

REPUBLIC OF KENYA



COAST WATER WORKS DEVELOPMENT AGENCY

WATER AND SANITATION DEVELOPMENT PROGRAM (WSDP)

Preparation of Detailed Designs, Preliminary ESIA/RAP and Tender Documents for Water Distribution Works for Mombasa and 3WSPs

Contract No. CWSB/WaSSIP-AF/C/34/2017



ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT (ESIA) PROJECT REPORT FOR THE PROPOSED WATER DISTRIBUTION SHORT TERM WORKS FOR MOMBASA NORTH MAINLAND

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**Coast Water Works Development Agency
(CWWDA)**

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WATER AND SANITATION SERVICE IMPROVEMENT PROJECT – ADDITIONAL FINANCING (WASSIP-AF)

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LIST OF ABBREVIATIONS& ACRONYMS

CWWDA	Coast Water Works Development Agency
CoC	Code of Conduct
COVID-19	Corona Virus Disease-19
C-ESMP	Contractor's Environmental & Social Management Plan
EHS	Environment Health and Safety
ESHS	Environmental, Social, Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMF	Environment and Social Management Framework
EMCA	Environmental Management & Coordination Act
ESMP	Environmental & Social Management Plan
GBV	Gender Based Violence
GoK	Government of Kenya
HASP	Health & Safety Plan
IDA	International Development Association
KIMAWASCO	Kilifi-Mariakani Water and Sewerage Company Ltd.
MAWASCO	Malindi Water & Sewerage Company Ltd.
MOWASSCO	Mombasa Water Supply and Sanitation Company Ltd.
MWS	Ministry of Water and Sanitation
NEMA	National Environment Management Authority
NEP	National Environment Policy
NGEC	National Gender Equality Commission
NGO	Non-Governmental Organization
NRW	Non-Revenue Water
OSHA	Occupational Health and Safety Act
OP	Operational Policy
PPEs	Personal Protective Equipment
PAP	Project Affected persons
PSEAP	Project Sexual Exploitation Action Plan
ARAP	Abbreviated Resettlement Action Plan
SEA	Sexual Exploitation and Abuse
SDGs	Sustainable Development Goals
SH	Social Health
STD	Sexually Transmitted Diseases
VAC	Violence Against Children
WB	World Bank
WIBA	Workplace Injuries and Benefits Act
WSP	Water Services Provider
WASSIP-AF	Water & Sanitation Service Improvement Project- Additional Financing
WSDP	Water and Sanitation Development Project

EXECUTIVE SUMMARY

E. EXECUTIVE SUMMARY

E.1 BACKGROUND INFORMATION

The Government of Kenya (GoK) and Coast Water Works Development Agency (CWWDA) has undertaken to prepare Detailed Designs, ESIA/RAP and Bid Documents for Water Distribution Works for Mombasa and three (3) Water Service Providers (WSPs) under the Water and Sanitation Service improvement Project- Additional Financing (WaSSIP-AF), which is financed by the International Development Association (IDA).

The 4 WSPs targeted under the assignment cover the Counties of Mombasa, Kilifi and Taita Taveta and include:

- Mombasa Water Supply & Sanitation Co. Ltd. (MOWASSCO)
- Malindi Water & Sewerage Co. Ltd. (MAWASCO)
- Kilifi-Mariakani Water & Sewerage Co. Ltd. (KIMAWASCO)
- TAVEVO Water and Sewerage Co. Ltd. (TAVEVO)

This Report presents the Environmental & Social Impact Assessment (ESIA) Report for the Proposed Distribution Network – **Short-Term Investments for Mombasa North Mainland**. This report was prepared under Water and Sanitation Improvement Project (WaSSIP) but implementation is under Water and Sanitation Development Program (WSDP).

The review of this ESIA is undertaken during the Coronavirus disease 2019 (COVID-19) pandemic outbreak. However, the preparation of the ESIA including the relevant consultations were undertaken before the first case of COVID-19 was reported in Kenya. As such, specific mitigation measures have been introduced to prevent the spread of the pandemic during the construction period. Moreover, consultations required as part of the mitigation measures, such as during RAP implementation and training on E&S issues, also pose a risk of infection to communities. For this reason, the risk of contracting the virus during consultations will be avoided, minimized and mitigated with specific measures to ensure national requirements on social distancing and recommendations on how to minimize contact are adhered to.

E.2 STUDY AREA DELINEATION AND EXISTING WATER SUPPLY SYSTEM

The Terms of Reference (ToR) of the Assignment specified that the Project Area for the Detailed Design of the Water Distribution Network covers the Urban Centres and the Peri-urban areas only.

Delineation of the MOWASSCO Area of jurisdiction was detailed in Deliverable D2 of this Assignment and titled “Water Supply and Demand Assessment Report for MOWASSCO”. This Report was Submitted in June 2018.

The entire area within the MOWASSCO Area is classified as **Urban** by the **Kenya National Bureau of Statistics (KNBS)** as per the 2009 Population Census. A brief description of the Urban Centres within the Project Area is given in the following sub-sections.

E.2.1 Study Area Delineation

The Jurisdiction of Mombasa Water Supply and Sanitation Co. Ltd. (MOWASSCO) is the whole of Mombasa County. The County comprises of four distinct Geographical Areas which also correspond to Administrative Divisions, namely: Mombasa Island, North Mainland, West Mainland and South Mainland. A brief description of Mombasa North Mainland is given below:

North Mainland covers the whole of Kisauni Division (Nyali and Kisauni Sub Counties) and is predominantly a residential area with several commercial shopping centres and high, middle and low income earners.

E.2.2 Existing Water Supply System

The Existing Water Supply System for MOWASSCO consists of the Bulk Water Supply System and local Storage and Distribution Networks as detailed in the following sub-sections:

E.2.3 Bulk Water Supply System

At present, Mombasa County is supplied with water from the following four Bulk Water Supply sources:

- Marere springs: Current estimated supply to MOWASSCO is 2,500 m³/d
- Tiwi Well Field: Current estimated supply to MOWASSCO is 2,000 m³/d
- Baricho Well Field: Current estimated supply to MOWASSCO is 27,000 m³/d
- Mzima Springs: Current estimated supply to MOWASSCO is 15,000 m³/d

E.2.4 Water Supply to Mombasa North Mainland

Mombasa North Mainland is supplied from the Baricho Wellfields through Nguu Tatu Reservoirs (Storage capacity 27,100m³ and Elevation 78 m asl).

The existing Distribution Network covers Kisauni and Bamburi Divisions bounded by Mtwapa Creek. The Distribution Network is estimated to have a total length of 134 km and consists mainly of uPVC and AC pipes.

E.3 PROPOSED WORKS FOR MOWASSCO WATER DISTRIBUTION NETWORK

E.3.1 Planning Horizons

Prioritized Distribution Network Investment Plans have been prepared for the Project Area of MOWASSCO considering the Planning Horizon years of 2020, 2030 and 2040. Based on these Planning Horizons, an Investment Program with an Implementation Schedule of 3 Phases has been prepared as follows:

- Short Term Phase (Immediate Interventions) : 2017 - 2020

- | | | |
|---------------------|---|-------------|
| • Medium Term Phase | : | 2021 - 2030 |
| • Long Term Phase | : | 2031 - 2040 |

This Report covers the Short-Term Works for Mombasa North Mainland. Separate ESIA's will be prepared for the Medium Term and Long-Term Phases when ready for implementation.

E.3.2 Categorization of Proposed Works

The works to be carried out in three phases of Short-Term, Medium-Term and Long-Term have been grouped into 3 categories as follows:

- **Replacements** - This includes gradual replacement of Asbestos Cement (AC) pipelines and any other pipelines which are currently in a dilapidated state. Priority has been given to the pipelines with reported frequent leakages and replacement of 6.46km of AC pipelines under the Short-Term Phase (2017-2020). Replacement of the remaining AC pipelines will be carried out during the Medium-Term Phase such that by year 2030 all the AC pipelines will have been phased out. Due to Environmental, Health and Safety concerns associated with handling and disposal of AC Mains and lack of a licensed asbestos disposal site nearby, the Mains will be decommissioned and left in the ground.
- **Extensions** - Some Areas that are currently not served by the existing Distribution Network require extensions to take care of the rising water demands. Under Short Term Phase (2017-2020), priority has been given to the Areas which are already built up but lack Distribution Network. Other Areas with potential for faster developments have been considered in the Medium-Term and Long-Term Phases.
- **Augmentation** - Where the existing Distribution Pipelines have been found to be inadequate, new pipelines have been proposed to augment the existing pipelines. For economic and space considerations, priority has been given to implementing pipelines with capacities adequate to meet the year 2040 water demand with a phased development under the Short-Term, Medium-Term and Long-Term Phases.

E.3.3 Summary of Proposed Works

A summary of the Proposed Distribution Network Short Term Works for North Mainland service area is given in **Table E1** below.

Table E1: Summary of Lengths of Proposed Water Distribution Network Short Term Works for North Mainland (km)

Service Area	Category of Works	Short-Term Phase (2017 – 2020)
North Mainland	Replacement:110 - 350 dia	6.46
	Augmentation:110 - 400 dia	-
	Extension:110 - 160 dia	27.32
	Total (km)	33.78

E.4 OBJECTIVES OF THE ESIA ASSESSMENT

This Environmental & Social Impact Assessment (ESIA) has been conducted in compliance with the Environmental Impact Assessment Regulation as outlined under

the Gazette Notice No. 56 of 2003 established under the Environmental Management and Coordination Act (EMCA) 2015 and EMSF and provisions of the World Bank OP 4.01.

The ESIA is expected to achieve the following:

- Identify all potential significant environmental and social impacts of the proposed Project and recommend measures for mitigation.
- Assess and predict the potential impacts during site preparation, construction and operational phases of the Project.
- Verify compliance with environmental regulations.
- Generate baseline data for monitoring and evaluating how well the mitigation measures are being implemented during the Project cycle.
- Promote public participation.
- Create an Environmental and Social Management Plan to mitigate the identified impacts so as to ensure sustainability of the proposed Projects.
- Recommend feasible, cost effective and culturally appropriate measures to be implemented to mitigate against the potential negative impacts while ameliorating the positive ones.

E.5 APPROACH AND METHODOLOGY

The approach to this exercise was structured to cover the requirements under the EMCA, 2015 as well as the EIA regulations as stipulated under the Gazette Notice No. 56 of 13th June 2003 and the World Bank Operational Policy OP 4.01.

The assessment involved an understanding of the Project background, the Project designs and the implementation plan as well as Project commissioning. In addition, the baseline information was obtained through physical investigation of the site and the surrounding areas, interviews with surrounding community members through local administration and County structures, stakeholder benchmarking, photography and most importantly, discussions with the Client and the Design Team.

E.6 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The Report has been prepared in line with the provisions of relevant policies, legislation and institutional frameworks that guide preparation of ESIA at both National and at the World Bank. **Table E2** on **Page E-5** summarizes the Kenyan legal and policy statutes that were reviewed during the assessment while **Table E3** on **Page E-5** provides triggered World Bank Operational Safeguard Policies.

