Ministry of Water, Sanitation and Irrigation

CONDITIONAL LIQUIDITY SUPPORT GRANT (CLSG) II PROJECT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY

Desilting and installation of scour systems for 2 No. intakes, installation of 38km HDPE pipelines and installation of consumer & bulk meters

Gatundu Water and Sewerage Company (GATWASCO) - Kiambu County

DECEMBER 2024

PROPONENT	EIA LEAD EXPERT
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CERTIFICATION

This ESIA Report has been prepared in accordance with the Environmental Management and Coordination Act (EMCA) 1999 and the Environmental (Impact Assessment and Audit) Regulations 2003 for submission to the National Environment Management Authority (NEMA). **Report Title:** Environmental Impact Assessment (ESIA) Study for the proposed desilting and installation of scour systems for 2 No. intakes, supply and installation of 38km HDPE pipelines DN32- DN110, supply and installation of 6478 Consumer meters, DN15 and 172 No bulk meters (DN25 to DN250) for Gatundu Water and Sanitation Company (GATWASCO)

Proponent: Gatundu Water and Sanitation Company (GATWASCO)

Activity: Preparation of Environmental Impact Assessment (ESIA) Study for the desilting and installation of scour systems for 2 No. intakes, supply and installation of 38km HDPE pipelines DN32-DN110, supply and installation of 6478 Consumer meters, DN15 and 172 No bulk meters (DN25 to DN250)

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Signed: _____ **Date:** 13/02/2025

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
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
GoK	Government of Kenya
GRM	Grievance Redress Mechanism
HASP	Health and Safety Plan
HIV/AIDS	Human Immuno-deficiency Virus
KENHA	Kenya National Highways Authority
KNBS	Kenya National Bureau of Statistics
LA	The Land Act
GATWASCO	Gatundu Water & Sanitation Company Limited
MDG	Millennium Development Goal
MOWSI	Ministry of Water Sanitation and Irrigation
NEMA	National Environment Management Authority
NEP	National Environment Policy
NGO	Non-Governmental Organization
NLC	National Land Commission
OP	Operational Procedures
OS	Operational Safeguards
PAP	Project Affected Person
PPE	Personal Protective Equipment
RAP	Resettlement Action Plan
SEA	Sexual Exploitation and Abuse
SGBV	Sexual and Gender Based Violence
STDs	Sexually Transmitted Diseases
ToR	Terms of Reference
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

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. Gatundu Water and Sanitation Company (GATWASCO) 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.

Gatundu water and sanitation company (GATWASCO) is a Water Service Provider licensed by Water Services Regulatory board (WASREB) to provide water and sewerage services to residents of Gatundu North and Gatundu South of Kiambu County as stipulated in the Service Provision Agreement. GATWASCO is a limited liability company, which was incorporated in October 2014 following the Merger of Karimenu and Gatundu south water and sanitation companies. It is the only licensed water and sanitation service provider in Gatundu North and South Sub-Counties and serves Gatundu North sub-county, Gatundu South sub-county and parts of Githunguri and Juja. The area of service has approximately 280,000 Population out of which 65% have access to water services and 92% to sanitation services. The total water demand is approximately 40,000m3/day against a water production of 27,440m3/day. Water is supplied from 8 no. surface water sources namely Gakoe, Kairi and Karure that draw water from Karimenu river, Ndarugu and Nyamang'ara that draw water from Ndarugu river, Kirangi and Gaitete that draw water from Ruabora river, Gacharage that draws water from Thiririka river and Theta that draws water from Theta Dam.

GATWASCO has proposed the desilting and installation of scour systems for 2 intakes located on the upper Thiririka River (at Gaitete) and Ndarugu River (at Kanda Komu), supply and installation of 38km HDPE pipelines DN32- DN110, supply and installation of 6,478 Consumer meters, DN15 and 172 bulk meters (DN25 to DN250), in order to improve water supply services for the residents on Kenyatta Road in Juja and Theta Wards, Juja Sub - County under the CLSG II Program. The implementation of such a development project will generate positive socio-economic benefits, but also negative impacts to human community and environment. 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 conduct 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 negative impacts. An Environmental and Social Management Plan (ESMP) has been formulated in this report to ensure that the proposed mitigation measures will be implemented effectively.

2. Project description/project activities

Proposed Project Location

Geographical coverage

Gatundu Water and Sanitation Company (GATWASCO) covers Gatundu North & Gatundu South Sub-counties and part of Githunguri Sub- County. Its area of coverage is approximately 376km2 covering nine wards including Ng'enda, Kiamwangi, Kiganjo, Chania, Ndarugu, Gituamba, Gathaite, Mang'u and parts of Komothai. According to the 2019 census, this area has an approximate population of about 231,973 persons. There are about 278,976 people currently within the service area of the utility out of which about 68% are served.

Proposed Scope of Works

The summarized Scope of Works for the proposed project include:

- Desilting and installation of scour systems for 2 intakes located on the upper Thiririka River (at Gaitete) and Ndarugu River (at Kanda Komu).
- Supply and installation of 38km HDPE pipelines DN32- DN110, in order to improve water supply services for the residents on Kenyatta Road in Juja and Theta Wards, Juja Sub – County.
- Supply and installation of 6,478 Consumer meters, DN15 and 172 bulk meters (DN25 to DN250) within the water distribution system.

The estimated cost of the proposed Project is **KES 21,589,390**

The 2 intakes are located on the upper Thiririka River (at Gaitete) and Ndarugu River (at Kanda Komu). The pipelines extensions are targeting the consumers on the Kenyatta Road including upcoming residential areas such as Croton, Riverside, Kays, Murrum, Hard Rock Park, Boma and Mariapolis Estates. The consumer and bulk water meters will be installed within GATWASCO's water distribution system.

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

3. Objectives of the ESIA study

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

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

4. Scope of the ESIA study

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

- Detailed Project's descriptions.
- Description of the Baseline Environment.
- Stakeholders Engagement.
- Description of the Relevant National and International Legislative and Institutional Regulatory Framework.

- Identify all potential significant environmental and social impacts of the proposed Project and recommend measures for mitigation.
- Cumulative Impact Assessment.
- Assessment of the Project's alternatives.
- Development of Environmental & Social Management & Monitoring plan to avoid, mitigate and where not possible, offset the identified impacts to ensure sustainability of the proposed Project.

5. Methodology utilized

The general methodology utilized has focused on:

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

6. Policy-legal and institutional framework

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

- Constitution of Kenya 2010
- Water Act, 2016
- Environmental Management and Coordination Act (EMCA), 1999
- Occupational Safety and Health Act (OSHA 2007)
- The Public Health Act
- Work Injury Benefit Act 2007
- Labour Relations Act 2012
- Climate Change Act of 2016
- Land Act, 2012
- 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 Safety Policies

Safeguards Policies	Provision	Relevance to the Project
World Bank OP 4.01 on Environmental Assessment	Provides for environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making	An Environmental and Social Impact Assessment of the development/rehabilitation of water supply schemes will be conducted.
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 where the proposed pipelines (Approx. 38 Km) will be installed, have been undertaken and confirmed that the proposed project does not involve any resettlements of PAPs. There are no PAPS who are likely to suffer economic displacement. There is 1 road crossing on Kenyatta Road where KENHA has provided a conduit next to Mariapolis Estate for crossings of utility service lines. Within the roads in residential estates, there are culverts specifically installed below cabro pavements for services lines crossings. 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.
World Bank OP 4.11 on Physical Cultural Resources	Provides for measures to protect cultural heritage from the adverse impacts of project activities and support its preservation.	No physical cultural resources were identified within the project areas. However, the ESIA has provided chance find procedures to be adopted by the contractor during civil works.

International Conventions and Treaties

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

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

7. Baseline conditions in the project area

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

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

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

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

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

8. Stakeholders and public consultations
As part of the ESIA preparation for the proposed Project, the consulting team conducted several stakeholder consultations to gather valuable input and address concerns.

Key Informant Interviews
The key informant consultations were conducted between 14th -17th June 2024. The method used to carry out consultations took into consideration the profile of the stakeholders, type of information desired and level of engagement. Each primary key stakeholder was visited at their offices.

- **Managing Director - GATWASCO**

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

- **Technical Manager - GATWASCO**

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

- **Commercial Manager – GATWASCO**

The ESIA Study Team wanted to understand the expected impacts on consumer & bulk metes installations.

Other Key Informants:

- Assistant Forester in Charge of Kieni Forest -Kenya Forest Service (KFS)
- Water Resources Authority (WRA) Sub- Basin Area Coordinator – Kiambu County
- Representatives of Water Resource Users Associations (WRUAs) for Thiririka and Gatamayu sub-catchments
- KENHA Roads Maintenance Engineer – Kiambu County
- County Engineer (Roads & Public Works) – Kiambu County
- Ward Administrator – Juja & Theta Wards in Juja Sub – County
- Kiambu County Water & Public Health Officers
- Area Chiefs/Assistant Chiefs – Ndarugu, Gakoe (Githobokoni), Theta & Juja Town Locations

The outcome of the Key Informant Interviews is summarized below:

1	**Key informant interviewed**	**Summary of remarks**
	Managing Director - GATWASCO	• All the technical documents including the Bills of quantities have been prepared and the project is only waiting for the ESIA clearance to commence construction works. • Desilting of the intakes need to be carried out before the onset of the short rains.
2	Technical Manager - GATWASCO	• This area has been experiencing severe water shortages due to frequent pipe bursts and low pressures in the dilapidated water distribution infrastructure. • The replacement of the old water supply pipelines and the last mile connectivity shall improve water supply distribution in the area.
3	Commercial Manager - GATWASCO	• The uncounted for water for GATWASCO is currently at about 40% which means that a lot of revenue is lost. • With the procurement and installation of new water meters, the billing accuracy will be improved and hence, increased revenue.
4	Sub-County Water Officer (Juja Sub-County)	• The water demand in the area is increasing due to development of housing estates at an extremely high rate. • Improved access to water will spur other economic activities and create jobs for the area youth.
5	Sub-County public Health officer (Juja Sub-County)	• Improved access of clean drinking water for the residents of area will significantly reduce cases of water borne diseases. • The Contractor to minimize pollution of the environment while conducting construction works.
6	Assistant Forest in Charge of Kieni Forest -Kenya Forest Service (KFS)	• Kieni Forest is within the Aberdares Water Tower where Ndarugu & Thiririka Rivers originate. • KFS has put in place adequate measures to minimize pollution of the water sources in the forest by controlling human activities especially the shamba system in the forest where local farmers are allowed to grow both plantation trees and food crops on small plots, tending the trees and harvesting the crops until the trees become established. • KFS will continue to conserve the water sources for the 2 No. intakes but requested the project to consider supporting KFS in repair of forest boundary fence to prevent illegal logging.
7	Water Resources Authority (WRA) Sub- Basin Area Coordinator – Kiambu County	• WRA has permitted water abstractions for domestic use at the 2 water sources. • Requested that proper measures are put in place during the desilting works to avoid pollution of water for the downstream water users. • The project proponent to submit the methodology and schedule for the desilting works to WRA for review and approval prior to commencement of activities.
8	Representatives of Water Resource Users Associations	• The WRUAs have been working closely with KFS to ensure that the local farmers who have been allowed to cultivate inside the forest while taking care of the trees under the Shamba System do not pollute the rivers.

	(WRUAs) for Thiririka and Gatamayu sub-catchments	• This is done by ensuring that farming activities are at least 15 metres from the rivers.
9	KENHA Roads Maintenance Engineer – Kiambu County	• Noted that the main pipeline extension is along the Kenyatta Road which is under the management of KENHA. • 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 ensure that pipelines are installed at the authorized locations along the road reserve.
10	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.
11	Ward Administrator – Theta Ward	• There will be clean and safe water accessibility in the area which a priority for the County Government of Kiambu. • His office will support the contractor to ensure that no hindrances occur during implementation of the project. • At the time of recruitment, the local people will be given the first priority provided they have the required skill and competence to undertake the available tasks. • Importantly, there will be a number of unskilled jobs where most of the local people can be employed. • However, appropriate screening is paramount to ensure recruitment of capable and committed employees to ensure timely completion of the construction activities.
12	chief – Theta Location	• The project is long overdue and will save the residents substantial money that they have been using to buy water from private vendors at exorbitant costs. • The Chief requested that the youths of the area should be given the first priority when recruiting Project workers. He indicated that through his office, they can screen and recruit very good workers from the local community.
13	Chief – Juja Location	• He assured support from his office so that the project can be completed on time. • The chief wanted to know if the contractorhas identified campsites and sources of construction materials.

		• The local community members need to be kept updated of the progress on the Project including sharing the Project implementation schedule once available.
14	Chief – Ndarugu Location	• Most of the homesteads in the location do not get clean water although the intake and water treatment plant are located in the location. • The local people should be given priority in employment when construction works commence. • Hoped that with the proposed rehabilitation of the Thiririka intake, local residents will start getting clean water.
15	Assistant Chief – Gachege Sub-loaction (Githobokoni)	• The Local youth should be given employment opportunities since most of them are jobless after completing their secondary and tertiary education. • The contractor to conserve the environment during the execution of works and repair any damages on the roads during the transportation of materials. • Gave assurance of security and cooperation with local residents during the implementation of the project. • Local residents should be provided with water as much as the target areas are the main urban areas of Kamwangi & Gatundu Towns.

Area residents:

The public consultative meeting was organized by the areas Chiefs & Assistant Chiefs in consultation with the Ward Administrators and held on 14th & 15th June 2024 at the various proposed Project sites in Gatundu North, Gatundu South and Juja Sub-Counties.These meetings were held as below:

- **Public Meeting at Kenyatta Road (Water extension pipelines) – Juja Ward**
  This meeting was held on 14th June 2024 at the Ward Administrator's office near Riverside Estate along Kenyatta Road with 23 participants.
- **Public Meeting at Gaitete – Thiririka River Intake**
  This meeting was held on 15th June 2024 at Gaitete Shopping Centre (which is located about 1.4 Km from the Thiririka River Intake), with 22 participants.
- **Public Meeting at Gachege – Ndarugu River Intake**
  This meeting was held on 15th June 2024 at Gachege Chief's Office (which is located about 2.1 Km from the Ndarugu River Intake), with 37 participants.

The purpose of these consultations was to ensure that the concerns and perspectives of those directly affected by the project were considered. The stakeholder consultations played a crucial role in the ESIA process, enabling the consulting team to understand the diverse perspectives, address concerns, and incorporate local knowledge and expectations into the environmental and social management planning of the proposed Projects.

Some of the key outcomes of these meetings were:

(a) The proposed project will create significant economic and social benefits to the communities through provision of clean and adequate water and contribute to the attainment of the national priority goals and ongoingnational efforts to accelerate economic growth and alleviate poverty.

(b) Employment opportunities will be offered to the construction workers and any other person who will be hired to provide her/his services during the construction phase. Inaddition to direct employment, supplies of necessities to the workers will also lead to more employment opportunities and

acquisition of entrepreneurial skills. This will engrain a sense of project ownership within the community.

(c) The proposed project will also play a role in reduction of idleness particularly amongst the youth due to an increase in income generating activities both directly or indirectly.

(d) The standard of living of the community especially vulnerable beneficiaries (elderly, female headed households and children) since there will be a reduction in distances travelled and time spent in search of water.

(e) The community will be assured an all-year-round access to clean water supply for their domestic water and other needs such as poultry farming.

(f) Reduced poverty levels through increased incomes and improved livelihoods resulting from construction of the proposed project and maintenance employment and consumption from the local markets, emergence of other associated economic opportunities and activities.

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.

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**
Employment Opportunities	- Employment opportunities for unskilled and skilled from local communities during constructions of the proposed Project. - Technical skills will be gained by the local people who will be employed by the project, and this is likely to contribute to their enhanced capacity and skills to undertake such construction activities in future.
Project Area Economic Growth	- Market for construction materials such as sand, cement, and ballast for the local hardwares. - Increased property values and attractiveness for investment due to improvement of water supply in the Project areas. - Stimulating growth in related small-scale industries and businesses. - Availability of water will improve livestock watering and milk production in the area hence contributing to improvement in both household income and nutritional security. - Implementation of the project will provide an opportunity to access to improved water supply hence reducing time and distance travelled to fetch the commodity particularly by women and the girl child.
Public Health Improvement	- Improved hygiene conditions and standards among residents through provision of treated safe water. - Increased access to clean and safe water for the local population will contribute to decline in cases of water-borne diseases.

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

Project Activities	Potential Impacts	Recommended Mitigation Measures
During Construction Phase		
Desilting of intakes and installations of scour systems Excavation for installation of pipelines network, zonal & consumer water meters and construction of valve/meter chambers.	**Pollution of water** – Pollution of water in the rivers which could affect water quality to the downstream users.	- The Contractor to ensure that no removed materials get back to the river. The removed silt should be transported to approved disposal sites such as open areas within the adjacent Kieni forest which has been earmarked for tree planting. - Use of silt removal methodology that minimizes pollution of water for downstream water users (e.g pumping out of the silt instead of mechanical excavations). - Carry out desilting works during the low river flows seasons.
	Vegetation Cover – Clearing of vegetation cover exposes soils to agents of soil erosion such as wind and runoff, this could lead to soil degradation.	- Areas to be cleared should be agreed and demarcated before the start of the clearing operations to minimize exposure. - Vegetation should only be cleared along the Project construction sites and where it will interfere with - Construction works and/or present a hazard. - Reinstatement of the project sites to their original after completion of construction works. - The use of existing cleared or disturbed areas for the Contractor's Camp, stockpiling of materials etc. shall be encouraged.
	Impacts on Soils The Project activities are likely to have minor impacts on soils, these impacts include: - Destruction of soil structure due to topsoil excavations. - Soil contamination caused by oils and fuel leaks from construction equipment. - Soil erosion due to clearing of vegetation cover and trenching activities.	- The contractor to stick to clear delineation of the construction to minimize vegetation loss. - Excavation works should be controlled so that land that is not required for the Project works is not disturbed. - Excavated materials and excess earth should be kept at appropriate sites approved by the Supervising Engineer. - Proper and compacted back filling of excavated areas. - Planting of vegetation cover along the pipeline wayleaves after pipelines installations.

	Solid Wastes Generation from Construction activities - Construction activities at the work sites will generate some spoil material, solid wastes such as plastic containers, used tyres, metal parts, plastics and cables.	- Maximum reuse of excavated material. - Construction sites to have designated waste collection points and disposal to appropriately and approved sites. - Environmental Management, Health and Safety Training Programs to be conducted for Contractor's staff to create awareness on proper solid wastes management.
	Accidental oil and fuel spills and leaks - The Project will involve use of oils and fuel for vehicles and construction equipment. If these oils and fuel accidentally leak into the environment, they could result to significant contamination of soil, surface and underground water resources.	- Checking and regular vehicles and construction equipment. - Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used.
	Interference with the existing infrastructure and physical settings - The proposed project could result into the interruption of existing infrastructure such as access roads to residential estates and houses utility services such as internet cables and water pipelines.	- Liaisons with the relevant authorities and service providers to locate existing infrastructure before commencement of excavation works for pipe laying. - Formal request for permission for a wayleave and laying the water pipeline should be sought from relevant roads authorities.
	Noise Pollution and Vibrations - Construction of the proposed project will result in noise emissions because of the machines that will be used (excavation equipment etc.) and construction vehicles delivering materials to site.	- Best available work practices will be employed on-site to minimize occupational noise levels - All construction equipment will be regularly inspected and maintained in good working condition. - Provision of earmuffs for those working with noise producing equipment. - Combine noisy operations so that they occur at the same time.

