



Ministry of Water, Sanitation and Irrigation

CONDITIONAL LIQUIDITY SUPPORT GRANT (CLSG) II PROJECT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT

PROPOSED CONSTRUCTION OF 23.5KM HDPE PIPELINES AND INSTALLATION OF 225 NR DN15 WATER METERS - KIAMBU WATER AND SEWERAGE COMPANY (KIWASCO)

DECEMBER 2024

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Environmental Impact Assessment (ESIA) Study for the proposed Construction of 23.5km HDPE pipelines and installation of 225nr DN15 water meters for Kiambu Water & Sewerage Company (KIWASCO) in Kiambu County

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).

Report Title: Environmental Impact Assessment (ESIA) Study for the proposed construction of 23.5km HDPE pipelines and installation of 225 nr DN15 water meters - Kiambu Water and Sewerage Company (KIWASCO)

Proponent: Kiambu Water and Sewerage Company (KIWASCO)

Activity: Preparation of Environmental Impact Assessment (ESIA) Study for the proposed construction of 23.5km HDPE pipelines and installation of 225 nr DN15 water meters - Kiambu Water and Sewerage Company (KIWASCO)

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ABBREVIATIONS AND ACRONYMS

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
ESHS	Environmental, Social Health and Safety Guidelines
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
KIWASCO	Kiambu Water and Sewerage Company
KENHA	Kenya National Highways Authority
KURA	Kenya Urban Roads Authority
LA	Land Act
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
PPE	Personal Protective Equipment
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. Kiambu Water and Sewerage Company (KIWASCO) 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.

Kiambu Water & Sewerage Company Ltd (KWCL) was incorporated under the Companies Act (Cap. 486) in 2006 and is an agent appointed by Kiambu County Government to ensure efficient and economical provision of water and sewerage services within Kiambu Sub-County. The service area comprises of four wards, namely Ndumberi, KiambuTownship, Riabai and Ting'ang'a. The total geographical area of jurisdiction is 105 square kilometers with a population of 145,698 according to the 2019 census.

KIWASCO has proposed the construction of 23.5km HDPE pipelines and installation of 225 nr DN15 water meters under the CLSG II Program to improve water supply services for the residents of Kiambu Town, Ndumberi, Riabai & Ting'ang'a Wards in Kiambu County. The installation of water meters will improve billing and revenue collection by KIWASCO. Although the implementation of such a development project will generate positive socio-economic benefits, it could also have 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 any 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 Descriptions

Project Location

The proposed project is located within Kiambu Town (Thindigua), Ndumberi , Riabai & Ting'ang'a Wards Kiambu in Kiambu County.

Scope of Works

The Scope of Works for the proposed project include:

- Construction of 23.5km HDPE pipelines.
- Installation of 225 nr DN15 water meters.

- Supply of Motorcycles and other equipment for improvement of meter readings and improvements of revenue collections.

The estimated cost of the proposed project is **KES 15,774,900**

The source of water for the proposed pipelines extensions is the Kiambu Urban Water Supply system (Riara & Kamiti Water Treatment Plants) with a total production capacity of 8,000m3/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.

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. Utilized Methodology

The general methodology utilized has focused on:

- Review of existing documents on the proposed 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 also 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
- Public Participation Bill of 2023
- 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.

Applicable World Bank Operational Policies

Safeguards Policy	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 4.11 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.
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 screenings along the wayleaves have been undertaken and confirmed that the proposed project does not involve any resettlements of PAPs. However, 33 PAPs will be affected during the installation of pipelines due to temporary disruptions of the livelihood income activities. Consultations with Road Agencies (KENHA, KERRA, KURA & County Roads) have been done to establish the requirements for the necessary permits to install pipelines on the road reserves. The application forms and requirements from the Road Authorities have been attached in the ESIA Report as Annex V.

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 Areas

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.

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. Public consultation process was undertaken between 13/06/2024 and 15/06/2024 through administration of an open-ended questionnaire aimed at introducing the project to the residents, gathering their views and concerns related to the project and incorporating their views into the Study Report.

Key Informant Interviews

The key informant consultations were conducted on the 14th & 15th 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. The outcome of the Key Informant Interviews is summarized below:

	Key informant interviewed	Summary of remarks
1	Managing Director - KIWASCO	• The proposed pipeline extensions to Thindigua, Ndumberi, Riabai & Ting'ang'a areas will solve the persistent water problems. • With the anticipated increase in bulk water from the soon to be commissioned Northern Collector Tunnel which is under implementation by Athi Water Works Development Agency (AWWDA), Kiambu Town and the environs will be getting adequate water for distribution.
2	Technical Manager - KIWASCO	• KIWASCO will be receiving about 5,000M3 of water from the recently completed Kigoro Water Treatment Plant and the Kigoro – Gigiri bulk water transmission pipeline under AWWDA. • KIWASCO therefore need to expand the distribution system for the last mile connectivity.
3	Commercial Manager - KIWASCO	• The procurement and installation of water meters will significantly improve on the management of Non-Revenue Water (NRW). • The new water meters will be installed as a priority for the connections on the new pipeline extensions under the proposed project. • Revenue generation for KIWASCO is expected to increase.
4	Field Technical Officers – KIWASCO (Pipelines Operations & Maintenance Team, Meter Readers.	• Hoped that the installed pipelines and water meters will be of good qualities to prevent pipe burst and loss of water. • High quality water meters will improve on the accuracy of meter reading for increased revenues and minimizing complaints from the customers.
5	Bulk Water & Transmission Pipelines Manager (AWWDA)	• AWWDA has also developed Karemenu Dam in Gatundu North Sub-County in Kiambu County. Karemenu Dam water treatment plant has capacity to produce about 73,000 m3/day with bulk of the water being supplied in Kiambu County. • With the increased supply of water to Kiambu County, the proposed pipeline extensions in the proposed Project areas will be receiving sufficient water.

6	KENHA Roads Maintenance Engineer – Kiambu County	• The KENHA Engineer indicated that the proposed pipeline extensions will be partly installed along KENHA managed roads within Kiambu Town Sub-County. • KENHA has provided adequate wayleaves along the road reserve for installation of utility services such as water pipelines and there are existing pipelines already installed. • The project proponent will be required to obtain permit to install the pipelines after paying the prescribed fees to KENHA. • KENHA will carry out inspections during the installation of pipelines to ensure that pipelines are installed at the authorized locations along the road reserves.
7	Engineer in Charge – KURA, Kiambu County	• KURA is responsible for urban road infrastructure in Kiambu including Kiambu Town and the main trading centres, Kirigiti, Riabai, Ndumberi & Ting'ang'a included. • The proposed project proponent (KIWASCO) will need to obtain permit for pipeline installation along the road reserves. • After the installation of pipelines, proper pipe location indicators will be installed to clearly mark the pipelines alignment. • KURA will provide all the necessary support during the implementation of the proposed project including timely issuance of permits to the implementation Agency (KIWASCO).
8	Regional Director - Kenya Rural Roads Authority (KERRA), Kiambu Region	• The proponent will be required to provide layouts and designs of the proposed pipelines along KERRA Managed roads and apply for permits before works commence. • KERRA Engineers will visit sites to ensure the pipelines alignments are within the permitted sections within the road reserves. • Proper markings for the installed pipelines will be required to guide other utilities on the pipelines' locations.
9	Sub-County Water Officer (Kiambu Sub - County)	• The residents of Township, Ndumberi, Riabai & Ting'ang'a Wards have for a long time been complaining of lack of adequate water supply. • The areas are under severe water rationing, getting water for only 2 days in a week. • With the increase in bulk water and the proposed pipeline extensions, water shortages will be addressed.

10	Sub-County public Health officer (Kiambu Sub-County)	• Various water borne diseases particularly among the children have been reported in Kiambu Level 5 Hospitals as well as in other health facilities in Kiambu Town Sub – County. • The proposed project should improve water supply situation in the target areas and help in minimizing water related disease cases.
11	County Engineer (Roads & Public Works) – Kiambu County	• The County Government of Kiambu is responsible for County Roads under the Roads ACT. • GATWASCO will need to provide layout plans for the proposed pipelines within the residential estates. • Some of the roads within the estates along Kenyatta Road have been earmarked for tarmacking and therefore the pipelines should be installed within the provided wayleaves to prevent damage during the construction of estate roads.
12	Ward Administrators – Township, Ndumberi, Riabai & Ting'ang'a Wards	• Kirigiti, Thindigua, Ndumberi, Riabai & Ting'ang'a areas are fast growing suburbs due to proximity to Nairobi. There is need to upgrade the infrastructure in the areas so as to cope with the increasing population. • It is observed that the proposed pipelines extensions will be installed within the wayleaves set aside for public utility services along the public roads. • There for, there shall be no requirement for compensations due to relocations of people and businesses.
13	Chiefs and Assistant chiefs - Township, Ndumberi, Riabai & Ting'ang'a Locations.	• The local National Government officials will provide the necessary security to the implementation team during the construction phase. • However, the hired contractor should be encouraged to employ as many locals as possible so that they can benefit from the project.
14	Kenya National Chamber of Commerce & Industry (KNCCI) – Kiambu Chapter	• The KNNCI Kiambu Chapter through the Chairman raised the following concerns: - Kiambu Town and its environs has a severe water shortage and this has discouraged potential investors. - Kiambu Town is only 12 Km from Nairobi CBD and improved services on water, sewerage and roads can significantly spur growth in commerce and industry. - The County and National Governments need to expand the sewerage system within Kiambu town to attract investors and manage wastewater.

15	Director - Ndumberi Dairy Farmers Co-operative Society Ltd	• Ndumberi Dairy Farmers Co-operative Society Ltd., a small cooperative of just 1,054 members, each of whom raise up to five cows on small parcels of peri-urban land. • Ndumberi processes about 15,000 liters of milk per day, on average. • Most of the members come from Ndumberi, Ting'ang'a and Riabai wards in Kiambu County. • Adequate water supply is not only critical for domestic use but also for milk production (dairy farming) and processing. • The Co-operative Society Is eagerly waiting for the implementation of the proposed project with very high expectations that the water supply challenges will now be solved to improve dairy farming and provide domestic water to the local residents.
16	Chairman – Ting'ang'a Market Traders Association	• Ting'ang'a ultra-modern Market was constructed about 3 years ago with the partnership between the National & County Governments. • Currently, about 900 traders are operating in the market doing all types of businesses. • Water supply and sanitation has been a major issue for the market which has significantly affected various businesses particularly those involved in food and service industry. • The management of the market hopes that with the implementation of the proposed project, businesses will greatly thrive for the benefit of the business community.

Project Areas Community Consultations

Public meetings were held in Riabai & Ting'ang'a Locations (14/6/2024 and Kirigiti & Ndumberi Locations 15/6/2024. The recorded attendances were 19 No. in Riabai, 27 No. in Ting'ang'a, 31 No in Kirigiti and 23 No. in Ndumberi. Some of the key concerns and issues raised by stakeholders included:

- Assurance of water supply services adequacy and reliability after implementation of the proposed project.
- Local considerations in the employment opportunities during implementation of the Project.
- Roadside livelihoods disruptions during the construction of the water distribution extension pipelines.
- Income generation opportunities to local suppliers and traders during construction phase.
- Water tariffs, affordability and willingness to pay.

In all the public meetings, the participants agreed that the proposed project will have minimal environmental, socio-economic and cultural concerns that would inhibit its implementation.

9. Potential Environmental and Social Impacts

The observations from field visits and the perspectives of the residents & leadership as well as from other stakeholders were assessed and considered. Based on the evaluation of the risks/impacts that will result from the proposed activities, it can be concluded that the risks and impacts are minor and limited in scale and time.

Positive Impacts

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

Table 0-1 Summary of positive impact due to project implementation Impacts

Impact Category	Positive impacts due to project implementation
Water supply distribution	- Enhanced water supply distribution and integration with existing County planning and development. - Improve affordable, clean, reliable water supply within Project area. - Improved water billing and reduction of Non- Revenue Water (NRW) through the installation of new water meters.
Project Area Economic Growth & Employment Opportunities	- Employment opportunities during construction, unskilled and mid-skilled level labour will be sourced from the local market. - Market for construction materials such as sand, cement, and ballast. - Transfer of technological skills and knowledge to the local sector through the artisans employed and trained by the Project. - Injection of funds into the local economy. - Increased property values and attractiveness for investment. - Stimulating growth in related small-scale industries and businesses. - Provision of clean reliable safe water supply will eliminate water burden to women and girl child allowing women to engage in other economic activities while the girl child concentrates on education.
Public Health Improvement	- Improve health and nutrition of beneficiaries of target areas in KIWASCO through provision of treated safe water. - Improved hygiene conditions and standards among residents.

Negative Impacts

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

Table 0-2 Summary impacts and mitigation matrix

Impact	Summary of Mitigations
Bio-physical Environment	
Impacts on Vegetation Resources	• Vegetation should only be cleared along the Pipelines alignment (approx. 0.5 m wide) to allow for trenching and installation of pipelines.

The project activities will require minimal clearance of vegetation along proposed water pipeline routes.	
Health and Safety Impact **Air Pollution** Air quality pollution caused by emissions from construction plant and equipment which include dust and gaseous emissions.	• Contractor will comply with the provisions of EMCA 2015 (Air Quality Regulations 2014). • Water sprays shall be used on site to suppress in areas within 200 metres of human settlement especially during the dry season. • The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be revegetated or stabilized as soon as practically possible. • Do not carry out dust generating activities (excavation, handling, and transport of soils) during times of strong winds. • Vehicles delivering soil materials shall be covered to reduce spills and windblown dust. • Vehicle speeds shall be limited to minimize the generation of dust on site. • Proper maintenance of construction vehicles
Noise and excessive vibration from construction equipment and vehicles could pose health and safety risks to workers and community sensitive receptors	• Contractor will comply with provisions of EMCA 2015 (Noise and Excessive Vibrations Regulations of 2009). • The Contractor will keep noise level within acceptable limits (60 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas. • Sensitive receptors shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity.
Occupational health and safety risks associated with the Project to workers and community	• Establish a Health and Safety Plan (HASP) for civil works, the plan will identify localized specific health hazards and risks and provide appropriate mitigation measures accompanied with a budget and implementation responsibility. • Provide workers with adequate and appropriate Personal Protective Equipment (PPEs) such as gloves, ear gears, sturdy rubber boots and overalls to protect their skin from the effects of cement. • Provide workers training on safety procedures and emergency response such as fire.
Solid waste generation from construction activities	• A site waste management plan should be prepared by the Contractor prior to commencement of construction works. This should include designation of appropriate waste storage areas, collection and removal schedule and identification of approved disposal site.