Table E2: Applicable Legal and Policies Statutes

Statute Category	Specific Statute
Policy Provisions	Constitution of Kenya 2010
	Kenya Vision 2030
	National Environment Policy (NEP) 2013
	HIV and AIDS Policy 2009
	National Land Policy 2009
	Gender Policy 2011
	Kenya National Youth Policy 2006
	Sustainable Development Goals (SDGs) 2015
	National Climate Change Response Strategy 2010
Acts of parliament	EMCA 2015
	Land Act 2012
	Water Act 2016
	Physical and Land Use Planning Act 2019
	The Urban Areas and Cities Act 2011
	The Public Health Act (Cap.242)
	HIV and AIDS Prevention and Control Act 2011,
	Occupational Health and Safety Act (OSHA 2007),
	Sexual Offences Act 2006,
	Child Rights Act (Amendment Bill) 2014,
	Labour Relations Act 2012
	National Gender and Equality Commission Act 2011,
	Workplace Injuries and Benefits Act (WIBA) 2017
	Employment Act 2007
	Penal Code (Cap 63 of Kenya)

The ESIA makes reference to the Water and Sanitation Development Program (WSDP)- Environment and Social Management Framework (EMSF) (February 2017) and Water and Sanitation Development Program (WSDP)- Resettlement Policy Framework (RPF) (February 2017). Applicable World Bank Operational Safeguard Policies are listed in **Table E3** below.

Table E3: Applicable World Bank Operational Safeguard Policies

Safeguards Policies	Provision	Relevance to the Project
World Bank OP 4.01 on Environmental Assessment	-Provides for environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making	-An Environmental and Social Impact Assessment of the development/rehabilitation of water supply schemes will be carried out.
World Bank OP 4.12 on Involuntary Resettlement	The World Bank Involuntary Resettlement Policy OP 4.12 covers direct economic and social impacts that result from Bank-assisted investment projects.	The total number of PAPs enumerated within the Project area were 31 PAPs who will suffer economic displacements
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 (appendix 2) to be adopted by the contractor during civil works.

E.7 STAKEHOLDER AND PUBLIC CONSULTATIONS

Stakeholder consultation is generally useful for gathering environmental data, understanding likely impacts, determining community and individual preferences, selecting Project alternatives and designing viable and sustainable mitigation and compensation plans.

Stakeholder and public participation are guided by various legal and policy framework documents. For the proposed MOWASSCO Water Distribution Network Project, public consultation activities conform to both National and International Legal Instruments as described in **Table E4** below.

Table E4: Legal and Policy Provisions for Public Participation

Level	Statutes
National (Kenya)	Kenya Constitution 2010 Articles 10(2), 35, 69(1), 118, 174(c), 184(1)(c), 196, 201(a), 232(1)d
	Public Participation Bill 2016
	The Environmental Management and Coordination Act (EMCA), 2015 and subsequent regulations of Environment Impact Assessment and Audit Regulation of 2003
International	World Bank Operational Policy OP 4.01

Stakeholder Mapping was done to ensure that all the stakeholders likely to be affected or influenced by the Project were identified and involved in ESIA detailed study. **Table E5** below presents details of stakeholders who were engaged in the ESIA process: -

Table E5: Institutional Consultations

Institution	Office Consulted
MOWASSCO	Environmental and Safeguards Officer- MOWASSCO
	Ag General Manager Business Commercial - MOWASSCO
	Ag General Manager Engineering
	Ag Business Unit Manager- North Mainland (Kisauni)
Local Administration	Chief Kisauni
Kenya National Highways Authority (KeNHA)	Coastal Region Manager KeNHA

Consultations were done with relevant stakeholders within the Project area during preparation of the ESIA Project Report. **Table E6** below provides schedule of Public Consultations conducted.

Table E6: Schedule of Public Consultations

Date of the Meeting	Meeting Venue	Participants Involved	Number of participants & Gender Representation
8 th November 2018 at 11 am	North Mainland Kisauni Sub Location Mombasa County	<ul style="list-style-type: none"> Area Assistant Chief Nyumba Kumi Chairperson Consultant representative MOWASSCO representatives Residents of Bamburi and Mto Panga 	Male 15 Female 8
			TOTAL 23

The Project designs and Environment and Social Impact Assessment (ESIA) incorporated issues discussed and resolved in the consultative meeting as summarized in **Table E7** below.

Table E7: Issues Discussed and in cooperation into the Project Reports

Town	Summary of Issues Discussed	Response
North Mainland – Kisauni Meeting.	Interruption of public amenities during Project implementation and associated risks of interfering with tourism activities	The contractor will be supervised by a consulting Engineer, he/she will be required to comply to Environment Health and Safety Guidelines of the World Bank
	Project impacts on structures and sources of livelihood encroaching into the proposed water easement corridor	All structures and livelihoods encroaching will be enumerated and compensated appropriately.
	Benefits of the Project to local residents in addressing water related challenges	The project once implemented will address perennial water shortages in the within Kisauni Location in North Mainland

E.8 PROJECT SENSITIVE RECEPTORS

The assessment identified several receptors located within close proximity of 200m to 500m to the proposed water lines that might be affected by Project civil activities at the time of construction.

The receptors might suffer damage associated with the Project activities, for instance, if the receptor is a school the impact could be related to Health and Safety of pupils or if the receptor is a market associated impacts could be disruption of business and demolition of structure. If the receptor is a communal water body, the associated impact could be pollution of the water resource.

Table E8 on **Page E-8** presents the receptors identified in Mombasa North Mainland Island while **Table E9** on **Page E-11** provides appropriate mitigation measures for likely adverse impacts to these receptors.

Table E8: Sensitive Receptors in Mombasa North Mainland.

Type of Receptor	Adjacent Pipeline	GPS coordinates of the Receptor	Name of Receptor
Technical School	NM 13	S 04° 1'29.42 E 39°42'4.63	Bombolulu Workshop
School(s)	NM 14	S 04°23.231' E 039°34.456'	Kadzandani Primary School
	NM 07	S 04°21.385' E 039°69.256'	Frere Town Primary School
	NM 16	S 04°55.807' E 039°34.278'	Mtopanga Secondary School
	NM 20	S 04°22.961' E 039°34.087'	St. Joseph Herman Marx Primary School
Hospital/Health Centre(s)	NM 07	S 04°23.425' E 039°34.967'	Kisauni Dispensary
	NM 17	S 04°23.215' E 039°33.678'	Vikwatani Sub-county Health Centre
Bus Stage	NM 13	S 04° 1'30.54 E 39°41'58.06	Bombolulu Stage
	NM 12	S 04° 0'12.95 E 39°42'39.27	Mwembeni stage
	NM 05	S 04° 0'55.36 E 39°41'33.04	Kanu stage- Bakarani
Church/Mosque(s)	NM 09	S 04°23.152' E 039°34.407'	Masjid Answar Sunna
	NM 15	S 04°23.305' E 039°34.563'	Repentance and Holiness Kings Church
	NM 12	S 04°23.013' E 039°34.293'	Deliverance Church Mwembeni
	NM 13	S 04°23.305' E 039°34.563'	Vineyard Mega Church- Bombolulu
	NM 05	S 04°23.563' E 039°34.924'	Masjid Rawdha
	NM 14	S 04°23.894' E 039°34.520'	Masjid Al Hasan Wazalendo
	NM 06	S 04°56.821' E 039°34.067'	Masjid Tawheed
	NM 03	4° 0'43.23"S 39°42'44.40"E & 4° 1'27.75"S 39°41'32.03"E	<ul style="list-style-type: none"> Emmanuel Evangelical Baptist Church Power in the Word Church
	NM 20	S04° 04'99.11 E039° 67'92.94	Al Farsy Mosque
Estate	NM 04	S 04°56.134' E 039°33.112'	<ul style="list-style-type: none"> SDA Church- Kisimani A.B.C Church Kisauni
	NM 15	4° 0'27.81"S 39°41'58.07"E	<ul style="list-style-type: none"> Fahari estate gate A Ajanta estate phase 2
Public Utility	NM 16	4° 0'47.87"S 39°41'26.12"E	Mtopanga estate
	NM 04	4° 1'34.01"S 39°41'35.11"E	<ul style="list-style-type: none"> Chandaria Social Hall Public toilets
	NM	4° 1'33.19"S	Frère Town public toilets

Type of Receptor	Adjacent Pipeline	GPS coordinates of the Receptor	Name of Receptor
		39°41'38.99"E	

E.9 PROJECT IMPACTS

An ESIA assessment was systematically conducted to determine whether the proposed Project will have negative impacts on the environment. Impacts arising during each of the phases of the proposed development namely construction, operation and decommissioning are grouped into impacts on the Biophysical environment, Health and Safety and Social-economic impacts.

E.9.1 Positive Impacts During Construction Phase

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

- Employment opportunities during construction, unskilled and mid-skilled level labour will be sourced from the local market.
- Associated employment opportunities created during rehabilitation and extension of water pipelines, these jobs will be as a result of market for construction materials such as sand, cement and ballast” Transfer of technological skills and knowledge to the local sector through the artisans employed and trained by the Project.

E.9.2 Positive Impacts During Operation Phase

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

- Improve affordable, clean, reliable water supply within Project area leading to improved health and hygiene.
- Reduce exposure to health risks posed by consumption of untreated water from existing community water schemes.
- Improve health and nutrition of beneficiaries of target areas in MOWASSCO through provision of treated safe water.
- Provision of clean reliable safe water supply will eliminate water burden to women and girl child allowing women to engage in other economic activities while the girl child concentrates on education.
- The Project once operational will save community members money, this is because the water will be billed at recommended tariff by Water Services Regulatory Authority as opposed to the current exorbitant tariffs posed by local community water schemes

E.9.3 Negative Impacts and Mitigation Measures during Construction Stage

The Project involves replacement of Asbestos Cement (AC) Mains. Therefore, to mitigate Environmental Health and Safety issues associated with handling and disposal of AC

Mains, the mains will be decommissioned and left below the ground since there is no licensed hazardous waste disposal site nearby.

In the event decommissioning and disposal has to be carried out, the following mitigation measures shall be implemented within the Project Area:

1. Proper mapping of existing asbestos cement pipes as provided in the layout plans in the Project Design Report. A work plan will be developed prior to demolition work, to protect workers, the general community and provide for proper waste disposal. This will be guided by a detailed risk assessment to be conducted by a duly registered occupational safety and health advisor, as per the OSHA (2007) and NEMA (2013) guidelines in safe management and disposal of asbestos, to be retained on site by the contractor before commencing works and during the works along the affected pipeline sections
2. Filing Notification to NEMA as per the NEMA notification form (providing information on the location, condition of the materials, estimated the quantities involved, the quantities to be disposed etc.)
3. Asbestos Cement Material (ACM) should be transported in leak-tight containers to a secure landfill operated in a manner that precludes air and water contamination that could result from ruptured containers. The waste will be disposed appropriately by a licensed NEMA hazardous waste handler.
4. Protection from “retaliatory and disciplinary measures” of workers who remove themselves from work because they believe ACM poses a danger to their health
5. Provision of appropriate Personal Protective Equipment (PPEs) for workers
6. Provision of adequate changing rooms on site and at campsite and wash facilities to prevent dust from being carried to homes
7. Training of workers about the health hazards of ACM to themselves and their families. The training shall further involve inspections, maintenance, removal, or laboratory analysis of waste material.
8. Periodic medical examination of workers during the contract period
9. Periodic air monitoring of the work environment with records filed at the local NEMA office in Mombasa.

Detailed Abstract on Asbestos Cement Drinking Water Pipes and Possible Health Risks is presented in **Appendix 3** to this report.