	Dust Emissions - Dust will be emitted during excavation and related earthworks.	- Strict measures are to be applied for the handling of construction materials in powder form such as cement, lime, concrete additives, etc. and for the disposal of the packaging. - Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present. - Minimizing the number of motorized vehicles on use. - Wet all active construction areas as and when necessary. - Vehicle speeds be limited to a maximum of 30Km/hr. - A monitoring and evaluation program for air quality shall be implemented and reported on throughout the construction phase cycle.
	Workers, Community Health and Safety Risks during Construction - Construction workers and the communities are likely to have injuries and hazards at the construction works, unavoidably exposing them to occupational health and safety risks.	- Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer and the Proponent's Environmental & Safety Officer. - Construction workers, the supervision team and authorized visitors to construction sites to be provided with Personal Protective Equipment (PPEs) including gloves, gumboots, overalls and helmets. - Use of PPE to be enforced by the Environmental & Safety Officer. - Fully stocked First Aid Kits to be provided within the sites, camps and in all Project vehicles. - Isolate the site for access by the local communities during the construction for their safety and health. - Use of warning signage and tapes where the trenches are open and at other active construction sites.
	Labour influx and effects of immigrat workers -The project will need to employ labourers and although most of the unskilled and semi-skilled labour requirements could be filled locally (from within the project areas), congregation of potential labourers from outside the project areas is likely, as they seek employment opportunities.	- Contractor should use the local workforce as much as possible (preference to local community members on skills locally available). - Effective community engagement and strong grievance mechanisms on matters related to labour - All workers to sign an employment contract including a Code of Conduct governing appropriate behaviour. - The workforce should be sensitized to local social and cultural practices and be educated on the expected behaviour and conduct. - Contractor should prepare and implement a gender action plan.

	HIV /AIDS & other communicable diseases - Indirect impacts on the community can be the introduction of new communicable diseases such as HIV/AIDS due to in-migration for job opportunities, poverty, and prostitution.	- The contractor at the time of Project implementation will develop appropriate training on potential spread and awareness materials for Information, Education, and sensitization of workers during project construction phase. - Develop an intervention strategy compatible with the construction program to address success of the HIV/AIDS prevention and provide peer educators for sustainability in collaboration with other stakeholders. - Integrate monitoring of HIV/AIDS preventive activities as part of the construction supervision. Basic knowledge, attitude and practices are among the parameters to be monitored, and particularly on provision of condoms, status testing and use of ARVs.
	Child Labour - Due to provision of cheap labour and differentiation in bargaining power, the underage workers may be employed leading to exploitation.	- The contractor will comply with national and international labour laws in recruiting construction staff. - All workers will be required to produce their national identification cards to confirm their age. - Ensure no children are employed on site in accordance with national labour laws. This can be done through incorporating prohibitive provisions in the code of conduct and having the recruitment policies that prohibits child labour. - Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.
	Sexual Exploitation and Abuse (SEA) & Gender-Based Violence (GBV) - Due to vulnerability of women, they could be taken advantage of in the Project workplace in order to receive what is due to them or favours. GBV incidences may increase due immoral behaviours arising from increased cash flows for the construction workers.	- Develop and implement code of conduct, signed by all workers. - Provide training and awareness programs to project contractor's staff, and community members on GBV and sexual harassment prevention and reporting. - Collaborate with local communities, leaders, and women's groups to address concerns related to GBV and sexual harassment. - Collaborate with local law enforcement and authorities to address and prevent GBV incidents. - Implement clear and confidential reporting mechanisms for any incidents of GBV or sexual harassment. - Contractor should prepare and enforce a No Sexual Harassment and Non-Discrimination Policy.
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.

	Generation of liquid and solid wastes	- The County Government of Kiambu & GATWASCO to expand the sewerage system to the Project area. - Solid wastes generated during repair and maintenance activities will be collected and disposed-off in designated manner.
	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. - The proponent shall provide first-aid facilities for repair and maintenance staff.
	Improved and reliable water supply for the residents of Athi River Town.	- Positive impact, no mitigation measures. - Improve customer experience through better water supply services. - Reduction of water outages/ rationing. - Expansion of coverage area.
	Increased reliability of water supply to the residents of Gatundu North & South Sub - Counties.	- Positive impact, no mitigation measures. - Reduction of water outages/ rationing.

10. ENVIRONMENTAL, 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 (GATWASCO) shall ensure that the implementation of the Environmental and Social Management Plan (ESMP) is effectively executed and that adequate resources have been provided. GATWASCO 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 GATWASCO 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 proposed pipeline extensions will be installed along the wayleaves on public roads with no encumbrances and therefore there are no Project Affected Persons (PAPs) requiring any form of compensation due to disturbances during the implementation of works. The other works (desilting of intakes and installation of meters will not involve disruption of businesses or activities for the project areas residents.

12. Project alternatives

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.

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 Project. 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 and the need for improved water infrastructure were key factors that justified the selection of the preferred alternatives.

13. Conclusions & recommendations

Conclusions

- 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.

- The project will be constructed within existing public land and no private land will be
- acquired.
- The World Bank Operational Procedure 4.12 is not triggered since the proposed pipeline routes are in clear lands free from encroachment and is a reserve for the water pipelines.
- 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 temporary damage to the physical environment and/or human health only if mitigation measures are not implemented as recommended in this ESIA Study Report.

To address the possible negative environmental impacts, the ESIA Study has developed a comprehensive environmental management and monitoring plan that will ensure environmentally sustainable development.

Recommendations

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

- A Provisional Budget of **KES 2,870,000** that is required for implementation of mitigation measures of potential negative environmental should be included in the Project Implementation costs.

TABLE OF CONTENTS

CERTIFICATION i
ABBREVIATIONS AND ACRONYMS ii
EXECUTIVE SUMMARY iii
1 INTRODUCTION 1
1.1. Project background 1
1.2 Justification for the ESIA 2
1.3 Objectives of the ESIA study 2
1.4 Scope of the ESIA study 2
1.5 Approach and methodology of the study 3
1.6 Socio economic survey methodology 4
1.7 Impacts identification and assessment 5
1.8 ESIA study report structure 6
1.9 Public disclosure of the ESIA 7
2 PROJECT DESCRIPTION 8
2.1 Project location 8
2.2 Proposed project objectives 10
2.3 Description of the proposed project's construction activities 10
2.4 Materials for the construction works 21
2.5 Anticipated waste material and by-products 22
2.6 Labour 22
2.7 Construction machines/equipment 22
2.8 Estimated Cost of the proposed Project 22
The detailed BOQs and Cost Estimates are attached as Annex IV in this Report. 22
3.1 Policy Framework 23
3.2 Legal Framework 26
3.3 Institutional Structure of the Water Sector 29
3.4 Institutional Structure – Environmental 31
3.5 Sectoral Integration 32
3.6 World Bank Operational Procedures 32
3.7 The World Bank Safeguards 32
3.9 Harmonization of both WB and GoK requirements for social and environmental sustainability 36
3.10. Project implementation institutional structure 36
4.1 Project location 38
4.2 Physical environment 38
4.4 Biological environment 39
4.5 Social setup 40
4.6 Socio economic survey 40
5 PUBLIC PARTICIPATION AND CONSULTATIONS 44
5.2. Stakeholders and public consultations objectives 44
5.3 The consultative process adopted 45
5.4 Key informant interviews 45
6.2. Types of impacts 55
6.3 Concepts in impact significance assessment 56
6.4 Significance of impacts 57
6.5 Potential impacts identification and assessment 58
6.6 Positive impact during construction phase 58
6.7 Positive impacts during operation phase 59

6.8 Negative impacts during construction phase 60
6.9 Impacts during operational phase 65
6.10 Decommissioning of the project 66
8.2 Purpose and objectives of ESMoP 73
8.3 Auditing of environmental and social management and monitoring plan (ESMMP) 76
8.4 Management responsibility of ESMMP 76
9 CHANCE FIND PROCEDURES 78
9.1 Purpose of the Chance Finds Procedure 78
9.2 Responsibility 78
9.3. Scope of the Chance Finds Procedure 78
9.4. Induction/training 78
9.5. Details on Chance Find Procedures 78
10.1 Introduction 80
10.2 Potential Grievances 80
10.3 Objective of a Grievances Redress Mechanism 80
10.4 Guiding Principles for an effective Grievance Redress Mechanism 81
10.5 The Proposed Grievance Structure 81
11.2 Recommendations 83
REFERENCES 84
ANNEXES 84

1 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. Gatundu Water and Sanitation Company (GATWASCO) 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.

Gatundu water and sanitation company (GATWASCO) is a Water Service Provider licensed by Water Services Regulatory board (WASREB) to provide water and sewerage services to residents of Gatundu North and Gatundu South of Kiambu County as stipulated in the Service Provision Agreement.

GATWASCO is a limited liability company, which was incorporated in October 2014 following the Merger of Karimenu and Gatundu south water and sanitation companies. It is the only licensed water and sanitation service provider in Gatundu North and South Sub-Counties and serves Gatundu North sub-county, Gatundu South sub-county and parts of Githunguri and Juja.

The area of service has approximately 280,000 Population out of which 65% have access to water services and 92% to sanitation services. The total water demand is approximately 40,000m3/day against a water production of 27,440m3/day. Water is supplied from 8 no. surface water sources namely Gakoe, Kairi and Karure that draw water from Karimenu river, Ndarugu and Nyamang'ara that draw water from Ndarugu river, Kirangi and Gaitete that draw water from Ruabora river, Gacharage that draws water from Thiririka river and Theta that draws water from Theta Dam.

GATWASCO has proposed the desilting and installation of scour systems for 2 No. intakes located on the upper Thiririka River (at Gaitete) and Ndarugu River (at Kanda Komu), supply and installation of 38km HDPE pipelines DN32- DN110, supply and installation of 6,478 Consumer meters, DN15 and 172 No bulk meters (DN25 to DN250), in order to improve water supply services for the residents on Kenyatta Road in Juja and Theta Wards, Juja Sub - County under the CLSG II Program. The implementation of such a development project will generate positive socio-economic benefits, but also adverse impacts to human community and environment. 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 conduct 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 ESIA

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

1.3 Objectives of the ESIA study

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

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

1.4 Scope of the ESIA study

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

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

1.5 Approach and methodology of the study

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

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

1.5.1 Environment 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 visits. Documents reviewed include:

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

1.5.3 Field Assessment

The physical evaluation of the Project area was conducted 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 consultation meetings were held on 13th June 2024 in some specific proposed pipelines extension areas along Kenyatta Road, in addition to rapid interactions with the stakeholders living in the area to capture the views of all the parties affected.

1.5.4 Public Participation

The assessment involved consultations with the affected persons and other relevant stakeholders in Kiambu County. The aim of stakeholder consultations was to give a platform for information sharing and opinion gathering in relation to the proposed project; consultations were done in form of public meetings and key informant interviews. The issues were than analyzed and presented to design team for finalization of Project

designs and planning on how best to implement the Project. The public consultative meetings were held on 14th & 15th June 2024 within the locations of proposed projects.

1.5.5 Consultation with stakeholders

The study applied different participatory methods, namely:

i) Official meetings with GATWASCO's senior Technical staff.
ii) Key informant Interviews (KIIs) with relevant stakeholders.
iii) Public meeting discussions.

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

1.5.6 Baseline information gathered on the Project

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

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

Field data / information collection

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

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

1.6 Socio economic survey methodology

1.6.1 Socio Economic Survey

The survey was conducted in the proposed project areas with target respondents being the anticipated Project beneficiaries of the proposed pipelines extensions and installation of water meters. The information gathered was based on (a) review of secondary data and (b) collection of primary data, both qualitative and quantitative. The qualitative data was gathered through administration of questionnaires and public consultative meetings organized by the area local administration and community members and other stakeholders in the locations.

1.6.2 Household Surveys

The objective of the household survey was to:

- Understand demographic and economic profile of households within the project locations,
- Know status of and issues related to ownership and tenancy structure.
- Assess resident's access to infrastructure, social amenities.
- Understand environmental conditions, health and other social issues.

This information is important as it help in establishing baseline data required during Project impact evaluation after commissioning.

1.6.3 Survey Questionnaire

The questionnaire used contains several modules including demographics and household composition, security of housing, land and tenure, economic and employment profile, infrastructure services and health.

1.6.4 Secondary Socio-Economic Data

This information was largely drawn from the Kenya National Bureau of Statistic, The Kenya Population and Housing Census VII on Population and Household Distribution by Socio Economic Characteristic, August 2019, Kiambu County Integrated Development Plan (CIP 2023 -2027) and findings from household survey undertaken during Environmental and Social Impact Assessment (ESIA) process.

1.7 Impacts identification and assessment

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

- The degree of sensitivity.
- The occurrence.

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

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

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

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

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

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

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

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

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

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

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

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

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

1.8 ESIA study report structure

This ESIA Study Report is organized in Sections as follows:

1- Introduction

2 - Project description

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

1.9 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 GATWASCO will ensure that the Results of Public Consultations including ESIA area disclosed on NEMA, World Bank, WSTF & GATWASCO websites.
ii) The Report will also be made available at the Gatundu North & South Sub-County Offices in Kiambu County, for ease of access by the Project's interested parties at local 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.

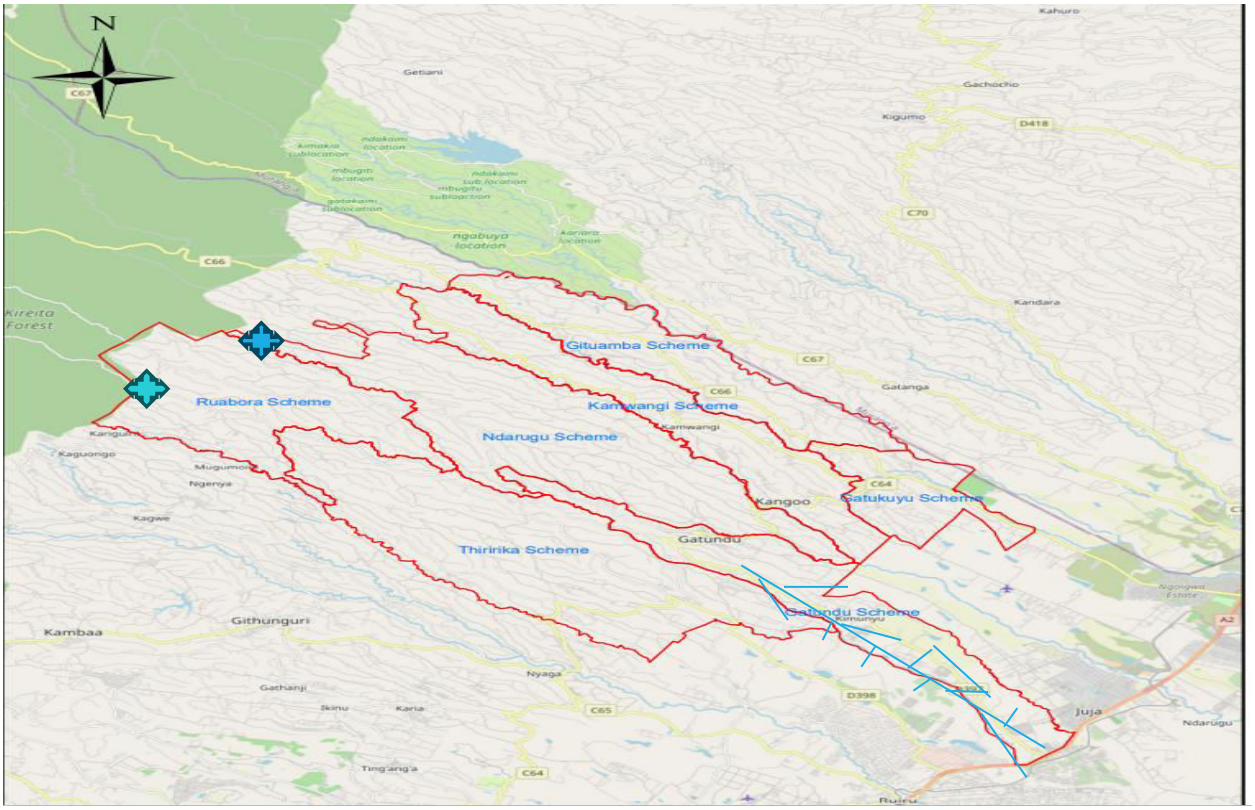
2 PROJECT DESCRIPTION

2.1 Project location

Gatundu Water and Sanitation Company (GATWASCO) covers Gatundu North & Gatundu South Sub-counties and part of Githunguri Sub- County. Its area of coverage is approximately 376km2 covering nine wards incl. Ng'enda, Kiamwangi, Kiganjo, Chania, Ndarugu, Gituamba, Gathaite, Mang'u and parts of Komothai. According to the 2019 census, this area has an approximate population of about 231,973 persons. There are about 278,976 people currently within the service area of the utility out of which about 68% are served.

The 2 No. intakes where rehabilitation works will be undertaken are located on the upper Thiririka River (at Gaitete) and Ndarugu River (at Kanda Komu). The proposed pipelines extensions are targeting the consumers on the Kenyatta Road including upcoming residential areas such as Riverside, Kays, Hard Rock Park, Boma and Mariapolis Estates. The consumer and bulk water meter s will be installed within GATWASCO's water distribution system.

The figure below shows the service area under the jurisdiction of GATWASCO and the locations for the proposed projects.



Location of Intake Weir on Ndarugu River at Kanda Komu

Location of Intake Weir on Upper Thiririka River at Gaitete

Proposed pipelines extensions from Gatundu Town Water Storage Tank along Kenyetta Road towards Muigai-in & Juja Town areas

2.1.2 Existing Water Supply Infrastructure

The Project area is served by Gatundu Town Water Supply System which is operated by the Gatundu Water and Sewerage Co Ltd. (GATWASCO). The Company's mandated area of supply is approximately 300km^2, comprising Gatundu Sub County, part of Gatundu North and part of Githunguri. The company currently supplies approximately 240km2 of its mandated area. Gatundu Water and Sewerage Co Ltd. operate three Water Supply Schemes, namely: Ndarugu, Thiririka and Rwabura Water Supply Schemes. The capacities of the existing Water Supply Schemes are as below:

- Thiririka Water Supply - 9,000 m^3/day,
- Ndarugu Water Supply - 4,000 m^3/day,
- Rwabura Water Supply - 1,200 m^3/day.

On-going projects

The following water supply projects are currently under implementation as part the on-going Gatundu Water & Sewerage Project:

- Construction of water intake weir at Handege along Thiririka River and a water treatment plant of capacity 9,600 M^3/day,
- Construction of water intake weir at Ituru along Ruabura River and a water treatment plant of capacity 4,000 M^3/day,
- Construction of water intake weir at Ng'enda along Theta River and a water treatment plant of capacity 4,000 M^3/day,
- Construction of 8km clear water main for Ruabura system,
- Construction of 6km clear water main for Ng'enda system,
- Construction of 35km, diameters of 50 – 400mm HDPE pipe water distribution network within GATWASCO's water supply areas.

The above projects currently under implementation have been issued with licenses by the National Environmental Management Authority (NEMA) as required.



Theta Dam – One of the sources of water for GATWASCO located in Kinale Forest (GPS: -0.905116^0, 36.779180^0)

2.2 Proposed project objectives

The principal objective of the project is to improve access to clean water supply in the targeted areas along Kenyatta Road in Juja & Theta Wards of Juja Sub-County. The other objective is the reduction of Un-accounted for Water (UFW) and Non – Revenue Water (NRW) through the installation of bulk and consumer water meter within GATWASCO's water distribution network, thereby increasing revenue for the WSP. Overall, the proposed Project will contribute to enhanced hygiene and sanitation of the residents, hence reducing water borne diseases and contribute to alleviation poverty within the area through improvement of socio-economic activities. The reduction of NRW will and increased revenues will improve on the operational sustainability of GATWASCO.

2.3 Description of the proposed project's construction activities

2.3.1 Mobilization site preparation works

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

2.3.2 Desilting and rehabilitation of Intakes

The proposed scope of works includes the desilting and installation of scour systems for the 2 intakes which are located on the upper Thiririka River (at Gaitete) in Ndarugu Ward of Gatundu South Sub-County and Ndarugu River (at Kanda Komu) in Githobokoni Ward of Gatundu North Sub-County.