	• Ensure that the solid waste collection, segregation, and disposal system is always functioning properly during the construction phase. • Recycle and re-use wastes where possible such as scraps metal. • All hazardous waste to be collected and disposed by licensed waste handler.
Liquid wastes during the construction phase, various liquid wastes including grey and black water, concrete washings, runoff from camp and workshop areas.	• The contractor shall prevent runoff loaded with sediments from flowing into water channels. • No grey water runoff or uncontrolled discharges from the site or working areas to adjacent water resources. • The contractor shall ensure that the machines an equipment are in good condition to prevent leakages. • Interceptors such as sand can be used to prevent pollutants from reaching water resources. • Ensure proper handling of lubricants, fuels and solvents while maintaining the equipment.
Risk of Accidents on site related movement of plant and equipment and exposure to hazards such as open unbarricaded trenches.	• Contractor to provide a Traffic Management Plan during construction to be approved by the Supervising Engineer. • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles. • Strict use of warning signage and tapes where the trenches are open and at other active construction sites. • Contractor to Employ and train Road Safety Marshalls who will be responsible for management of traffic on site
Social Impacts	
Temporary interruption of business activities during the installation of pipelines and loss of livelihood income to the PAPs.	• Creating awareness, informing all community members along the pipeline routes. • Preparation PAPs Compensation Entitlement Matrix. • Compensation of the Project Affected Persons.
Temporary removal of assets during the excavations for installation of pipelines.	• Valuation of affected assets. • Full restoration of the affected assets to their original status. • Compensation for the PAPs for non-use of the assets during the interruption period.
Spread of communicable diseases and HIV/AIDS infection	• 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.
Labour Influx to the Project area.	• Effective community engagement and strong grievance mechanisms on matters related to labour through Grievance Redress Mechanism (GRM) Provided. • Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx, including sexual exploitation and abuse. • Proper records of labour force on site while avoiding child and forced labour. • Fair treatment, non-discrimination, and equal opportunity of workers.
Gender-based violence and Sexual Harassment at the community level	• Ensure clear human resources policy against sexual harassment that is aligned with national law. • Integrate provisions related to sexual harassment in the employee Code of Conduct. • Ensure appointed human resources personnel to manage reports of sexual harassment according to policy. • The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse.
Violation of children rights by contractor and labour force on site.	• Develop and implement a Children Protection Strategy that will ensures minors are protected against negative impacts associated by the Project. • All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior. • Children under the age of 18 years shall not be hired on site as provided by Child Rights Act (Amendment Bill) 2014.

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 (ESMP) 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 (KIWASCO) shall ensure that the implementation of the Environmental and Social Management Plan (ESMP) is effectively executed and that adequate resources have been provided. KIWASCO 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 KIWASCO 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 total number of Project Affected Persons (PAPs) enumerated along the proposed water pipelines routes is 33 PAPs. The PAPs are mainly those whose businesses will be temporarily interrupted during the installation of pipelines within Kirigiti Area in the outskirts of Kiambu Town Central Business District, where connections from the main 600mm diameter pipeline for pipelines extensions to Ndumberi, Riabai and Ting'ang'a will be done. A few PAPs are located along the provided wayleaves along public road reserves. These PAPs are operating roadside small scale income-generating activities with temporary timber structures and others on open grounds. Since all the proposed pipelines will be installed on the wayleaves that have provided by the road agencies for public utilities (including water), loss of land will not be triggered under this Project.

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 Kiambu Town, Ndumberi, Riabai & Ting'ang'a Wards in Kiambu County, 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 extensions and installation of consumer water meters. 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 Kiambu Town, Ndumberi, Riabai & Ting'ang'a Wards, 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.

- Promote community participation to ensure residents' support on the proposed project.

- Compensations for the identified Project Affected Persons be implemented prior to commencement of construction works on the Project.

- A Provisional Budget of **KES 3,300,143** that is required for implementation of mitigation measures of potential negative environmental should be included in the Project Implementation costs. This amount includes **KES 875,143** for the restoration of Affected Assets and compensations for PAPs due to loss of livelihood income during installation of pipelines.

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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. Kiambu Water and Sewerage Company (KIWASCO) 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.

Kiambu Water & Sewerage Company Ltd (KIWASCO) was incorporated under the Companies Act (Cap. 486) in 2006 and is an agent appointed by Kiambu County Government to ensure efficient and economical provision of water and sewerage services within Kiambu Sub-County. The service area comprises of four wards, namely Ndumberi, Kiambu Township, Riabai and Ting'ang'a. The total geographical area of jurisdiction is 105 square kilometers with a population of 145,698 according to the 2019 census.

KIWASCO has proposed the construction of 23.5km HDPE pipelines and installation of 225 nr DN15 water meters under the CLSG II Program to improve water supply services for the residents of Ndumberi, Kiambu Township, Riabai and Ting'ang'a in Kiambu County. The installation of water meters will improve billing and revenue collection by KIWASCO. Although the implementation of such a development project will generate positive socio-economic benefits, it could also have 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 any 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 Project

While the population of Kiambu County particularly in the urban areas is growing at a high rate, this is not matched with the current water services requirements. It is for this reason that the proposed project is important in the following ways:

- Extension of water distribution networks to reach more people.
- Provision of reliable, affordable, and clean water to the consumer, thereby improving their well-being.
- Generate additional income to the Water Services Provider.

1.3 Justification for the ESIA Study

The proposed project is classified as a medium risk based on the National Environmental Management Authority (NEMA) 2019 Legal Notice No. 31 thus requiring Comprehensive Project Report (CPR) on Environmental and Social Impact assessment will be carried out. The proposed Project is also categorized by the World Bank as category 2 with moderate risk operations likely to cause adverse environmental and social impacts which could be minimized by applying appropriate management and mitigation measures. It is against this backdrop that this ESIA Study has been undertaken in accordance with the regulations and guidelines set out by NEMA, and the World Bank's Safeguard Policies.

1.4 Objectives and Scope of the ESIA Study

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

- 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 mitigation measures will be implemented during the project cycle.
- To allow for public participation.
- To give an Environmental and Social Management Plan to mitigate the identified impacts to ensure sustainability of the proposed Project.
- To recommend cost effective measures to be implemented to mitigate against the expected impacts.

1.5 Approach and Methodology of the ESIA 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 Environmental and Social Scoping

Scoping process involved the identification of significant environmental and social issues associated with the proposed Works. Through reviews of the secondary Documents and available data supported with field evaluations, it was possible to estimate the status of the water and sanitation infrastructure, implications of additional water into the system, the capacity and integrity of the

distribution network and the consumers' locations. Interviews and discussions with stakeholders and Project beneficiaries were applied in determining the aspects such as adequacy of the supply, awareness ownership, willingness to pay for water and general opinions of the people. Significant issues identified through this process have been applied in drawing up the impacts as well as the management plan under this Report.

1.5.2 Desk Reviews

A desktop review was conducted prior to site visit. Documents reviewed include:

- Feasibility Study Reports and Preliminary Designs of the proposed Project's components.
- National Environmental Acts and Regulations (EMCA 1999 and EIA/EA Regulations 2003).
- The World Bank's Operational Safeguards Policies.

1.5.3 Field Assessment

The physical evaluation of the Project area was carried out with specific focus on the environmental and social issues. The environmental issues assessed include, water sources and water quality, drainage and hydrology, air quality, sanitation and hygiene, biodiversity, and sources of environmental pollution. The social issues include settlement patterns, socio economic activities, land use, presence of traditional/cultural sites in the area. On the social economic front, structured stakeholder consultations meetings were held between 13th & 15th June 2024 in some specific areas in addition to rapid interactions with the stakeholders to capture the views of all the parties affected Detailed methodology on data collection and field surveys for the above narrated environmental variables is presented in sub sections below.

1.5.4 Data collection and Site Surveys

Data collection and site surveys involved visiting stakeholder institutions and making consultations with key community members in all the target locations in the Project area. The main objective of this activity was to carry out on-site field assessments of the expected effects of the planned developments on the physical, biological, and socio-economic environment. During these surveys, interviews, observations, and the administration of screening checklists was carried out with key informants who included County Government and National Government staff, local leaders and community representatives. Details of each survey are explained in subsequent sections.

1.5.5 Flora and Fauna Surveys

The assessment of flora and fauna focused on the proposed work sites and their immediate surroundings. These were assessed by means of walks, interviews, and secondary data collection. Walks were undertaken at sites where various construction works have been proposed (along the project route). Interviews were conducted with both local members of the community and key informants. Secondary data was collected using appropriate maps and relevant literature. Other useful information collected included GPS locations, digital still camera records, and data sheets.

1.5.6 Socio-Economic Baseline

The socio-economic baseline was established principally from secondary data, consultations conducted for ESIA, and observations on-site and areas through which the pipelines pass.

1.5.7 Secondary and Primary Data

Secondary socio-economic data was obtained from books, reports, journals and other sources such as the CIDP for County Government of Kiambu, Kenya National Bureau of Statistics Reports, Feasibility study report among others. Primary data was collected from key informants and consultations which included a public baraza.

1.5.8 Public Participation

Methodology of Stakeholder Consultations

This assessment recognizes that consultation is an ongoing process throughout Project implementation phases. Under this Project, consultation was undertaken during the ESIA process and will continue during the construction and operational phases of the project. The ESIA team conducted public participation within the project area with an aim of giving the community a platform to express their environmental and social concerns in relation to the project. Institutional consultations were conducted with relevant Agencies and interested parties in relation to the project.

The consultations were through a key informant interview for institutional stakeholders and public meetings at Riabai & Ting'ang'a Locations (14/6/2024 and Kirigiti & Ndumberi Locations 15/6/2024. The recorded attendances at these meetings were 19 No. in Riabai, 27 No. in Ting'ang'a, 31 No in Kirigiti and 23 No. These meetings were organized through the local area Chiefs, who helped in the mobilizations of the participants.

The meetings were held in accordance with the requirements of NEMA and the WB OP. 4.01 policy and guidelines for conducting an ESIA. The specific objectives of this public consultation were to:

- Disseminate information on the proposed project to the community members.
- Collect views and issues to be considered in the ESIA Study.
- Evaluate perceptions about positive and negative impacts of the proposed Project.
- Receive concerns about environmental and social impacts and other implementation challenges.

1.5.9 Adverse Environment and Social Impacts Ranking

Impact Rating Variables

The impact rating evaluation adopted is summarized in three key areas related to the extent of the impact, timing of occurrence of the impact, intensity of the impact and probability of the impact as explained in Table 1.1 below:

Table 1.1: Impact Rating Variables

Impact Rating	Description
Extent	An area of influence covered by the impact, if the action produces a much-localized effect within the space, it is considered that the impact is low (1). If, however, the effect does not support a precise location within the project environment, having a pervasive influence beyond the project footprint, the impact will be at location level (3) or could be Beyond County (5)
Timing:	Refers to the moment of occurrence, the time lag between the onset of action and effect on the appearance of the corresponding factor. We consider five

	categories according to this period is zero, up to 1 year (short term), or more than two years, which are called respectively medium term (3), long-term (4), and permanent (5).
Intensity	Refers to the degree of impact on the factor, in the specific area in which it operates, ranked from low (1) to high (5).
Probability	Refers to the likelihood of the impact occurring during the project implementation, this is also ranked as Probable (1) to highly probable.

Impact Severity

The impact severity was determined based the capacity of the receptor to sustain shocks triggered by the impact. In this regard the impact severity could be termed as negligible, low, medium or high as summarized in Table 1.2 below:

Table 1.2: Impact Severity

Impact Rating	Description
Sensitivity	Definition (considers duration of the impact, spatial extent, reversibility, and ability of comply with legislation)
High	Refers to the moment of occurrence, the time lag between the onset of action and effect on the appearance of the corresponding factor. We consider five categories according to this period is zero, up to 1 year (short term), or more than two years, which are called respectively medium term (3), long-term (4), and permanent (5).
Medium	Vulnerable receptor (human or ecological) with limited capacity to absorb proposed changes or limited opportunities for mitigation.
Low	Vulnerable receptor (human or ecological) with some capacity to absorb proposed changes or moderate opportunities for mitigation
Negligible	Vulnerable receptor (human or ecological) with good capacity to absorb proposed changes or and good opportunities for mitigation

1.5.10 Approach to Mitigation and Management

The ESIA Study includes a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse impacts on the environment. The identification of such measures is an iterative process which needs to be undertaken in parallel with the design to aid the incorporation of measures into the design during project development. Early adoption of appropriate mitigation will help reduce significant environmental impacts to a practicable minimum. Where feasible the following hierarchy of mitigation measures has been applied to reduce, where possible, the significance of impacts to acceptable levels:

- Mitigation / elimination through design.
- Site / technology choice.
- Application of best practice.

As part of the ESIA approach, the contractors to be hired by the Proponent for construction activities will develop project specific Environmental and Social Management Plan (ESMP). These plans

essentially set the framework for the Environmental and Social Management System for the proposed Project. moving forward. The assessment of the significance of impacts and identification of residual impacts has taken account of any incorporated mitigation measures adopted by the Project and is largely dependent on the extent and duration of change, the number of people or size of the resource affected and their sensitivity to the change. The criteria for determining significance are specific for each environmental and social aspect and are reported within each impact assessment chapter but generally for each impact the magnitude is defined (quantitatively where possible) and the sensitivity of the receptor is defined.

1.5.11 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 - Project Affected Persons
10 - Grievance Redress Mechanism (GRM)
11 - Chance Find Procedures
12 - Conclusion and recommendations

- References
- Annexes

1.5.12 Public Disclosure of the ESIA

This ESIA provides for the below listed provisions with regards to public disclosure:
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 KIWASCO will ensure that the Results of Public Consultations including ESIA area disclosed on NEMA, World Bank, WSTF & KIWASCO websites.
(ii) The Report will also be made available at the Kiambu Town Sub-County offices as well at the Riabai, Ndumberi & Ting'ang'a Ward Offices, Kiambu 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.