Other Impacts

The Construction Stage will involve activities such as; delivery of pipes and associated fittings to the Project site, excavation of trenches, temporary stockpiling of excavated materials along the trenches, importing materials for pipeline bedding and surrounds (e.g. sand, cement, and concrete), etc.

These activities can trigger negative environmental and social impacts which can be categorized into three settings, namely: Biophysical, Socio Economic and Occupational Health and Safety setting. **Table E9** on **Page E-11** provides a summary of identified impacts and possible mitigation measures.

Table E9: Negative Impacts and Proposed Mitigation Measures During Construction

Impact	Summary of Mitigations
Bio-physical Environment	
<u>Impacts on Vegetation Resources</u> <ul style="list-style-type: none"> The project footprint will require minimal clearance of vegetation along proposed water pipeline routes This impact is less significant because the pipelines are proposed to be implemented within urban centers where vegetation has been cleared by anthropogenic activities 	<ul style="list-style-type: none"> Compensatory planting of trees that will be cut by the contractor during excavation of water pipeline trenches, through the support of Kenya Forest Services (KFS), person living close the pipeline route should be given tree seedlings to plant in their farms Vegetation should only be cleared along the Project corridor and where it will interfere with Project construction and/or present a hazard. The local community should be given a chance to harvest the targeted vegetation if they so wish. Areas to be cleared should be agreed and demarcated before the start of the clearing operations to minimize exposure. Stage vegetation clearance is also recommended so as not to clear the entire corridor all at once. The use of existing cleared or disturbed areas for the Contractor's Camp, stockpiling of materials etc. shall be encouraged.
<u>Water Resources</u> <ul style="list-style-type: none"> Water resources common within project area are shallow wells where residents get water to supplement unreliable water supplied by MOWASSCO The soil structure is composed of porous coral rocks; this implies that effluents could easily infiltrate into the water resources Major concerns will be water abstraction, soil erosion and effluent pollutants from plant and equipment. 	<ul style="list-style-type: none"> Isolate solid wastes disrupted from the works during excavations for safe disposal. The wastes should be collected and disposed in approved sites. Excavations for the construction are carried out considering safety of the surface drainage. Control siltation of rivers and other surface drains Ensure spilt oil does not discharge into water sources Provide oil spill containment including concrete platform for servicing of construction equipment and holding of scrap oil drums. Contain excavated soils so that they will not find their way into nearby water sources Spilled cement or concrete should be collected and disposed away from natural water ways or storm water drainage; Sensitize workers and enable them to properly handle concrete spillages or waste cement;
<u>Soil resources</u> <ul style="list-style-type: none"> Alteration of soil physical properties as well as exposure to erosion agents may result from the civil and general works within the Project site. Effects of soil pollution may also result from accidental oil spills. Soils in the Project area are composed of highly porous coral weathered soils 	<ul style="list-style-type: none"> The spilled oil from fuelling and servicing stations should be trapped in grit chambers for settling of suspended matter before being release into the environment Collected oil should be properly disposed to avoid any underground water contamination To limit exposing soils to agent of erosions, water pipeline excavations will be limited within set out areas Wherever possible, excavations should be carried out during the dry season to prevent soil from being washed away by the rain; Excavated materials should be kept at appropriate sites approved by the Supervising Engineer;

Impact	Summary of Mitigations
Health and Safety Impact	
<u>Air Pollution</u> <ul style="list-style-type: none"> Air quality pollution caused by emissions from construction plant and equipment which include dust and gaseous emissions. Impacts relate to the receptors such as schools, health facilities, market centres and places of worship as identified in Table E8 on Pages E-7 to E-8 	<ul style="list-style-type: none"> Contractor will comply with the provisions of EMCA 2015 (Air Quality Regulations 2014). Water sprays shall be used on site to suppress dust in areas within 200 metres of human settlement especially during the dry season. The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilised as soon as practically possible; Do not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds. Vehicles delivering soil materials shall be covered to reduce spills and windblown dust; Vehicle speeds shall be limited to minimize the generation of dust on site. Proper maintenance of construction vehicles
<u>Noise and excessive vibration</u> from construction equipment and vehicles could pose health and safety risks to workers and community sensitive receptors identified in Table E8 on Pages E-7 to E-8	<ul style="list-style-type: none"> Contractor will comply with provisions of EMCA 2015 (Noise and Excessive Vibrations Regulations of 2009). The Contractor will keep noise level within acceptable limits (60 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas. Sensitive receptors, presented in identified in Table E8 on Pages E-7 to E-8 shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity.
<u>Occupational health and safety risks</u> associated with the Project to workers and community	<ul style="list-style-type: none"> Establish a Health and Safety Plan (HASP) for civil works, the plan will identify localized specific health hazards and risks and provide appropriate mitigation measures accompanied with a budget and implementation responsibility. Provide workers with adequate and appropriate Personal Protective Equipment (PPEs) such as gloves, ear gears, sturdy rubber boots and overalls to protect their skin from the effects of cement; Provide workers training on safety procedures and emergency response such as fire.
<u>Solid waste</u> generation from construction activities	<ul style="list-style-type: none"> A site waste management plan should be prepared by the Contractor prior to commencement of construction works. This should include designation of appropriate waste storage areas, collection and removal schedule and identification of approved disposal site; Ensure that the solid waste collection, segregation, and disposal system is functioning properly at all times during the construction phase; Recycle and re-use wastes where possible such as scraps metal. All hazardous waste to be collected and disposed by licensed waste handler
<u>Liquid wastes</u> during the construction phase, various liquid wastes including grey and black water, concrete washings,	<ul style="list-style-type: none"> Water containing pollutants such as concrete or chemicals should be directed to a conservancy tank for removal from the site where applicable

Impact	Summary of Mitigations
runoff from camp and workshop areas.	<ul style="list-style-type: none"> • The contractor shall prevent runoff loaded with sediments from flowing into water channels. • No grey water runoff or uncontrolled discharges from the site or working areas to adjacent water resources. • The contractor shall ensure that the machines and equipment are in good condition to prevent leakages • Interceptors such as sand can be used to prevent pollutants from reaching water resources • Ensure proper handling of lubricants, fuels and solvents while maintaining the equipment
Risk of Accidents on site related movement of plant and equipment and exposure to hazards such as open un-barricaded trenches	<ul style="list-style-type: none"> • Contractor to provide a Traffic Management Plan during construction to be approved by the Supervising Engineer • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles • Strict use of warning signage and tapes where the trenches are open and at other active construction sites • Contractor to Employ and train Road Safety Marshalls who will be responsible for management of traffic on site
<p>Spread of COVID-19. During construction, it is expected that large numbers of construction workers will interact closely in meetings, toolbox talks and at work sites. This could present an enabling environment for the COVID-19 virus to spread rapidly if mitigation measures provided here are not adhered to and enforced.</p>	<ul style="list-style-type: none"> • The Contractors will develop a standard operating procedures (SOPs) for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client, before mobilizing to site. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions; • Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including workers and visitors; • Avoid concentrating more than 15 workers at one location. Where there are two or more people gathered, maintain social distancing of at least 2 meters; • All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs; • The project shall put in place means to support rapid testing of suspected workers for Covid-19; • Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used; • Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc;
Social Impacts	
Spread of COVID-19 amongst community members during consultation processes	<ul style="list-style-type: none"> • Electronic means of consulting stakeholders and holding meetings, shall be encouraged, whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced; • Avoid concentrating more than 15 community members at one location. Where more than one person are gathered, maintain social distancing of at least 2 meters (6 feet);

Impact	Summary of Mitigations
	<ul style="list-style-type: none"> • The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people and stakeholders they intend to meet. • Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Ensure to allow participants to provide feedback and suggestions. • Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration. • In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chat groups. • Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants.
Project impact to private property and sources of livelihood	<ul style="list-style-type: none"> • The ARAP report has been prepared as a separate document and will presented as volume II to this assessment.
Spread of communicable diseases and HIV/AIDS infection	<ul style="list-style-type: none"> • The contractor at the time of Project implementation will develop appropriate training on potential spread and awareness materials for Information, Education and sensitisation of workers during project construction phase. • Develop an intervention strategy compatible with the construction programme to address success of the HIV/AIDS prevention and provide peer educators for sustainability in collaboration with other stakeholders; and • Integrate monitoring of HIV/AIDS preventive activities as part of the construction supervision. Basic knowledge, attitude and practices are among the parameters to be monitored, and particularly on provision of condoms, status testing and use of ARVs
Labour Influx to the Project area.	<ul style="list-style-type: none"> • Effective community engagement and strong grievance mechanisms on matters related to labour through Grievance Redress Mechanism (GRM) Provided • Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx, including sexual exploitation and abuse • Proper records of labour force on site while avoiding child and forced labour • Fair treatment, non-discrimination and equal opportunity of workers. • Comply to provisions of Labour Relations Act 2012 and Work Place Injuries and Benefits Act (WIBA 2007) and Employment Act Cap 222 of 2007 • The contractor shall comply with the International Labour Organization Standards ratified in Kenya which include but not limited to: Prohibition of forced labour (ILO No 29) and Abolition of forced labour (ILO No 159). • The contractor shall prohibit servitude, forced and bonded labour, Equal remuneration ILO No 100 and Discrimination (Employment and Occupation) and Freedom of Association and Right to collective Bargaining Convention No 98. • The contractor shall comply with affirmative action that it will employ persons and make employment-related decisions without regard to an individual's race, color, religion, sex, age,

Impact	Summary of Mitigations
	<p>creed, ancestry, marital status, sexual orientation, gender identity, disability, medical condition, genetic information, or any other characteristic protected by law.</p> <ul style="list-style-type: none"> • The contractor shall ensure compliance with the Kenya's persons with disabilities PWDs Act. The company will make reasonable accommodations for qualified individuals with known disabilities. This policy governs all aspects of employment, including selection, job assignment, compensation, discipline, termination and access to benefits and training. • The contractor responsibility to provide all employees with a workplace free of harassment, intimidation, coercion and retaliation as provided by Kenya's Employment Act Cap 226 of 2007 • All employees, officers and directors are responsible for conducting themselves so that their actions are not considered sexually harassing, demeaning or intimidating. • Any employee(s) who witness or believe they have been subject to discrimination, harassment, retaliation is encouraged to notify their supervisor
Gender-based violence and Sexual Harassment at the community level	<ul style="list-style-type: none"> • Ensure clear human resources policy against sexual harassment that is aligned with national law • Integrate provisions related to sexual harassment in the employee CoC • Ensure appointed human resources personnel to manage reports of sexual harassment according to policy • The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse • The contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: <ul style="list-style-type: none"> ○ effective and on-going community engagement and consultation, particularly with women and girls; ○ review of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; etc. • the contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc. • The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation
Violation of children rights by contractor and labour force on site.	<ul style="list-style-type: none"> • Develop and implement a Children Protection Strategy that will ensures minors are protected against negative impacts associated by the Project. • All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior • Children under the age of 18 years shall not be hired on site as provided by Child Rights Act (Amendment Bill) 2014 • Wherever possible, ensure that another adult is present when working in the proximity of children. • Not invite unaccompanied children to workers' homes, unless they are at immediate risk of injury or in physical danger.