The current storage capacities at the 2 intakes have significantly reduced due to the accumulation of silt deposits in the reservoirs. This implies that the intakes cannot supply adequate water at the Thiririka and Ndarugu Water Treatment Plants which are currently operating below their design capacities. The scour systems at the 2 intakes are currently not operational due to defective opening/closing mechanisms and therefore, routine gradual removal of silt at the intakes has not been taking place and hence the accumulation of huge volumes over time in the reservoirs. The photos below illustrate the current status of the Ndarugu & Thiririka intakes.



Status of the Ndarugu Intake Weir and reservoir with a defective scour gate



Heavily silted Ndarurugu River water intake



Status of the Thiririka Intake Weir and reservoir – highly silted and polluted stored water



Thiririka River upstream extending into Kieni Forest

Proposed activities at the intakes:

- Temporary diversion of the rivers at the intakes to facilitate removal of silt and debris from the reservoir and replacement of the scouring mechanisms.
- Removal through mechanized excavations, transportation and safe disposal of the silt.
- Replacement of the scouring mechanisms and rehabilitation of outlet chambers.
- Fencing the intake works with concrete posts and galvanized chain-link and barbed wires.

2.3.2.1 Desilting of the intakes

Desilting is the process of removing sediment from a water supply dam or reservoir. Sediment is a naturally occurring material that can be washed into a reservoir from surrounding areas by rain and runoff. Sediment can also be deposited in a reservoir by rivers and streams.

These works will involve the removal of the accumulated silt materials at the Ndarugu and Thiririka intakes to increase water storage to design capacity. There are several different methods that can be used to desilt a water supply reservoir. The most common methods of desilting are:

- **Scouring and flushing of sediments from the reservoir**

This method involves the opening of the scour valves to flush out the silt and stored water in the reservoir at high pressures.

Advantages

- Least expensive since it involves opening of the scour mechanism for the release of the accumulated silt downstream of the reservoir.

- Takes a considerable short period and therefore reduced interruptions of water supply to consumers.

Disadvantages

- Abrupt release of water and silt from the reservoir may affect the quality of water for downstream users.
- It may also affect the aquatic ecosystem downstream of the reservoir.
- Could cause soil erosion and destruction of vegetation, crops and other property.

This method cannot be used for the proposed desilting works as the scour system is defective and the operations may affect water quality for downstream water users.

- **Sediment bypassing and traps.**

This method involves bypassing the sediment around the reservoir by constructing a bypass channel. The sediment is then deposited in a designated area where it can be removed or allowed to settle.

Traps

This method involves installing sediment traps in the reservoir. Sediment traps are devices that slow down the flow of water and allow the sediment to settle. The sediment is then removed from the traps by dredging or other methods.

Advantages

- There are no interruptions with operations at the intakes during the removal of the silt.
- The reservoir storage capacity is maintained to near design capacity throughout the operational period, and therefore providing reliable water source.
- As the silt and debris are collected at the sediment bypasses and traps before they get into the reservoir, pollution in the stored water is minimized, thereby bringing the cost of treatment down.

Disadvantages

- High capital costs for the installation of sediment bypasses and silt traps.
- The structures require adequate land space for effective operations.

The structures for sediment bypassing and silt traps are not in place at the 2 intakes and therefore this option is not applicable.

- **Mechanical Desilting - dredging**

This method involves lowering the water level in the reservoir to expose the sediments, which is then removed by dredging. The removed silt is then pumped out and loaded into trucks, transported and disposed off safely in designated areas.

Advantages

- Mechanized desilting can remove all the sediments from the reservoir and restore the water storage capacity to design levels.

Disadvantages

- Risk of the disposed sediments getting back to the water body, further causing pollution especially to downstream water users.

This is the method that will be used for the proposed desilting of the 2 intakes at Thiririka and Ndarugu Rivers. The client has planned with the Forest Department to have the silt deposited at designated open areas within the adjacent Kieni forest where tree nurseries are being developed. Since the 2 intakes are located next to the forest, transportation costs of the silt to the disposal sites within the forest will be minimal. Disposal, spreading and where necessary compaction of silt at the sites will be carried out under the supervision of GATWASCO & KFS officers.

2.3.3 Installation of water pipelines

The proposed pipelines extensions are designed to cover a total length of about 38 kilometers, exclusively using HDPE pipes. The main pipeline will connect water from the main water storage tanks within Gatundu Town and follow Kenyatta Road upto Muigai-In, at the junction of Nairobi – Thika super highway. The main pipeline will be installed on the provided road reserve. Various distribution branch pipelines will be installed to serve the residential estates along Kenyatta Road and other estates within Theta & Juja Wards in Juja Sub-County.

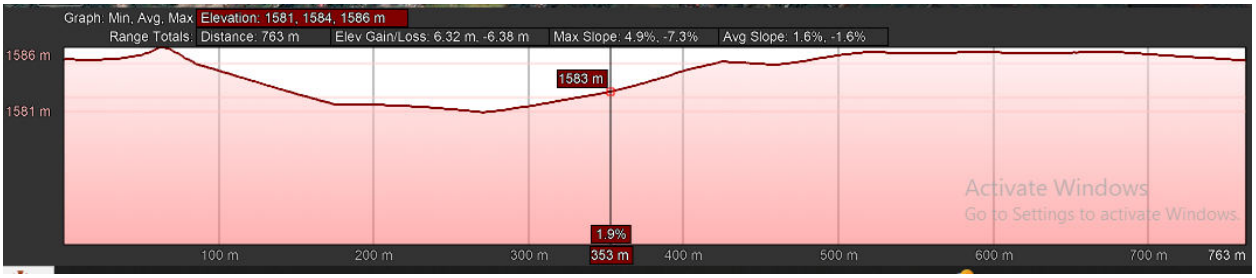
HDPE pipes are selected for their flexibility, corrosion resistance, and ease of installation, making them suitable for the distribution of treated water to various areas within the designated areas. The installed pipelines will be of varying diameter of OD 32-110mm complete with all fittings. GATWASCO has identified pipeline routes that best suit the terrain and intended goal of reaching as many people as possible through individual connections as well as communal water points where necessary.

Through field site visits and the use of topographic maps and engineering designs, the following was established to have been adhered in the designs for the aligning of the proposed distribution pipeline extensions:

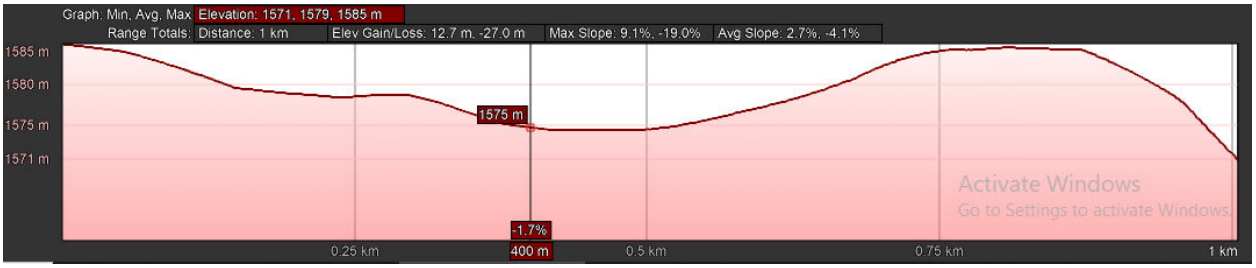
- The distribution pipelines will be installed within the available road reserves with no encumbrances to ensure easy accessibility for maintenance.
- The adopted pipeline routes allow for easy access to the pipelines and does not interfere with the existing infrastructure.
- Social screenings along the wayleaves where the proposed pipelines (Approx. 38 Km) will be installed, have been undertaken and confirmed that the proposed project does not involve any resettlements of PAPs. There are no PAPS who are likely to suffer economic displacement.

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

Profiles for the proposed pipelines within various residential estates in Theta Ward



1. Riverside main-90mm HDPE PN 10-760m



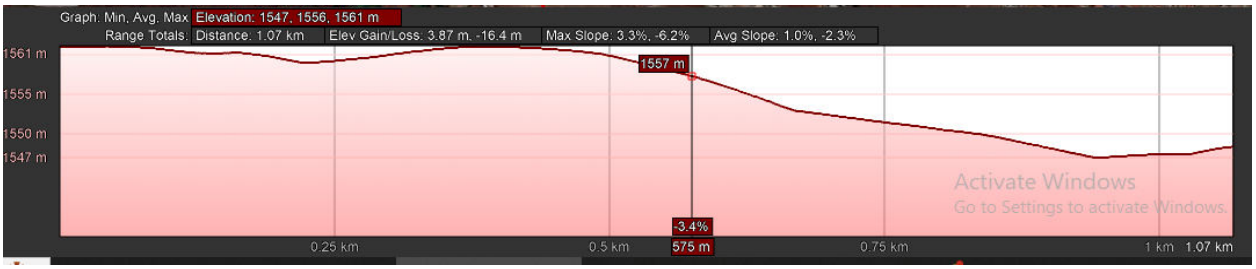
2. Riverside main-63mm HDPE PN 10-1000m



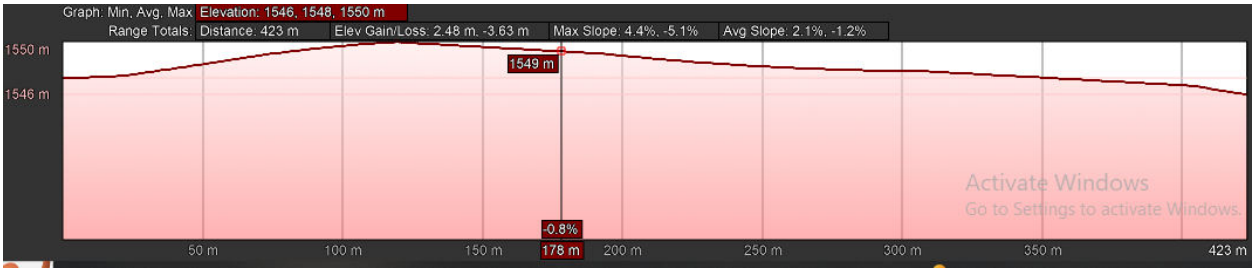
3. Croton (Thiririka) -63mm HDPE PN 10-900m



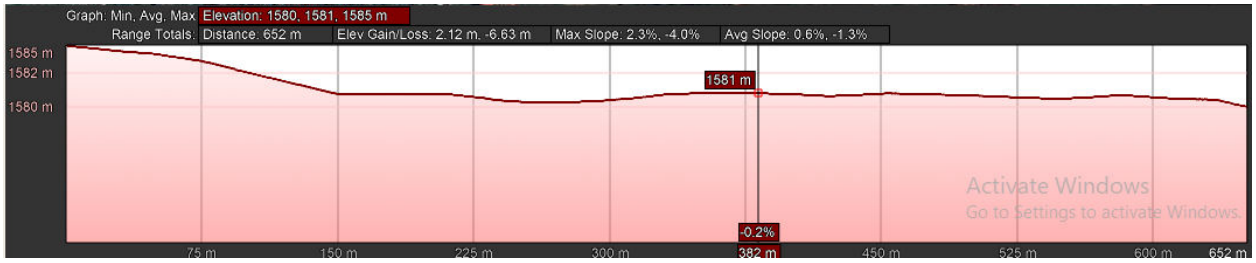
4. Croton-Main Entrance sec. 2 -63mm HDPE PN 10-350m



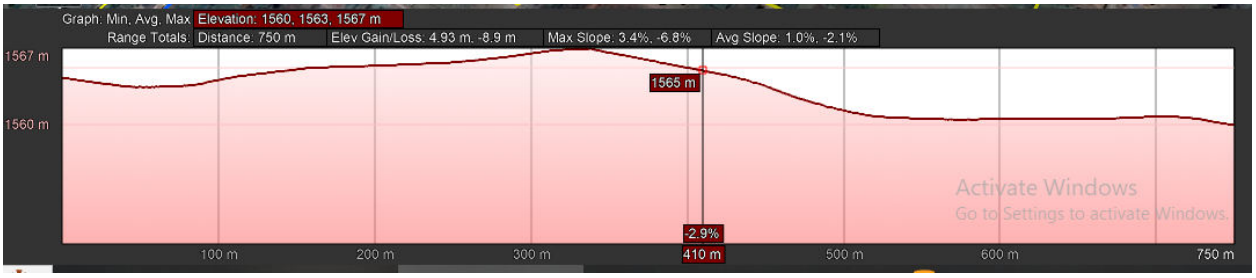
5. Croton-Marple Court Garden 63mm HDPE PN 10-1070m



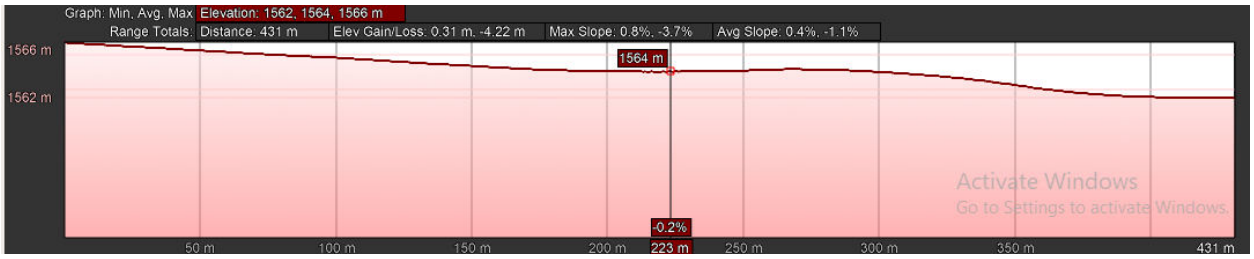
6. Murram Estate 2 -63mm HDPE PN 10-421m



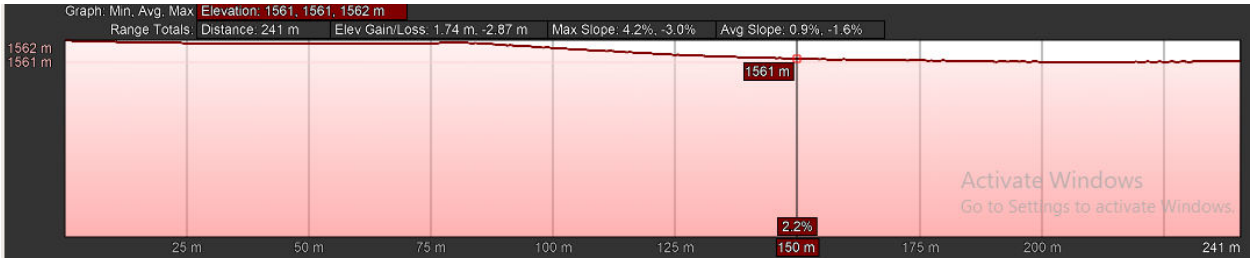
7. Riverside-50mm - HDPE PN 10-650m



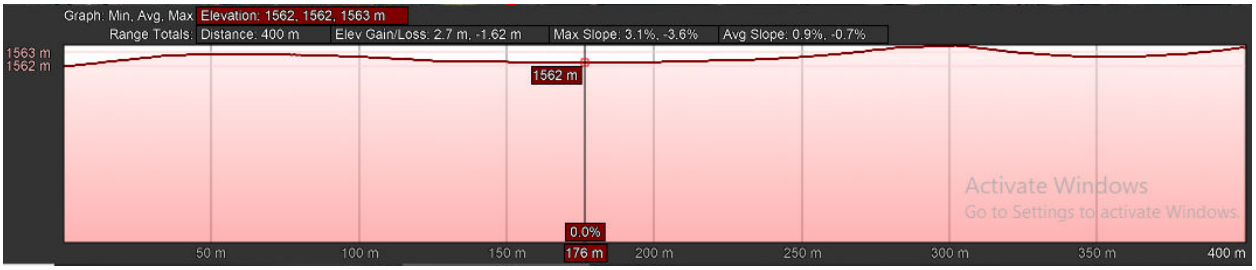
8.Croton (Thiririka) -50mm- HDPE PN 10-750m



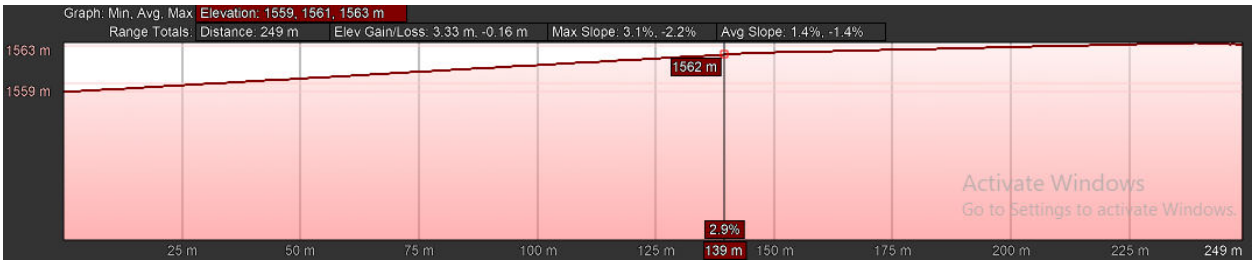
9. Croton (Sect. 1, 1st Ave.) -32mm- HDPE PN 10-430m



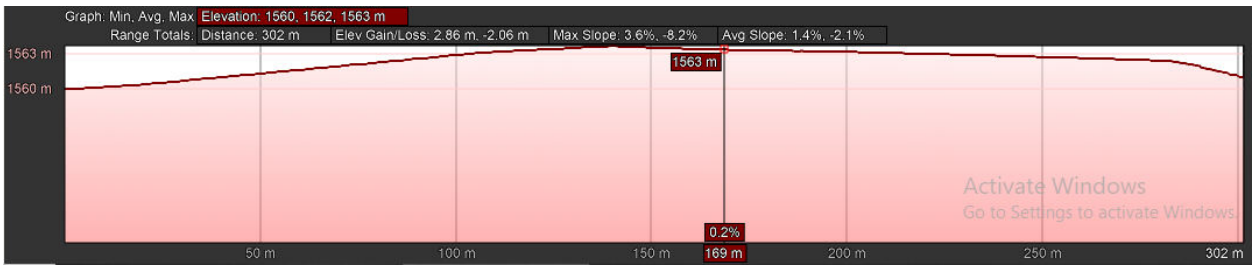
10. Croton (Sect. 2, 1st Ave.) -32mm- HDPE PN 10-240m



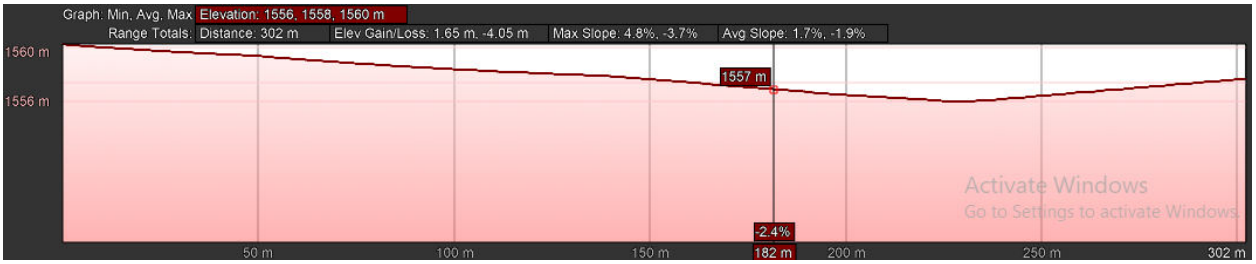
11. Croton (Sect. 2, 2nd Ave.) -32mm- HDPE PN 10-400m



