
- World Bank

Table 10.1: Grievance redress mechanism summary

	Institution	Membership	Functions
1	Grievance Redress Committee/ Community Stakeholders Level (community	• Established at the community / Stakeholders' level with membership from the project area. Consists of a 7 -11member	• Assist community / stakeholders to file a complaint. • To address affected persons grievances as 1st,

	Liaison Officer - CLO).	committee (exclusive of ex official members). • Membership should be drawn from a variety of factors including affected persons (all gender, elders' representatives, and youth in cognizance of local dynamics). • A representation of the local government administration i.e., chief and assistant chief as Ex official default members with no voting rights.	point of contact, within 15 days.
If no amicable solution or settlement is reached, the aggrieved person is not satisfied or does not hear from the GRC through CLO within the required time limits (15 days), they can escalate the grievance to the next level.			
2	Management Level – The project Implementation Team	• The proponent will consider grievance reports forwarded to it and make a determination. • Membership consists of the management team. • The CLO may be invited to the meeting to give a highlight and account of grievances.	• Escalation Mechanism to determine grievances unresolved by GRC within 15 days. • Responsible for monitoring the complaints. • Providing inputs into the monitoring and evaluation process i.e., quarterly reports on grievances handled.
3	Water Sector Trust Fund	Through the proponent, the grievances not concluded at the management level can be forwarded to WSTF for further review.	Resolves matters forwarded from the implementation team. Should WSTF be unable to resolve, it will be escalated to World Bank
4	World Bank	Grievances not resolved at WSTF level will be escalated to World Bank	Review and attend to matters received from WSTF.

The aggrieved person can go Court as a last resort. Given the above mechanism it is not foreseen that many disputes will end up in court.

Court of Law

- The aggrieved party may seek legal deals specifically with land and redress and at their own cost.
- The legal option will act as a last resort and will be sort after all other redress medium have been exhausted unsuccessfully.

11 CONCLUSION AND RECOMMENDATIONS

11.1 Conclusion

Through the assessment and evaluation of all potential environmental and social impacts of the proposed construction of pipeline extensions to Graceland & Jam-City Estates and installation of zonal/consumers water for DMAs in Athi River Town, it is concluded that the Project will have net ecological, economic, social and health benefits to residents of the target Project areas.

Project activities that are envisaged to have potential less significant negative impacts at different phases of the project implementation have been assessed in detail in this Report and appropriate Mitigation Measures proposed. To mitigate the potential negative impacts and to make the Project environmentally and socially sound, Environmental and Social Management and Monitoring Plans (ESMMPs) have been prepared for implementation. The ESMMPs include the Mitigation Plan, the Monitoring and Enforcement Requirements, and the Responsible Persons/Organizations. All the recommendations/ mitigations mentioned in the assessment will be financed and incorporated in the construction and supervision contracts.

The main findings from the assessment described in the Report are as follows:

- The Environmental and Social Scoping undertaken for the project indicate that the investment will result in low impact on biological environment; however, the Project triggers World Bank Operational Procedure 4.01 on Environmental Assessment.
- The proposed project is likely to have minimal or no adverse environmental impacts and therefore been categorized as B. A Comprehensive Project Report (CPR) on the proposed Project has been prepared for approval by NEMA.
- A Provisional Budget that is required for implementation of mitigation measures of potential negative environmental shall be included in the Project Implementation costs.
- The proposed pipeline extensions will be installed along the wayleaves on public roads with no encumbrances and therefore there are no Project Affected Persons (PAPs) requiring any form of compensation due to disturbances during the implementation of works.

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11.2 Recommendations

The project is recommended for implementation provided that the mitigation measures identified in the study for the potential negative impacts are implemented, the recommendations will also form part of NEMA License that will be issued for the Project.

i. Contractor will be required to commit to implementing the Environment, Social Health and Safety (ESHS) Provisions by developing site specific (ESHS) plans.

ii. At Project implementation period, the Contractor reports to the Project proponent on monthly basis, on how ESHS provision detailed in this ESIA are addressed at each Project/activity Site.

iii. On completion of the Civil Works, MAVWASCO will commission an independent Consultant to undertake an initial Environment, Social, Health and Safety Audit as required by Environment

Impact Assessment and Audit Regulations of 2003. The audit will identify non-conformities which the Contractor will address through the defect's liability period of the Project.

iv. The Contractor is encouraged to engage the locals for casual employment opportunities for temporary income, enhanced acceptability of the project and building local human capacity.

v. Involve representatives of the communities within the project corridor at the initial stages of the construction to address public amenities' routing and roadside services.