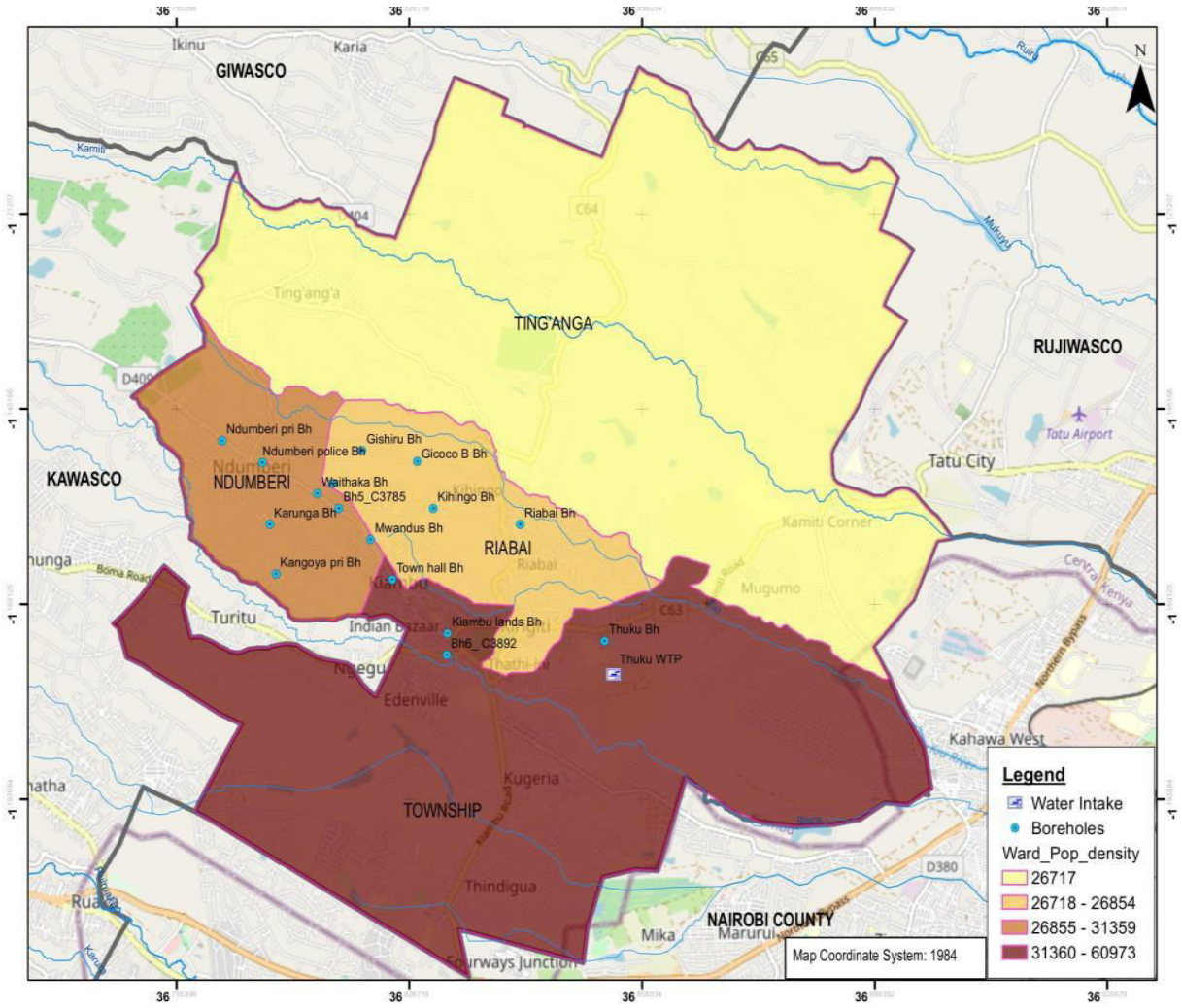
2 PROJECT DESCRIPTIONS

2.1 Project location

The proposed project is located within Kiambu Township, Ndumberi, Riabai & Ting'ang'a Wards of in Kiambu County.

2.2 Existing Water Supply Infrastructure

The Project area is served by Kiambu Water and Sewerage Company (KIWASCO) which was established as a private company under the Companies Act, Cap 486 and is wholly owned by the Kiambu County Government. The service area comprises of four wards, namely Ndumberi, Township, Riabai and Ting'ang'a. The total geographical area of jurisdiction for KIWASCO is 105 square kilometers.



KIWASCO's Water supply area of jurisdiction within Kiambu County

Water Sources

The main sources of water for KIWASCO are:

- Kamiti weir intake and full treatment plant with a production capacity of 4,000 cubic meters of water per day.

- Riara weir intake and full treatment plant) with a production capacity of 4,000 cubic meters of water per day.
- 19No. boreholes with a total production capacity of approximately 3,060m3/day. with a total production capacity of approximately 3,060m3/day.
- Bulk supply from Nairobi Water & Sewerage Company - 230 m3/day.



Kamiti Water Treatment Plant

2.3 Existing Sewerage Infrastructure

The Wastewater Treatment Works (WWTW) for Kiambu town has a design capacity of treating 2,200 m³/day. The sewerage network and WWTW is not able to meet the existing demand therefore, KIWASCO is no longer connecting consumers to the sewerage network. The existing sewerage network covers only Kiambu Township andtherefore most of the developing areas are not served by the sewer system. The urban and peri-urban areas which are not served by the sewerage network use septic tanks as an alternative mode of wastewater disposal.

2.4 Proposed Project's objectives

The principal objective of the project is to improve access to clean water supply in the targeted areas of Kiambu Township, Ndumberi, Riabai & Ting'ang'a Wards through pipelines extensions. The other objective is the reduction of Un-accounted for Water (UFW) and Non – Revenue Water (NRW) through the installation of consumer waters, thereby increasing revenues for KIWASCO. 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 target areas.



Wayleave along a public road for the proposed pipeline extension in Ting'ang'a area



Wayleave along a public road for the proposed pipeline extension in Riabai area

2.5 Scope of Works

The summarized Scope of Works for the proposed project include:

- Construction of 23.5km HDPE pipelines.
- Installation of 225 nr DN15 water meters.
- Supply of Motorcycles and other equipment for improvement of meter readings and improvements of revenue collections.



A homestead within Ndumberi Ward which expects to be connected with KIWASCO water supply system from the proposed pipeline extensions.



On going excavation works for installation of water pipelines in Ting'ang'a area. The proposed pipelines will be installed along the wayleaves provided for utility services infrastructure.

2.6 Description of the proposed Project's construction activities

- **Mobilization and 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 so as to create employment to the local residents especially the youth.

- **Pipelines Routes**

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. Consultations with the relevant Road Agencies (KENHA, KURA, KERRA & County Road Department) confirmed that the existing road reserves have provided wayleaves for installation of utilities services. However,

KIWASCO will have to make applications and pay for permits before the installation of pipelines on road reserves. Copies of the application forms and requirements have been provided in this ESIA Report as Annex V.

- The adopted pipeline routes allow for easy access to the pipelines and does not interfere with the existing infrastructure.

- **Trenching works for pipelines installations**

To lay the new pipelines, the contractor will dig trenches. The depth of the trench will vary depending on the pipe diameters but will not exceed 1m. Similarly, the width of the trenches will range between 0.3m and 0.6m to allow for safe working space for works to be conducted within the trenches.

- **Laying of Pipelines**

This will involve placing the pipes in the excavated trenches and jointing. The works will also include the installations of the necessary pipe fittings & valves.

- **Pressure testing of pipelines**

Following the laying of pipelines, the Contractor will test the water pipes to ensure flows within the pipelines and, for no leakages within the system.

- **Back filling of pipelines trenches on pipelines**

Following successful installation of the water pipes, the contractor will backfill the trenches, mainly using the excavated materials and provide the necessary signage for the pipelines' alignments, valves, and chambers. Cover vegetation including grass, lawns, and flowers will be replanted. In sections that were previously paved, the Contractor will repave these areas to the specifications of the respective road authority or individual satisfaction.

- **Water connections and installation of consumer water meters**

Upon completion of pipelines installation works, water supply connections to consumers and fixing of meters complete with associated fittings will be carried out.

- **Materials for the construction works**

This will include:

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

2.7 Anticipated waste materials

The construction and operation activities are expected to produce minimal waste and spoil since any overburden removed from the site will be replaced after laying of the pipelines. The following are some of the wastes foreseen during the construction: -

- Spoil from land clearing and excavation works.

- Debris from construction and demolition works; (scrap materials, nails, bricks, concrete, timber, steel; timber; plastic materials, existing surface dressing).
- Hazardous waste such as cement residue; oils, gases.
- Wastes from the sanitation facilities for the construction workers.
- Gaseous waste from combustion products from construction engines, welding gas, generator etc.
- The project works will not require the establishment of borrow sites or quarries for materials. All construction materials will be sourced from the local suppliers.

2.8 Labour

The project will require both skilled and unskilled labour during construction and operation phases of the project. This will result in migrant labour influx that could trigger Community Health and Safety risks. There will be need to put in place a labour influx management plan and conduct labour influx risk assessment with focus on the key impacts on local community. 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 skilled workers may be hired for highly technical works. 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.

2.9 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.
- Trucks and pick up vehicles.

2.10 Estimated Cost of the Proposed Project

	Works Description	**Approx. Cost (KES)**
1	Supply of Motorcycles and other equipment for improvement of meter readings and improvements of revenue collections	1,272,000
2	Ting'ang'a shopping centre pipelines extensions	922,450
3	Ndumberi pipelines extensions	1,368,500
4	Lower Ngegu distribution pipelines networks	797,100
5	Thindigua pipelines extensions	1,530,500
6	Kirigiti/Kiamumbi pipelines extensions	4,725,000
7	Supply of 225 Nr Consumer water meters & fittings	1,842,750
8	Rehabilitation of the 7Km existing pipelines networks	3,516,600
Total		**15,774,900**

The detailed BOQ and cost estimates are provided in this ESIA Report as Annex IV

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, KIWASCO, 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 of Kirigiti, Riabai, Tinga'ang'a and Ndumberi Locations in the outskirts of Kiambu 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

The source of water for the proposed pipelines extension is surface water (Kamiti & Riara Rivers) which experience low flow during the dry spells. 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 KIWASCO 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.

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 Kiambu Water & Sewerage Company Limited (KIWASCO) which is a water utility, wholly owned by Kiambu County Government. The Project once complete will be managed by KIWASCO 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 Kiambu 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 Kiambu County, the relevant WWDA is the Athi Water Works Development Agency (AWWDA), 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. In Kiambu County there are various WSPs mandated to provide water and sanitation services in different areas of their jurisdictions. Kiambu water and Sewerage Company (KIWASCO), is the mandated WSP that provides water in Kiambu Town and its environs.

3.4 Institutional Structure – Environmental

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 Kiambu 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 resettlements 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

The proposed project is on public land reserved for the water pipelines. Social screenings along the wayleaves have been undertaken and although there are no permanent re-locations of persons and assets, there are 33 PAPs whose livelihoods will be temporarily affected during the installation of pipelines. A list of the PAPs and inventory of the affected assets as well as the compensations dues has been prepared and included in this ESIA Report.

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.

Table 3.1: Applicable World Bank Operational Policies

Operational Policy	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 4.11 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.
World Bank OP 4.12 on	The World Bank Involuntary Resettlement Policy OP 4.12	The pipelines shall be installed along the provided wayleaves on the public roads. Social

Involuntary Resettlement	covers direct economic and social impacts that result from Bank-assisted investment projects.	screenings along the wayleaves have been undertaken and confirmed that the proposed project does not involve any resettlements of PAPs. However, 33 PAPs will be affected during the installation of pipelines due to temporary disruptions of the livelihood income activities. Consultations with Road Agencies (KENHA, KERRA, KURA & County Roads) have been done to establish the requirements for the necessary permits to install pipelines on the road reserves. The application forms and requirements from the Road Authorities have been attached in the ESIA Report as Annex V.

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 pipelaying.

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 to the significancy 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 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 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 Kiambu Water & Sewerage Company Limited (KIWASCO)

KIWASCO 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. KIWASCO 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 KIWASCO 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

4.1 Project Location

Kiambu town is located within Kiambu County, which is one of the 47 counties of Kenya. The population of the county estimated at 2,417,735 populations according the 2019 census report from the Ministry of Planning and National Development and an annual growth rate of 2.3% per annum. The County has a total area of 2543.4 km2. Major towns in the county include Kiambu, Thika, Kikuyu, Limuru, Githunguri and Gatundu. The proposed project is in Kiambu Township, Riabai, Ndumberi & Ting'ang'a Wards of Kiambu County.

4.2 Physical Environment

4.2.1 Climate

- **Rainfall**

The climate of Kiambu is highly influenced by Aberdare Forest Ecosystem. Kiambu is located on the Eastern side of the Southern edge of Aberdare Escarpment as it drops into the Rift Valley. The region is characteristic by equatorial climatic conditions and rainfall is highly influenced by altitude and comes in two seasons: long rains between March to May and short rains between October and December. The annual mean rainfall varies from 1070mm to 1750mm per annum. The area has steep slopes which enable run off to easily flow by gravity.

- **Temperatures**

Temperature is also influenced by altitude due proximity to the Aberdare range. Mean annual temperature varies from 17 and 25 degrees Celsius.

- **Humidity and Evaporation**

Main wind direction is easterly and evaporation ranging from 100 to 150mm per month while the humidity varies between 50% and 90%.

4.2.2 Topography

The project area is characterized by steep slope and deep valleys. Physiographic of the region is influenced by Aberdare ranges with topography varying from steep in the western region and undulating landforms volcanic ranges in the northern region.

4.2.3 Geology and Soils

The geology of the area is part of the Eastern Border Zone of the Rift Valley, filled with kainozonic volcanic and sediments underlying the upper Athi generating good aquifers. Soils on the other hand develop from weathering activities of the volcanic rocks and are highly fertile with high levels of perforation. Typical tropic red soils (Latosols) are also dominant in some sections within the project area. They have a high clay content, a thin, but fertile, humus layer and a distinct aggregate structure. These characteristics make them resistant to soil erosion.

4.3 Hydrology

The project area is well drained both horizontally because of the horizontal valleys, vertical slopes and loamy red volcanic soils which are porous and allow for all infiltration, the ranges are covered by

tea zones. Due to this, cases of flooding are not likely to happen. Clearing of vegetation on the steep slopes is strictly discouraged as flush surface runoff is likely to dominate the region. The catchments are constituted by lower Aberdare ranges feeding to the numerous rivers and streams around.

4.3.1 Surface Water Resources

Kiambu Town and the environs are generally endowed with numerous springs and streams. The major rivers are Kiu, Kamiti, Riara and Gatharaini Rivers.

4.3.2 Ground Water Resources

The Project area has numerous boreholes with average yields of 7m3/hr and pumps set at an average depth of 200 to 300 m deep. Thuku Borehole on Kamiti road neat Kiambu Town is a high yielding artesian borehole with a production capacity of about 30m3/hr. This borehole is one of the major sources of water for the residents of Kiambu Town.

4.4 Biological Environment

4.4.1 Vegetation and Flora

Biodiversity of the Project location is highly influenced human activities, the area lies within Agro-Eco-zone III and IV where agriculture is the main economic activity practiced by people, tea and coffee farming is the main cash crop grown, other crops include cabbages, irish potatoes and dairy farming. Trees are used mainly for shade, boundary demarcation, fencing, and production of fruits, timber, and fuel wood and for ornamental purposes.

Kiambu Sub - County enjoys proximity to Nairobi City and this has resulted to landowners changing land use from original agricultural use to real estate and housing units. This pressure has resulted to clearing of coffee plantations and wood lands to provide land for establishment of housing units.

4.4.2 Fauna

Human habitation and agricultural activities have also significantly interfered with both terrestrial and aquatic habitats in the Project areas. There is no terrestrial wildlife observed in the Project areas since most land is under agricultural use for many years pushing the animals into the Aberdare Forest. Animals in the area are mainly domestic animals such as cattle, sheep, goats, pigs and poultry.

4.5 Social - Economic Settings

4.5.1 Population

Kiambu Sub - County is located within Kiambu County which had a population of 2,417,735 according the 2019 National Census. The total population for the proposed Project area as per the 2019 population census for Kiambu Township, Ndumberi, Riabai & Ting’ang’a Wards was 145,942 people, with a population grow rate of 2.3% per annum.

4.5.2 Settlement Patterns

The settlement patterns in Kiambu Town and environs are influenced by rural to urban migration, good infrastructure, and proximity to Nairobi City. Majority of the population reside within Kiambu Town, which is the main commercial & Administrative Centre for Ndumberi, Ting’ang’a, Thindigwa

and Kirigiti Locations. The proposed project area is densely populated, and land has been subdivided into small sizes. Currently, there is a high rate of change of user of land from agricultural to residential due to high housing pressure from Kiambu Town and Nairobi City.