12. Croton (Sect. 2, 2nd Ave. 1st drive) -32mm- HDPE PN 10-250m



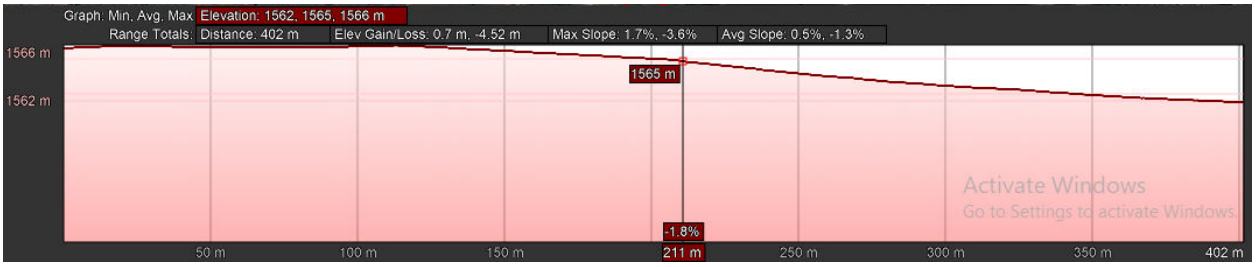
13. Croton (Sect. 2, 2nd Ave. 2nd drive) -32mm- HDPE PN 10-300m



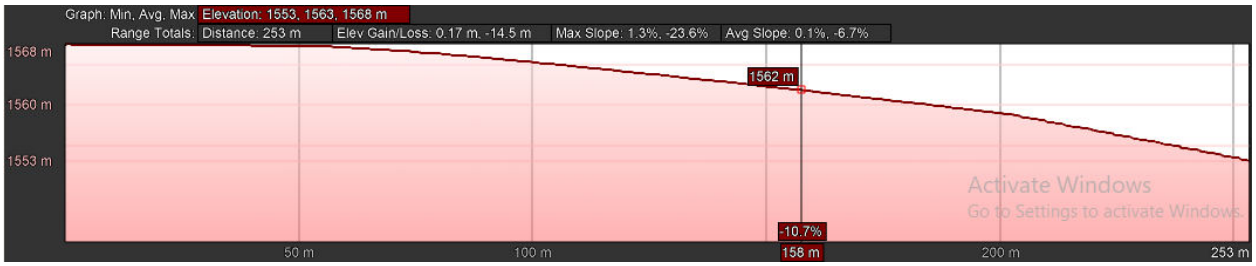
14. Croton (Thiririka) -32mm- HDPE PN 10-300m



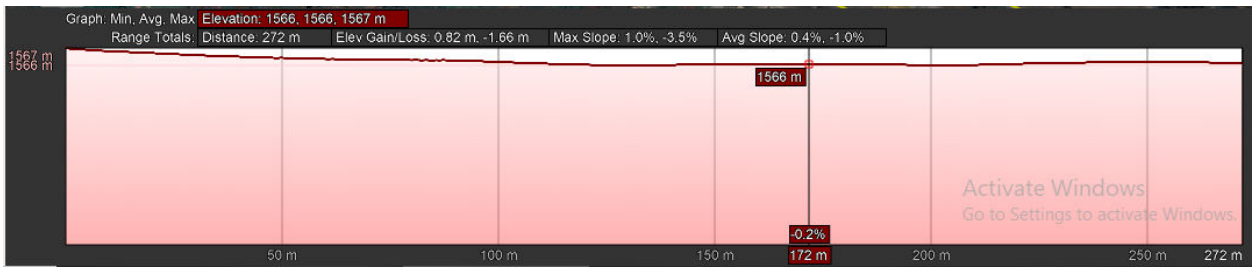
15. Croton (Thiririka) lane 2-32mm- HDPE PN 10-150m



16. Croton-Azalea lane-32mm- HDPE PN 10-400m



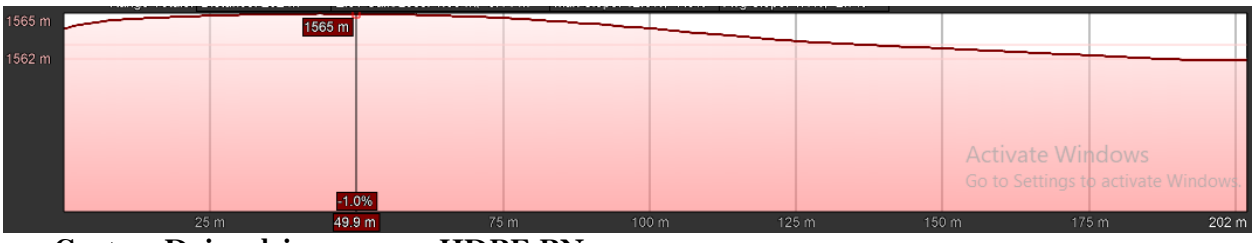
17. Croton-Marigold drive-32mm- HDPE PN 10-250m



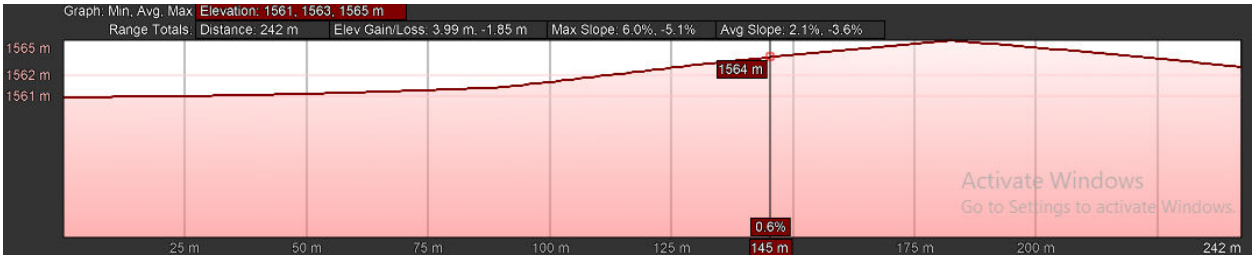
18. Croton-Rosewood 32mm- HDPE PN 10-270m



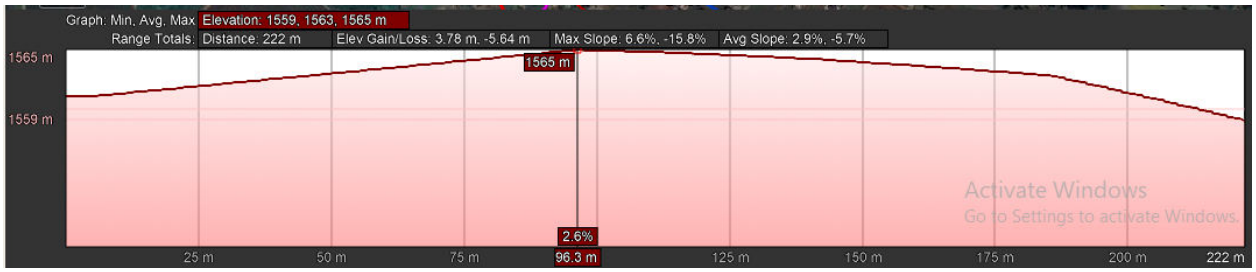
19. Croton-Ballota 32mm- HDPE PN 10-150m



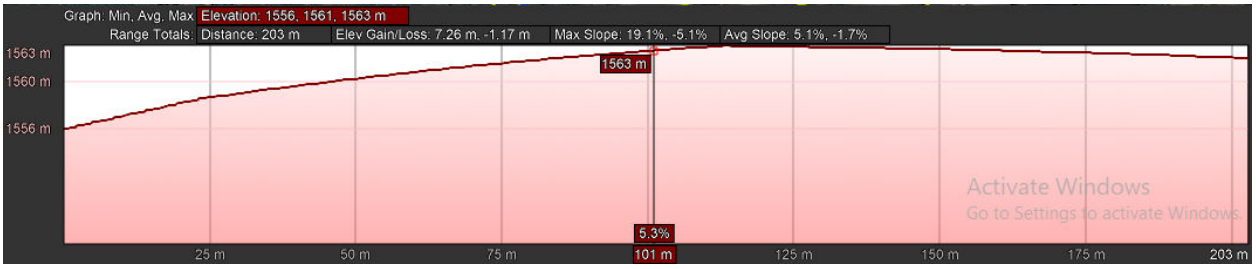
20. Croton-Daisy drive 32mm- HDPE PN 10-200m



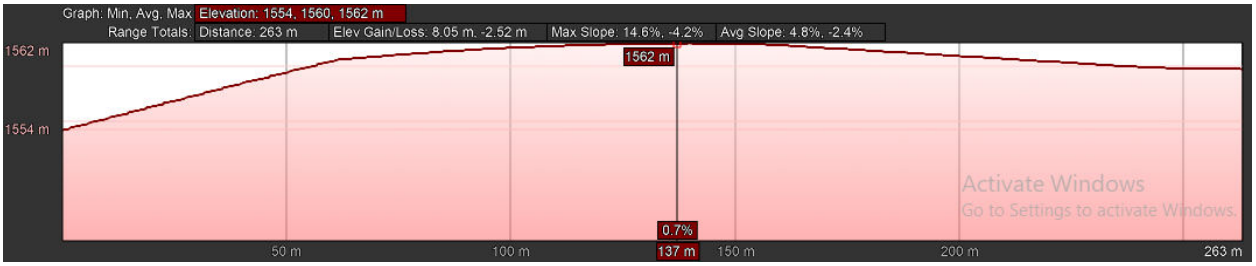
21. Croton-7th Ave. lane 1- 32mm- HDPE PN 10-240m



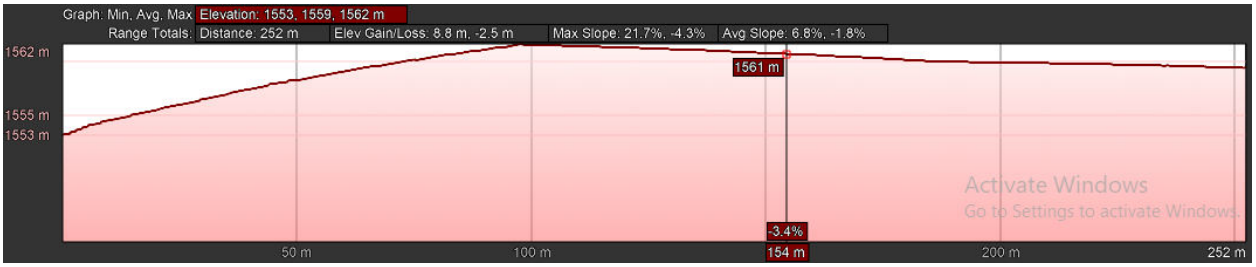
22. Croton-Riverside drive lane 1 32mm- HDPE PN 10-220m



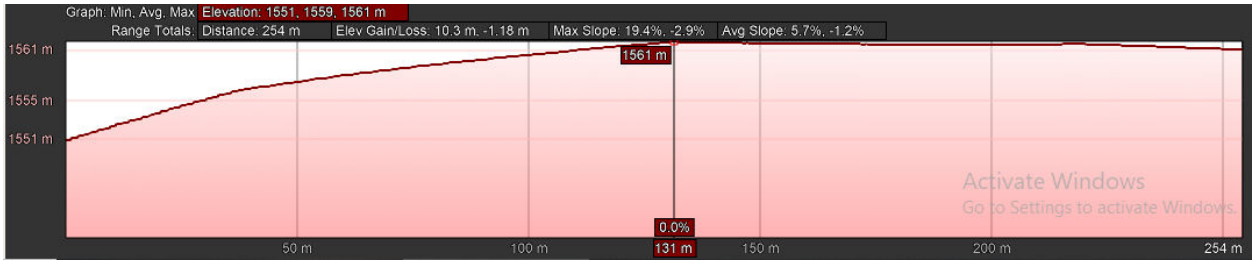
23. Croton-Riverside drive, lane 2, 32mm- HDPE PN 10-200m



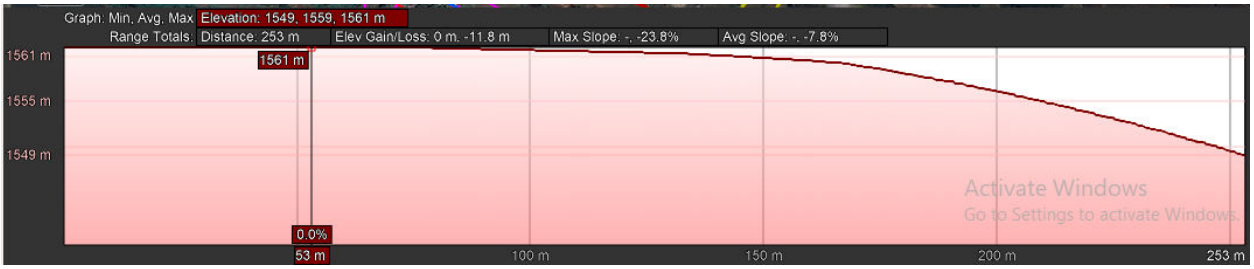
24. Croton-Riverside drive, lane 3, 32mm- HDPE PN 10-260m



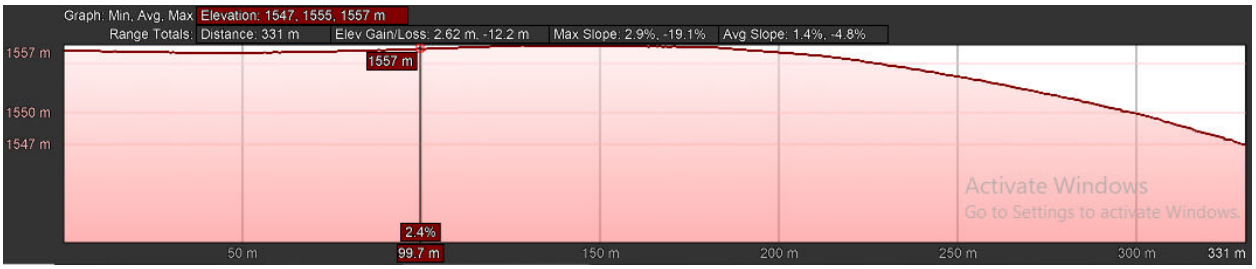
25. Croton-Blossom lane, 32mm- HDPE PN 10-250m



26. Croton-Cherry lane, 32mm- HDPE PN 10-260m



27. Croton-Marble court, lane 1, 32mm- HDPE PN 10-250m



28. Croton-Section 3, lane 1, 32mm- HDPE PN 10-330m



Residential areas in Croton Estate along Kenyatta Road to be served with water from the proposed pipelines extensions.



Existing wayleaves within Riverside estate roads where the pipelines will be installed

2.3.3.1 Installation of Air Valves and Wash Outs for the pipelines

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

2.3.4 Installation of zonal and consumer water meters

The works will involve the installation of zonal and consumer water meters within the water distribution system. The meters complete with associated fittings will be installed inside chambers with lockable covers.

2.3.5 Construction of Valves & Meter Chambers

The project entails the construction of air-release chambers, which release air pockets within the pipeline system to optimize water flow. Additionally, washout chambers will be built to provide access points for pipeline flushing and cleaning, ensuring water quality is maintained. Control valve chambers will house valves to regulate water flow and pressure. Several section valve chambers will be constructed to allow for segmenting the system during maintenance or repairs. Valve chambers will connect the existing water supply system with the new system, ensuring seamless integration. These inspection chambers contribute to the overall reliability, efficiency, and longevity of the proposed water supply system, providing sustainable and high-quality water supply to the communities it serves.

2.4 Materials for the construction works

This will include:

- HDPE, Steel and uPVC pipes.
- Steel valves & fittings.
- HDPE valves & fittings.
- Steel pipes and gate valves for installation of scour systems at the intake works.
- Bulk and consumer water meter.
- Sand, aggregate, cement, water for concrete works on the various chambers.

2.5 Anticipated waste material and by-products

Wastes Generated during Construction Phase:

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

2.6 Labour

The project will require both skilled and unskilled labour during construction and operation phases of the project. 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. The entire recruitment process of the workers will be managed by the contractor in accordance with Kenya labor laws following guidance of the Labour Influx Plan. Normal working hours are planned to be from around 08:00-17:00 from Monday to Saturday. Works outside of normal working hours will be sought from the relevant local authorities.

2.7 Construction machines/equipment

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

- Crawler excavators and tipper Lorries for the desilting works.
- Backhoe excavator for trenching.
- Compressors for breaking hard ground formation.
- Welding equipment.
- Concrete mixers.
- HDPE pipe fusion equipment.
- Pipelines pressure testing equipment.
- De-watering pumps.

2.8 Estimated Cost of the proposed Project

The estimated cost of the proposed Project is **KES 41,542,505** as summarized below:

SUMMARY OF COSTS

WORKS COMPONENT	**KES**
Desilting of Thiririka & Ndarugu Intakes	8,887,200
Supply and Installation of water pipelines	12,702,190
TOTAL FOR GATWASCO CLSG- 2 PROJECT	**21,589,390**

The detailed BOQs and Cost Estimates are attached as Annex IV in this Report.

3 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

Introduction

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, GATWASCO, 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 to the Project

This Project aims at improving access to clean water supply in the targeted areas of Kenyatta Road in Juja & Theta Wards of Juja Sub-County. 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 to the Project

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 to the Project

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 to the Project

The source of water for the proposed pipelines extension is surface water (Rwabora, Ndarugu & Thiririka 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 GATWASCO 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 to the Project

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 to the Project

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 workforce 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 to the Project

Due to the substantial 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 to the Project

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.

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 to the Project

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 as 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. This Act is applicable on the proposed desilting works at the intakes.

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 Gatundu Water & Sanitation Company Limited (GATWASCO) which is a water utility, wholly owned by Kiambu County Government. The Project once complete will be managed by GATWASCO 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.

Relevance to the Project

The Project identified will be implemented as provided by Kiambu County Government and Land Use Plan for Urban areas. 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. Gatundu water and Sanitation Company (GATWASCO), is the mandated WSP that provides water in Gatundu North & South Sub – Counties and some parts of Githunguri & Juja Sub - Counties.

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 honor 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 Chair of the Standard and Enforcement Review Committee. The members of the SERC are set out in the third schedule to EMCA. They consist of representatives of various relevant government ministries and parastatals that are Lead Agencies as well as those responsible for matters such as economic planning and national development, finance, labour, public works, law and law enforcement, etc. Other members are drawn from public universities, and other government institutions.

3.4.5 National Environmental Tribunal (NET)

The NET is established under Section 125 of EMCA for the purpose of hearing appeals from administrative decisions by organs responsible for enforcement of environmental standards. An appeal may be lodged by a project proponent upon denial of an EIA License or by a local community upon the grant of an EIA License to a project proponent. NEMA may also refer to any matter that involves a point of law or is of unusual

importance or complexity to NET for direction. The proceedings of NET are not as stringent as those in a court of law and NET shall not be bound by the rules of evidence as set out in the Evidence Act. Upon the making of an award, NET's mandate ends there as it does not have the power to enforce its awards. EMCA provides that any person aggrieved by a decision or award of NET may within 30 days appeal to the High Court.

3.4.6 Land and Environment Court

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

3.5 Sectoral Integration

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

3.6 World Bank Operational Procedures

Like in any project financed by, or with financial participation of, the World Bank, the environmental and social safeguards as defined in the Bank's Operational Procedures will be respected for the purposes of this project implementation. The World Bank classifies its projects into three Environmental Assessment categories according to the likely impacts on the environment they will have. This classification is as below:

Category A: The proposed project is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. For a Category **A** project, the Proponent is responsible for preparing an EIA report.

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

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

This Project has been categorized as B.

3.7 The World Bank Safeguards

3.7.1 OP/BP 4.01 (Environmental Assessment)

The World Bank has well-established environmental assessment procedures, which apply to its lending activities and to the projects undertaken by borrowing countries, to ensure that development projects are

sustainable and environmentally sound. Although its operational policies and requirements vary in certain respects, the World Bank follows a relatively standard procedure for the preparation and approval of an environmental assessment study, which:

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

Relevance to the Project

An Environmental and Social Impact Assessment (ESIA) Study shall be conducted 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 during the desilting of intakes.

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. 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 resettlement are included. Preference should be given to land-based resettlement strategies for people dislocated from

agricultural settings. If suitable land is unavailable, non-land-based strategies built around opportunities for employment or self-employment may be used."