REFERENCES

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2. Kenya gazette supplement number 56. Environment Impact Assessment and Audit Regulations 2003. Government printer, Nairobi
3. Kenya gazette supplement number 69. Environmental Management and Coordination (waste Management) Regulations 2006. Government Printer Nairobi.
4. Kenya gazette supplement number 68. Environmental Management and Coordination (water quality) Regulations 2006. Government Printer.
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6. Kenya gazette supplement Acts Public Health Act (Cap. 242). vii. World Bank Operational Safeguards Policies on Environment and Social Risks.
7. Machakos County Integrated Development Plan (2017 – 2022)

ANNEXES

ANNEX I: SAMPLE QUESTIONNAIRE RESPONSES

MAVWASCO QUESTIONNAIRE 1.pc

MAVWASCO QUESTIONNAIRE 2.pc

ANNEX II: MINUTES OF CONSULTATIONS MEETING AND ATTENDANCE LIST

MINUTES OF MEETING - MAVWAS(

LIST OF ATTENDANCE - MAV\

ANNEX III: LETTER FOR AUTHORIZATION OF PIPELINE INSTALLATION WITHIN KMC LAND

MAVOKO KMC Water request.pdf

ANNEX IV: LAYOUT MAPS FOR THE TARGET GRACELAND & KMC ESTATES

MAVOKO GraceLand_Estate_Prc

Graceland Estate proposed pipelines extensions

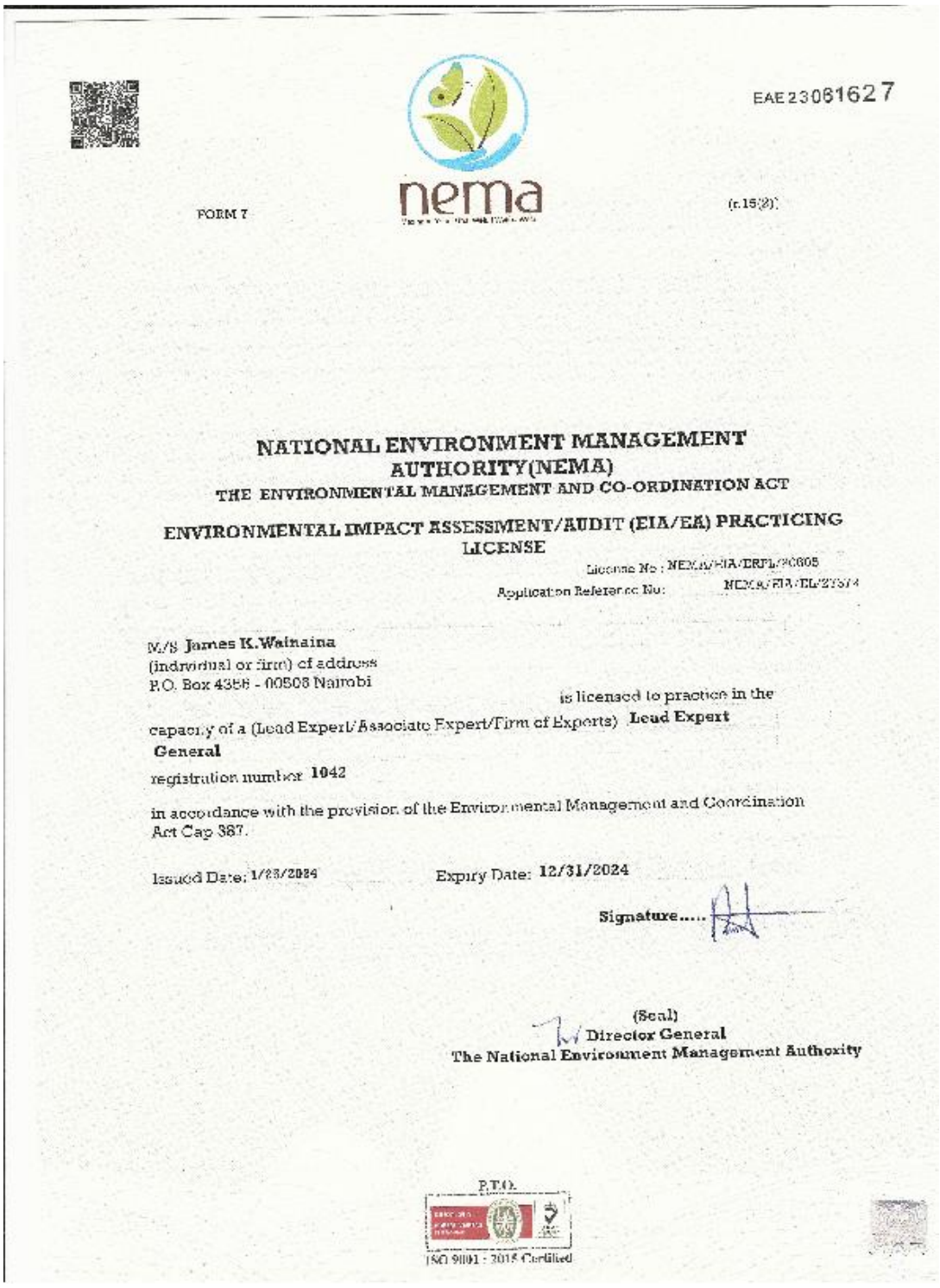
MAVOKO ESIA Map_Showing_Propo:

KMC Estate proposed pipelines extensions

ANNEX V: BOQs AND COST ESTIMATES FOR THE PROPOSED MAVOKO WSP

MAVOKO WSP
PROJECT BOQ.pdf

ANNEX VI: ESIA STUDY TEAM LEADER's NEMA LICENCE - 2024



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FORM 7 (r.15(2))

nema

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/20605

Application Reference No: NEMA/EIA/EL/27574

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registration number **1042**

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

Issued Date: 1/23/2024 Expiry Date: **12/31/2024**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001 : 2015 Certified