4.5.3 Land Use Patterns

Land tenure in the Project area is majorly Free Hold. Land near the urban centers has been subdivided into plots for real estate developments. The land within the outskirts of Kiambu Town is mainly used for both large- and small-scale agriculture. However, with the growing demand for housing, the farms are being converted to housing estates. The Northern and Western parts of the town receive the highest amount of rainfall, and tea, coffee and dairy farming are common. Some irrigated farming is also undertaken in the drier eastern areas of the Kiambu Sub - County.

4.6 Socio Economic Survey

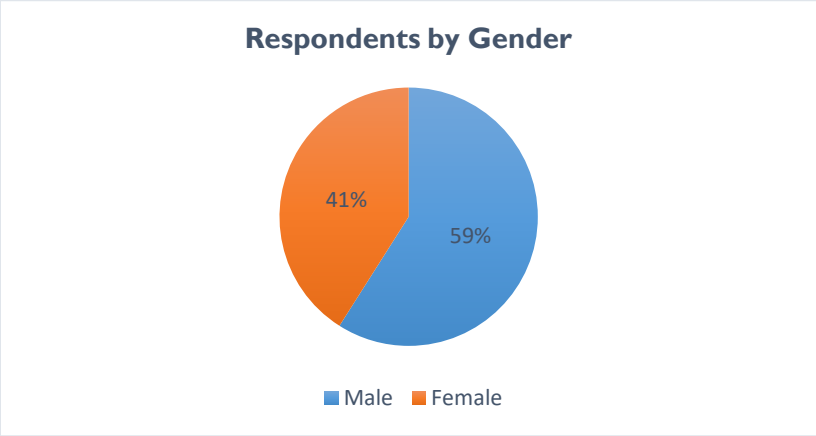
The assessment of socio-economic conditions of Proposed Project area was assessed during the study and below is the summary of the findings:

4.6.1 Household Characteristic

The socioeconomic survey covered a sample of 139 households (HH) drawn from Kiambu Township (42 HH), Ndumberi (38 HH), Riabai (26 HH) & Ting'anga (33 HH). The survey sought views from household heads or adult members found in the household at the time of the interview.

- **Gender of Respondents**

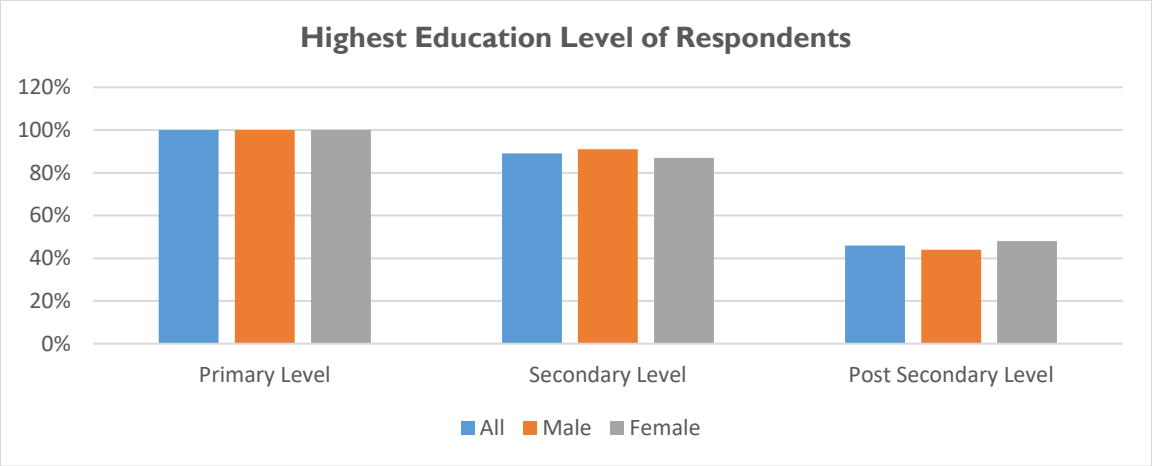
Among the 139 respondents who responded to the questionnaire 82 No. (59%) were male while 57 No.(41%) were female.



- **Education Level**

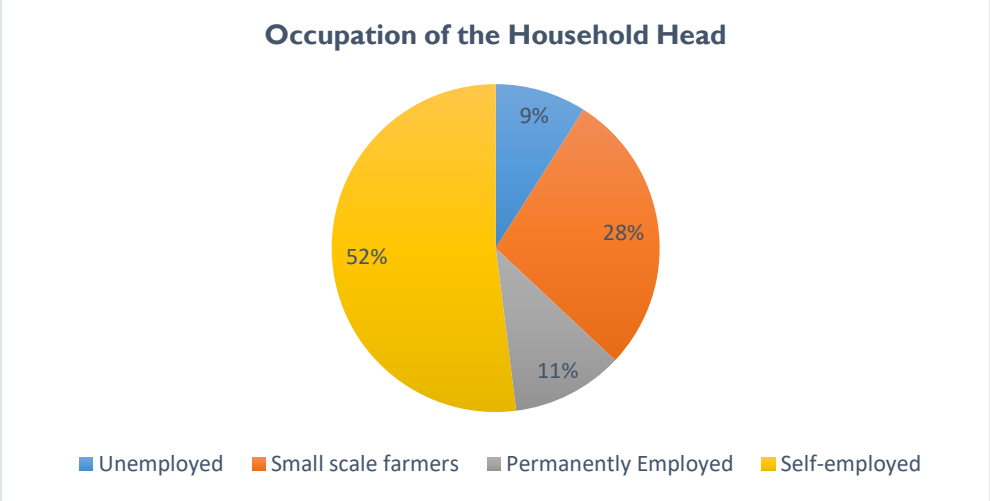
Analysis of level of education of the household head by gender indicate that the highest education level achieved at primary school education level is 100%, 89% at secondary school level and 46% at post-secondary level. Analysis of education level by gender revealed almost equivalent levels of attainment among male compared to female heads at 100% both for male & female completing primary school education, 91% male & 87 % female at Secondary school level and 48% female

against 44% male at the post-secondary level. This could be attributed to the fact that both boy and girl child are given equal opportunities of attending school.



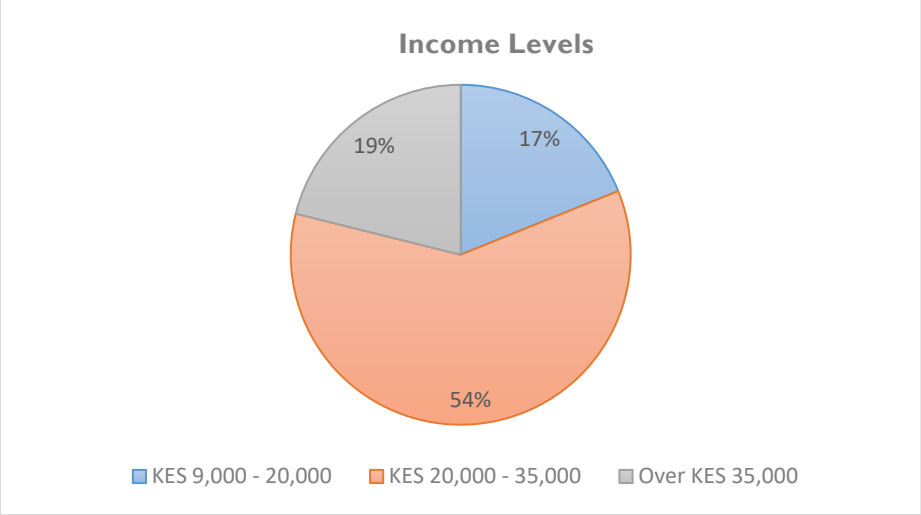
- **Occupation of the Household Head**

Analysis of the household head against their occupations revealed that 72 No. (52%) within the sample size derive their livelihoods from self-employment, 39 No. (28%) are farmers, 15 No. (11%) are permanently employed and 13 No. (9%) are unemployed.



- **Income Levels**

According to self-reported income levels, the average household monthly income within the proposed Project areas was estimated at KES 17,000 drawn from a minimum of KES 9,000 and a maximum of KES 78,000. Analysis of household income by category revealed that 19% proportion of the households earn over KES 35,000/month, 54% of the household earned KES 20,000 –KES 35,000/month while 17% earn less than KES 9,000 – 20,000/month.
The Average amount earned as daily wage per household was reported as KES 900.



4.6.2 Water Services

Water Sources

The main source of water for KIWASCO are:

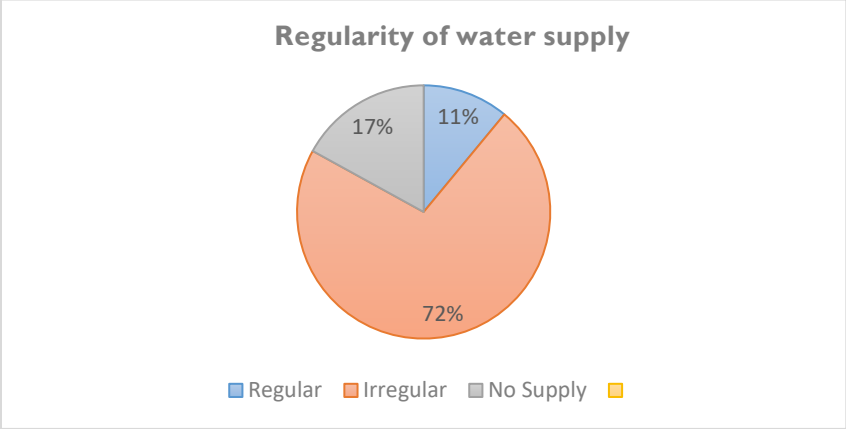
- Kamiti weir intake and full treatment plant with a production capacity of 4,000 cubic meters of water per day.
- Riara weir intake and full treatment plant) with a production capacity of 4,000 cubic meters of water per day.
- 19No. boreholes with a total production capacity of approximately 3,060m3/day. with a total production capacity of approximately 3,060m3/day.
- Bulk supply from Nairobi Water Company - 230 m3/day.



A private Borehole in Kangoya area, Ndumberi Ward where residents without KIWASCO water connections buy water for domestic use.

- **Regularity of Water Supply**

100 No.(72%) of those who responded to the questionnaire reported to getting irregular supply of water for 2-3 days in a week, compared to 15 No. (11%) who reported a regular supply although not in adequate quantity and pressure while 24 No. (17%) reported not getting water at all although they have to connections to their homesteads.





A pipeline marker post indicating the location where the proposed pipelines will connect to the main DN 600mm pipeline which supplies water to Kiambu Town and its environs.

- **Alternative Water Sources**

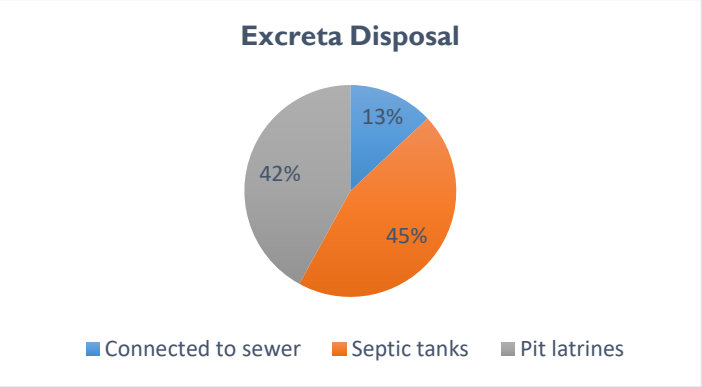
The residents within the proposed Project areas have developed alternative methods of water supply to cope with insufficient water supply. Those mentioned include reducing the amount of water used for domestic chores, water storage, fetching from nearby streams as well as buying from private water vendors.

4.6.3 Waste Disposal

- **Excreta Disposal**

The socio-economic survey recognizes that inadequate sanitation leads to several financial and economic costs including direct medical costs and loss of productivity at household level hence the need for more investments towards its improvement. Data and information collected during the survey shows that the Project areas have very limited sewer network outside the periphery of Kiambu Town.

Only 18 No. (13%) of the respondents reported to have sewer connections to their homesteads, 63 No. (45%) have constructed septic tanks which are regularly exhausted, while 58 No.(42%) use onsite pit latrines.



- **Garbage Disposal**

The common methods of household garbage disposal in the Project's area were observed to be by burning and collection by youth groups who collect the garbage weekly at a monthly fee of Ksh.400.

4.6.5 Willingness to pay for improved water & sanitation services

Out of the 139 households who responded to the questionnaire, over 127 No. (91.5%) expressed their willingness to pay for individual water and sewer connections to the homesteads. A few respondents cited affordability of connection fees and monthly water and sewerage services bills. The most preferred method of excreta disposal was water closet connected to public sewer. Respondents associated attributed their high preference to this type of technology to high levels of cleanliness and easy maintenance, reduced burden of emptying the septic tanks, enhanced privacy and convenience to the use of pit latrines.

4.6.6 Health and Hygiene

The survey identified some common diseases among children, women and men in the proposed Project's areas, among them water borne, and water related illnesses as below:

Table 4.1: Common Diseases and their Causes

Category	Prevalent Disease	Major Cause
Children	Diarrhea, malaria, skin conditions, bronchitis, pneumonia, and coughing malnourishment.	- Poor sanitation and hygiene practices - Lack of treated drinking water - Poor feeding
Women	Typhoid & amoeba, Tuberculosis, STIs & HIV/AIDS, malnourishment.	- Poor sanitation and hygiene practices - Poor feeding Irresponsible behaviors
Men	Typhoid and malaria tuberculosis HIV/AIDS and STIs, diabetes.	- Poor sanitation and hygiene practices Irresponsible behavior - Consumption of excessive alcohol

5 PUBLIC PARTICIPATION AND CONSULTATIONS

5.1. Introduction

Stakeholder consultation is generally useful for gathering environmental data, understanding likely impacts, determining community and individual preferences, and designing viable and sustainable mitigation and compensation plans. Stakeholder consultation during ESIA process is undertaken during the design, implementation, and initial operation stages of the Project. The aim is to disseminate information to interested and affected parties (stakeholders), solicit their views, and consult on sensitive issues. The specific aims of the Public Consultation and Participation process during the Preparation of the ESIA at the design stage include:

- To inform the local people, leaders and other stakeholders about the proposed Water Distribution Project and its objectives.
- Obtain the main concerns and perception of the community and their representatives of the Project.
- To promote Project ownership by the operator and beneficiaries to minimize conflicts.
- Obtain opinions and suggestions from the directly affected persons on the Project impacts and best suited measures to mitigate them.
- Obtain opinions and suggestions on the Project Concepts, Designs, etc. and therefore minimize conflicts and delays in implementation.
- To facilitate the development of appropriate and acceptable entitlements options.
- To increase long term Project sustainability and ownership.
- To reduce problems of institutional coordination, especially at the different Governments levels.

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. 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 potential Project Affected Persons, neighboring communities of the project areas, local leaders, 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. A stakeholder mapping was done to ensure that all the stakeholders likely to be affected or influenced by the Project were identified and involved in ESIA assessment. Key informants' interviews and public meetings were held at Kirigiti, Ndumberi, Riabai & Ting'ang'a & Market Centres between 13/06/2024 & 15/06/2024.