Impact	Summary of Mitigations
	<ul style="list-style-type: none"> • Refrain from physical punishment or discipline of children). • Refrain from hiring children for domestic or other labor, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury. • Comply with all relevant local legislation, including labor laws in relation to child labor specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation • Prepare and sign code of conduct with specific provisions for the protection against sexual harassment of project staff by project staff in the workplace.
Sexual exploitation and abuse of community members by project workers	<ul style="list-style-type: none"> • Develop and implement an SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). • The SEA action plan will include how the project will ensure necessary steps are in place for: <ul style="list-style-type: none"> ○ Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials; ○ Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management; ○ Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights; ○ Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.

E.9.4 Negative Impacts and Mitigation Measures During Project Operation Period

Table E10 below presents a summary of potential negative impacts likely to be experienced during operation of the project and the proposed mitigation measures.

Table E10: Potential Negative Impacts and Proposed Mitigation Measures During Operation

Potential Impact	Proposed Mitigation Measures
Risk of Encroachment and Construction of Structures on the Pipeline Way Leave	<ul style="list-style-type: none"> Arrest and prosecution of encroachers as required by Mombasa County by-laws on Way Leaves and Road Reserves MOWASSCO to undertake awareness campaigns aimed at preventing encroachment Regular patrol /inspection on wayleaves
Risk of Pipeline Bursts Leading to Water Loss (Non-Revenue Water)	<ul style="list-style-type: none"> The risk of pipeline bursts is low as the pipeline design, including the selection of pipe material and pipe pressure classes, has been carried out to minimize this risk. Risks to be further minimized through regular inspection, repair and maintenance of the pipeline by the Operator, MOWASSCO
Risk of Illegal Connections and Vandalism of the Pipeline	<ul style="list-style-type: none"> Regular inspection by MOWASSCO of the pipeline corridor for illegal connections Prosecution of encroachers as required by Mombasa County By laws on Way Leaves and Road Reserves MOWASSCO will undertake awareness campaigns to prevent illegal connection to the water lines

E.10 CONCLUSIONS

The Environmental and Social Impact Assessment (ESIA) undertaken for the Project indicates that the Project will have the following impacts:

- The Project area is located within Mombasa North Mainland. The area is influenced by anthropogenic activities and no sensitive environment ecosystems were identified along the Proposed Water line routes. Therefore, there will be no direct interaction of the Project activities at the time of construction with the natural sensitive ecosystems.
- The Environment and Social impacts will be less significant and can be mitigated as discussed in **Chapter 8** of this Report.

The **Key provisions** of the Environment and Social Impact Assessment Project Report are as follows:

- The **Bid Documents** prepared for the Project incorporates the Environment, Social Health and Safety Provisions discussed under Chapter 7 (Environment and Social Impact Assessment and Mitigation Measures).
- The **Project Contract Document** should include provisions for the contractor preparing and implementing site specific **Environment and Social Management**

Plan (ESMP), appendices to the ESMP will include:

- *Health, Hygiene and Safety Plan*
- *Labour Management Plan*
- *Child Protection Strategy*
- *Waste Management Plan*
- *Asbestos handling and disposal plan*
- *Contractors Code of Conduct including provisions on VAC, SEA, and SH*
- *Gender Based Violence and Sexual Harassment Prevention Plan*
- *GBV Action Plan, including:*
 - ✓ *SEA Prevention and Response Strategy*
 - ✓ *SH Policy*
 - ✓ *GBV Mitigation Plan*
 - ✓ *SEA Redress Mechanism*
 - ✓ *SH Redress Mechanism*
- *HIV/Aid & Communicable Diseases Prevention Strategy*

(iii) The Project supervising engineer will engage on a fulltime basis environment and social safeguards officers who will be in charge of ensuring compliance of the contractor to environment and social provisions provided by the ESIA and Construction Environment and Social Management Plans (CEMP) prepared by the contractor. The officer will participate in monthly and quarterly meeting and will generate monthly and quarterly environment and social safeguards compliance reports.

The contractor should also recruit a community liaison officer who will act as a link between the community and the contractor.

(iv) At Project Implementation Stage, the Contractor will report monthly to the Project management team comprising of the Consultant and the Project proponent on how ESHS provisions detailed in this ESIA are addressed. In addition, as per the requirement of the Occupational Health and Safety Act (OSHA) 2007, EMCA 1999 and its 2015 revisions, and World Bank EHS guidelines, all ESHS incidents, accidents, dangerous occurrences including occupational diseases shall be promptly reported to the respective regulatory institutions in the prescribed manner and template outlined in DOSH ML/DOSH/FORM 1 and further to the World Bank. Records of all incidents shall also be maintained and made available for inspection on site throughout the project implementation phase. Investigation shall be conducted, and a corrective action plan developed for every reportable incident to prevent recurrence.

(v) At Project completion stage, within the defects liability Period, Coast Water Works Development Agency (CWWDA) will initiate an **Initial Environment and Social Audit** and subsequent annual audits for the Project as required by EIA/EA Audit regulation of the year 2003. The audit will develop an Environment and Social Audit Action Plan (ESAAP) that will be used to track Project Environment and Social Compliance during Project operation stage.

The ESIA provides that the ARAP report prepared for the Project should be implemented in line with the provisions of the World Bank (OP 4.12 on Involuntary Resettlement). The ARAP findings are summarized in **Table E11** on **Page E-18**.

Table E11: Summary of ARAP findings

Item	Description	Affected PAPs
2	Mombasa North Mainland	
2.1	PAPs who are Women	7
2.2	PAPs who are Men	24
2.3	PAPs who are Vulnerable within the total number of PAPs	3
	Total number of PAPs	31

The estimated ARAP budget as presented by this ESIA is **Kshs 2,164,715 (Two Million, One Hundred and Sixty-Four Thousand, Seven Hundred and Fifteen Shillings Only)** while the estimated ESMMP budget is **Kshs 1,050,000 (One Million and Fifty Thousand Shillings Only)**

MAIN REPORT

1 BACKGROUND INFORMATION

1.1 General Information

The Government of Kenya (GoK) and Coast Water Works Development Agency (CWWDA) has undertaken to prepare Detailed Designs, ESIA/RAP and Bid Documents for Water Distribution Works for Mombasa and three (3) Water Service Providers (WSPs) under the Water and Sanitation Service improvement Project- Additional Financing (WaSSIP-AF). The project is financed by the International Development Association (IDA).

The 4 WSPs targeted under the assignment cover the Counties of Mombasa, Kilifi and Taita Taveta and include:

- Mombasa Water Supply & Sanitation Co. Ltd. (MOWASSCO)
- Malindi Water & Sewerage Co. Ltd. (MAWASCO)
- Kilifi-Mariakani Water & Sewerage Co. Ltd. (KIMAWASCO)
- TAVEVO Water and Sewerage Co. Ltd. (TAVEVO)

The Targeted Areas for each WSPs include the following Urban Centres:

- MOWASSCO: Mombasa Island, North Mainland, South Mainland and West Mainland
- MAWASCO: Malindi, Watamu, Gongoni and Mazrui
- KIMAWASCO: Kilifi, Mtwapa, Mariakani, Mazeras and Kaloleni
- TAVEVO: Taveta, Voi, Mwatate and Wundanyi

Figure 1.1 on **Page 1-2** shows the respective Areas of jurisdiction for the 4 WSPs.

This Report presents the Environmental & Social Impact Assessment (ESIA) Report for the Proposed Distribution Network – **Short-Term Investments for Mombasa North Mainland.**

Stand Alone Environmental & Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) Reports have been prepared for the other 3Nr Water Services Providers (WSP) namely, KIMAWASCO, MAWASCO and TAVEVO.

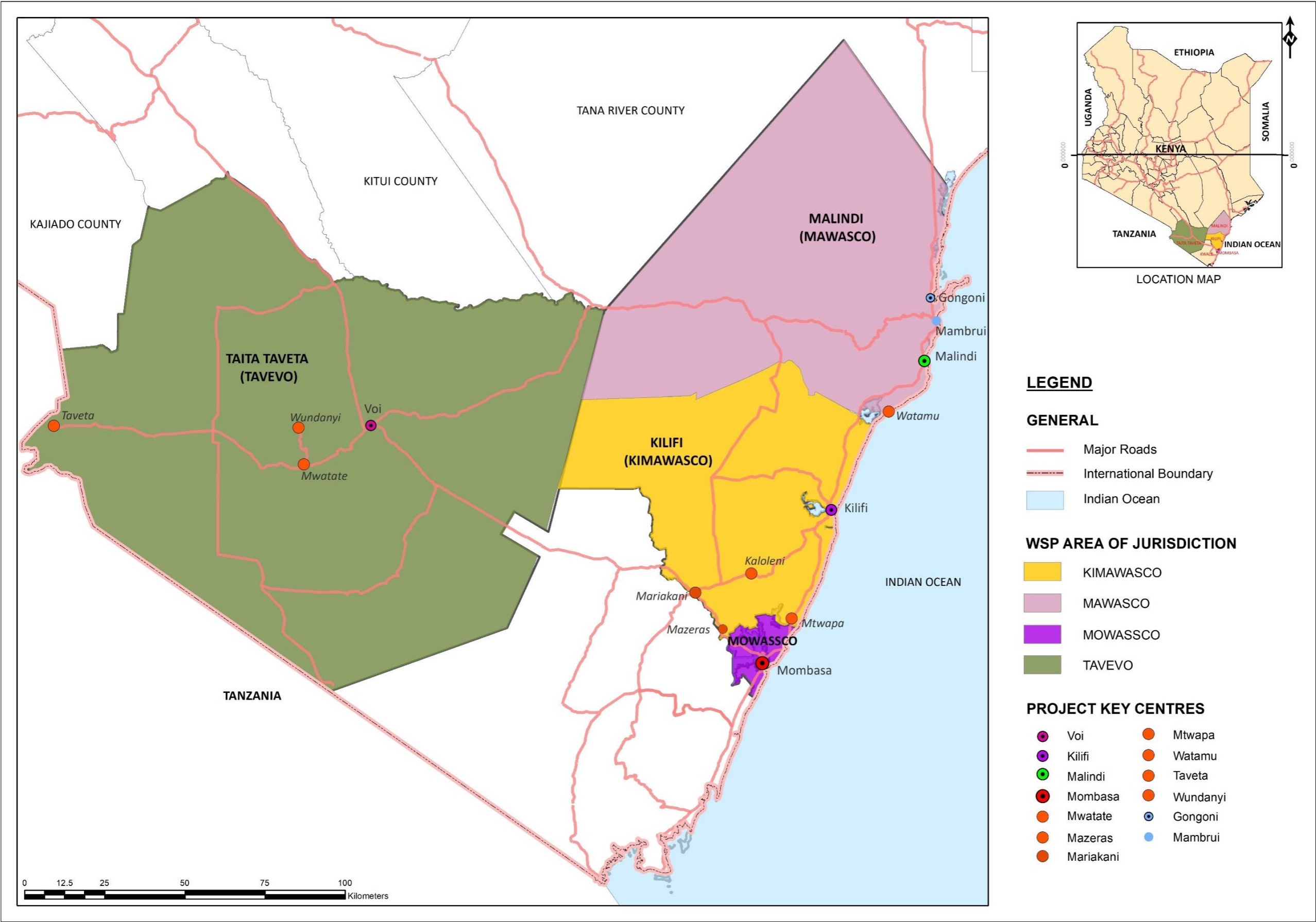


Figure 1.1: Area of Jurisdiction of 4 WSPs in Mombasa, Kilifi and Taita Taveta Counties

1.2 Project Background

The main existing water sources serving key Towns and Urban Centres in the Coastal Region such as Mombasa, Malindi, Kilifi, Kwale and Voi include:

- Baricho Wellfield – Capacity 96,000 m³/day, serving Mombasa North Mainland and Island, Malindi, Watamu, Kilifi, Mtwapa and en-route population
- Mzima Springs – Capacity 35,000 m³/day, serving Voi, Mombasa West Mainland & Island and en-route population
- Marere Springs – Capacity 12,000 m³/day, serving Kwale, Kinango, Mombasa West & South Mainlands and en-route population
- Tiwi Boreholes – Capacity 10,000 m³/day, serving Ukunda, Tiwi and Mombasa South Mainland
- Njoro Kubwa Springs – Capacity 3,000 m³/day, serving Taveta.