Relevance to the Project

Not Triggered. The proposed project is on public land reserved for the water pipelines & works. Social screenings along the wayleaves where the proposed pipelines (Approx. 38 Km) will be installed, have been undertaken and confirmed that the proposed project does not involve any resettlements of PAPs. There are no PAPS who are likely to suffer economic displacement.

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

The proponent has proposed to deposit the excavated silt in the nearby Kieni Forest. This study has considered this proposal and found it environmentally acceptable provided that proper compaction of the deposited silk is carried out to prevent the deposited silt getting back into the river courses. The Kenya Forest Services (KFS) has issued a letter allowing the project proponent (GATWASCO) to deposit the silt at designated sites in Kinale forest. A copy of the letter is attached as Annex VII of this ESIA Report.

Table 3.1: Applicable World Bank Operational Policies

OP	Title	Comments
4.01	Environmental Assessment	Triggered. This project falls under category B as per the World Bank OP 4.01 and an environmental and social impact assessment has been undertaken as part of the project preparation to ensure the design, construction, operation and decommissioning phase mitigate the significant adverse environmental and social impacts.
4.04	Natural Habitats	Not applicable. There are no significant natural habitats on the site of the proposed project.
4.09	Pest Management	Not applicable. There are no pests at the proposed project site.
4.11	Physical Cultural Resources	Applicable. Site visits and inventories have not indicated the presence of any cultural (historical, archaeological) sites in the sample settlements. However, to manage "chance finds" an appropriate procedure is included in this report. Such procedure to be followed by contractors during the construction phase.
4.12	Involuntary Resettlement	Not Triggered. The proposed project is on public land reserved for the water pipeline.
4.36	Forests	Triggered. The proponent has proposed to deposit the excavated silt in the nearby Kieni Forest. This study has considered this proposal and found it environmentally acceptable provided that proper compaction of the deposited silk is carried out to prevent the deposited silt getting back into the river courses.
7.60	Projects in Disputed Areas	Not applicable. The proposed project sites are located within public land with no encumbrances.

3.8 Relevant international conventions and treaties

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

3.8.1. International Convention on Biological Diversity (1992)

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

Relevance to the Project

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

3.8.2. Ramsar Convention 1971

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

Relevance to the Project

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

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

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

Relevance to the Project

This Convention is relevant due to the significance of climate change on existing water sources and water resources management.

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

The Convention on the Elimination of all forms of Discrimination against Women (CEDAW) places explicit obligations on states to protect women and 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 be 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, 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 websites, as well as copy of the report available at the project site.

3.10. Project implementation institutional structure

3.10.1 Gatundu Water & Sewerage Company Limited (GATWASCO)

GATWASCO 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. GATWASCO 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 GATWASCO 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 forty-seven 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 Theta & Juja Wards of Juja Sub - County.

4.2 Physical environment

The physical environment of Gatundu is presented in the sub chapters below, the sub-sections below briefly describe the physical, biophysical, social and cultural environment of the Project area, while chapter 7 of this report presents the likelihood of the project activities to alter or impact the identified physical environment physical parameters discussed.

4.2.1 Climate

The climate of Gatundu Sub County is highly influenced by Aberdares Forest Ecosystem; climate is characterized by mist and rain that occur throughout the year, with precipitation varying from 1000mm yearly on the Northern Western slopes of Aberdare Escarpments to as much as 3000mm in the Southeastern. Heavy rainfall occurs throughout the year. The upper sub-catchment which lies within the Kikuyu Escarpment Forest comprises the humid zone and is the source of Rwabura and Thiririka River and other tributaries discharging into Ndarugu River and other adjacent rivers. The middle sub-catchment comprising the sub-humid and semi-humid zones provides agricultural land where small-scale agricultural activities are undertaken mostly tea farming, woodlots and dairy farming. Climate is often considered to be the driving factor for stream flow, and it is spatially and seasonally variable in the basins. The climate of the study area is heavily influenced by its geographical location and altitude relative to the Aberdares ranges and the equator. The basin falls within the equatorial trough of the Intercontinental convergence zone (I.T.C.Z), with a low pressure cell, where the south easterly and the north easterly trade winds converge, but due the local differences in elevations, and the continentally, the climate is modified to "modified equatorial climate". This climate is much cooler than the general tropical continental climate or highland subtropical climate.

4.2.2 Topography

The Project area is characterized by steep slopes toward the Eastern side of the town. The nature of the landscape depicts an oval configuration with short spans of ridges and deep gorge valleys that run parallel to each other with close proximity and ultimately converging within river valleys, major river valleys in the area include Rwabura, Karimenu and Thiririka rivers. The altitude ranges between 2000 -2200 m a.s.l to 1750 at the proposed site for the Wastewater Stabilization Ponds

4.2.3 Geology and Soils

The geology of the Gatundu Sub County is composed of Pyroclastic rocks with minor intercalations of basalts all of Pliocene to Lower Pleistocene Age. Rock exposures are found at riverbeds in deeply incised valleys. The geomorphology of project area is consisting of a highly dissected platform with narrow ridges separated by deep valleys and sometimes gorges. The landscape has a general slope towards the South-East, which also the direction of the drainage system. Exposures of Pyroclastic rocks in the river courses are rare and mainly

confined to the harder bands forming waterfalls. Typical tropic red soils (Latosols) are in the mountain areas at high altitudes. 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. The soils of the gentle to sloping slops of the middle and low altitudes are covered by light red soils. There are also a lot of patches of grey soils (Gleysols, "vlei soils"). Shallow, stony soils are located on the steep slopes around the channels. The flat areas are swampy. Soil erosion and mass movement are one of the major problems in the catchment.

4.3.1 Surface Water Resource

The study area is on the eastern slopes of Aberdare Forest Ecosystem, which is among the major water towers in Kenya and wind ward side of the escapements the area is traversed by numerous rivers that flow eastwards in the general direction of the slopes of Aberdare to Athi River drainage basin. These rivers include the Ndarugu, Rwabura, Thiririka and Karimenu. Figure 7 below show images of river Rwabura within the study area.

4.3.2 Ground water Resources

Largely due to the proximity of the region to Aberdare Forest Ecosystem, the source abundant river water draining the catchment into Athi Catchment, the ground water sources have not been extensively exploited. Shallow wells are the most prevalent category of ground water sources within the area. They are found within homesteads in areas where the water table is high. Community water schemes in the area are also common water supply schemes, the community water scheme supply raw water to consumers in the areas not supplied by Gatundu Water and Sanitation Company. The schemes draw water upstream ensuring that the systems are gravity fed, this negates the need to exploit ground water sources which could prove to be more expensive to initiate and operate.

4.4 Biological environment

4.4.1 Vegetation and Flora

Biodiversity of the Project location is highly influenced by the Aberdare Forest Ecosystem with respect to indigenous plant cover species. However, due to human activities, indigenous plant species have been displaced by exotic species that have also acquired economic values among the communities. Such plant species include tea, coffee, Eucalyptus spp, Cypress ssp., Casuarina spp. and Graviera SSP and wattle trees species. Other plant features include grass species, ferns, nippier grass, avocado, banana, yams (mainly in the river flood plains), cassava, sugar cane, pineapple, arrowroots, and coffee.

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. However, limited rodents like squirrels, moles and different bird species among others are found in the area (specific habitats characteristics will be established during the detailed assessment. Among the aquatic species present within the river basins include frogs, freshwater fishes are found naturally in the rivers. Livestock keeping is significant with dairy cows, sheep, goats, poultry and house pets (dogs and cats) may also constitute part of the wider biodiversity).

4.5 Social setup

4.5.1 Settlement Patterns

Gatundu Sub County is densely populated with population distribution determined by infrastructure, food availability, and proximity to Nairobi City among other factors. High population density is distributed around market centers. The settlement patterns within the Project area are characterized by myriad of high, medium and low-income residents with the areas occupied by low and medium residents depicting high population densities. Population also varies from the towns and rural areas. In the rural areas population density is low compared to the urban centers. Urban settlement is mostly concentrated within 3km radius from the town's Central Business District.

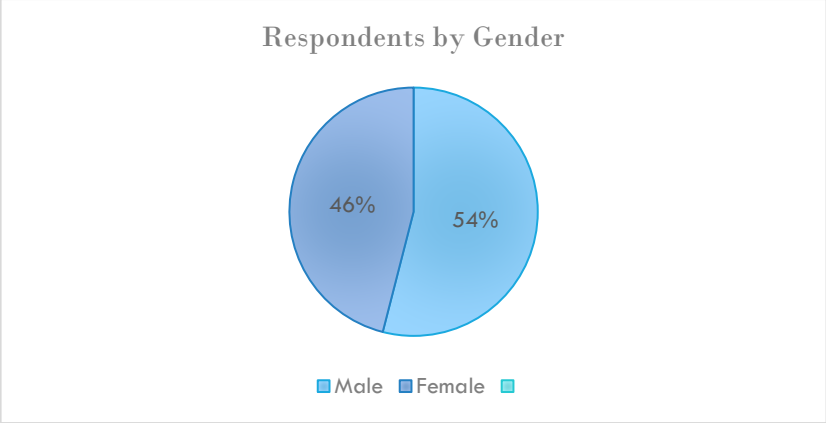
4.5.2 Land Use Patterns

The Project area is generally divided into four land use categories: light dairy industrial, institutional (schools, hospitals, hostels), commercial and residential (high, medium and low-income residences together with informal settlements). Industrial development in the town is relatively minimal. Major industries within the town area include milk processing industry. The land prices vary depending on their location and proximity to the urban centers, all weather road network and tertiary educational institutions. With the fertile agricultural lands that characterize Gatundu in general, cost of land is comparatively high.

4.6 Socio economic survey

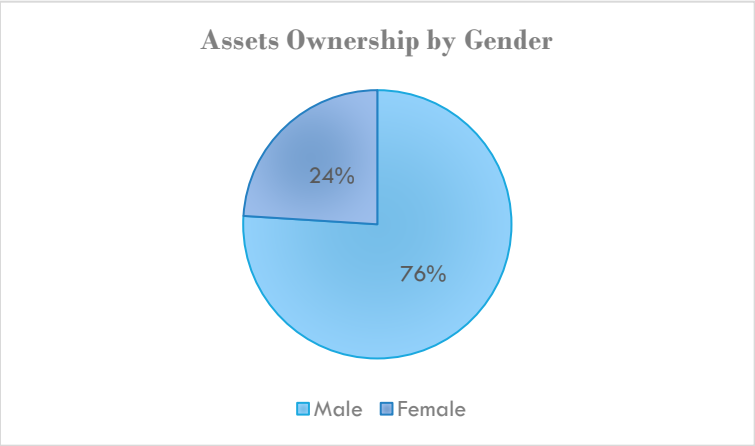
4.6.1 Household Characteristic

The socioeconomic survey covered a sample of 63 households drawn randomly from the proposed projects areas. The estimated population within the proposed projects areas is 13,564 people. The survey sought views from household heads or adult members found in the household at the time of the interview. Among the respondents, 29 No. (46%) were women while 34 No. (54%) were male.



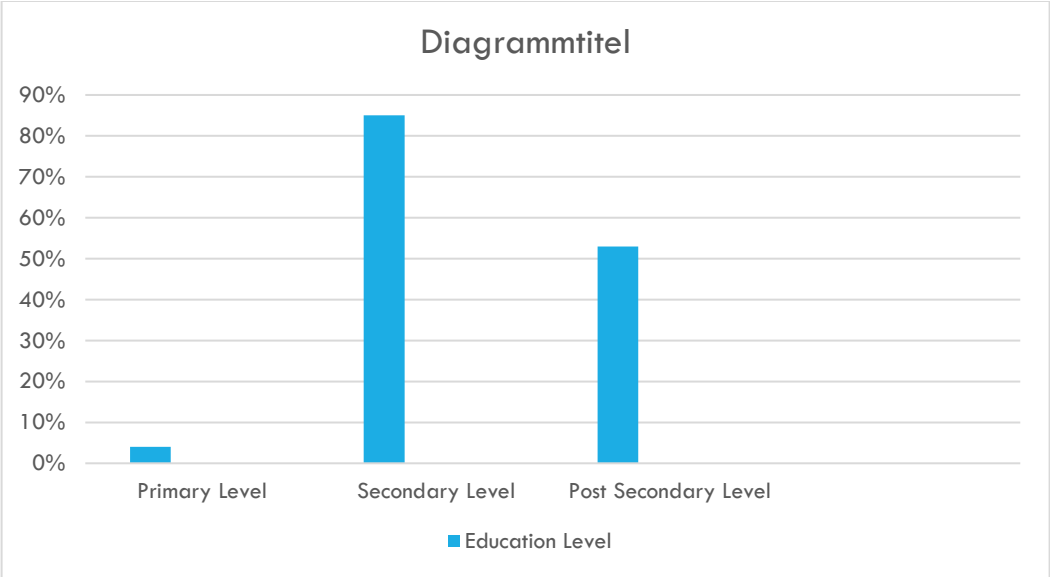
4.6.2 Assets Ownership by Gender

Majority of respondents were landlords i.e 41 No. (65%) compared to 22 No. (35%) of the respondents who rent houses. The areas are well planned with residents having title deed to the parcels they occupy (freehold) from Kiambu County Government. Analysis of structure owners by gender across the sample revealed that 48 No.(76%) are owned by the male while 15 No. (24%) are owned by the female.



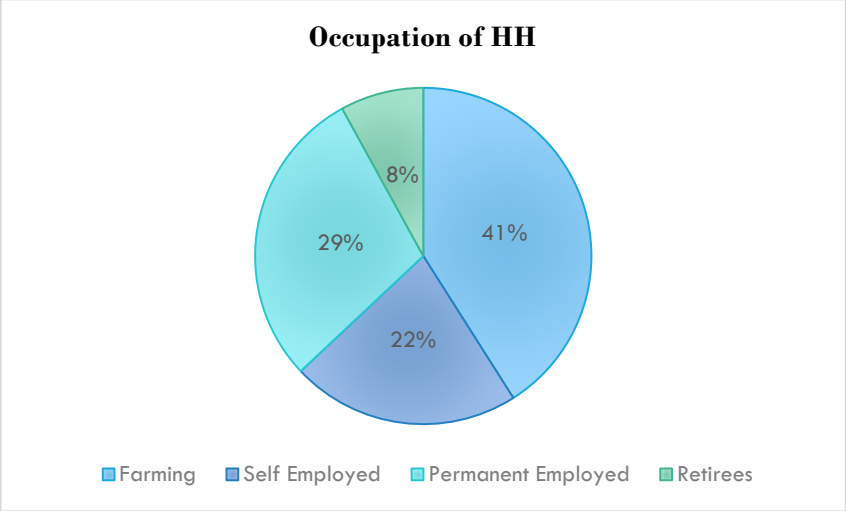
4.6.3 Education Level

The highest education level attained by majority of the household heads had completed secondary education at 85%, and 53% post-secondary and only 4% up to primary level.



4.6.4 Occupation of the Household Head

Analysis of the household head against their occupations revealed that 26 No. (41%) within the sample size derive their livelihoods from farming, 14 No. (22%) are self-employed, 18 No. (29%) are permanently employed and 5 No. (8%) are retirees.



4.6. 5 Development Priorities

An assessment of development priorities within the project area Gatundu ranked water and roads high on the list of respondents' perceived development priorities. Water comes ahead as a priority amongst 13 development social problems mentioned by the respondents.

4.6.5 Water Services

Service level is a measure of water availability and accessibility, which therefore measures the extent of hardship for a given community. Water availability refers to general reliability while accessibility relates to proximity, ease of fetching and affordability. Based on this definition, the survey analyzed the current water situation among the households in within the proposed project areas using water service level indicators among them was water access. The projects areas are supplied with water by Gatundu Water and Sanitation Company (GATWASCO). Projects recently commissioned by Athi Water Works Development Agency (AWWDA) to supply the area include Thiririka Water Supply, Ndarugu Water Supply and Theta Water Supply Projects. However, not all areas within the proposed projects areas are supplied with water from the project.

4.6.6 Regularity of Water Supply

A total of 39 No. (62% of the respondents within the proposed projects areas described their water supply as irregular. Analysis of regularity of water supply by source revealed rainwater and community water supply schemes are the most reliable source of water for residents while piped was said to be least dependable. Only 3 No. (5%) of the respondents indicated as receiving water from GATWASCO at least once a day. Unreliable water is the major issue to the respondents who are connected to the Water Service Provider.

4.6.7 Coping Strategies

Residents in the proposed projects areas adapt various strategies to cope with insufficient water supply. Those mentioned include reducing the amount of water used for domestic chores, water storage as well as buying from vendors and use of shallow wells, streams and boreholes.

4.6.8 Environmental Sanitation

The socio-economic survey recognizes that inadequate sanitation leads to a number of 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 in the proposed project area shows that the area has no sewer network and has no planned sanitation facilities. Majority of the properties within the area are served by pit latrines, soakage pits and septic tanks. The soakage pits and septic tank often overflows and dispose raw sewage into the drainage channels which end up into the permeable subsoil posing pollution threat to water resources and soil contamination.

5 PUBLIC PARTICIPATION AND CONSULTATIONS

5.1. Introduction

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

The Environmental Management and Coordination Act (EMCA) of 1999, calls for effective stakeholder participation and public consultation in the ESIA Study process. EMCA requires a project proponent to seek the views of persons/communities that may be affected by the project to be consulted, at least explain project potential impacts and obtain oral/written comments, which will be included in the ESIA for implementation by the proponent. Consultation and participation are a process through which stakeholders influence and share control over development initiatives and participate in decisions on resources that affect them. It is a two-way process where the executing agencies, policy makers, beneficiaries and affected persons discuss and share their concerns in a project process. According to the World Bank's policies, project affected persons and host communities are to be meaningfully consulted early in the planning process and encouraged to participate in all stages up to the implementation of the project.

During ESIA scoping and sites visits, consultations were held with representatives of the communities of the project areas at Gaitete, Gachege and Kenyatta Road, local leaders and the Project's Proponent senior officers. The stakeholders and public consultations were conducted 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 conduct the environmental impact assessment.

This Section highlights the need for stakeholder participation and the consultative process adopted during the study and summary results of the process.

5.2. Stakeholders and public consultations objectives

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

- Identification of significant impacts.
- Identification of public's interest and values.
- Identification of priorities for assessment.
- Encouraging public understanding of the proposed project.

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

5.3 The consultative process adopted

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

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

Several methods were used to engage stakeholders in the process of capturing their views, issues and concerns on the proposed project during data collection. The levels of project stakeholder engagement during data collection approaches and procedures were through household questionnaire data collection, key informant interview with selected leaders and through community meeting at the Ward Administrator's office near Riverside Estate along Kenyatta Road.

5.4 Key informant interviews

The key informant consultations were conducted between 14th -17th June, 2024. The method used to conduct consultations took into consideration the profile of the stakeholders, type of information desired and level of engagement. Each primary key stakeholder was visited at their offices. There was a session of introduction followed by a brief on the prosed project before the views of the stakeholder were sought through an interactive interview session. Key informants were provided with a Key Informant Questionnaire to fill. The outcome of the interviews is summarized in Table 5-1

Table *5.1*: Summary of Key Informant Interview

1	**Key informant interviewed**	**Summary of remarks**
	Managing Director - GATWASCO	• All the technical documents including the Bills of quantities have been prepared and the project is only waiting for the ESIA clearance to commence construction works. • Desilting of the intakes need to be carried out before the onset of the short rains.