5.2 Stakeholders Consultative Process

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 interviews with selected leaders and through community meetings at Kirigiti, Ndumberi, Riabai & Ting'ang'a Trading Centres.

5.2.1 Household Questionnaire

The Household questionnaire was administered to a sample of 71 No. participants, representing the diverse groups of residents who are potentially affected (either directly or indirectly) by the implementation of the proposed project. These included domestic water consumers and small-scale business operators in Kirigiti, Ndumberi, Riabai & Ting'ang'a Trading Centres and their environs which are the target areas for the proposed pipeline extensions and installation of new water meters.

5.2.2 Analysis of the questionnaire responses

- Among the respondents interviewed, 82 No. (59%) were male while 57 No. (41%) were female.
- Analysis of education level by gender revealed almost equivalent levels of attainment among male compared to female heads at 100% both for male & female completing primary school education, 91% male & 87 % female at Secondary school level and 48% female against 44% male at the post-secondary level.
- Analysis of the household head against their occupations revealed that 72 No. (52%) within the sample size derive their livelihoods from self-employment, 39 No. (28%) are farmers, 15 No. (11%) are permanently employed and 13 No. (9%) are unemployed.
- Analysis of occupation by gender revealed that slightly more men than women in Kiambu are in self-employment at (55%) compared to 45% male.
- The average household monthly income within the proposed Project areas was estimated at KES 17,000 drawn from a minimum of KES 9,000 and a maximum of KES 78,000.
- Analysis of household income by category revealed that 19% proportion of the households earn over KES 35,000/month, 54% of the household earned KES 20,000 –KES 35,000/month while 17% earn less than KES 9,000 – 20,000/month.
- 72% of the respondents in the Project area reported to getting irregular supply of water for 2-3 days in a week, compared to 11% who reported a regular supply although not in adequate quantity and pressure while 17% do not get at all although they have to connections to their homesteads.
- The residents within the proposed Project areas have developed alternative methods of water supply to cope with insufficient water supply. Those mentioned include reducing the amount of water used for domestic chores, water storage, fetching from nearby streams as well as buying from private water vendors.
- Data and information collected during the survey shows that the Project areas have very limited sewer network outside the periphery of Kiambu Town. Only 13% of the respondents reported to have sewer connections to their homesteads, 45% have constructed septic tanks which are regularly exhausted, while 42% use onsite pit latrines.

- The common methods of household garbage disposal in the Project's area were observed to be by burning and collection by youth groups who collect the garbage weekly at a monthly fee of Ksh.400.
- Out of the 139 households interviewed, over 90% expressed their willingness to pay for individual water and sewer connections to the homesteads.
- A few respondents cited affordability of connection fees and monthly water and sewerage services bills.
- The most preferred method of excreta disposal was water closet connected to public sewer. Respondents associated attributed their high preference to this type of technology to high levels of cleanliness and easy maintenance, reduced burden of emptying the septic tanks, enhanced privacy, and convenience to the use of pit latrines.
- The most common diseases among the children include diarrhea, malaria, skin conditions, bronchitis, pneumonia, coughing and malnourishment.
- The most common diseases among the adult population include Typhoid & amoeba, Tuberculosis, STIs & HIV/AIDS, diabetes, and high blood pressure.
- Majority of the respondents acknowledged the benefits from the implementation of the proposed project being:
  - Provision of safe drinking water.
  - Decrease in water borne diseases.
  - Improved hygiene and sanitation.
  - Employment during construction and operational phases.
- The negative impacts mentioned by majority of the respondents include employment disruption of businesses for those operating on the road reserves, breaking up of pavements and cabro roads for pipe laying, generation of dust and excess noise and increased vehicular movements during the construction phase.
- The respondents were also concerned that employment opportunities arising from the proposed project may not benefit the locals.
- Possible Increase of water bills following the installation of the new meters was also mentioned by a few respondents.

5.2.3 Key Informant Interviews

The key informant consultations were conducted on the 14th & 15th 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.

Table 5.1: Key Informants consulted.

Institution	Office/Officer Consulted
KIWASCO	Managing Director
	Technical Manager
	Commercial Manager
	Pipelines Foremen

National Government Agencies	Athi Water Works Development Agency (AWWDA)
	Kenya National Highways Authority (KENHA)
	Kenya Urban Roads Authority (KURA)
	Kenya Rural Roads Authority (KERRA)
Kiambu County Government	Township, Ndumberi, Riabai & Ting'ang'a Ward Administrators
	Kiambu Town Sub - County Health Officer
	Kiambu Town Sub - County Water Officer
	Kiambu County Engineer (Roads & Public Works)
National Government Administration	Chiefs & Assistant Chiefs – Kiambu Townhship, Ndumberi, Riabai & Ting'ang'a Trading Centres.
Business Groups	Kenya National Chamber of Commerce & Industry (Kiambu Chapter) Ndumberi Dairy Farmers Co-operative Society Ltd
	Ting'ang'a Market Traders Association

The outcome of the interviews is summarized in Table 5-2.

Table 5.2: Summary of Key Informant Interview

	Key informant interviewed	**Summary of remarks**
1	Managing Director - KIWASCO	• The proposed pipeline extensions to Thindigua, Ndumberi, Riabai & Ting'ang'a areas will solve the persistent water problems. • With the anticipated increase in bulk water from the soon to be commissioned Northern Collector Tunnel which is under implementation by Athi Water Works Development Agency (AWWDA), Kiambu Town and the environs will be getting adequate water for distribution.
2	Technical Manager - KIWASCO	• KIWASCO will be receiving about 5,000M3 of water from the recently completed Kigoro Water Treatment Plant and the Kigoro – Gigiri bulk water transmission pipeline under AWWDA. • KIWASCO therefore need to expand the distribution system for the last mile connectivity.
3	Commercial Manager - KIWASCO	• The procurement and installation of water meters will significantly improve on the management of Non- Revenue Water (NRW). • The new water meters will be installed as a priority for the connections on the new pipeline extensions under the proposed project. • Revenue generation for KIWASCO is expected to increase.
4	Field Technical Officers – KIWASCO (Pipelines Operations & Maintenance Team, Meter Readers.	• Hoped that the installed pipelines and water meters will be of good qualities to prevent pipe burst and loss of water.

		• High quality water meters will improve on the accuracy of meter reading for increased revenues and minimizing complaints from the customers.
5	Bulk Water & Transmission Pipelines Manager (AWWDA)	• AWWDA has also developed Karemenu Dam in Gatundu North Sub-County in Kiambu County. Karemenu Dam water treatment plant has capacity to produce about 73,000 m3/day with bulk of the water being supplied in Kiambu County. • With the increased supply of water to Kiambu County, the proposed pipeline extensions in the proposed Project areas will be receiving sufficient water.
6	KENHA Roads Maintenance Engineer – Kiambu County	• The KENHA Engineer indicated that the proposed pipeline extensions will be partly installed along KENHA managed roads within Kiambu Town Sub-County. • KENHA has provided adequate wayleaves along the road reserve for installation of utility services such as water pipelines and there are existing pipelines already installed. • The project proponent will be required to obtain permit to install the pipelines after paying the prescribed fees to KENHA. • KENHA will carry out inspections during the installation of pipelines to ensure that pipelines are installed at the authorized locations along the road reserves.
7	Engineer in Charge – KURA, Kiambu County	• KURA is responsible for urban road infrastructure in Kiambu including Kiambu Town and the main trading centres, Kirigiti, Riabai, Ndumberi & Ting'ang'a included. • The proposed project proponent (KIWASCO) will need to obtain permit for pipeline installation along the road reserves. • After the installation of pipelines, proper pipe location indicators will be installed to clearly mark the pipelines alignment. • KURA will provide all the necessary support during the implementation of the proposed project including timely issuance of permits to the implementation Agency (KIWASCO).
8	Regional Director - Kenya Rural Roads Authority (KERRA), Kiambu Region	• The proponent will be required to provide layouts and designs of the proposed pipelines along KERRA Managed roads and apply for permits before works commence. • KERRA Engineers will visit sites to ensure the pipelines alignments are within the permitted sections within the road reserves. • Proper markings for the installed pipelines will be required to guide other utilities on the pipelines' locations.

9	Sub-County Water Officer (Kiambu Sub - County)	• The residents of Township, Ndumberi, Riabai & Ting'ang'a Wards have for a long time been complaining of lack of adequate water supply. • The areas are under severe water rationing, getting water for only 2 days in a week. • With the increase in bulk water and the proposed pipeline extensions, water shortages will be addressed.
10	Sub-County public Health officer (Kiambu Sub-County)	• Various water borne diseases particularly among the children have been reported in Kiambu Level 5 Hospitals as well as in other health facilities in Kiambu Town Sub – County. • The proposed project should improve water supply situation in the target areas and help in minimizing water related disease cases.
11	County Engineer (Roads & Public Works) – Kiambu County	• The County Government of Kiambu is responsible for County Roads under the Roads ACT. • GATWASCO will need to provide layout plans for the proposed pipelines within the residential estates. • Some of the roads within the estates along Kenyatta Road have been earmarked for tarmacking and therefore the pipelines should be installed within the provided wayleaves to prevent damage during the construction of estate roads.
12	Ward Administrators – Township, Ndumberi, Riabai & Ting'ang'a Wards	• Kirigiti, Thindigua, Ndumberi, Riabai & Ting'ang'a areas are fast growing suburbs due to proximity to Nairobi. There is need to upgrade the infrastructure in the areas so as to cope with the increasing population. • It is observed that the proposed pipelines extensions will be installed within the wayleaves set aside for public utility services along the public roads. • There for, there shall be no requirement for compensations due to relocations of people and businesses.
13	Chiefs and Assistant chiefs - Township, Ndumberi, Riabai & Ting'ang'a Locations.	• The local National Government officials will provide the necessary security to the implementation team during the construction phase. • However, the hired contractor should be encouraged to employ as many locals as possible so that they can benefit from the project.
14	Kenya National Chamber of Commerce & Industry (KNCCI) – Kiambu Chapter	• The KNNCI Kiambu Chapter through the Chairman raised the following concerns: - Kiambu Town and its environs has a severe water shortage and this has discouraged potential investors.

		- Kiambu Town is only 12 Km from Nairobi CBD and improved services on water, sewerage and roads can significantly spur growth in commerce and industry. - The County and National Governments need to expand the sewerage system within Kiambu town so as to attract investors and manage wastewater.
15	Director - Ndumberi Dairy Farmers Co-operative Society Ltd	• Ndumberi Dairy Farmers Co-operative Society Ltd., a small cooperative of just 1,054 members, each of whom raise up to five cows on small parcels of peri-urban land. • Ndumberi processes about 15,000 liters of milk per day, on average. • Most of the members come from Ndumberi, Ting'ang'a and Riabai wards in Kiambu County. • Adequate water supply is not only critical for domestic use but also for milk production (dairy farming) and processing. • The Co-operative Society ls eagerly waiting for the implementation of the proposed project with very high expectations that the water supply challenges will now be solved to improve dairy farming and provide domestic water to the local residents.
16	Chairman – Ting'ang'a Market Traders Association	• Ting'ang'a ultra-modern Market was constructed about 3 years ago with the partnership between the National & County Governments. • Currently, about 900 traders are operating in the market doing all types of businesses. • Water supply and sanitation has been a major issue for the market which has significantly affected various businesses particularly those involved in food and service industry. • The management of the market hopes that with the implementation of the proposed project, businesses will greatly thrive for the benefit of the business community.

5.2.4 Project Areas 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 chiefs and the Ward Administrators. The public meetings were held at Township (Kirigiti), Ndumberi, Riabai & Ting'ang'a Trading Centres between13/06/2024 and 15/06/2024 respectively. 19No., 23 No., 21 No., & 26 No. participants attended the public the meetings at Kirigiti, Ndumberi, Riabai & Ting'ang'a respectively.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.



Public consultations for the ESIA in Ndumberi Area



Public Consultations Meeting at Ndumberi during the ESIA Study

5.2.5 Summary of Issues Raised during local community consultative meetings and the responses provided.

There were several issues that were raised by the communities within the project areas with responses provided on the concerns as captured in Table 5-3:

Table 5.3: Summary of issues raised during public consultation and responses provided.

	Comment/ Question	Response
1	Mr. Simon Murage (Ndumberi) - Will the new pipelines distribute adequate water to the area residents without rationing?	The ESIA consultant informed him that the new pipelines shall eventually have more water to be supplied to the area residents once constructed.
2	Mr. Ben Kimotho (Ndumberi) - Will the proposed pipelines pass through private land and if that is the case, are they going to be compensated?	The ESIA consultant informed the meeting that the proposed pipelines shall pass through the existing public road reserves and thus will not affect their private lands.
3	Ms. Janet Wanjia (Ndumberi) - Where will the additional water come from? We know Kiambu Town residents do not get enough water.	KIWASCO has started receiving additional water from the recently completed Karemenu Dam in Gatundu North and therefore there is adequate water for distribution.
4	Mr. John Kibe (Ndumberi) – Has KIWASCO increased water tariffs without informing the consumers? Many consumers have been complaining of exaggerated water bills, but no action has been taken but their connections have been cut off instead after failing to pay.	KIWASCO informed the meeting that the applicable tariffs are as approved by the Water Services Regulatory Board (WASREB). Any disputed bill will be assessed and an amicable solution arrived at.
5	Mr. Samuel Kahuria (Kirigiti) - Was concerned that the proposed project will interfere with the installed water distribution infrastructure and cut them off from water supply.	The ESIA consultant informed the meeting that due care shall be taken in constructing the new line and that all damages that would occur to the existing distribution network will be taken care off by the Contractor.
6	Ms. Rahab Gitau (Kirigiti) - From the descriptions of the proposed works, some people with businesses at Kirigiti will be affect. Will the proposed project result in evictions of traders?	The ESIA Consultant informed the meeting that a few some business premises will be affected during pipelines installation in Kirigiti area through interferences with access by customers. However, these interreferences will be minimized as much as is practical. Reasonable compensations for loss of business will be considered.

7	Ms. Julia Nduta (Kirigiti) - Enquired if the new pipelines will have enough water considering the existing lines do not have adequate supplies. She suggested that rehabilitation of the existing pipelines and provision of sewerage facility would have been more beneficial.	The ESIA Consultant indicated that the existing infrastructure is considered dilapidated and has gone beyond the design life thus the inability to provide adequate water to the proposed Project's target areas. KIWASCO is considering expansion of sewerage services within their areas of operations.
8	Mr. Hebro Gachanja (Kirigiti) – Noted that there were so many and frequent water leaks from the existing pipelines with so much water going to waste.	The Technician from KIWASCO replied that KIWASCO has been facing a myriad of challenges due to the old pipelines. He noted that the UPVC pipelines had lived beyond design life and needed replacement.
9	Mr. Joseph Karuri (Ting'ang'a) – The local residents welcome the project and proposes that it be fast tracked to solve residents' water problem. The sewerage project should also follow the project as the increase water supply would have a negative impact on the area because of non-existent sewerage infrastructure.	The ESIA Consultant indicated that the suggestion has been noted and that appropriate recommendations will be made to KIWASCO.
10	Ms. Mary Waceke (Ting'ang'a) – Commented that the frequent water rationing forces them to use untreated water that has affected them negatively Healthwise.	KIWASCO acknowledged that the available water sources have been inadequate, and rationing was being applied. Residents were assured of improved supply following the commissioning of Karemenu Dam Water Supply Project.
11	Mr. Titus Murigi (Ting'ang'a) – How will the project the local people other than increased supply of water?	The ESIA Consultant mentioned the additional benefits 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. • Employment opportunities during the construction and operation phases of the proposed projects.
12	Ms. Marion Kariuki (Riabai) – How will the project help the young people get employment opportunities?	The ESIA Consultant informed the meeting that the Contractor who will be selected to carry out construction works will be encouraged to hire

		local residents as a first priority. The contractor will also be expected to procure construction material from local hardware traders.