The capacity (261,941 m³/d) of the existing sources is inadequate to meet the present water demand (312,486 m³/d) in the target service areas. The water scarcity compounded with the high Non-Revenue Water (NRW) results in extreme water shortages in the region leading to increased prevalent poverty levels and health problems especially among the low-income population category.

A “Master Plan for Water Supply for the Coast Region” was prepared in 2014 (TAHAL/Bhundia). The Master Plan identified existing and proposed future water sources that can be developed to meet the water supply deficit brought about by the growing population. The Water Supply Sources identified under the Master Plan are as given in **Table 1.1** below.

Table 1.1: Sources Identified under the Water Supply Master Plan

Water Source	Status	Current Capacity (m ³ /d)	Potential Production (m ³ /d)
Mzima Springs	Existing	35,000	105,000
Marere Springs	Existing	12,000	12,000
Baricho Well Field	Existing	96,000	180,000
Tiwi Well Field	Existing	10,000	15,000
Njoro Kubwa Springs	Existing	3,000	100,000
Msambweni Aquifer	Under development	-	20,000
Mkurumudzi Dam	Existing (for Private Use)	-	19,000
Mwache Dam	At Tendering Stage	-	186,600

(Source: Water Supply Master Plan -Tahal/Bhundia 2014)

The Water Supply Master Plan (2014) recommends options for the development of the existing and proposed new water sources in four stages:

- Immediate Phase (2015)
- Phase I (2020)
- Phase II (2025)
- Phase III (2035)

In the Water Supply Master Plan (2014), the preferred option for the water sources development comprises of:

- Mwache Dam (to be completed by 2020)
- Second Enhancement of Baricho Scheme (to be completed by 2025)
- Mzima II Pipeline (to be completed by 2035)

To ensure optimum value is obtained upon Commissioning of these Planned Water Sources, the Master Plan prepared by MIBP/ Nippon (2017) recommended Improvement of the Water Distribution Networks.

1.3 Project Implementing Agency

Mombasa Water Supply and Sanitation Company Limited (MOWASSCO) is the Water Service Provider mandated to provide Cost effective and Affordable Quality water to residents of Mombasa County. It was incorporated on 1st September 2005, and later reincorporated in March 2011 under the Companies Act.

The estimated area of jurisdiction is 230 km², excluding 65km² of water mass; with a population of approximately 939,370 (National Housing and Population Census, 2009).

The service area for the WSP is Mombasa County, which is classified into four Geographical Regions; Mombasa Island, North Mainland, South Mainland and West Mainland.

MOWASSCO head offices are in Mikindani Street off Nkrumah Road, Mombasa Island and the branch offices are as follows:

- Nyali & Kisauni Branch Offices serves Kisauni Division, North Mainland
- Changamwe Branch Office serves Changamwe Division, West Mainland
- Likoni Branch Offices serves Likoni Division, South Mainland

The Coverage Area of MOWASSCO WSP is as shown in **Figure 1.2** on **Page 1-5**.

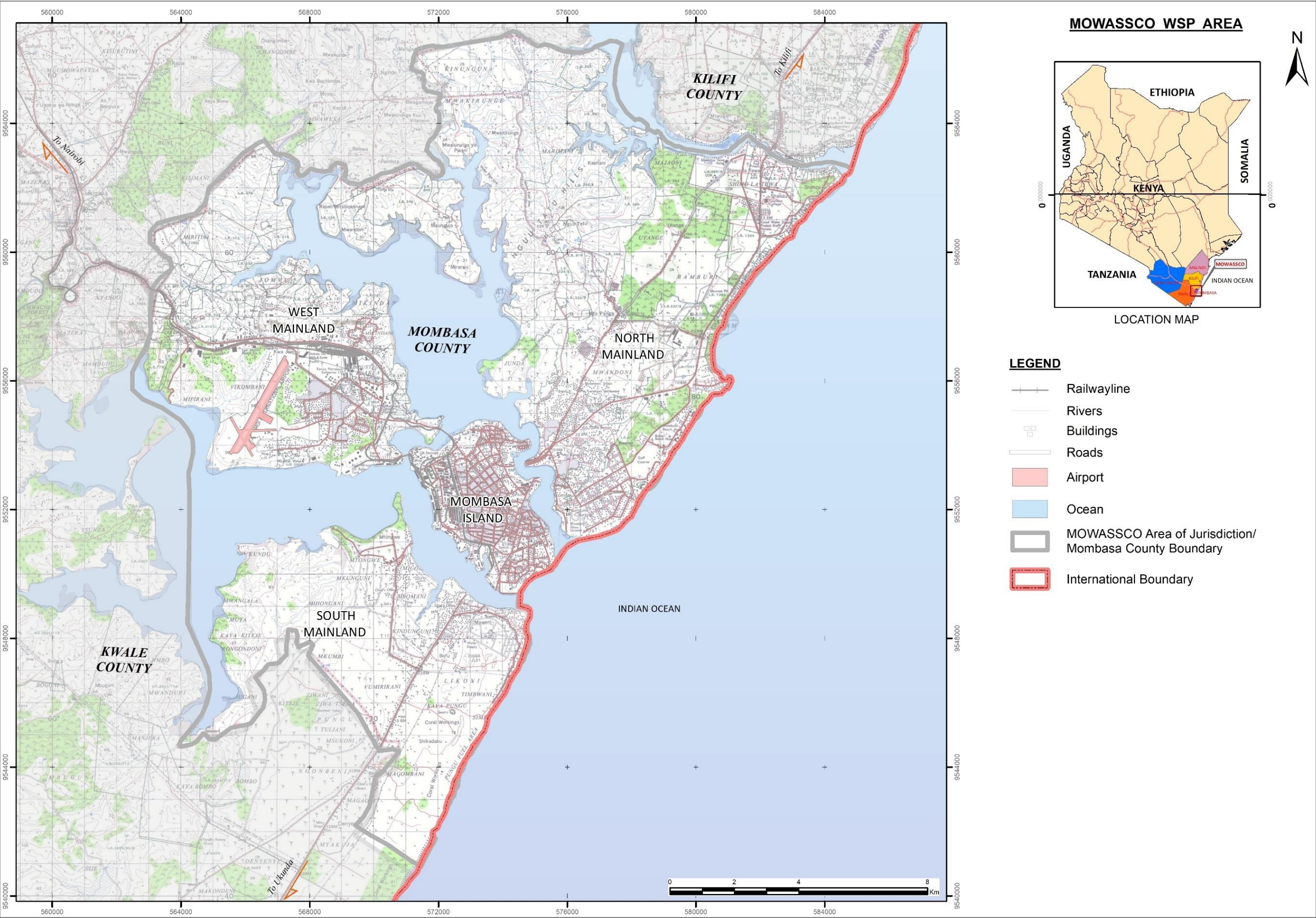


Figure 1.2: Coverage Area of MOWASSCO WSP

2 STUDY AREA DELINEATION AND EXISTING WATER SUPPLY SYSTEM

2.1 Delineation of MOWASSCO Area

The total area under the jurisdiction of Mombasa Water Supply and Sanitation Company Ltd. (MOWASSCO) is the whole of Mombasa County and is approximately 230 km² (Land Mass) and 65 km² (Inshore Waters).

The Terms of Reference (ToR) of the Assignment specified that the Project Area for the Detailed Design of the Water Distribution Network covers the Urban Centres and the Peri-urban areas only.

The Kenya National Bureau of Statistics (KNBS) defines an “**Urban Centre**” as an “**area with an increased density of human created structures in comparison to the areas surrounding it and has a population of 2,000 and above**”. In this definition, KNBS includes Cities, Municipalities, Town Councils and Urban Councils as Urban Centres.

Therefore, the entire area within Mombasa County is classified as **Urban** by the **Kenya National Bureau of Statistics (KNBS)** as per the 2009 Population Census. Mombasa County comprises of four distinct Geographical Areas which also correspond to Administrative Divisions, namely:

- Island (Island Division)
- North Mainland (Kisauni Division)
- South Mainland (Likoni Division)
- West Mainland (Changamwe Division)

The four Administrative Divisions are subdivided into thirty Wards. A brief description of Mombasa North Mainland is given below.

- **Mombasa North Mainland**

Mombasa North Mainland covers the entire Kisauni Division (Nyali and Kisauni Sub Counties) and is predominantly a residential area with several commercial shopping centres. Its Coastal strip with Sandy beaches is pre-dominantly occupied by hotels and tourist resorts.

The high income Nyali residential area which was originally planned for single dwelling houses is now undergoing major transformation to multi dwelling premises. This will result in further pressure on the already strained Water Supply Services.

2.2 Existing Water Supply System

The Existing Water Supply System for MOWASSCO consists of the Bulk Water Supply System and Local Storage and Distribution Networks as detailed in the following sub-sections:

2.2.1 Bulk Water Supply System

At present, Mombasa County is supplied with water from the following four Bulk Water Supply sources;

- Marere springs: Current estimated supply to MOWASSCO is 2,500 m³/d
- Tiwi Well Field: Current estimated supply to MOWASSCO is 2,000 m³/d
- Baricho Well Field: Current estimated supply to MOWASSCO is 27,000 m³/d
- Mzima Springs: Current estimated supply to MOWASSCO is 15,000 m³/d

Figure 2.1 below shows the schematic diagram of the Existing Bulk Water Supply System serving MOWASSCO Area of jurisdiction.