2	Technical Manager - GATWASCO	• This area has been experiencing severe water shortages due to frequent pipe bursts and low pressures in the dilapidated water distribution infrastructure. • The replacement of the old water supply pipelines and the last mile connectivity shall improve water supply distribution in the area.
3	Commercial Manager - GATWASCO	• The uncounted for water for GATWASCO is currently at about 40% which means that a lot of revenue is lost. • With the procurement and installation of new water meters, the billing accuracy will be improved and hence, increased revenue.
4	Sub-County Water Officer (Juja Sub-County)	• The water demand in the area is increasing due to development of housing estates at an extremely high rate. • Improved access to water will spur other economic activities and create jobs for the area youth.
5	Sub-County public Health officer (Juja Sub-County)	• Improved access of clean drinking water for the residents of area will significantly reduce cases of water borne diseases. • The Contractor to minimize pollution of the environment while conducting construction works.
6	Assistant Forest in Charge of Kieni Forest -Kenya Forest Service (KFS)	• Kieni Forest is within the Aberdares Water Tower where Ndarugu & Thiririka Rivers originate. • KFS has put in place adequate measures to minimize pollution of the water sources in the forest by controlling human activities especially the shamba system in the forest where local farmers are allowed to grow both plantation trees and food crops on small plots, tending the trees and harvesting the crops until the trees become established. • KFS will continue to conserve the water sources for the 2 No. intakes but requested the project to consider supporting KFS in repair of forest boundary fence to prevent illegal logging.
7	Water Resources Authority (WRA) Sub- Basin Area Coordinator – Kiambu County	• WRA has permitted water abstractions for domestic use at the 2 water sources. • Requested that proper measures are put in place during the desilting works to avoid pollution of water for the downstream water users. • The project proponent to submit the methodology and schedule for the desilting works to WRA for review and approval prior to commencement of activities.
8	Representatives of Water Resource Users Associations (WRUAs) for Thiririka and Gatamayu sub-catchments	• The WRUAs have been working closely with KFS to ensure that the local farmers who have been allowed to cultivate inside the forest while taking care of the trees under the Shamba System do not pollute the rivers. • This is done by ensuring that farming activities are at least 15 metres from the rivers.

9	KENHA Roads Maintenance Engineer – Kiambu County	• Noted that the main pipeline extension is along the Kenyatta Road which is under the management of KENHA. • 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 ensure that pipelines are installed at the authorized locations along the road reserve.
10	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.
11	Ward Administrator – Theta Ward	• There will be clean and safe water accessibility in the area which a priority for the County Government of Kiambu. • His office will support the contractor to ensure that no hindrances occur during implementation of the project. • At the time of recruitment, the local people will be given the first priority provided they have the required skill and competence to undertake the available tasks. • Importantly, there will be a number of unskilled jobs where most of the local people can be employed. • However, appropriate screening is paramount to ensure recruitment of capable and committed employees to ensure timely completion of the construction activities.
12	chief – Theta Location	• The project is long overdue and will save the residents substantial money that they have been using to buy water from private vendors at exorbitant costs. • The Chief requested that the youths of the area should be given the first priority when recruiting Project workers. He indicated that through his office, they can screen and recruit very good workers from the local community.
13	Chief – Juja Location	• He assured support from his office so that the project can be completed on time. • The chief wanted to know if the contractorhas identified campsites and sources of construction materials.

		• The local community members need to be kept updated of the progress on the Project including sharing the Project implementation schedule once available.
14	Chief – Ndarugu Location	• Most of the homesteads in the location do not get clean water although the intake and water treatment plant are located in the location. • The local people should be given priority in employment when construction works commence. • Hoped that with the proposed rehabilitation of the Thiririka intake, local residents will start getting clean water.
15	Assistant Chief – Gachege Sub-location (Githobokoni)	• The Local youth should be given employment opportunities since most of them are jobless after completing their secondary and tertiary education. • The contractor to conserve the environment during the execution of works and repair any damages on the roads during the transportation of materials. • Gave assurance of security and cooperation with local residents during the implementation of the project. • Local residents should be provided with water as much as the target areas are the main urban areas of Kamwangi & Gatundu Towns.

5.5 Project area community consultations

The community consultation was held in addition to Key informant interviews and household surveys as a means of seeking the opinion of community members regarding the proposed project. The public consultative meeting was organized by the areas Chiefs & Assistant Chiefs in consultation with the Ward Administrators and held on 14th & 15th June 2024 at the various proposed Project sites in Gatundu North, Gatundu South and Juja Sub-Counties. The invitations for these public meeting were done through the respective Area Chief's office and the 'Nyumba Kumi' leaders (estates/village leaders), who went around the residential estates and villages inviting the community members a week prior to the dates of the meetings. The main objective of the public consultations with the affected project area residents was to gather information on their concerns, perceptions, reactions and fears of the livelihood changes to be brought about because of the proposed Project implementation. Other specific objectives were the following:

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

During the presentation session, the local residents were given detailed information about the project by the consultant team. The presentation highlighted the project background, components, objectives, expected upcoming activities, potential socio-economic and environmental impacts. After the presentations, the community was given opportunity to give their views, comments and queries. Questions were answered, clarifications provided and their recommendations recorded.

A) Public Meeting at Kenyatta Road (Water extension pipelines) – Juja Ward

This meeting was held on 14th June 2024 at the Ward Administrator's office near Riverside Estate along Kenyatta Road. 23 participants attended this meeting, 16 of them being male while 7 were female.



Public Meeting at Kenyatta Road

The following is a summary of issues raised by the members who attended the meeting:

Perceived Benefits

(g) The proposed project will create significant economic and social benefits to the communities through provision of clean and adequate water and contribute to the attainment of the national priority goals and ongoingnational efforts to accelerate economic growth and alleviate poverty.

(h) Employment opportunities will be offered to the construction workers and any other person who will be hired to provide her/his services during the construction phase. Inaddition to direct employment, supplies of necessities to the workers will also lead to more employment opportunities and acquisition of entrepreneurial skills. This will engrain a sense of project ownership within the community.

(i) The proposed project will also play a role in reduction of idleness particularly amongst the youth due to an increase in income generating activities both directly or indirectly.

(j) The standard of living of the community especially vulnerable beneficiaries (elderly, female headed households and children) since there will be a reduction in distances travelled and time spent in search of water.

(k) The community will be assured an all-year-round access to clean water supply for their domestic water and other needs such as poultry farming.

(l) Reduced poverty levels through increased incomes and improved livelihoods resulting from construction of the proposed project and maintenance employment and consumption from the local markets, emergence of other associated economic opportunities and activities.

Issues and concerns raised during the meeting
Kenyatta Road Estates Stakeholders meeting

	Comment/ Question	Response
1	Mr. Daniel Mburu (Asst. Chief) The Chief requested that the youths of the area should be given the priority when recruiting Project workers. He indicated that through his office, they can screen and recruit very good workers from the local community.	**GATWASCO** At the time of recruitment, the local people will be given the priority provided they have the required skill and competence to undertake the available tasks; importantly, there will be a number of unskilled jobs where most of the local people can be employed. However, appropriate screening is paramount to ensure recruitment of capable and committed employees to ensure timely completion of the construction activities.
2	Ms. Emily Njeri Wanted to know whether there will be a safety officer during the construction phase as most of the issues were related to safety of the environment and people.	**ESIA Consultant** The contractor will have a safety department/ team to ensure health and safety of the workers and environment. The safety team will have members based on site throughout the construction phase.
3	Mr. Jacob Mwangi Wanted to know how the locals will benefit from the project. He was concerned that most of the contractors usually come with their own staff.	**ESIA Consultant** **ESIA Consultant & GATWASCO** At the time of recruitment, the local people will be given the priority provided they have the required skill and competence to undertake the available tasks; importantly, there will be several unskilled jobs where most of the local people can be employed. However, appropriate screening is paramount to ensure recruitment of capable and committed employees to ensure timely completion of the construction activities.
4	Ms. Jane Gitau Asked how long it was going to take to implement the project.	**GATWASCO** The duration of the construction phase will be informed by the detailed project design once completed. However, principally, after obtaining all the necessary Project approvals (including ESIA License), the contractor will be required to complete the construction activities within 6 months. The local community members will be kept updated of the progress on the Project including sharing the Project implementation schedule.
5	Mr. Joseph Gachigi Wanted to know whether they will get opportunities to supply construction materials.	Local sources if available are preferred provided that the available materials are of the right quality and quantity. However, HDPE pipes, valves, fittings and water meters will be procured from the manufactures.

6	Mr. Daniel Kamau Wanted to know the availability of the money required to implement the Projects since he had witnessed incomplete projects in the past attributed to lack of enough money.	**GATWASCO** The Project will be funded by the World Bank and the funds are already with GATWASCO.
7	Mr. Simon Chege Asked whether there will be insurance cover for those who will be injured during the construction.	**ESIA Consultant** The contractor will abide by the Kenyan laws and international standards including the Work Injury Benefit Act (WIBA) which caters for any work-related injuries.
8	Mr. Andrew Ng'eno Wanted to know whether they will be employed at the Project site during the construction phase.	**GATWASCO** Local Community will be given priority when employment opportunities arise.
9	Mr Sam Kageni The community wanted assurance of regular supply of clean water supply for their domestic water and other needs such as poultry farming in sufficient quantities.	**GATWASCO** Once the project has been implemented, residents will receive reliable and adequate supply of water.

B) Public Meeting at Gaitete – Thiririka River Intake

This meeting was held on 15th June 2024 at Gaitete Shopping Centre (which is located about 1.4 Km from the Thiririka River Intake), starting from 10.40 am. 22 participants attended this meeting, 10 of them being male while 12 were female.



Public Meeting near Gaitete Shopping Centre

Issues and Concerns raised during the meeting:
Thiririka Intake Stakeholders meeting

	Comment/ Question	Response
1	Mr. Hezekia Wanyagaga Residents do not benefit from the existing water supply scheme as it the water is currently transmitted to the major towns.	**GATWASCO** There has been a significant reduction of water production from the installed water treatment plants due to the reduced water storage capacities at the existing intakes. The proposed rehabilitation works are aimed at reinstating water production capacities and thereby provide more water to consumers.
2	Mr. Josphat Mwangi (Area Chief) - Local residents had not been given employment opportunities for maintenance of the intake and the water treatment works.	**GATWASCO** There are a number of local residents who have been engaged on temporary bases for maintenance works at both the intake and the water treatment plant. When opportunities arise, the local people will be given considerations based on their skills.
3	Mr. John Njenga - Poor disposal of the excavated silt will lead to pollution of the environment.	**ESIA Consultant** The Contractor will work under close supervision of the Resident Engineer and Environmental Specialists to ensure that the Environmental & Social Management Plan is adhered to.
4	Ms. Mercy Wangari - The residents were concerned that the desilting works will destroy the vegetation and trees.	**ESIA Consultant** The Contractor's working area will be clearly marked to avoid damage of trees and other vegetation. The proponent has proposed dredging as the desilting method which has minimal interference with the vegetation.
5	Mr. Willis Mbote - There will be increased road traffic resulting from transportation of the silt from the intake to the proposed dump sites in Kieni Forest. This will increase dust emissions and accidents.	**ESIA Consultant** Speed limits will be set for the trucks transporting excavated silt from the Intake to the dumping site to minimize emission of dust. If necessary, watering of the roads will be done to reduce dust.
6	- Ms. Zipporah Wanjiru Will the local youth be considered for jobs when construction works start?	**GATWASCO/ESIA Consultant** The desilting works will mainly be carried out through mechanized methods (dredging and pumping out of the silt) and then transportation using tippers to the dumping sites. However, residents will be given first incase manual job opportunities become available.
7	Mr. Fransis Kimani - GATWASCO to consider reducing the water meter connection charges which they felt were too high.	**GATWASCO** Water tariffs and connection fees are determined and approved by the Water Services Regulatory Bord (WASREB) after taking all factors into considerations

		including the prevailing costs of materials and labour.
8	- Ms. Salome Mbugua Can the Contractor who will be doing the desilting consider repairing a foot bridge next to the water intake that was damaged during the recent floods?	**GATWASCO** The contractor will be requested to support the community if this shall be possible as part of Corporate Social Responsibility.
9	Peter Waweru - When is the expected commencement date for the works?	**GATWASCO** Once all the approvals on the implementation of the project were obtained, the works will start since the funding has been secured.

C) Public Meeting at Gachege – Ndarugu River Intake

This meeting was held on 15th June 2024 at Gachege Chief's Office (which is located about 2.1 Km from the Ndarugu River Intake), starting from 2.30 pm. 37 participants attended this meeting, 21 of them being male while 16 were female.



Public Meeting at Gachege Chief's Office

Issues and Concerns raised during the meeting:
Ndarugu Stakeholders meeting

	Comment/ Question	Responses
1	Mr. Peter Njoroge Jobs opportunities that will arise during the construction period should be reserved for the residents of the project area.	**GATWASCO/ESIA Consultant** The local Residents will be given priority when job opportunities occur during the implementation of the project.
2	Joseph Wairigi (Chief) The proponent and the contactor should involve local administration and community during the construction phase of the project.	**GATWASCO** The Contractor will be required to work closely with the local administration and community for smooth execution of works.
3	Rueben Murigi The contractor should not damage the existing roads or emit excess dust during the transportation of silt.	**ESIA Consultant** The Contractor will be required to fully implement the Environmental & Social Management Plan. The proponent (GATWASCO) will ensure compliance.
4	Ms. Maryann Wangare Was concerned that only the skilled would have jobs leaving out the unskilled who are the majority in the area.	**ESIA Consultant** The local Residents will be given priority when job opportunities occur during the implementation of the project.
5	Mr. Waititu Muriu Clean water should be supplied to local residents before being transmitted to Gatundu and Juja Towns as they are the ones who conserve the water sources.	**GATWASCO** Water distribution will be done to all consumers irrespective if they are rural or urban. The local residents are encouraged to apply for connections if they have not been connected.
6	Lillian Mwangi Expressed their fears over noise pollution that would come from the construction works and the vehicles transporting excavated materials to the dumping areas.	**ESIA Consultant** The Contractor will work under close supervision of the Resident Engineer and Environmental Specialists to ensure that the Environmental & Social Management Plan is adhered to.
7	Nathan Chege Enquired if they could be allowed to use water from the intake for small scale farming of vegetables during the dry seasons.	**GATWASCO** The storage capacity at the intake would not allow for abstractions for irrigation purposes. The current license from WRA only permits water abstraction for domestic use only.
8	William Karugu Wanted to know the extent of the reservoir since his farm has been experiencing flooding during the rainy seasons	**ESIA Consultant** As per the Water Resources Authority Rules, the buffer zones for perennial rivers is about 30m from the water on either side of the river.

6 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

6.1 Introduction

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

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

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

6.2. Types of impacts

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

6.2.1 Direct impacts

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

6.2.2 Indirect impacts

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

6.2.3 Cumulative impacts

Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (for example, removal of vegetation may cause soil erosion, leading to excessive sediments in receiving stream, leading to reduced sunlight penetrating the water and thus reducing dissolved oxygen in the water and

adversely affecting aquatic life and water quality). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

6.3 Concepts in impact significance assessment

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

Table 6.1: Terminologies and Definitions Guiding Impact Assessment

Characteristic	Definition	Options and Definitions	
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect).	Direct	Impacts that result from a direct interaction between the Project and a resource/receptor (e.g., between occupation of a plot of land and the habitats which are affected).
		Indirect	Impacts that follow on from the direct interactions between the Project and its environment because of subsequent interactions within the environment (e.g., viability of a species population resulting from loss of part of a habitat as a result of the Project occupying a plot of land)
		Induced	Impacts that result from other activities (which are not part of the Project) that happen because of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).
		Cumulative	An additional impact that arises because of an impact from the project interacting or combining with an impact from another third party planned activity that is not considered to be part of the project's area of influence.
Extent	The 'reach' of the impact (e.g., confined to a small area around the Project Footprint, projected for several kilometers, etc.).	Local Regional International	Defined on a resource/receptor-specific basis
Duration	The time period over which a resource / receptor is affected.	• Temporary • Short-term • Long-term • Permanent	Defined on a resource/receptor-specific basis
Scale	The size of the impact (e.g., the size of the area damaged	No fixed options; intended to be a numerical value.	

	or impacted, the fraction of a resource that is lost or affected, etc.)	
Frequency	A measure of the constancy or periodicity of the impact	No fixed options; intended to be a numerical value

6.4 Significance of impacts

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

Table 6.2: Significance Matrix

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

Negligible

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

Minor

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

Moderate

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

Major

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

Likelihood

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

Table 6.3 Likelihood Qualitative Scale

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

Residual Impacts

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

6.5 Potential impacts identification and assessment

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

- Construction,
- Operational and
- Decommissioning phases.

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

(i) Whereby certain impacts to the environment are identified.
(ii) Risk evaluation (by using a stipulated assessment criteria whereby impacts are given a rating or weighting and obtaining an overall rating or significance of an impact) and
(iii) Risk management (relating directly to applicable mitigation measures to be implemented to manage a risk of an impact in the best interest of the project beneficiaries and surrounding communities.

6.6 Positive impact during construction phase

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

6.6.1 Creation of Employment

During the construction of the proposed Project, there will be employment opportunities for both professionals and unskilled workers. Several workers including casual laborers, plumbers and engineers are expected to work on during the construction period. Semi-skilled, unskilled laborers and formal employees are expected toobtain gainful employment during the period of construction. With labour intensive construction

technologies, the project will provide employment for youths and provide supportto the Government of Kenya initiatives on creation of jobs.

The creation of employment opportunities is beneficial both from the economic and social point of view. Economically, it means abundant unskilled labour will be used in digging of trenches, laying of pipes, and transport of construction materials. Socially, these people will be engaged in productive employment and minimize social ills like alcohol abuse which is rampant in the project area. This positive social change in the social behavior will be one of the anticipated transformational indicators in the project area.

6.6.2 Injection of money into the local economy

A considerable sum of the project money shall be released into the local economy due to the construction activities. This money will be in form of payments for skilled and unskilled labour,purchases of construction materials and payments for local provisions including fuel, foods and accommodation.

6.6.2 Creation of market for construction materials

The project will require materials, some of which will be sourced locally within the project area. Some of these include sand, cement, steel, hardcore and building stones for the construction of meter and valve chambers. Local suppliers will be given priority in supply of construction materials.

6.7 Positive impacts during operation phase

Positive project impacts during operation phase are summarized as follows:

6.7.1 Increased water production

Desilting of the 2 No. intakes will significantly increase the volume of water available for abstraction, treatment and distribution to consumers.

6.7.2 Provision of clean water services

The Project's main aim is to provide clean treated and wholesome water to the residents of the target areas along Kenyatta Road and adjacent areas.

6.7.3 Reduced Incidences of Water-Borne Diseases

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

6.7.4 Accessibility water for domestic use

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

6.7.5 Reduction in poverty levels of households

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

6.7.6 Employment

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

6.8 Negative impacts during construction phase

6.8.1 Pollution of water during the desilting of the intakes

Desilting works at the intakes will involve the removal of the accumulated silt at the water impoundment. These activities could result in pollution of water and affect water quality to the downstream users and aquatic life such as fish breeding.

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

Mitigation measures

- The Contractor to ensure that no removed materials get back to the river. The removed silt should be transported to approved disposal sites such as open areas within the adjacent Kieni forest which has been earmarked for tree planting.
- Use of silt removal methodology that minimizes pollution of water for downstream water users (e.g pumping out of the silt instead of mechanical excavations).
- Carry out desilting works during the low river flows seasons.

6.8.2 Impacts on Vegetation Cover

Clearing of vegetation cover exposes soils to agents of soil erosion such as wind and runoff, this could lead to soil degradation. This could trigger sedimentation in nearby rivers & streams resulting in increased turbidity of water and could also lead to flooding. The risk of destruction of vegetation in the project areas is low and will be further minimized by limiting site clearance and construction activities to the pipeline routes within the Project areas.

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

Mitigation measures

- Areas to be cleared should be agreed and demarcated before the start of the clearing operations to minimize exposure.
- Vegetation should only be cleared along the Project construction sites and where it will interfere with Construction works and/or present a hazard.
- Reinstatement of the project sites to their original after completion of construction works.
- The use of existing cleared or disturbed areas for the Contractor's Camp, stockpiling of materials etc. shall be encouraged.

6.8.3 Impacts on Soils

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

- Destruction of soil structure due to topsoil excavations.

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

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

Mitigation measures

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

6.8.4 Solid Wastes Generation from Construction activities

Construction activities at the work sites will generate some spoil material, solid wastes such as plastic containers, used tyres, metal parts, plastics and cables. Such material if not mitigated could be washed away to drainage channels and rivers eventually clogging the drainage channels and increasing river sedimentation.