5.3 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 KIWASCO will ensure that the Results of Public Consultations including ESIA area disclosed on NEMA, World Bank, WSTF & KIWASCO websites.

(ii) The Report will also be made available at the Kiambu Town Sub-County offices as well at the Riabai, Ndumberi & Ting'ang'a Ward Offices, Kiambu 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.

6 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

6.1 Introduction

Reliable water availability is critical to economic growth and poverty reduction especially in agricultural zones that support urban and industrial activities through provision of raw materials and food supply. With increasing pressure on land for agriculture and settlement, water resources come under serious threat of degradation. Use of chemical fertilizers and pesticides near drinking water sources exposes consumers to the risk of water borne diseases, water pollution and sometimes conflict over use of resources. Socioeconomic needs of a particular community entirely require water, over abstraction from sources, infrastructure maintenance, management of related wastewater and ecological balance and sustenance is among the problems associated with public water supplies.

Public water supplies such as the proposed KIWASCO pipelines extension Project have far reaching social and economic implications that need to be addressed throughout the project cycle. The effects are mainly positive calling for enhancement and the negative ones calling for mitigation. The negative impacts were identified to be reversible and limited to the project site. For such environmental and social impacts, this report identifies the mitigation measures implementation of which can effectively minimize the negative impacts and increase positive environmental and social impacts of the proposed project.

An ESIA assessment was systematically conducted to determine whether the proposed Project will have negative impacts on the environment. The Environmental Management and Co- Ordination Act (EMCA) No.8 of 2015 provide the legal and statutory guideline for the Environment and Social Impact Assessment process in Kenya. Also, the World Bank OP 4.01 on environment assessment provides guidelines of assessing environment and social risk for World Bank funded Projects and the World Bank's Good Practice Note (2018) for addressing Gender-based Violence in Investment Project Financing involving major civil works. The impacts in this Chapter have been generated based on the analysis of the proposed environment in relation to the proposed project. Impacts arising during each of the phases of the proposed development namely construction, operation and decommissioning are grouped into impacts on the Biophysical environment, Health and Safety and Social-economic impacts.

6.2 Environmental and Socio-economic Impacts

6.2.1 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.

- **Direct impacts**

Direct impacts are impacts that are 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.

- **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.

- **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.

6.2.2 Positive Impacts

- **During Construction Phase**

Some of the projected positive impacts during the construction phase of the project include:

- Employment opportunities during construction, unskilled and mid-skilled level labour will be sourced from the local market.
- Market for construction materials such as sand, cement, and ballast.
- Transfer of technological skills and knowledge to the local sector through the artisans employed and trained by the Project.

- **Positive Impacts During Operation Phase**

The Project shall result in both direct and indirect benefits to the target residents during its operation as summarized below:

(i) Improve affordable, clean, reliable water supply within Project area leading to improved health and hygiene.
(ii) Improve health and nutrition of beneficiaries of target areas in KIWASCO through provision of treated safe water.
(iii) Provision of clean reliable safe water supply will eliminate water burden to women and girl child allowing women to engage in other economic activities while the girl child concentrates on education.

6.3 Negative Impacts

6.3.1 Negative Impacts and Mitigation Measures during Construction Stage

The Construction Stage will involve activities such as delivery of pipes and associated fittings to the Project site, excavation of trenches, temporary stockpiling of excavated materials along the trenches, importing materials for pipeline bedding and surrounds (e.g. sand, cement, and concrete), etc. These activities can trigger negative environmental and social impacts which can be categorized into three settings, namely: Biophysical, Socio Economic and Occupational Health and Safety setting. Table 6.1 provides a summary of identified impacts and possible mitigation measures.

Table 6.1: Negative Impacts and Proposed Mitigation Measures During Construction

Impact	Summary of Mitigations
Bio-physical Environment	
Impacts on Vegetation Resources The project activities will require minimal clearance of vegetation along proposed water pipeline routes.	• Vegetation should only be cleared along the Pipelines alignment (approx. 0.5 m wide) to allow for trenching and installation of pipelines.
Health and Safety Impact Air Pollution Air quality pollution caused by emissions from construction plant and equipment which include dust and gaseous emissions.	• Contractor will comply with the provisions of EMCA 2015 (Air Quality Regulations 2014). • Water sprays shall be used on site to suppress in areas within 200 metres of human settlement especially during the dry season. • The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be revegetated or stabilized as soon as practically possible. • Do not carry out dust generating activities (excavation, handling, and transport of soils) during times of strong winds. • Vehicles delivering soil materials shall be covered to reduce spills and windblown dust. • Vehicle speeds shall be limited to minimize the generation of dust on site. • Proper maintenance of construction vehicles
Noise and excessive vibration from construction equipment and vehicles could pose health and safety risks to workers and community sensitive receptors	• Contractor will comply with provisions of EMCA 2015 (Noise and Excessive Vibrations Regulations of 2009). • The Contractor will keep noise level within acceptable limits (60 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas. • Sensitive receptors shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity.
Occupational health and safety risks associated with the Project to workers and community	• Establish a Health and Safety Plan (HASP) for civil works, the plan will identify localized specific health hazards and risks and provide appropriate mitigation measures accompanied with a budget and implementation responsibility. • Provide workers with adequate and appropriate Personal Protective Equipment (PPEs) such as gloves, ear gears, sturdy rubber boots and overalls to protect their skin from the effects of cement. • Provide workers training on safety procedures and emergency response such as fire.

Solid waste generation from construction activities	• A site waste management plan should be prepared by the Contractor prior to commencement of construction works. This should include designation of appropriate waste storage areas, collection and removal schedule and identification of approved disposal site. • Ensure that the solid waste collection, segregation, and disposal system is always functioning properly during the construction phase. • Recycle and re-use wastes where possible such as scraps metal. • All hazardous waste to be collected and disposed by licensed waste handler.
Liquid wastes during the construction phase, various liquid wastes including grey and black water, concrete washings, runoff from camp and workshop areas.	• The contractor shall prevent runoff loaded with sediments from flowing into water channels. • No grey water runoff or uncontrolled discharges from the site or working areas to adjacent water resources. • The contractor shall ensure that the machines an equipment are in good condition to prevent leakages. • Interceptors such as sand can be used to prevent pollutants from reaching water resources. • Ensure proper handling of lubricants, fuels and solvents while maintaining the equipment.
Risk of Accidents on site related movement of plant and equipment and exposure to hazards such as open unbarricaded trenches.	• Contractor to provide a Traffic Management Plan during construction to be approved by the Supervising Engineer. • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles. • Strict use of warning signage and tapes where the trenches are open and at other active construction sites. • Contractor to Employ and train Road Safety Marshalls who will be responsible for management of traffic on site
Social Impacts	
Temporary interruption of business activities during the installation of pipelines and loss of livelihood income to the PAPs.	• Creating awareness, informing all community members along the pipeline routes. • Preparation PAPs Compensation Entitlement Matrix. • Compensation of the Project Affected Persons.
Temporary removal of assets during the excavations for installation of pipelines.	• Valuation of affected assets. • Full restoration of the affected assets to their original status. • Compensation for the PAPs for non-use of the assets during the interruption period.
Spread of communicable diseases and HIV/AIDS infection	• 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.
Labour Influx to the Project area.	• Effective community engagement and strong grievance mechanisms on matters related to labour through Grievance Redress Mechanism (GRM) Provided. • Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx, including sexual exploitation and abuse. • Proper records of labour force on site while avoiding child and forced labour. • Fair treatment, non-discrimination, and equal opportunity of workers.
Gender-based violence and Sexual Harassment at the community level	• Ensure clear human resources policy against sexual harassment that is aligned with national law. • Integrate provisions related to sexual harassment in the employee Code of Conduct. • Ensure appointed human resources personnel to manage reports of sexual harassment according to policy. • The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse.
Violation of children rights by contractor and labour force on site.	• Develop and implement a Children Protection Strategy that will ensures minors are protected against negative impacts associated by the Project. • All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior. • Children under the age of 18 years shall not be hired on site as provided by Child Rights Act (Amendment Bill) 2014.

6.3.2 Negative Impacts during the operations phase

- Metering of water distribution may also be associated to an increase of cost of living which has a negative impact especially on the poor.

- Increased water cost will be received negatively by the consumers especially the poor, this may lead them to go for cheap available water sources hence cases water borne diseases might increase.
- Local water vendors who had also ventured in the same business will loss market.

6.4 Potential Cumulative Impacts of a Water Supply Project

Socioeconomic impacts

Changes in water availability can have socio-economic consequences for local communities and stakeholders.

Mitigation measures:

- Engage with local communities and stakeholders to understand their water needs and concerns. Implement water allocation plans that prioritize sustainable water use, balancing the needs of different sectors.
- Promote water conservation and efficiency measures to optimize water usage and minimize potential conflicts over water resources.

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, proposed mitigation measures, institution responsible for the mitigation, 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 shall be responsible for overall implementation of the ESMP during preconstruction and construction phases. A project Environmental and Social Officer shall be designated to make day to day follow up (e.g. follow up of ESMP implementation and liaise with stakeholders). The ESMP is a document reflecting the obligation of the Contractors. It will be reviewed during the life cycle of the project to ensure that it remains fit for purpose and continues to meet policies, laws, and regulatory requirements. The Contractor is obliged to implement all proposed mitigation measures and will also work together with the regulatory agencies and communities, especially WSP to ensure that the development of the project acceptable to all stakeholders. However, any changes in the construction methodology or activities undertaken on the site will be followed by a change of ESMP in terms of social and environmental requirements of the project. At the same time, any changes to the ESMP content will need to be updated and approved by the Supervision Engineer

7.2 Construction Phase Environmental and Social Management Plan

The following were key environmental concerns that need to be addressed during the construction phase of the project. They include:

- Effects on biodiversity ·
- Solid waste management issues
- Noise and vibrations from construction machineries
- Effluents from construction machineries to the quality of water
- Impacts of the construction activities on water quality

7.3 Operation Phase Environmental and Social Management Plan

Main concerns during operation phase include:

- Increased generation of wastewater due to increased water supply
- Pipe burst causing water spillages.
- Illegal connection to the new pipeline extension.

Table 7.1: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Project Activities	Potential Impacts	Recommended mitigation measures	Institutional Responsibilities	Cost of Estimates (KES)
CONSTRUCTION PHASE				
1. Excavations for installation of pipelines network. 2. Installation of 2,000 No. domestic water meters	Loss of Flora and Fauna	- The Contractor shall ensure that clearing of vegetation clearing is limited to the pipeline trench area (i.e. 0.5 meters width) within the road reserve. - Transportation of construction materials to be done through the existing local roads. - Avoidance of vegetation clearing along riparian land. - Sensitization of construction work- force on environmental conservation and ecological protection. - Re-vegetation of completed pipeline route with fibrous rooted indigenous vegetation species.	Construction Contractor	300,000
	Landslides due slope instability at excavation areas for pipelines installations.	- Use of manual labour for trenching and backfilling. - Avoid utilization of heavy machinery near steep landscapes. - Construction activities to be conducted during dry season.	Construction Contractor	150,000
	Soil erosion and siltation of surface water resources.	- Use excavated earth materials for backfilling. - Sprinkling of backfilled trenches with water. - Compaction of backfilled trenches. - Re-vegetation of excavated areas. - Channeling of surface water runoff away from the pipeline routes.	Construction Contractor	90,000
	Increased Vehicular and Human Traffic	- Transportation of construction material to specific sites will be done through the existing local roads. - The contractor will rehabilitate the local roads that will be damaged during construction activities. - Consultation with the local communities on planned road diversions if any. - Restriction of Vehicular and Human Traffic to the road reserve where possible. - Sensitization of drivers to comply with prescribed speed limits.	Construction Contractor	120,000
	Interruption of Existing Infrastructure	- The Contractor will liaise with KIWASCO for location of existing water pipelines within the provided working wayleave.	Construction Contractor KIWASCO	700,000

		- Liaison with other service providers for location of electricity & internet cables within the provided wayleave to minimize damages. - The contractor to liaise with road authorities (KENHA, KURA, KERRA, & County Roads Department) during the installation of pipelines in the provided road reserves. - The contractor will immediately restore the damaged infrastructure during the installation of pipelines, to pre-construction conditions.		
	Air quality degradation, emission of dust and exhaust smoke	- Restricting traffic speed of vehicles. - Supply and construction vehicles will only use the designated transport routes. - Watering of the unpaved roads to minimize dust emissions. - The contractor will ensure proper repair and maintenance of vehicles and equipment to minimize exhaust smoke. - Construction workers will be provided with dust masks to mitigate.	Construction Contractor	200,000
	Noise pollution	- Noise minimized by limiting operating times to daylight hours. - Reduce as possible the vehicles' speed and movement of people.	Construction Contractor	50,000
	Generation of solid wastes	- Provision of solid waste collection facilities (waste bins). - Contracting licensed solid waste handlers. - Sensitization of construction workers on proper disposal of solid wastes.	Construction Contractor	100,000
	Discharge of polluting substances into the soil including washed water from construction areas, oil, accidental spills etc.	- Proper handling of waste oils and greases during servicing of vehicles and equipment. - Minimizing oil leakages in vehicles and construction equipment. - Good management of wastewater before releasing in natural environment. - Planning for good management of hazardous substances, if any.	Construction Contractor	45,000
	Risk of accidents to workers, road users, and neighbor community	- Strict application of Occupational Safety and Health (OSH) plan. - Availability of protective safety equipment specific to the working environment.	Construction Contractor	300,000

		- Availability of First Aid Box and emergency medical coverage as well as trained Nurse and a safety officer.		
	Temporary interruption of business activities during the installation of pipelines and loss of livelihood income to the PAPs.	- Creating awareness, informing all community members along the pipeline routes. - Preparation PAPs Compensation Entitlement Matrix. - Compensation of the Project Affected Persons.	KIWASO	572,546
	Temporary removal of assets during the excavations for installation of pipelines.	- Valuation of affected assets. - Full restoration of the affected assets to their original status. - Compensation for the PAPs for non-use of the assets during the interruption period.	KIWASCO Construction Contractor	162,597
	Disputes arising from the implementation of ESMP including PAPs compensations & restoration of affected assets.	- Establishment and operationalization of Grievance Redress Mechanism (GRM).	KIWASCO	140,000
	Health and Safety Hazards	- Continuous supervision of occupational, health and safety management to ensure compliance. - Occupational Safety and Health. - Training for contractor's staff. - Conduct orientation talks and visits. - Conduct toolbox talks.	Construction Contractor	120,000
	Increased prevalence and transmission of HIV/AIDS and other STDs due to influx of workers migrating to worksites seeking jobs or already recruited.	- Application of public health management plan. - Increasing awareness and campaigns against transmitted diseases among workers and local population.	Construction Contractor	140,000
	Sexual Exploitation and Abuse (SEA) & Gender-Based Violence (GBV)	- Contractor to develop and implement code of conduct, signed by all workers. - Contractor to provide training and awareness programs to project contractor's staff, and community members on GBV and sexual harassment prevention and reporting.	Construction Contractor	110,000