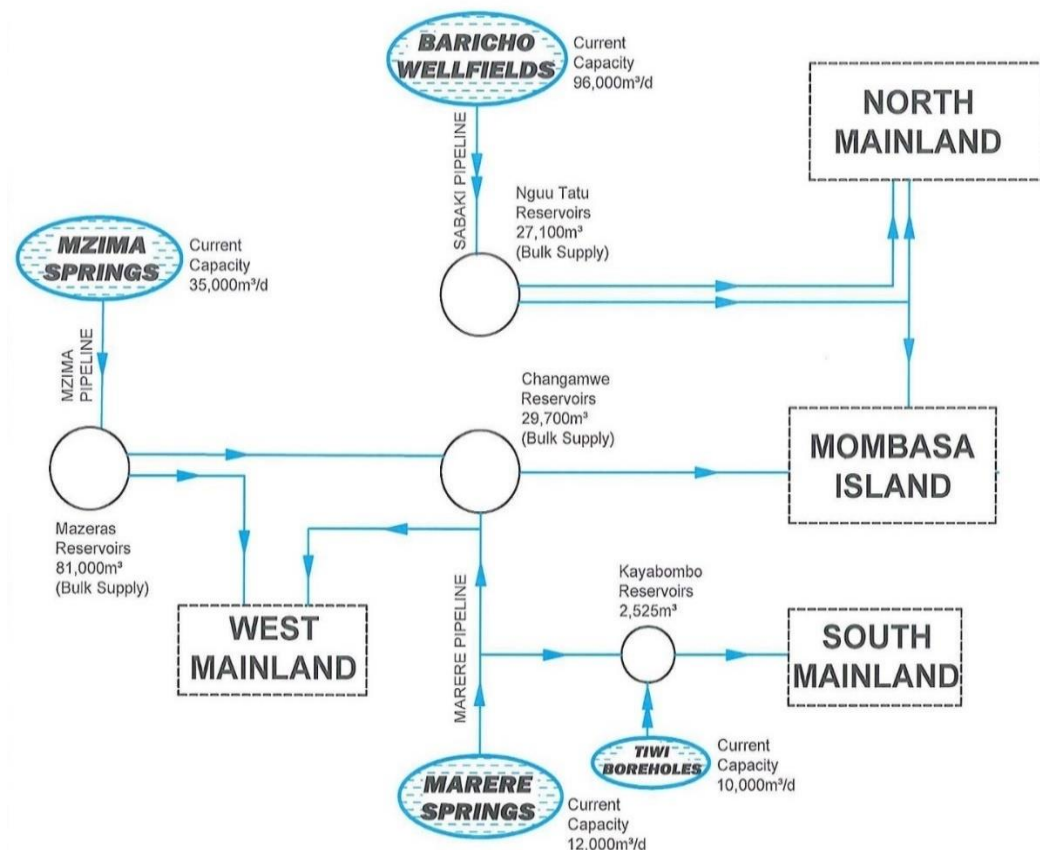


Figure 2.1: Schematic Diagram of Existing Bulk Water Supply Sources for Mombasa County

The Bulk Water Supply Sources serve en-route Service Areas of Kilifi, Mtwapa, Voi and Kwale besides Mombasa County. Because of the rapid population growth in the en-route urban centres of Mtwapa and Kilifi, the abstraction along the transmission pipelines has significantly increased to satisfy the resulting water demand. This has led to reduced water supply to Mombasa County even with the aid of storage at Nguu Tatu and Changamwe Reservoirs. For instance, Mombasa Island with sufficient Water Distribution Network experiences acute water shortages.

The water demand for Mombasa County for the Year 2016 and 2040 was estimated to be **187,496 m³/d** and **395,407 m³/d** respectively. Considering the unsatisfied current demand and the current water supply status, development of new Water Sources is necessary for regular water supply in the county (Refer to **Section 3.2** of this Report).

The Water Supply Master Plan (Tahal/Bhundia 2014) identified Mwache Dam (to be completed by 2020) as a potential new Bulk Water Source for Mombasa County with four new Transmission pipelines from Mwache Dam planned for construction (Feasibility Study on Water Transmission Facilities for Kenya Coast Province Water Supply, Hankuk-2016).

Baricho Wellfields is also another existing Bulk Water Supply Source for Mombasa County. With the laying of new dedicated Pipeline to serve Kilifi Town from Kakuyuni reservoirs as planned in the Immediate Phase of the Water Supply Master Plan (2014), it is expected that off-takes on Sabaki Pipeline which serve Kilifi Town will be disconnected and more water from Baricho Wellfields conveyed to Mombasa County.

A schematic illustration of the four Proposed Transmission Pipelines from Mwache Dam is given in **Figure 2.2** below.

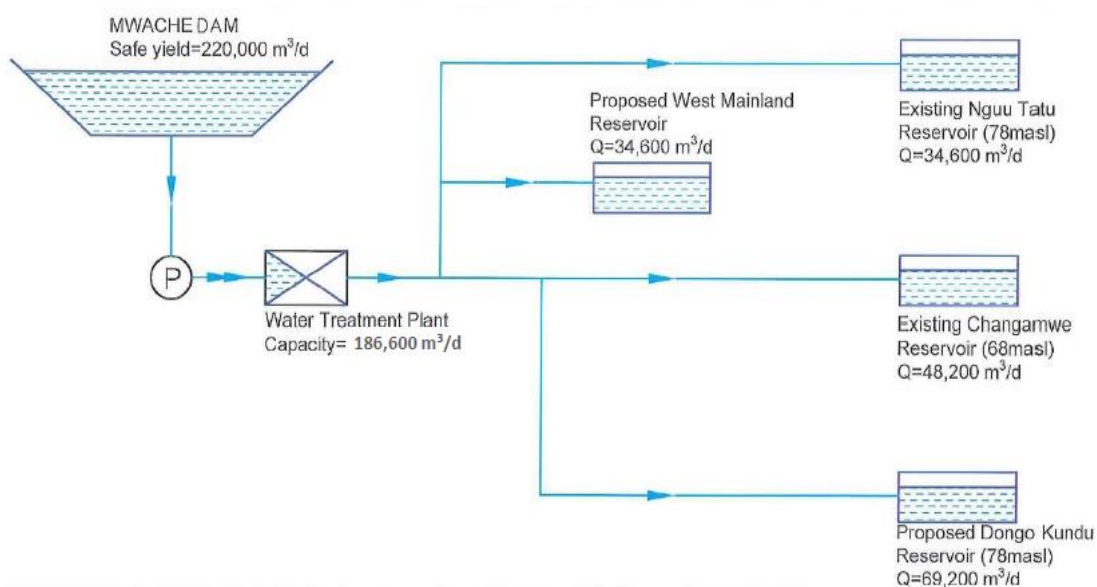


Figure 2.2: Schematic Diagram of the Proposed Transmission Pipelines from Mwache Dam

2.2.2 Water Supply to Mombasa North Mainland

Mombasa North Mainland is supplied from the Baricho Wellfields through Nguu Tatu Reservoirs (Storage capacity 27,100m³ and Elevation 78 m asl).

The following Trunk Mains supply water to the North Mainland:

- DN 700 mm dia. from Nguu Tatu Reservoir.
- DN 500 mm DI Trunk Main from Nguu Tatu Reservoir to Kiembeni and Bamburi.
- DN 1200/1000 mm dia. ferrous Trunk Main estimated length of 3.2km (recently laid under Lot 2 contract)
- DN 700 mm dia. Ferrous Trunk Main estimated length of 3.5km recently laid.

The existing Distribution Network covers Kisauni and Bamburi Divisions bounded by Mtwapa Creek. The Distribution Network is estimated to have a total length of 134 km and consists mainly of uPVC and AC pipes. A break-down of the Distribution Network is summarized as follows:

- 17.7 km of AC pipes ranging from 75 to 100 mm diameter
- 9.2 km of AC pipes ranging from 150 to 200 mm diameter
- 5.16 km of AC pipes ranging from 250 to 350 mm diameter
- 7 km of Ferrous pipes ranging from 75 to 100 mm diameter
- 4 km of Ferrous pipes ranging from 250 to 350 mm diameter
- 15.6 km of Ferrous pipes ranging from 400 to 500 mm diameter
- 16.3 km of Ferrous pipes ranging from 700 to 1200 mm diameter
- 20 km of uPVC pipes ranging from 75 to 110 mm diameter
- 22.3 km of uPVC pipes ranging from 150 to 200 mm diameter
- 12.3 km of uPVC pipes ranging from 250 to 350 mm diameter
- 4 km of uPVC pipes ranging from 400 to 500 mm diameter

A Layout Plan of the Existing Water Distribution Network in Mombasa North Mainland is given in **Figure 2.3** on **Page 2-5**.

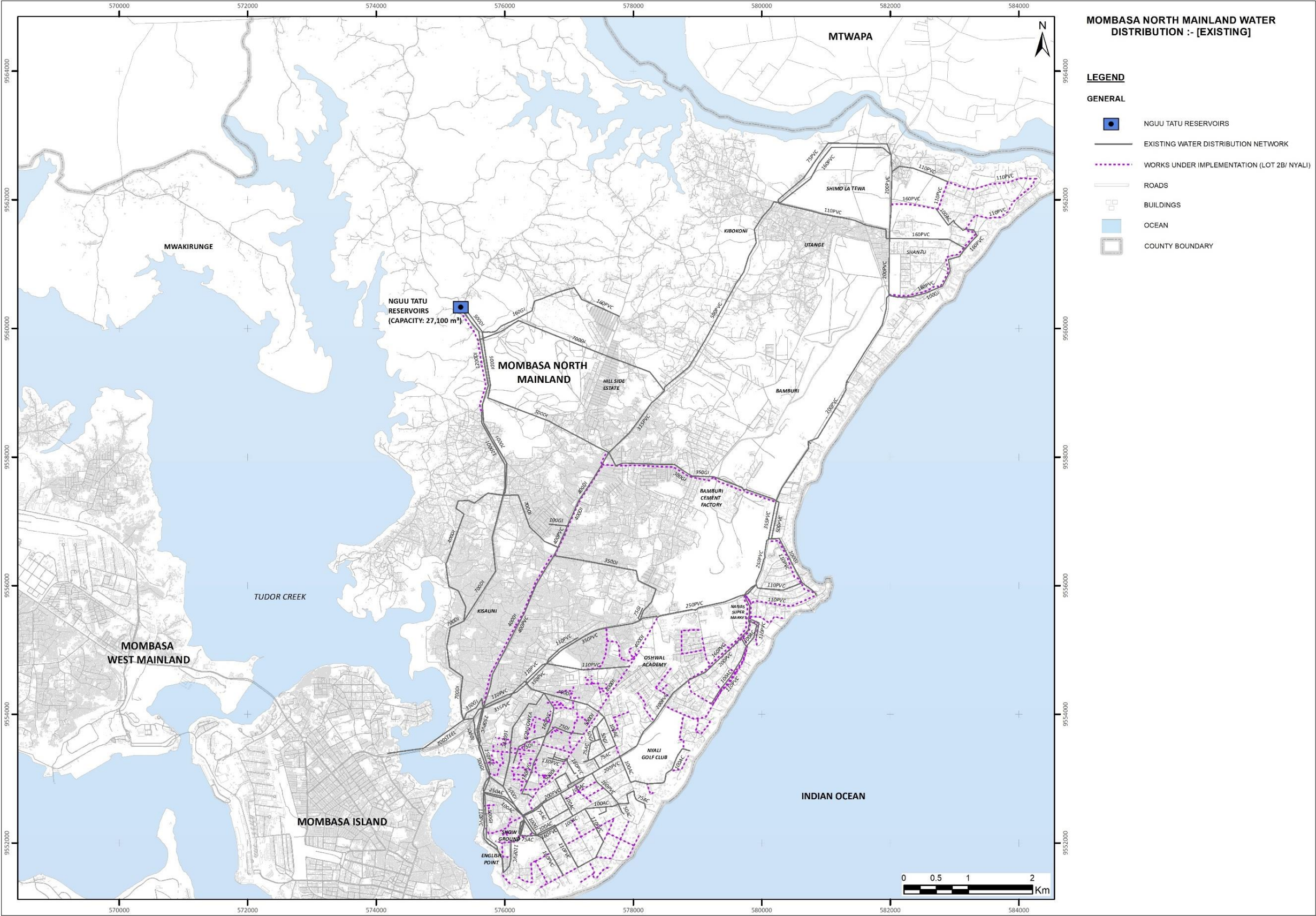


Figure 2.3: Layout Plan of the Existing Water Distribution Network in Mombasa North Mainland

3 PROPOSED WORKS FOR MOWASSCO WATER DISTRIBUTION NETWORK

3.1 Planning Horizons

The Water Distribution Master Plan prepared by MIBP/NIPPON (2017) proposed Distribution Network Investment Plans with an Implementation Schedule of 3 Phases:

- i. Short Term Phase (Immediate Interventions) :2017 - 2020
- ii. Medium Term Phase : 2021 - 2030
- iii. Long Term Phase : 2031 - 2040

This Report covers the Short-Term Works for Mombasa North Mainland. Separate ESIAs will be prepared for the Medium Term and Long-Term Phases when ready for implementation.