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

Mitigation measures

- Maximum reuse of excavated material.
- Construction sites to have designated waste collection points and disposal to appropriately and approved sites.
- Environmental Management, Health and Safety Training Programs to be conducted for Contractor's staff to create awareness on proper solid wastes management.

6.8.5 Accidental oil and fuel spills and leaks

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

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

Mitigation measures

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

6.8.6 Interference with the existing infrastructure and physical settings

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

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

Mitigation measures

- Liaisons with the relevant authorities and service providers to locate existing infrastructure before commencement of excavation works for pipe laying.
- Formal request for permission for a wayleave and laying the water pipeline should be sought from relevant roads authorities.

6.8.7 Noise Pollution and Vibrations

Construction of the proposed project will result in noise emissions as a result of the machines that will be used (excavation equipment etc.) and construction vehicles driving materials to site. Noise could impact negatively on the workers during the construction phase. Noise can also be a nuisance to the local community if construction worksbegin too early in the day and continues into the night.

Noise levels from construction activities exceeding 60 dB (A) at the construction camp site have a negative impact to the environment.

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

Mitigation measures

The following noise-suppression techniques will be employed to minimize the impact oftemporary construction noise at the Project site:

- Best available work practices will be employed on-site to minimize occupational noise levels
- All construction equipment will be regularly inspected and maintained in good workingcondition.
- Provision of earmuffs for those working with noise producing equipment.
- Combine noisy operations so that they occur at the same time. The total noise level will not be significantly louder than the level produced if the operations were to be undertaken separately.

6.8.8 Dust Emissions

Dust will be emitted during excavation and related earthworks. Air borne particulate matter pollution is likely to occur during the route clearance, excavation and during the transport of construction materials. This is likely to affect site workers and the residents, in extreme situations leading to respiratory problems.

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

Mitigation measures

The following measures can help mitigate dust generation and damage likely to arise duringthe construction phase:

- Strict measures are to be applied for the handling of construction materials in powderform such as cement, lime, concrete additives, etc. and for the disposal of the packaging.
- Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present.
- Minimizing the number of motorized vehicles on use.
- Wet all active construction areas as and when necessary.
- Vehicle speeds be limited to a maximum of 30Km/hr.
- A monitoring and evaluation program for air quality shall be implementedand reported on throughout the construction phase cycle.

6.8.9 Workers, Community Health and Safety Risks during Construction

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

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

Mitigation measures

- Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer and the Proponent's Environmental & Safety Officer.
- Construction workers, the supervision team and authorized visitors to construction sites to be provided with Personal Protective Equipment (PPEs) including gloves, gumboots, overalls and helmets. Use of PPE to be enforced by the Environmental & Safety Officer.
- Fully stocked First Aid Kits to be provided within the sites, camps and in all Project vehicles.
- Isolate the site for access by the local communities during the construction for their safety and health.
- Use of warning signage and tapes where the trenches are open and at other active construction sites.
- The contractor shall avoid the usage of heavy excavation machinery along the pipeline route. Manual labour shall be used for trenching and backfilling during construction in addition to supporting the sides of the excavation with wooden planks to prevent cave-ins.

6.8.10 HIV /AIDS & other communicable diseases

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

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

Mitigation measures

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

6.8.11Labour influx and effects of Immigrant Workers

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

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

Mitigation measures

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

6.8.12 Child Labour

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

Mitigation measures

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

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

Impact Characterization /Significance			
Local	Reversible	Low	Probable

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

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

Impact Characterization /Significance			
Local	Reversible	Low to Moderate	Probable

Mitigation measures

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

6.9 Impacts during operational phase

6.9.1 Positive Impacts

6.9.1.1 Creation of Employment

During operational phase, there will be employment opportunities especially for those who will be employed to manage, maintain the water supply system. Several youths within the project area will be employed to undertake such activities as pipelines maintenance and meter reading among others. This will improve their living standards and by engaging them will also change their social behavior.

6.9.1.2 Creation of Wealth

The proposed project will provide revenues to the beneficiaries and expand the wealth base for the nation. It will pump both liquefied and tied up wealth hence making the nation gain. It will also go a long way in uplifting Kiambu County and its neighborhood. Once the people will be empowered in the project area, some will invest and develop the nearby towns.

6.9.1.3 Improved Well-being of Women and Children

At the household level, women and children bear the burden of fetching water. Other than thetime spent in getting water from long distances, these practices has far reaching consequences on their health and wellbeing. Domestic water accessibility at homesteads would translate to time saving by the women. Time saved thus would be invested in other engagements that could bring financial benefits to the family. Children also bear the brunt of water borne diseases while women are tied downto provide nursing care to the sick family members. With proximity of water all these negative Impacts will be reversed in the project area.

6.9.2 Negative Impacts and their Mitigations Measures

6.9.2.1 Increased wastewater

The key environmental issue during operation will be the increased supply of water which will generate increased wastewater. The area is currently not served with sewerage infrastructure.

Mitigation measures

- Extension of sewer infrastructure in the project areas.
- Encourage all developments to installation of septic tanks and bio-digesters.

6.9.2.2 Population influx due to improved supply of water

The rapid increase in population may result in strain of infrastructure services e.g. electricity, road network and water supply systems which may get overloaded before the design period.

Mitigation measures

The County & National Government to continue with expansion of infrastructure and services to cope with the increasing demands.

6.9.2.3 Vandalism of water supply installations

There will be risk of vandalism of the installed water supply installations such as water meters and valves for re-sale and pipelines for illegal water connections.

Mitigation measures

The proponent (GATWASCO) shall put measures in place for the protection of the installed pipelines, meters and valves through regular pipeline patrols and having lockable valve/meter covers.

6.10 Decommissioning of the project

The project can be decommissioned when the design period ends or due to one of the following reasons:

- The source may become inadequate due to unexpected change in climate rendering the project inefficient.
- Other cheaper means of getting water may be developed near the entire or part the community and other target areas and cause the proponent to close and change to the source.

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

7.1 Overview

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

The project proponent shall avail this ESMP to the successful contractor awarded the tender for construction work for this project. The contractor shall be responsible for overall implementation of the ESMP during the construction phases. The contractor will be required to formulate a more specific ESMP and work methods that will ensure construction of the project in compliance with established standards and legislation. A project Environmental and Social Officer shall be designated by the contractor to make day to day follow up (e.g., follow up of ESMP implementation and consult with stakeholders). The contractor will factor the costs of implementing the ESMP into their budget. The project proponent GATWASCO) through the WSP's Environmental and Social Officer will take the necessary steps to ensure that the ESMP is fully implemented.

TABLE 7.1: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Project Activities	Potential Impacts	Recommended Mitigation Measures	Responsibility	Approx. Cost (KES)
During Construction Phase				
Desilting of intakes and installations of scour systems Excavation for installation of pipelines network, zonal & consumer water meters and construction of valve/meter chambers.	**Pollution of water -** Pollution of water in the rivers which could affect water quality to the downstream users.	- The Contractor to ensure that no removed materials get back to the river. The removed silt should be transported to approved disposal sites such as open areas within the adjacent Kieni forest which has been earmarked for tree planting. - Use of silt removal methodology that minimizes pollution of water for downstream water users (e.g pumping out of the silt instead of mechanical excavations). - Carry out desilting works during the low river flows seasons.	Project Construction Contractor	650,000
	Vegetation Cover - Clearing of vegetation cover exposes soils to agents of soil erosion such as wind and runoff, this could lead to soil degradation.	- Areas to be cleared should be agreed and demarcated before the start of the clearing operations to minimize exposure.	Project Construction Contractor	300,000

		- Vegetation should only be cleared along the Project construction sites and where it will interfere with - Construction works and/or present a hazard. - Reinstatement of the project sites to their original after completion of construction works. - The use of existing cleared or disturbed areas for the Contractor's Camp, stockpiling of materials etc. shall be encouraged.		
	Impacts on Soils The Project activities are likely to have minor impacts on soils, these impacts include: - Destruction of soil structure due to topsoil excavations. - Soil contamination caused by oils and fuel leaks from construction equipment. - Soil erosion due to clearing of vegetation cover and trenching activities**.**	- The contractor to stick to clear delineation of the construction to minimize vegetation loss. - Excavation works should be controlled so that land that is not required for the Project works is not disturbed. - Excavated materials and excess earth should be kept at appropriate sites approved by the Supervising Engineer. - Proper and compacted back filling of excavated areas. - Planting of vegetation cover along the pipeline wayleaves after pipelines installations.	Project Construction Contractor	250,000
	Solid Wastes Generation from Construction activities – Construction activities at the work sites will generate some spoil material, solid wastes such as plastic containers, used tyres, metal parts, plastics and cables.	- Maximum reuse of excavated material. - Construction sites to have designated waste collection points and disposal to appropriately and approved sites. - Environmental Management, Health and Safety Training Programs to be conducted for Contractor's staff to create awareness on proper solid wastes management.	Project Construction Contractor	175,000
	Accidental oil and fuel spills and leaks – The Project will involve use of oils and fuel for vehicles and construction equipment. If these oils and fuel accidentally leak into the environment, they could result to significant contamination of soil, surface and underground water resources.	- Checking and regular vehicles and construction equipment. - Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used.	Project Construction Contractor	120,000

	Interference with the existing infrastructure and physical settings - The proposed project could result into the interruption of existing infrastructure such as access roads to residential estates and houses utility services such as internet cables and water pipelines.	- Liaisons with the relevant authorities and service providers to locate existing infrastructure before commencement of excavation works for pipe laying. - Formal request for permission for a wayleave and laying the water pipeline should be sought from relevant roads authorities.	Project Construction Contractor	400,000
	Noise Pollution and Vibrations - Construction of the proposed project will result in noise emissions because of the machines that will be used (excavation equipment etc.) and construction vehicles delivering materials to site.	- Best available work practices will be employed on-site to minimize occupational noise levels - All construction equipment will be regularly inspected and maintained in good working condition. - Provision of earmuffs for those working with noise producing equipment. - Combine noisy operations so that they occur at the same time.	Project Construction Contractor	75,000
	Dust Emissions - Dust will be emitted during excavation and related earthworks.	- Strict measures are to be applied for the handling of construction materials in powder form such as cement, lime, concrete additives, etc. and for the disposal of the packaging. - Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present. - Minimizing the number of motorized vehicles on use. - Wet all active construction areas as and when necessary. - Vehicle speeds be limited to a maximum of 30Km/hr. - A monitoring and evaluation program for air quality shall be implemented and reported on throughout the construction phase cycle.	Project Construction Contractor	180,000
	Workers, Community Health and Safety Risks during Construction - Construction workers and the communities are likely to have injuries and hazards at the construction works, unavoidably exposing them to occupational health and safety risks.	- Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer and the Proponent's Environmental & Safety Officer. - Construction workers, the supervision team and authorized visitors to construction sites to be provided with Personal Protective Equipment (PPEs) including gloves, gumboots, overalls and helmets. - Use of PPE to be enforced by the Environmental & Safety Officer.	Project Construction Contractor	450,000

		- Fully stocked First Aid Kits to be provided within the sites, camps and in all Project vehicles. - Isolate the site for access by the local communities during the construction for their safety and health. - Use of warning signage and tapes where the trenches are open and at other active construction sites.		
	Labour influx and effects of immigrat workers -The project will need to employ labourers and although most of the unskilled and semi-skilled labour requirements could be filled locally (from within the project areas), congregation of potential labourers from outside the project areas is likely, as they seek employment opportunities.	- Contractor should use the local workforce as much as possible (preference to local community members on skills locally available). - Effective community engagement and strong grievance mechanisms on matters related to labour - All workers to sign an employment contract including a Code of Conduct governing appropriate behaviour. - The workforce should be sensitized to local social and cultural practices and be educated on the expected behaviour and conduct. - Contractor should prepare and implement a gender action plan.	Project Construction Contractor	Contractor's Cost
	HIV /AIDS & other communicable diseases - Indirect impacts on the community can be the introduction of new communicable diseases such as HIV/AIDS due to in-migration for job opportunities, poverty, and prostitution.	- The contractor at the time of Project implementation will develop appropriate training on potential spread and awareness materials for Information, Education, and sensitization of workers during project construction phase. - Develop an intervention strategy compatible with the construction program to address success of the HIV/AIDS prevention and provide peer educators for sustainability in collaboration with other stakeholders. - Integrate monitoring of HIV/AIDS preventive activities as part of the construction supervision. Basic knowledge, attitude and practices are among the parameters to be monitored, and particularly on provision of condoms, status testing and use of ARVs.	Project Construction Contractor	150,000

	Child Labour - Due to provision of cheap labour and differentiation in bargaining power, the underage workers may be employed leading to exploitation.	- The contractor will comply with national and international labour laws in recruiting construction staff. - All workers will be required to produce their national identification cards to confirm their age. - Ensure no children are employed on site in accordance with national labour laws. This can be done through incorporating prohibitive provisions in the code of conduct and having the recruitment policies that prohibits child labour. - Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.	Project Construction Contractor	Contractor's Cost
	Sexual Exploitation and Abuse (SEA) & Gender-Based Violence (GBV) - Due to vulnerability of women, they could be taken advantage of in the Project workplace in order to receive what is due to them or favours. GBV incidences may increase due immoral behaviours arising from increased cash flows for the construction workers.	- Develop and implement code of conduct, signed by all workers. - Provide training and awareness programs to project contractor's staff, and community members on GBV and sexual harassment prevention and reporting. - Collaborate with local communities, leaders, and women's groups to address concerns related to GBV and sexual harassment. - Collaborate with local law enforcement and authorities to address and prevent GBV incidents. - Implement clear and confidential reporting mechanisms for any incidents of GBV or sexual harassment. - Contractor should prepare and enforce a No Sexual Harassment and Non-Discrimination Policy.	Project Construction Contractor	120,000
Cost Estimates for the construction Phase				**2,870,000**
OPERATIONAL PHASE				
Operations of the constructed project	Illegal connection to the new pipeline	- The project proponent will ensure that communities living along the pipeline route are adequately served with piped water. - The proponent will also conduct water balance studies and NRW audits to identify and plug points of water loss.		Proponent cost

	Generation of liquid and solid wastes	- The County Government of Kiambu & GATWASCO to expand the sewerage system to the Project area. - Solid wastes generated during repair and maintenance activities will be collected and disposed-off in designated manner.	County Government of Kiambu GATWASCO	Proponent cost
	Health and Safety Hazards	- Train all workers on Health, Safety and Environment (HSE) with an aim of improving awareness. - The proponent will erect appropriate safety signage during repair and maintenance activities. - The proponent shall provide first-aid facilities for repair and maintenance staff.	GATWASCO	Proponent cost
	Improved and reliable water supply for the residents of Athi River Town.	- Positive impact, no mitigation measures. - Improve customer experience through better water supply services. - Reduction of water outages/ rationing. - Expansion of coverage area.	GATWASCO	-
	Increased reliability of water supply to the residents of Gatundu North & South Sub - Counties.	- Positive impact, no mitigation measures. - Reduction of water outages/ rationing.	GATWASCO	-

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 (GATWASCO) 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)

Activity	Location	Means of Monitoring	Frequency	Responsible Agency	
				Implemented by	**Supervised by**
Occupational Health and Safety	Construction site	- Visual inspection of first aid area, - Injury reporting mechanism, - WIBA insurance policy, - Appropriate use and wearing of PPE, - Training programs for workers, health and safety plan prepared for site, - Clean drinking watering points, - Safety training certificates, gloves, earplugs, safety boots, reflector jackets, drinking water, nose mask, helmet, overall, sanitation facilities.	Daily	Contractor	Project Supervising Engineer E&S Expert
Public health	Areas surrounding the construction 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. - Signing of Code of Conduct by workers against un-social behaviours and sexual relations.	Monthly	Contractor	E&S Expert
Leakages and spills of greases, oil or fuel	Contractor's yard and construction site	- Visual inspection of hazardous waste leakage or spills to soils on site, - records of cutting pits for disposed off contaminated soils, - Developed site-specific incident management or response plan.	Weekly	Contractor	Project Supervising Engineer E&S Expert
Noise and vibrations	Construction site	- Use equipment with low noise levels or fitted with mufflers. - Visual inspection of site for use of PPE, - Use of soundproof materials, - Notices to public on noisy construction activities, restricting noisy activities daytime.	Weekly	Contractor	Project Supervising Engineer E&S Expert

		- Regular measurement of noise levels through mobile phone gadgets.			
Air quality	Construction site and along construction 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	- 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 - Chemical inspections	Monthly	Contractor	Project Supervising Engineer E&S Expert
Labour and employment related issues	Construction site and contractors' office	Physical counts and inspection of records on. - No. of locals employed on the project from the employment records.	Weekly	Contractor	Project Supervising Engineer

		- No. of Grievance recorded from employees and how they were addressed resolved.			E&S Expert
Immigration of workers	Construction site and office	- Review of records - Interviews with staff and local community	Monthly	Contractor	Project Supervising Engineer E&S Expert
Gender Equity and Sexual Harassment	Construction sites	- Number of female employees - Number of male and female toilets - Complaints from female employees	Weekly	Contractor	Project Supervising Engineer E&S Expert
Damage to private property	Project area	- Review of records - Interviews with staff and local community	Daily	Contractor	Project Supervising Engineer

8.3 Auditing of environmental and social management and monitoring plan (ESMMP)

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

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

8.4 Management responsibility of ESMMP

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

- Project Proponent (GATWASCO).
- NEMA.
- Contractor.
- Works construction Supervision Consultant.

8.4.1 Project Proponent (GATWASCO)

GATWASCO has the overall responsibility for the implementation of ESMMP through the provision of resources and supervisions & monitoring of activities to ensure compliance.

8.4.2 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.

8.4.3 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.

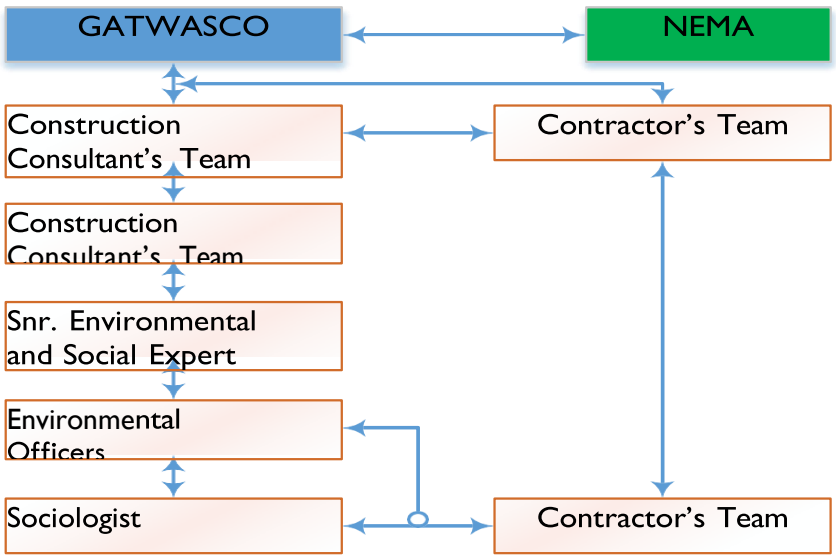
8.4.4 Works Construction Supervisions Consultant

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

8.4.5 County Government of Kiambu

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 GATWASCO will operate the Project once commissioned.

Figure 8.1: Administrative arrangement for the ESMMP



9 CHANCE FIND PROCEDURES

9.1 Purpose of the Chance Finds Procedure

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

9.2 Responsibility

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

9.3. 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.

9.4. 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.

9.5. 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 supervisor. The supervisor 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 manage 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.

10 GRIEVANCE REDRESS MECHANISM (GRM)

10.1 Introduction

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

10.2 Potential Grievances

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

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

10.3 Objective of a Grievances Redress Mechanism

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

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

10.4 Guiding Principles for an effective Grievance Redress Mechanism

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

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

10.5 The Proposed Grievance Structure

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

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

Table 10.1: Grievance redress mechanism summary

	Institution	Membership	Functions
1	Grievance Redress Committee/ Community Stakeholders Level (community Liaison Officer - CLO).	• 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 including affected persons (all gender, elders' representatives, and youth in cognizance of local dynamics).	• Assist community / stakeholders to file a complaint. • To address affected persons grievances as 1st, point of contact, within 15 days.