		- Collaborations with local communities, leaders, and women's groups to address concerns related to GBV and sexual harassment. - Collaboration with local law enforcement and authorities to address and prevent GBV incidents. - Implementation of clear and confidential reporting mechanisms for any incidents of GBV or sexual harassment.		
	Child Labour and Protection	- Ensure no children are employed on site in accordance with national labour laws. - Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.	Construction Contractor	No additional costs
	Effects of Immigrant Workers	- Contractor should use the local workforce as much as possible. - Effective community engagement and strong grievance mechanisms on matters related to labour.	Construction Contractor	No additional costs
	Injection of money to the local economy	- Positive impact, no mitigation measures. - The contractor shall strive to procure construction materials from the local suppliers and other basic items from the local shopping centers.	Construction Contractor	No direct costs anticipated
Cost Estimates for the Construction Phase				**3,300,143**
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.	KIWASCO	Proponent's cost
	Generation of liquid and solid wastes	- The County Government of Kiambu & KIWASCO to encourage the construction and usage of septic-tanks for disposal of wastewater by the residents of Township, Riabai, Ting'ang'a & Ndumberi areas in the areas that do not have sewer lines. - Solid wastes generated during repair and maintenance activities will be collected and disposed-off in designated manner.	Kiambu County Government KIWASCO	-
	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.	KIWASCO	-

		- The proponent shall provide first-aid facilities for repair and maintenance staff. - Proponent's staff will be required to use PPEs during repair and maintenance work.		
	Improved and reliable water supply for the residents of Township, Riabai, Ting'ang'a & Ndumberi.	- Positive impact, no mitigation measures. - Improve customer experience through better water supply services. - Reduction of water outages/ rationing. - Expansion of coverage area.	KIWASCO	-
	Increased reliability of water supply to the residents of Township, Riabai, Ting'ang'a & Ndumberi.	- Positive impact, no mitigation measures. - Reduction of water outages/ rationing.	KIWASCO	-
DECOMMISSIONING PHASE				
Demolition of project structures and disposal of construction materials	Reduced availability of potable water to beneficiaries	- The proponent shall provide an alternative source of potable water to the beneficiaries of the project.	KIWASCO	-
	Loss of Flora and Fauna	- The proponent shall ensure minimal clearing of vegetation. - Transportation of decommissioning wastes to be done through the existing local roads. - Sensitization of decommissioning workforce on environmental conservation and ecological protection. - Re-vegetation of cleared areas with indigenous vegetation species.	KIWASCO Decommissioning Contractor	
	Generation of solid wastes	- Provision of solid waste collection facilities (waste bins). - Contracting licensed solid waste handlers. - Sensitization of construction workers on proper disposal of solid wastes.	KIWASCO Decommissioning Contractor	-
	Health and Safety Hazards	- Continuous supervision of occupational, health and safety management to ensure compliance. - Occupational Safety and Health - Training for contractor's staff. - Conduct orientation talks and visits.	KIWASCO Decommissioning Contractor	-

		- Conduct toolbox talks.		
	Water quality degradation	- The contractor will maintain all site vehicles and equipment is a serviceable state. - Oils and greases emanating from repair and maintenance activities will be collected in containers to avoid entry into local drainage channels. - Water from cleaning of equipment will be utilized within the project site and will not be discharged into water courses.	KIWASCO Decommissioning Contractor	-
	Increased Vehicular and Human Traffic	- Transportation of decommissioning wastes to specific sites will be done through the existing local roads. - The contractor will rehabilitate the local roads that will be damaged during decommissioning activities. - Consultation with the local communities on planned road diversions. - The contractor will rehabilitate the local roads that will be damaged during decommissioning activities. - Restriction of Vehicular and Huma Traffic to the road reserve where possible. - Sensitization of drivers to comply with prescribed speed limits.	KIWASCO Decommissioning Contractor	-
	Air Quality Degradation	- Evacuation vehicles will only use the designated transport routes. The drivers will also be advised to stick to prescribed speed limits. - The contractor will ensure proper repair and maintenance of vehicles and equipment to minimize exhaust gases. - The contractor shall ensure recommended speeds on road sections that will be used by construction vehicles are adhered to on a needs basis to reduce the creation of dusts. - Construction workers will be provided with dust masks to mitigate.	KIWASCO Decommissioning Contractor	-
	Employment opportunities for local community	- Positive impact, no mitigation measures. - The contractor shall reserve opportunities for semi-skilled and casual work for interested members of the local communities.	KIWASCO Decommissioning Contractor	-

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 (KIWASCO) including the project supervising engineer and social safeguards consultant 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)

Parameter/ Activity	Location	Means of Monitoring	Frequency	Responsible Agency	
				Implemented by	**Supervised by**
Compensation for loss of livelihood due to business interruptions during pipelines installations.	Construction site	- All PAPs successfully compensated as recorded in the Compensation Entitlement Matrix. - Grievances resolved promptly (within the duration allowed in the Grievance Redress Mechanism.	Prior to commencement of construction activities at sites.	KIWASCO	E&S Expert Grievance Redress Committee
Restoration of affected assets during pipelines installations.	Construction site	- Visual inspections of restoration of affected assets to their original status. - Grievances resolved promptly (within the duration allowed in the Grievance Redress Mechanism.	Prior to commencement of construction activities at sites.	KIWASCO Contractor	Project Supervising Engineer E&S Expert Grievance Redress Committee
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
HIV & AIDS & STIs	Project area	- Inspection of HIV/AIDS prevention services within the site,	Monthly	Contractor	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	construct ion 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, - Low speed of construction vehicle, catalytic devices on vehicle and suppress dust.	Daily	Contractor	Project Supervising Engineer
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
Flora and fauna	Construction sites	- Documentation of uprooted and cut down trees, - Physical Inspection.	Weekly	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,	Monthly	Contractor	Project Supervising Engineer

		- Chemical inspections.			E&S Expert
Labour and employment related issues	Construction site and contractor's 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 contractor's 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.
- 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 should be involved in the implementation of this ESMMP:

- NEMA.
- Contractor.
- Works construction Supervision Consultant.
- Kiambu Water & Sewerage Company/County Government of Kiambu

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 construction supervision 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 KIWASO County Government of Kiambu

KIWASCO as the project proponent will be required to provide necessary resources for the implantation of ESMMP. KIWASO will also employ the works supervision consultant including the Environmental & Social Expert to supervise the implementation of ESMMP. 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 Kiambu under the KIWASCO will operate the Project once commissioned.

9 PROJECT AFFECTED PERSONS

Project affected persons (PAPs) are individuals, communities, households, institutions, and businesses whose assets may be lost and/or affected, including and other assets, livelihoods, and/or access to natural and/or economic resources as a result of activities related to a given investment especially component.

9.1 PAPs Assessments

Site assessments at the proposed Project sites were carried out between 5th & 6th December 2024 to establish the presence of any Project Affected Persons (PAPs). The assessments were undertaken jointly with the technical officers from KIWASCO. This assessment established that the implementation of the proposed pipelines extensions and installation of water meters will not require any land to be acquired and therefore loss of land will not be triggered under this Project. The pipelines will be installed along public road reserves within the areas set aside by the road authorities (KURA, KENHA & County Roads for public utilities. The water meters will be installed within the available road reserves or inside the consumer plots in some cases for security purposes. However, the assessment identified **33 PAPs** within the proposed pipelines installation alignments whose livelihood activities will temporarily be affected for a duration of 3 – 5 days during the implementation of the works. These PAPs include:

a) Temporary interruption of business activities within Kirigiti Trading Centre during the installation of pipelines offtakes for Thindigua, Ndumberi, Riabai and Ting'ang'a. Due to the limited available space within Kirigiti & Ting'ang'a Trading Centres, there will be need to break sections of walkway pavements thereby temporarily affecting access to some business premises.
b) Temporary removal of semi- permanent structure that have been erected at the road reserves to facilitate the installation of pipelines. The structures will be re-constructed upon completion of the works within the same location on the road reserve.
c) Traders carrying out business activities within the proposed pipelines alignments at the road reserves but with no erected structures (merchandise placed on the ground).
d) Several farmers with animal feed napier grass and crop cultivations along the road reserves.

KIWASCO has aligned the proposed pipelines within the existing road reserves such that disruptions of businesses and livelihood incomes are minimized as much as is practical. This is through:

i. Taking advantage of the spacious areas within the existing road reserves to avoid disruption of business activities. Most of the pipelines will be installed outside the urban centres with only a few encumbrances along the available wayleaves.
ii. Use of HDPE relatively small diameter pipes (OD 32mm – OD 63mm) in 50 -100m long coils whose alignments can easily avoid obstructions. The trench excavation widths for pipelines installations will be minimal (150 -300mm) due to the small diameter pipes.
iii. Duration any disruption of business activities during the installation of pipelines on the existing wayleaves is limited to a maximum of 5 days after which the PAPs can continue with their normal activities. This will be achieved through a well-planned program of construction activities.

9.2 PAPs Categorization

The total number of Project Affected Persons (PAPs) enumerated along the proposed water pipeline routes is 33 PAPs. This number includes 15 male PAPs of which 3 are vulnerable PAPs and 18 female PAPs of which 7 are vulnerable PAPs.

Vulnerable, or disadvantaged groups

Vulnerable groups include older persons, the sick; single mothers, children, PWDs, women; unemployed youth, and orphans; households headed by women that depend on sons, brothers, and others needing support and are especially vulnerable. The vulnerable groups are eligible for additional assistance.

The nature of vulnerability in the enumerated PAPs include:

- Women headed households (single mothers) among the female PAPs.
- Elderly PAPS (over the Age of 65 years).

Table 9.1: PAPs Categorization

PAPs	Male	Female
Total Enumerated PAPs by Gender.	15	18
Vulnerable PAPs.	3	7
PAPs whose business activities will be temporarily affected due to limitation of access to business premises.	6	6
PAPs whose semi-permanent business structures will be demolished and temporarily relocated within the existing road reserve area.	1	11
PAPs operating in open areas (no erected structures) but will be affected.	4	3
PAPs with cultivations within the road reserves earmarked for pipelines installations.	2	-

9.3 Eligibility for Compensation

The concept of eligibility is used with respect to the definition of PAPs and the criteria for determining their qualification for compensation. And any other resettlement assistance. The WSDP Resettlement Policy Framework (RPF) provides for, that if a Sub – project funded under WSDP causes loss of income or livelihood, regardless of whether or not the affected Project affected people are physically displaced, the project will meet the following requirements among others:

a) Promptly compensate economically displaced persons for loss of assets or access to assets at full replacement cost.

b) Compensate economically displaced persons who are without legally recognizable claim to land for lost assets including other improvements made to the land, other than land, at full replacement cost.

c) Provide transitional support to economically displaced persons, as necessary, based on a reasonable estimate of the time required to restore to restore their income earning capacity, production levels, and standards of living.

Eligibility Cut – Off Date

The entitlement cut-off date refers to the time when the assessment of persons and their property in the area is carried out for the preparation of investment specific RAPs during the census exercise. The affected persons are eligible for some form of assistance if they engaged in any livelihood activity at the affected sites before the entitlement cut-off date. The cut-off date was discussed and agreed upon during consultative meetings as the date of start of PAPs census activities – **4/12/2024 to** prevent opportunistic invasions.

9.4 Asset Valuation Methods and Compensations

Valuation Methods for the Affected Assets and losses of income

Valuation is the process of determining the value of land, or an asset that PAPs possess or use. A Replacement Cost Approach valuation method has been used where the costs of replacing assets are based on damages caused by project operations. The approach involves direct replacement of expropriated assets and covers an amount that is sufficient for asset replacement, moving expenses and other transaction costs. Replacement cost for properties affected by the proposed project has been based on the pre-project or pre-displacement market value of similar asset or structures, including preparation, registration, and transfer costs.

- For structures, it includes the cost of building materials, labor, contractors' fees, and transportation.

- Valuations for compensations on losses of income due to interruptions of business activities have been estimated from net daily profits of the businesses.

- For the affected crops and other cultivations, the prevailing market rate for mature crop/vegetation has been considered.

Table 9.2: Summary of the valuation methods used for the affected assets

Structures	• The prevailing market cost of the materials to build a replacement structure with an area and quality similar to or better than those of the affected structure, or • To repair a partially affected structure, plus the cost of transporting building materials to the construction site, plus the cost of any labour and contractors' fees, plus the cost of any registration and transfer taxes.
Loss of Income	• Losses of income for businesses have been estimated from net daily/monthly profit of the business verified by an assessment of visible stocks and activities. • In addition to the compensation, disturbance allowances of 15% of total compensation have been considered. • The estimation of supplementary assistance for affected commercial structures or business units has generally been based on the estimated income obtained from the use of the business/commercial unit and the estimated period of disruption of business activities.

Crops and cultivations	• The prevailing market rate incorporating the value of crops and labor invested in preparing new land. • That is, the average of last three years' market value for the mature and harvested crop and the average wage in the community for the same period for labour.

The valuation process of the Affected Assets included:

- Field preparation of asset inventory.
- Enumeration of each asset and recording in an inventory Asset Register.
- Valuation of the asset carried out using the approach described above and the values of each asset recorded in the Asset Register.

Compensation for the PAPs

- **Interruption due to lack of access to business premises**

PAPs losing business due to blockage of access during installation of pipes within Kirigiti Trading Centre will be entitled to cash compensation equivalent to daily average income derived from the businesses they operate. Restoration of access will be done by the works construction contractor upon installation of pipelines.

- **Temporary relocation of semi- permanent structures**

PAPs whose semi-permanent wooden structures will be temporarily affected will be entitled to full restoration of the structure at the same location after the installation of pipelines. This can either through cash compensation with the right to salvage materials without deduction from compensation and self-reconstruction or reconstruction carried out by the works implementation contractor on behalf of KIWASCO. The PAPs will be entitled to cash compensation equivalent to daily average income derived from the businesses they operate during this interruption.

- **Business interruption in open areas with no erected structures**

PAPs operating businesses on open areas within the road reserves, and which will be affected during pipeline installation, will be entitled to cash compensation equivalent to daily average income derived from the businesses they operate for the affected days.

- **PAPs with cultivations long pipelines wayleaves**

PAPs who have cultivations on the existing road reserves where the proposed pipelines will be aligned will be entitled to full compensation of mature crop or vegetation. In addition, they will be entitled for compensation on seeds and labour costs for re-plantation after the installation of pipelines.

- **Disturbance Allowance**

In addition to the compensation valuation amounts an additional 15% disturbance allowance has been provided.