3.2 Categorization of Proposed Works

The Works to be carried out have been grouped into 3 categories:

- **Replacements**-This includes gradual replacement of Asbestos Cement (AC) pipelines and any other pipelines which are currently in a dilapidated state. Priority has been given to the pipelines with reported frequent leaks/ bursts and replacement of 6.46km of AC pipelines under the Short-Term Phase (2017-2020). Replacement of remaining AC pipelines will be carried out during the Medium-Term Phase such that by year 2030 all the AC pipelines will have been phased out. Due to Environmental, Health and Safety concerns associated with handling and disposal of AC Mains and lack of a licensed asbestos disposal site nearby, the Mains will be decommissioned and left in the ground.
- **Extensions**-Some Areas that are currently not served by the existing Distribution Network require extensions to take care of the rising water demands. Under Short Term Phase (2017-2020), priority has been given to the Areas which are already built up but lack Water Distribution Network. Other Areas with potential for faster developments have been considered in the Medium-Term and Long-Term Phases.
- **Augmentation**-Where the existing Distribution Pipelines have been found to be inadequate, new pipelines have been proposed to augment the existing pipelines. For economic and space considerations, priority has been given to implementing pipelines with capacities adequate to meet the year 2040 water demand with a phased development under the Short-Term, Medium-Term and Long-Term Phases.

Layout Plan showing the Proposed Water Distribution Network Work for Mombasa North Mainland Area under the respective Planning Horizons are given in **Figure 3.1** on **Page - 3-2**.

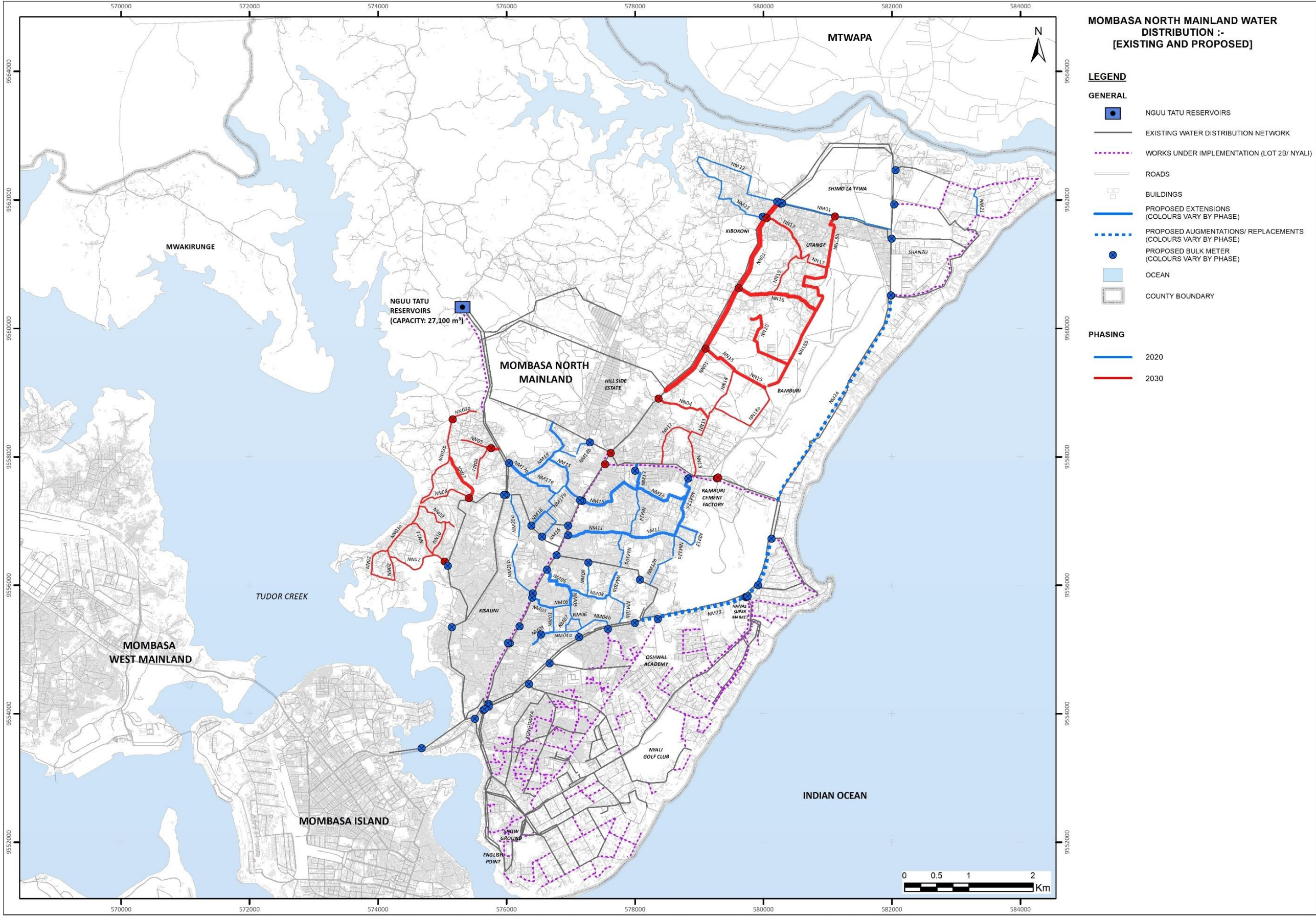


Figure 3.1: Layout Plan for the Network Improvements / Extensions for North Mainland

3.3 Proposed Works

Hydraulic Network Modelling results show that the existing Distribution Network is made up of pipes of sizes that are adequate to distribute the Water Demand estimated for year 2016 and will require Augmentation and Extension works for future water demands.

A summary of the proposed Network Improvements/Extensions for Mombasa North Mainland's Project Area at different Planning Horizons is given in **Table 3.1** below.

Table 3.1: Summary of Lengths of Proposed Water Distribution Network Work for Mombasa North Mainland (km)

Service Area	Category of Works	Short-Term Phase (2017 – 2020)	Medium-Term Phase (2021 – 2030)	Long-Term Phase (2031 – 2040)
North Mainland	Replacement:110 - 350 dia	6.46	-	-
	Augmentation:110 - 400 dia	-	-	3.85
	Extension:110 - 160 dia	27.32	28.82	61.78
	Total (km)	33.78	28.82	65.63

The required Network Improvements / Extensions for Mombasa North Mainland's Service Area with respect to the Planning Horizon (2017 to 2020) under which this ESIA is prepared is detailed in **Table 3.2** on **Page 3-4**.

Table 3.2: Mombasa North Mainland: Proposed Works for Short Term Phase (2017-2020)

Design Horizon	Water Mains (Layout Map)	Dia. (mm)	Length (m)	Material	Remarks
2020	NM01	350	1,803	FERROUS	Laying of a new pipeline in Shanzu
	NM02	160	220	HDPE	Laying of a new pipeline in Kisauni
	NM03	110	1,203	HDPE	
	NM04a	110	487	HDPE	
	NM04b	110	592	HDPE	
	NM05	250	661	FERROUS	
		200	235	HDPE	
	NM06	110	746	HDPE	
	NM07	110	258	HDPE	
	NM08	160	673	HDPE	
	NM09	110	555	HDPE	
	NM10a	110	626	HDPE	
	NM10b	110	588	HDPE	
		160	395	HDPE	
	NM11	200	1,743	HDPE	
		160	307	HDPE	
		110	537	HDPE	
	NM12a	200	1,052	HDPE	
		110	308	HDPE	
	NM12b	110	578	HDPE	
	NM13	200	1,346	HDPE	
	NM14	110	808	HDPE	
	NM15a	200	1,159	HDPE	
	NM15b	160	903	HDPE	
	NM16	200	350	HDPE	Laying of a new pipeline in Magongoni
		110	525	HDPE	
	NM17a	350	923	FERROUS	
	NM17b	110	393	HDPE	
	NM18a	110	267	HDPE	
	NM18b	110	340	HDPE	
	NM19	160	1,273	HDPE	
	NM20a	110	683	HDPE	
	NM20b	110	966	HDPE	
	NM21	110	434	HDPE	
	NM22	110	3,452	HDPE	Laying of a new pipeline in Bamburi
	NM23	350	2,671	FERROUS	Replacement of AC Pipeline in Kisauni/ Shanzu
	NM24	200	3,674	HDPE	

3.4 Investment Requirements for Mombasa North Mainland

A summary of the Investment Requirements for Mombasa North Mainland in the Short-Term Works under which this ESIA is prepared are given in **Table 3.3** below. The estimated project implementation duration is 34 months.

Table 3.3: Mombasa North Mainland Investment Requirements (Short Term)

	Description	Amount (Ksh)	Amount (USD)
1	Preliminaries & General	121,607,901	1,216,079
2	Primary and Secondary Mains:	339,308,878	3,393,089
3	Tertiary and Service Mains	125,730,530	1,257,305
4	Consumer Connections	88,415,220	884,152
5	Bulk Water Meters	80,400,494	804,005
6	Schedule of Dayworks	1,261,580	12,616
	Bills Total Exclusive of VAT (A)	756,724,603	7,567,246
	Add 10% of (A) for Contingencies (B)	75,672,460	756,725
	Bill Total Inclusive of Contingencies (C)	832,397,064	8,323,971
	Value Added Tax (VAT) - 16% of (C) (D)	133,183,530	1,331,835
	GRAND TOTAL [(C) + (D)]	965,580,594	9,655,806

Note: 1USD=Kshs.100

4 APPROACH AND METHODOLOGY

4.1 Screening for Environment and Social Impacts

An essential element of the ESIA is Environmental Screening for potential environment and social impacts that are likely to be triggered by infrastructure Projects. Therefore, the ESIA ensures that designs and investments are environmentally and socially sustainable, consequently commissioning the study to ensure environmental and social findings are integrated into the designs. Therefore, screening for environment and social risks adopted a standard screening checklist and guided by WSDP ESMF February 2017 and sample filled screening checklist for MOWASSCO Project target area is presented as **Appendix 4** of this Report.

As guided by WSDP ESMF February 2017, World Bank OP 4.01 and Kenya' Environment Impact Assessment and Audit regulations of 2006, the project qualifies to be subjected to an Environment Assessment at Project Report level and therefore the reason for commissioning an environment and social impact assessment.