		• 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 CONCLUSION AND RECOMMENDATIONS

11.1 Conclusion

Based on the findings, it is evident that construction and operation of the proposed project will result in overall economic growth and development as a result as improvement in the availability of water for domestic and commercial use within the project area. As it is indicated in Section 6, the potential negative impacts can be easily mitigated without any major effect to the environment. However, some important resources may be affected negatively such as flora,fauna, and water resources within the project area. These impacts vary from temporary to short term impacts. These impacts can however be mitigated as indicated in the Environmental and Social Management plan discussed in Section 7 of this report.

Among Socio-economic benefits include eradication of waterborne diseases, improved livestock production and time saving for other economic activities. These together with expected improved business in the project area, are positive impacts that outweigh any negative impacts associated with the project.

The proposed pipeline extensions will be installed along the wayleaves on public roads with no encumbrances and therefore there are no Project Affected Persons (PAPs) requiring any form of compensation due to disturbances during the implementation of works. The other works (desilting of intakes and installation of meters will not involve disruption of businesses or activities for the project areas residents.

11.2 Recommendations

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

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

ii. The water diversion and desilting of intake works will be conducted with minimal destruction to the environment and pollution of the river water sources. Any destroyed vegetation and trees will be re - planted to protect the intake works catchment.

iii. At Project implementation period, the Contractor reports to the Project management team on how ESHS provision detailed in this ESIA are addressed at each Project/activity Site.

iv. On completion of the Civil Works, GATWASCO will commission an independent Consultant to undertake an initial Environment, Social, Health and Safety Audit as required by Environment Impact Assessment and Audit Regulations of 2003. The audit will identify non-conformities which the Contractor will address through the defect's liability period of the Project.

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.
- Kenya gazette supplement number 68. Environmental Management and Coordination (water quality) Regulations 2006. Government Printer.
- Kenya gazette supplement Acts 2000, Environmental Management and Coordination Act Number 8 of 1999.Government Printers, Nairobi.
- 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

ANNEXES

ANNEX 1: Sample Questionnaire Responses



GATWASCO QUESTIONNAIRE 1 Q



GATWASCO QUESTIONNAIRE 2 Q

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



GATWASCO ESIA MINUTES.pdf



GATWASCO LIST OF ATTENDANCE.pdf



GATWASCO ESIA NDARUGU INTAKE M



GATWASCO THIRIRIKA INTAKE LIS

ANNEX III: Authorization letter to lay pipes along County roads wayleaves



Authority to Lay Pipes Along County R

ANNEX IV: Road Authorities Wayleaves Application Forms & Guidelines

KENHA ROAD RESERVE WORKS -Ap

KENHA

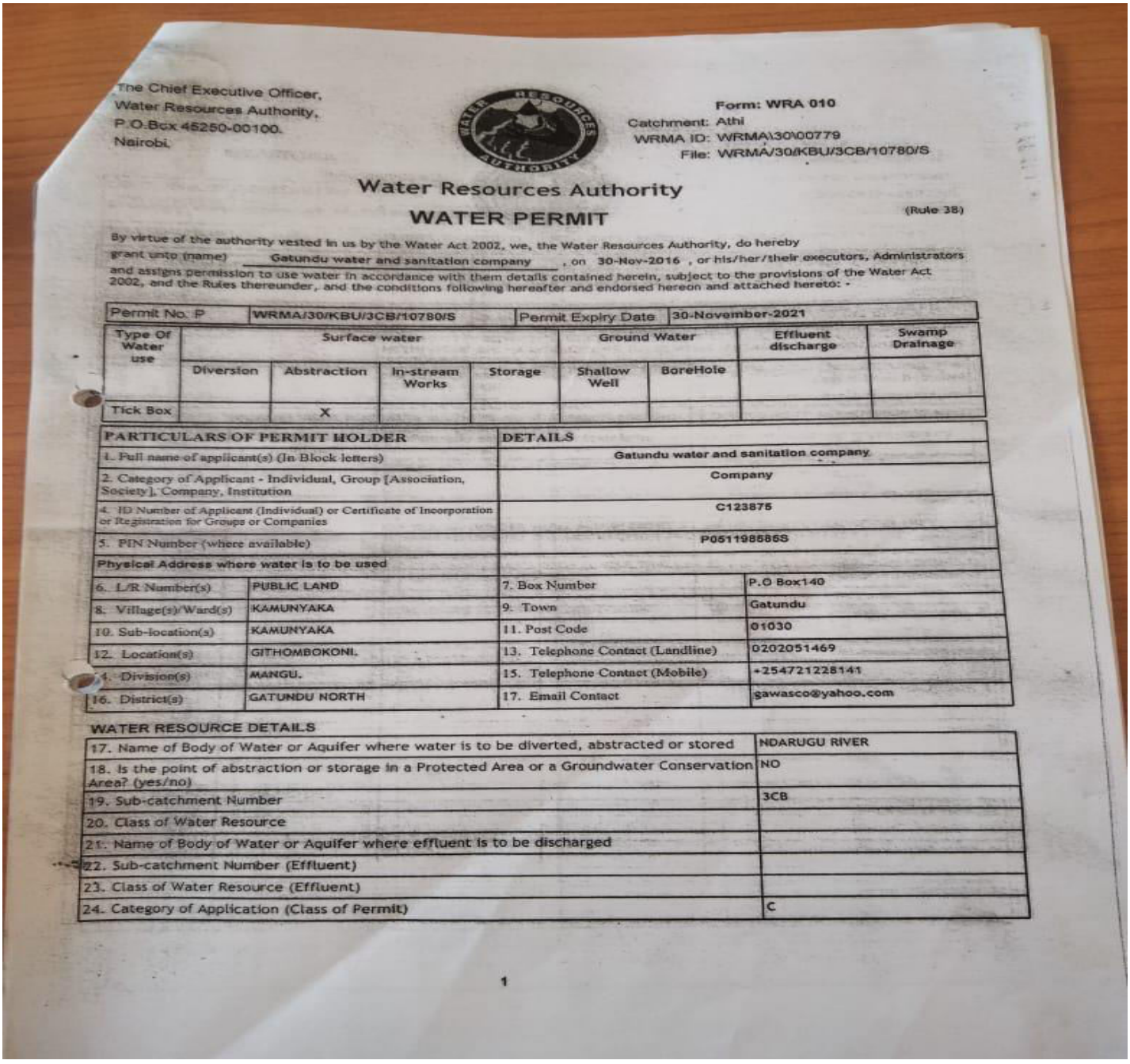
KURA ROADSIDE DEVELOPMENT APPLI

KURA

KERRA RoadsideDevtApplicat

KERRA

ANNEX V: Water Abstractions Permit for Ndarugu Intakes



The Chief Executive Officer,
Water Resources Authority,
P.O.Box 45250-00100.
Nairobi.

Form: WRA 010
Catchment: Athi
WRMA ID: WRMA\30\00779
File: WRMA/30/KBU/3CB/10780/S

Water Resources Authority

WATER PERMIT

(Rule 38)

By virtue of the authority vested in us by the Water Act 2002, we, the Water Resources Authority, do hereby grant unto (name) Gatundu water and sanitation company , on 30-Nov-2016 , or his/her/their executors, Administrators and assigns permission to use water in accordance with them details contained herein, subject to the provisions of the Water Act 2002, and the Rules thereunder, and the conditions following hereafter and endorsed hereon and attached hereto: -

Permit No. P	WRMA/30/KBU/3CB/10780/S	Permit Expiry Date	30-November-2021

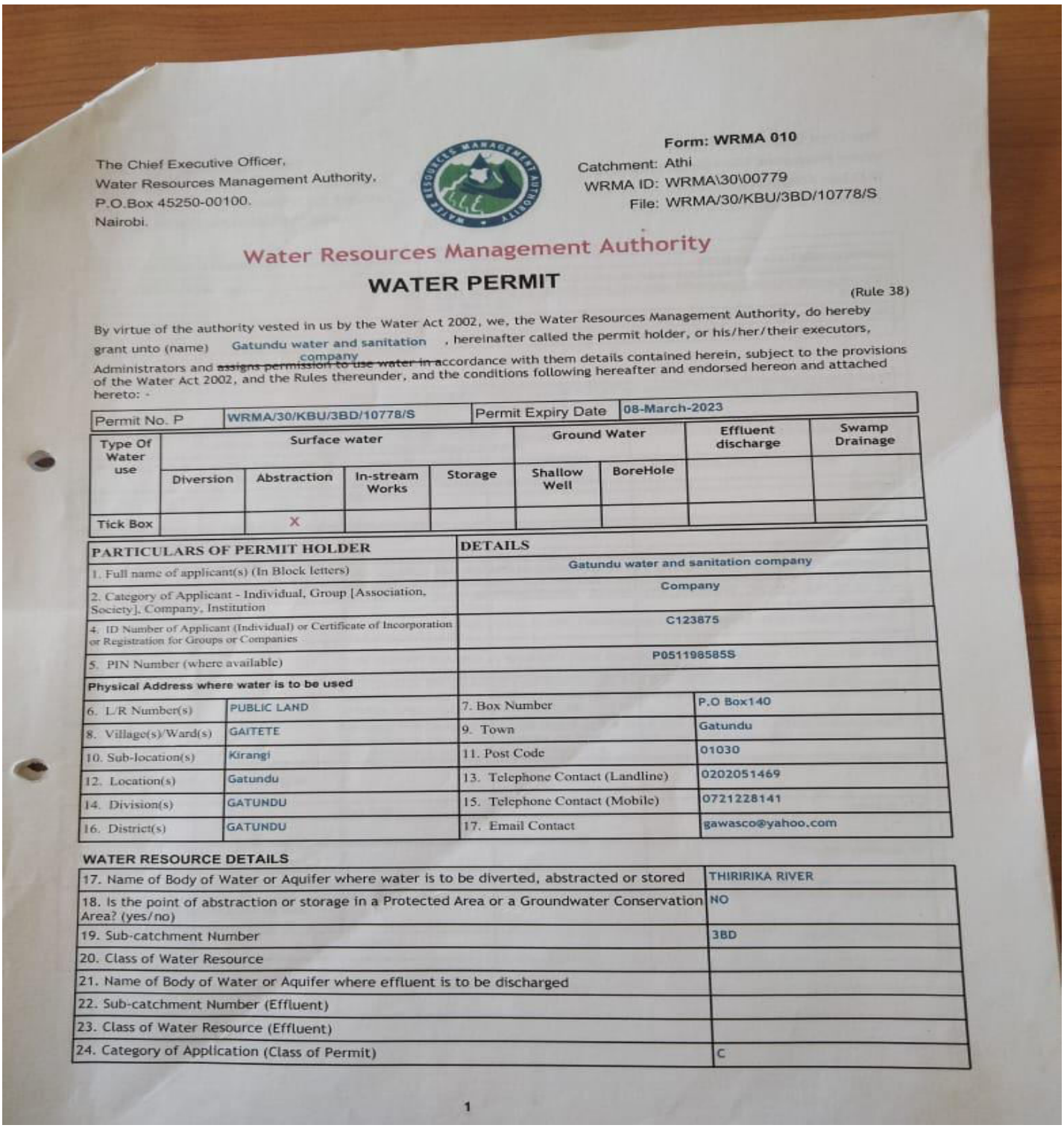
Type Of Water use	Surface water				Ground Water		Effluent discharge	Swamp Drainage
	Diversion	Abstraction	In-stream Works	Storage	Shallow Well	BoreHole		
Tick Box		X						

PARTICULARS OF PERMIT HOLDER		DETAILS	
1. Full name of applicant(s) (In Block letters)		Gatundu water and sanitation company	
2. Category of Applicant - Individual, Group [Association, Society], Company, Institution		Company	
4. ID Number of Applicant (Individual) or Certificate of Incorporation or Registration for Groups or Companies		C123875	
5. PIN Number (where available)		P051198586S	
Physical Address where water is to be used			
6. L/R Number(s)	PUBLIC LAND	7. Box Number	P.O Box140
8. Village(s)/Ward(s)	KAMUNYAKA	9. Town	Gatundu
10. Sub-location(s)	KAMUNYAKA	11. Post Code	01030
12. Location(s)	GITHOMBOKONI.	13. Telephone Contact (Landline)	0202051469
14. Division(s)	MANGU.	15. Telephone Contact (Mobile)	+254721228141
16. District(s)	GATUNDU NORTH	17. Email Contact	gawasco@yahoo.com

WATER RESOURCE DETAILS	
17. Name of Body of Water or Aquifer where water is to be diverted, abstracted or stored	NDARUGU RIVER
18. Is the point of abstraction or storage in a Protected Area or a Groundwater Conservation Area? (yes/no)	NO
19. Sub-catchment Number	3CB
20. Class of Water Resource	
21. Name of Body of Water or Aquifer where effluent is to be discharged	
22. Sub-catchment Number (Effluent)	
23. Class of Water Resource (Effluent)	
24. Category of Application (Class of Permit)	C

1

ANNEX VI: Water Abstractions Permit for Thiririka Intake



The Chief Executive Officer,
Water Resources Management Authority,
P.O.Box 45250-00100.
Nairobi.

Form: WRMA 010
Catchment: Athi
WRMA ID: WRMA\30\00779
File: WRMA/30/KBU/3BD/10778/S

Water Resources Management Authority

WATER PERMIT

(Rule 38)

By virtue of the authority vested in us by the Water Act 2002, we, the Water Resources Management Authority, do hereby grant unto (name) Gatundu water and sanitation company, hereinafter called the permit holder, or his/her/their executors, Administrators and assigns permission to use water in accordance with them details contained herein, subject to the provisions of the Water Act 2002, and the Rules thereunder, and the conditions following hereafter and endorsed hereon and attached hereto: -

Permit No. P	WRMA/30/KBU/3BD/10778/S	Permit Expiry Date	08-March-2023

Type Of Water use	Surface water				Ground Water		Effluent discharge	Swamp Drainage
	Diversion	Abstraction	In-stream Works	Storage	Shallow Well	BoreHole		
Tick Box		X						

PARTICULARS OF PERMIT HOLDER	DETAILS		
1. Full name of applicant(s) (In Block letters)	Gatundu water and sanitation company		
2. Category of Applicant - Individual, Group [Association, Society], Company, Institution	Company		
4. ID Number of Applicant (Individual) or Certificate of Incorporation or Registration for Groups or Companies	C123875		
5. PIN Number (where available)	P051198585S		
Physical Address where water is to be used			
6. L/R Number(s)	PUBLIC LAND	7. Box Number	P.O Box140
8. Village(s)/Ward(s)	GAITETE	9. Town	Gatundu
10. Sub-location(s)	Kirangi	11. Post Code	01030
12. Location(s)	Gatundu	13. Telephone Contact (Landline)	0202051469
14. Division(s)	GATUNDU	15. Telephone Contact (Mobile)	0721228141
16. District(s)	GATUNDU	17. Email Contact	gawasco@yahoo.com

WATER RESOURCE DETAILS

17. Name of Body of Water or Aquifer where water is to be diverted, abstracted or stored	THIRIRIKA RIVER
18. Is the point of abstraction or storage in a Protected Area or a Groundwater Conservation Area? (yes/no)	NO
19. Sub-catchment Number	3BD
20. Class of Water Resource	
21. Name of Body of Water or Aquifer where effluent is to be discharged	
22. Sub-catchment Number (Effluent)	
23. Class of Water Resource (Effluent)	
24. Category of Application (Class of Permit)	C

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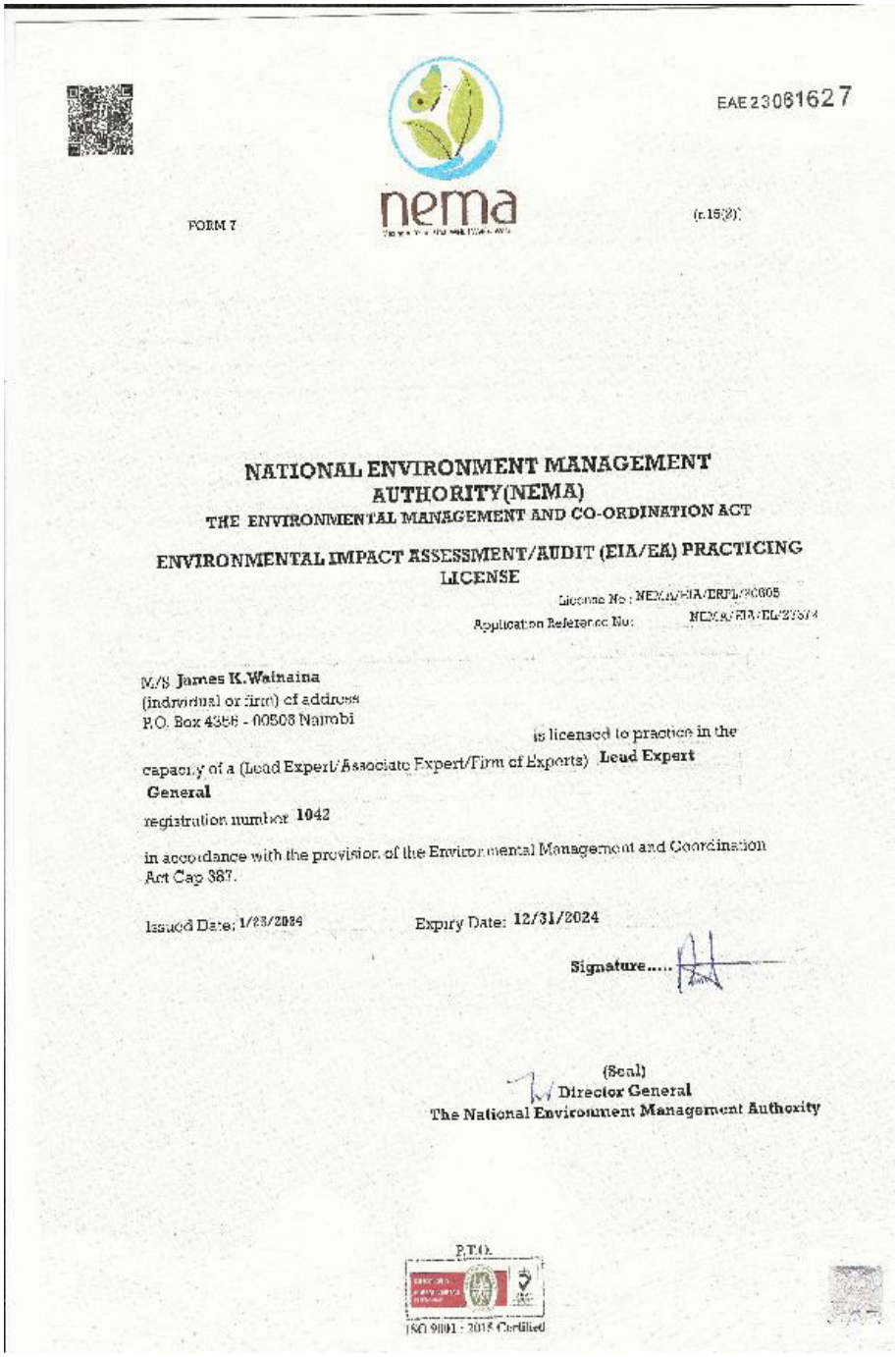
ANNEX VII: Letter from KFS authorizing deposit of silt in the forest.

Authority from KFS.pdf

ANNEX VIII: GATWASCO WSP PROJECT COST ESTIMATE

GATWASCO CLSG 2
COST ESTIMATES.pdf

ANNEX IX: ESIA Study Team Leader's NEMA Licence - 2024



EAE 23061627

FORM 7 (r.15(2))

nema

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/20605

Application Reference No: NEMA/EIA/EL/27574

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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