Provisions for Vulnerable PAPs

The below listed provisions are included for the vulnerable PAPs enumerated:

(i) Targeted and localized house-to-house sensitization for the vulnerable PAPs households during pre-payment consultations. This will be applicable during the PAPs compensation implementation to vulnerable PAPs (particularly the elderly) who are not able to attend PAPs sensitization forums. The

PAPs Compensation implementation teams will visit such PAPs at their premise and further sensitize and enlighten them on the compensation implementation process.
(ii) Priority consideration in processing compensation payments and extra assistance to vulnerable PAPs in explaining and filling out compensation payment forms.
(iii) Additional 25% of the eligible compensation amount to the vulnerable persons.

9.5 Income Restoration Measures

The PAPs assessment has been carried out to enhance restoration of the PAPs' income streams to pre-impact status. Therefore, in addition to compensation for loss of income due to the temporary disruption of business activities during the installation of pipelines, the Proponent (KIWASCO) will:

- Program work scheduling such that pipelines installations at any section does not take more than 3 days (including testing) with another about 2 days provided for re-construction of the affected structure.
- Minimal excavation widths for the areas where access pavements for the business premises will be affected. The proposed pipe diameters within most of the pipeline sections are small (OD 32 -63mm) and therefore the trench width of about 100 – 150mm will be sufficient and restoration can be achieved in a day.
- Re-construction of affected wooden semi-permanent business structures within the same locality on the road reserve immediately after the installation of pipeline section.
- Excavations, installations of pipelines, backfilling of trenches and levelling of target sections where businesses are conducted with no erected structures can be planned to take a maximum of 3 days interruption and the traders can resume usual business thereafter.

9.6 Affected Asset Valuation & PAPs Compensation Entitlement Matrix

The names and Telephone Contacts of the PAPs, details of affected assets & their valuations and compensation dues to the PAPs have been compiled and summarized in a PAPs and Assets Compensation and Entitlement Register. This Register is attached in the Report as **Annex III.**

9.7 PAPs Compensations Implementation Arrangements

9.7.1 Asset Restoration & PAPs Compensation Implementation Principles

The main objective of asset restorations and compensations are to ensure that the affected assets are restored to their original status and the PAPs get fair and prompt compensations. In this way it is expected that their income, production capacity and standard of living will be improved, or at least restored to their former levels. The guiding principles for the implementation of the PAPs compensations will be as follows:

(i) Disruptions of PAPs livelihoods has been minimized taking into consideration all possible alternative measures including re-alignment of pipeline routes where possible.
(ii) Compensation will be paid before Project works commence in a specific Project area and in a manner that does not curtail the livelihoods of the PAPs in terms of access and utilization of such compensation.
(iii) The compensation values awarded will be fair enough to restore the livelihoods of PAPs.
(iv) All other activities related to the proposed compensations will be communicated in advance to the PAPs using the preferred channels of communication.

(v) Where grievances arise, the respective PAPs will be given an opportunity to be heard, fairly and promptly.
(vi) Measures will be taken to ensure that vulnerable groups get special assistance and support; and where spousal and children consent is needed, the provision will be enforced.
(vii) A statutory disturbance allowance of 15 percent of the compensation value will also be included.

9.7.2 Asset Restoration & PAPs Compensation Implementation

- **KIWASCO PAPs Compensation Implementation Committee**

The KIWASCO PAPs committee will be in charge of overall monitoring and evaluation of the affected assets restorations and PAPs compensation process. The committee will comprise of:

- Project Engineer,
- Environmental and Social Safeguards Specialist,
- Land Surveyor,
- Accountant,
- Monitoring/ Evaluation Expert.

KIWASCO will hire short term consultancy services for the Environmental and Social Safeguards Specialist and Monitoring/ Evaluation Expert specifically for the Project as the WSP does not have the experts within the existing staffing.

The committee will work with representatives of relevant stakeholders including:

- Project Affected Persons (PAPs),
- Kiambu Town Business (Kirigiti) Community,
- Informal traders within the Project areas,
- Area Chiefs and Assistant Chiefs in the Project areas (Kirigiti, Thindigua, Ndumberi, Riabai & Ting'ang'a).

The Committee's roles shall be:
(i) To ensure the list of all PAPs has been verified. The register shall have among other parameters the following:

- The name of the person,
- Type of loss (structure / Livelihood)
- Identification number of the PAP
- Compensation Amount
- Bank Details or Mpesa details of the PAP.

(ii) To develop an appropriate procedure for delivering the compensation payments to the PAPs in keeping in mind that most PAPs have no bank accounts or did not want to share their bank account details during the assessment. All the PAPs preferred payments through Mpesa.
(iii) To provide information to the eligible PAPs prior to delivering the compensations. Such information will include:

- Names of eligible PAP,
- Dates and locations where payments will be made,

- Amount to be made Mode of payment, etc.

9.8 PAPs Compensations Implementation Budget

The estimated PAPs Compensations Implementation Budget includes provisions for the restoration of the affected structures and livelihood losses for 33 PAPs as well as monitoring and evaluation of the process as summarized in the Table below:

Table 9.4 : PAPs Compensations Implementation Budget

	Description	**Amount (KES)**
1	Asset Loss	162,597
2	Livelihood Loss	572,546
	Sub Total 1	**735,143**
3	Awareness raising and sensitization of PAPs	50,000
4	Training and Capacity Building for GRM	30,000
5	Operational & Administrative Costs of PAPs Compensation Committees	60,000
	Sub Total 2	**140,000**
	Total Approximate Budget	**875,143**

9.9 PAPs Compensations Implementation Schedule

The implementation schedule for the PAPs Compensations covers the period from the finalization of the preparation of the PAPs assessment and its subsequent approval to the conclusion of the envisaged Project within KIWASCO Project Area. This PAPs assessment is structured such that the procedures will be phased to synchronize with the work program of the contractor. Phasing is done to eliminate cases of re- encroachment on the pipeline way leave by PAPs after compensation.

Table 9.5: PAPs Compensation Implementation Schedule

Task	**Actors**	**Period in Weeks**					
		Implementation to begin immediately after approval of ESIA Report					
		1	2	3	4	5	6
Approval of PAPs Compensation Report	WSTF/ World Bank	■					
Formation of Grievance Management Committees	KIWASCO	■					
Disclosure of PAPs Compensation Report	WSTF/ World Bank/KIWASCO	■					
Validation of the Affected Asset Register	PAPs Implementation Committee		■				
Issuance of Demolition Notices for the affected structures	Kiambu County Government/KIWASCO		■				
Payment of compensations	KIWASCO		■				
Grievance Resolutions	GRC		■	■	■	■	■
Demolition/restorations of affected structures upon expiry of 2-week demolition notice	Contractor				■	■	
Monitoring activities	KIWASCO		■	■	■	■	■

9.10 Monitoring and PAPs Compensations Audit

Monitoring and Evaluation (M&E) procedures establish the effectiveness of all the Project affected assets in addition to the measures designed to mitigate adverse social impacts for the PAPs. The procedures include internal track-keeping efforts as well as independent external monitoring. The purpose of compensation monitoring for the Project is to verify that:

(i) Actions and commitments described in the PAPs Compensation Report are implemented.
(ii) Eligible PAPs receive their full compensation prior to the commencement of the construction activities in the Project area.
(iii) Actions and compensation measures have helped the people who sought cash compensation in restoring their lost incomes and in sustaining/improving pre-project living standards.
(iv) Complaints and grievances lodged by PAPs are followed up and, where necessary, appropriate corrective actions taken.
(v) Changes in compensation procedures are made, if necessary, to improve delivery of entitlements to PAPs.

The primary responsibility for Monitoring and Evaluation of the PAPs compensation processes rests with proponent (KIWASCO). The **Table 9.6** below indicates Internal Monitoring Indicators that will be checked during Internal Performance Monitoring by KIWASCO

Table 9.6: Internal Monitoring Indicators

Activity/Parameters	Indicators
Compensation Payments to PAPs	• PAPs successfully compensated • PAPs promptly paid • PAPs not paid promptly and reasons • Money paid to PAPs
Additional Assistance and Livelihood Restoration	• PAPs with restored assets • PAPS with restored livelihood enterprises • PAPs without restored assets • PAPS without restored livelihood enterprises
Community participation and public engagement	• Local consultative Meetings held • PAP consultative Meetings held
Grievance management	• Grievances received • Grievances resolved promptly (within the duration allowed in the Grievance Redress Mechanism) • Grievances not resolved in time but completed • Outstanding grievances not resolved

9.11 Conclusion and Provisions on PAPs Assessments

Conclusion

The PAPs assessment has identified that implementation of the proposed Project has the potential of resulting to risks associated with destruction of structures used for business belonging to private individuals. However, loss of land will not be triggered under this Project. The proposed pipelines alignments lie within existing road reserves and wayleaves shared by local utilities owned by the relevant Road Authorities i.e. Kenya Urban Roads Authority (KURA), Kenya National Highways

Authority (KENHA) and the Kiambu County Roads Department. Therefore, no land will be acquired since the PAPs are occupying the land informally. KIWASCO when implementing the water pipelines extension project shall seek for approvals from the relevant roads authority before laying the water pipes with the road reserves.

The total number of Project Affected Persons (PAPs) enumerated along the proposed water pipelines routes is 33 PAPs. This number includes 15 male PAPs of which 3 are vulnerable PAPs and 18 female PAPs of which 7 are vulnerable PAPs.

PAPs Compensations Provisions

To ensure smooth implementation of the Proposed Project, the below listed provisions will be undertaken by KIWASCO:

(i) KIWASCO will provide adequate notice to the PAPs for them to salvage and relocate their assets.
(ii) To minimize grievances, KIWASCO will not only follow the full replacement cost for compensation but hold comprehensive consultation and negotiations with the PAPs.
(iii) KIWASCO will ensure all the 33 PAPs are compensated prior to laying of the water pipelines.
(iv) The Affected Assets Restorations and PAPs Compensations schedule provides for phasing of compensation depending on the water pipelines that are ready for construction. This approach will eliminate the risk of PAPs re-encroaching on water lines after compensation.

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.
- Unfair compensation for affected assets and lose of livelihood during project implementation.

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 Liaison Officer - – LO).	• Established at the community / Stakeholders' level with membership from the project area. Consists of a 7 - 11member committee (exclusive of ex official members). • Membership should be drawn from a variety of factors	• Assist community / stakeholders to file a complaint. • To address affected persons grievances as 1st, point of contact, within 15 days.

		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.	
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 CHANCE FIND PROCEDURES

11.1 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.

11.2 Responsibility

Kiambu Water & Sewerage Company (KIWASCO) 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.

11.3. 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.

11.4. 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.

11.5. 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.

Ma**nagement 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.

12 CONCLUSION AND RECOMMENDATIONS

12.1 Conclusion

The process followed in this study was aimed at providing opportunity to the neighbouring community to express their views, fears, and expectations about the implementation of the proposed Project. The consultation process was open and unbiased. The objective of the consultation process was to discern what the public expect from the project proponent whilst clarifying the technical aspects of the project. The ESIA study and public consultation were conducted under an atmosphere of mutual trust and the local people were willing to spare their time to give audience to the ESIA consultants and provide their input in the entire process. Those consulted did not raise any significant issues about implementation of the proposed project and it can be concluded that stakeholders are supportive of the project. Their support for the project is based on the difficulties currently faced by residents of the area regarding water supply. They also feel that the project has more benefits and should therefore be implemented as proposed.

There are number of Project Affected Persons (PAPs) whose livelihood will be affected during the implementation of the Project. There is need to provide compensation to the PAPs for loss of income arising from disruption their activities and also ensure restoration of any affected structures to their original status. Since all the proposed pipelines will be installed on the wayleaves that have provided by the road agencies for public utilities (including water), loss of land will not be triggered under this Project.

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12.2 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.

- Promote community participation to ensure residents' support on the proposed project.

- Compensations for the identified Project Affected Persons be implemented prior to commencement of construction works on the Project.

- A Provisional Budget of **KES 3,300,143** that is required for implementation of mitigation measures of potential negative environmental should be included in the Project Implementation costs. This amount includes **KES 875,143** for the restoration of Affected Assets and compensations for PAPs due to loss of livelihood income during installation of pipelines.

REFERENCES

- Environment Management and Coordination EMCA Cap 387 and EIA/EA Regulations 2003)
- Kenya gazette supplement number 56. Environment Impact Assessment and Audit Regulations 2003. Government printer, Nairobi
- Kenya gazette supplement number 69. Environmental Management and Coordination (waste Management) Regulations 2006. Government Printer Nairobi.
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- Kenya gazette supplement Acts Public Health Act (Cap. 242). vii. World Bank Operational Safeguards Policies on Environment and Social Risks.
- World Bank Operational Safeguards Policies on Environment and Social Risks.
- Kiambu County Integrated Development Plan (CIDP) 2017- 2022
- Kiambu County Integrated Development Plan (CIDP) 2023 – 2027
- The Kenya National Population and Housing Census, 2019
- The WSDP Environmental and Social Management Framework (ESMF)
- The WSDP Resettlement Policy Framework (RPF)

ANNEXES

Annex 1: Sample Questionnaire Responses



KIWASCO SAMPLE ESIA QUESTIONNAIRI



KIWASCO SAMPLE ESIA QUESTIONNAIRI

Annex II: Minutes of Public Consultations Meetings & Participants Attendance Lists

a) At Ting'ang'a Ward

Minutes of meeting



KIWASCO ESIA - Ting'ang'a Minutes of

Attendance List



KIWASCO ESIA - TING'ANG'A MEETINC

b) At Ndumberi Ward

Minutes of meeting



KIWASCO ESIA - Ndumberi Minutes of

Attendance List



KIWASCO ESIA - NDUMBERI MEETING

Annex III: KIWASCO PAPs and Asset Register

KIAMBU WSP PAPs and Asset Register.xls:

KIWASCO PAPs & COMPENSATION DUE

Annex IV: KIWASCO CLSG – 2 Project BOQs & Cost Estimates

KIWASCO CLSG - 2 BOQs AND COST EST

Annex V: Road Authorities Wayleaves Application Forms & Guidelines

KENHA ROAD RESERVE WORKS -Ap

KURA ROADSIDE DEVELOPMENT APPLI

KERRA RoadsideDevtApplicat

KENHA **KURA** **KERRA**

Annex VI: ESIA Study Team Leader NEMA Licence - 2024



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FORM 7

(r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/20605

Application Reference No: NEMA/EIA/EL/27574

M/S James K.Wainaina
(individual or firm) of address
P.O. Box 4358 - 00506 Nairobi

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) Lead Expert General 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

Annex VII: Selected Photographs of Affected Structures



Businesses and access to business premises that will be affected during the installation of a section of the Kirigiti – Thindigua pipeline at Kirigiti trading Centre.



Semi-permanent business structures at Kirigiti Trading Centre where a section of the proposed pipelines will be installed on the road reserve.



Shoe vendor in Ndumberi Ward where a section of the proposed pipelines will be installed on the existing road reserve.



Cap selling business on the wayleave for the proposed 2Kirigiti – Riabai – Kiamumbi main pipeline



Groceries Kiosk on the the road reserve along where the proposed Muhathi pipeline in Ndumberi Ward will be installed.



Napier grass cultivation on road reserve to be affected during installation of Gatitu pipeline section in Ndumberi Ward