4.2 Objectives of the ESIA Assessment

This Environmental & Social Impact Assessment (ESIA) has been conducted in compliance with the Environmental Impact Assessment Regulation as outlined under the Gazette Notice No. 56 of 2003 established under the Environmental Management and Coordination Act (EMCA) 2015 and EMSF and provisions of the World Bank OP 4.01. The ESIA is expected to achieve the following:

- Identify all potential significant environmental and social impacts of the proposed Project and recommend measures for mitigation.
- Assess and predict the potential impacts during site preparation, construction and operational and decommissioning phases of the Project.
- Guide compliance with project ESMF, WB OP. 4.01 and the national environmental and social regulations.
- Generate baseline data for monitoring and evaluating how well the mitigation measures are being implemented during the Project cycle.
- Promote stakeholders' engagement and public participation.
- Design an Environmental and Social Management Plan to avoid, mitigate and where not possible, offset the identified impacts so as to ensure sustainability of the proposed Projects.
- Recommend feasible, cost effective and culturally appropriate measures to be implemented to mitigate against the potential negative impacts while ameliorating the positive ones.

4.3 ESIA Methodology

The approach to this exercise was structured to cover the requirements under the EMCA, 2015 as well as the EIA regulations as stipulated under the Gazette Notice No. 56 of 13th June 2003 and WSDP ESMF February 2017 and World Bank OP 4.01.

The assessment involved an understanding of the Project background, the Project designs and the implementation plan as well as Project commissioning. In addition, the baseline information was obtained through physical investigation of the site and the surrounding areas, interviews with surrounding community members through local administration and County structures, stakeholder mapping, photography and most importantly, discussions with the Client and the Project Design Team.

4.3.1 Environment and Social Scoping

The scoping study covered the physical, biological, socio-economic and cultural environment within the Project proposed areas within Mombasa North Mainland. The scoping study identified significant environmental and social issues associated with the proposed Works as well as sensitive receptors likely to be impacted by the Project Activities.

The Scoping Study involved the following activities:

1. Field visit to the Project Sites
2. Literature review of technical reports
3. Initial and broad assessment of the Project
4. Review of policies, regulations and baseline data
5. Determination of geographical coverage.
6. Identification of relevant stakeholders (interested and affected parties).
7. Significant impacts (areas of study) and the levels of detail in each impact study.

4.3.2 Desk Review

A desk review was conducted prior to the site visits. Documents reviewed include:

- Preliminary Environment and Social Impact Assessment (ESIA) for Water Distribution Network for MOWASSCO (MIBP/ NIPPON, 2017).
- Prioritized Investment Plan Report for Water Distribution Network for MOWASSCO (MIBP, 2018).
- Mombasa County Integrated Development Plan (CIDP) (2012 to 2017)
- National Environmental Acts and Regulations (EMCA 2015 and EIA/EA Regulations 2003)
- World Bank Operational Safeguard Policies OP 4.01 on Environment Assessment, OP 4.12 on Involuntary Resettlement and OP 4.11 on Physical Cultural Resources
- Water and Sanitation Improvement Project (WSDP) Environment and Social Management Framework (ESMF) February 2017.
- Water and Sanitation Improvement Project (WSDP) Resettlement Policy Framework (RPF) February 2017.

4.3.3 Field Assessment

The physical evaluation of the Project area was carried out with specific focus on the environmental and social issues. The assessment was carried out from 25th June to 28th July 2018. The environmental issues assessed include; Project impacts on vegetation resources, water resources, soil resources, liquid and solid waste management, health and safety impacts which include noise, excessive vibrations and air pollution.

The social issues included; settlement patterns, socio-economic activities, land use, and the presence of traditional/cultural sites in the area, gender-based violence, sexual exploitation and abuse, violence against children and labour influx related impacts. On the socio-economic front, structured stakeholder consultation meetings were held in addition to interviews with the stakeholders to capture the views of all the parties affected. Detailed methodology on data collection and field surveys for the above narrated environmental variables is presented in sub sections below.

4.3.4 Data collection and Site Surveys

Data collection and site surveys involved visiting stakeholder institutions and making consultations with key community members in all the target locations in the Project area.

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

4.3.5 Flora and Fauna Surveys

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

4.3.6 Socio-Economic Baseline

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

4.3.7 Secondary and Primary Data

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

4.3.8 Public Participation

4.3.8.1 Methodology of Stakeholder Consultations

This assessment recognizes that consultation is an ongoing process throughout Project implementation phases. Under this Project consultation was undertaken during the ESIA process and will continue during the construction and operational phases of the project.

The ESIA team conducted public participation within the project area with an aim of giving the community a platform to express their environmental and social concerns in relation to the project. Institutional consultations were conducted with relevant lead agencies and interested parties in relation to the project. These institutions included;

- The Local National Government Administration Units headed by Area Chiefs
- Project Affected Persons
- Learning Institutions (Technical University of Mombasa)
- General Community Members who included the business community and residents
- The Local Ward Representative Units headed by Members of County Assembly
- The Water and Services Provider (WSP) MOWASSCO
- Water Service Board (Coast Water Works Development Agency)
- Roads agencies including Kenya National Highways Authority (KeNHA) and Kenya Urban Roads Authority (KURA)

The consultations were through a key informant interviews for institutional stakeholders as detailed in **Table 4.1** below. Public meetings on the other hand were organized through the existing local National Government administration leadership headed by chiefs who were given adequate time to mobilize the participants

More stakeholder consultations will be undertaken at sectorial review of the ESIA prior to issuance of the environment license as well as during project implementations phases of the Project.

4.3.8.2 Institutional Consultations

The purpose of the consultations was to ensure that issues and concerns of all relevant institutions are documented, and appropriate mitigation measures are provided. Details of the issues discussed, and their outcomes are as documented in **Appendix 1. Table 4.1** below presents a summary of institutions consultations with relevant institutions.

Table 4.1: Schedule of Institutional Consultations in Mombasa North Mainland Area

Date	Officer consulted	Institution
31 st October 2018	Mwalimu Cristom K	Environmental and Safeguards Officer- MOWASSCO
31 st October 2018	Naima T. Yusuf	Ag General Manager Business Commercial - MOWASSCO
31 st October 2018	Mark Mwambota	Ag General Manager Engineering
31 st October 2018	Maldrine Mshai	Ag Business Unit Manager- North Mainland (Kisauni)
31 st October 2018	Hamisi S. Kesi	Chief Kisauni

4.3.8.3 Public Meetings

The purpose of conducting public meetings in Mombasa North Mainland was to allow the general public, as well as interested and affected parties, to give their views on the proposed Project. The meetings were held in accordance with the requirements of NEMA and the WB OP. 4.01 policy and guidelines for conducting an ESIA.

The specific objectives of this public consultation were to:

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

Issues raised during the deliberations of the meetings were recorded and are summarized in **Appendix 1. Table 4.2** below provides a schedule of Public Meetings held with Project Interested Persons within Mombasa North Mainland area.

Table 4.2: Schedule of Public Meetings within Mombasa North Mainland Area

Date of the Meeting	Meeting Venue	Participants Involved	Number of participants & Gender Representation
8 th November 2018 at 11 am	North Mainland Kisauni Sub Location Mombasa County	<ul style="list-style-type: none"> • Area Assistant Chief • Nyumba Kumi Chairperson • Consultant representative • MOWASSCO representatives • Residents of Bamburi and Mto Panga 	Male: 15 Female: 8
			TOTAL 23

4.3.9 Adverse Environment and Social Impacts Ranking

4.3.9.1 Impact Identification

The environment and social impact identification and analysis was done using the Leopold matrix, this method is an environment impact assessment method pioneered in 1971 by an Environment Researcher Called Leopold. The matrix is a grid that is used to identify the interaction between project activities, which are displayed along one axis, and environmental characteristics, which are displayed along the other axis.

4.3.9.2 Impact Rating Variables

The impact rating evaluation adopted is summarized in three key areas related to the extent of the impact, timing of occurrence of the impact, intensity of the impact and probability of the impact as explained in **Table 4.3** on **Page 4-6**.

Table 4.3: Impact Rating Variables

Impact Rating	Explanation
Extent	An area of influence covered by the impact, if the action produces a much-localized effect within the space, it is considered that the impact is low (1) . If, however, the effect does not support a precise location within the project environment, having a pervasive influence beyond the project footprint, the impact will be at location level (3) or could be Beyond County (5)
Timing:	Refers to the moment of occurrence, the time lag between the onset of action and effect on the appearance of the corresponding factor. We consider five categories according to this time period is zero, up to 1 year (short term), or more than two years, which are called respectively medium term (3), long-term (4), and permanent (5).
Intensity	Refers to the degree of impact on the factor, in the specific area in which it operates, ranked from low (1) to high (5).
Probability	Refers to the likelihood of the impact occurring during the project implementation, this is also ranked as Probable (1) to highly probable.

4.3.9.3 Impact Severity

The impact severity was determined based the capacity of the receptor to sustain shocks triggered by the impact. In this regard the impact severity could be termed as negligible, low, medium or high as summarized in **Table 4.4** below.

Table 4.4: Impact Severity

Sensitivity	Definition (considers duration of the impact, spatial extent, reversibility, and ability of comply with legislation)
High	Vulnerable receptor (human or ecological) with little or no capacity to absorb proposed changes or minimal opportunities for mitigation.
Medium	Vulnerable receptor (human or ecological) with limited capacity to absorb proposed changes or limited opportunities for mitigation.
Low	Vulnerable receptor (human or ecological) with some capacity to absorb proposed changes or moderate opportunities for mitigation
Negligible	Vulnerable receptor (human or ecological) with good capacity to absorb proposed changes or and good opportunities for mitigation

As explained by Leopold (1971), for effective impact identification, the environment characteristics are assigned weights used to indicate the severity of environment impacts detailed in **Table 4.5** below.

Table 4.5: Impact Rating Criteria for Environment and Social Risks

Extent		Duration		Intensity		Probability		Weighting Factor (WF)		Severity Rating (SR)		Mitigation efficiency	
Foot print	1	Short term	1	Low	1	Probable	1	Low	1	Low	0-19	High	0,2
Site (1km radius)	2	Short to medium	2			Possible	2	Low to Medium	2	Low to Medium	20-39	Medium to High	0,4
Location	3	Medium term	3	Medium	3	Likely	3	medium	3	Medium	40-59	medium	0,6
Sub County	4	Long term	4			Highly likely	4	Medium to high	4	Medium to high	60-79	Low to medium	0,8
Beyond County	5	Permanent	5	High	5	High	5	High	5	High	80-100	low	1,0

4.3.9.4 Approach to Mitigation and Management

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

Where feasible the following hierarchy of mitigation measures has been applied to reduce, where possible, the significance of impacts to acceptable levels:

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

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

4.3.9.5 Abbreviated Resettlement Action Plan

An Abbreviated Resettlement Action Plan (ARAP) has been developed in conjunction with this ESIA to mitigate the economic displacement impacts arising from the Project. The ARAP conducted a baseline socio-economic survey, a census survey, and an asset inventory of project affected persons. The ARAP presents entitlements and compensation options that form the basis for further negotiations between the project-affected persons and MOWASSCO on behalf of Mombasa County Government.

5 ENVIRONMENT AND SOCIAL SETTING OF THE PROJECT AREA

5.1 Project Location

Mombasa is the second largest city and major seaport of Kenya, located in south-eastern part within the country. It is located between the Latitudes 3° 80' and 4° 10' S and Longitudes 39° 60' and 39° 80' E.

It is the most important port city in the East African Region. In the national context, after Nairobi (the capital city), Mombasa acts as a natural magnet for urban-rural migration due to its location, economic opportunities and administrative role within Kenya. Some of the other main urban centres / towns surrounding Mombasa are Malindi, Kwale, Kilifi, Lamu, Mariakani and Voi.

Administratively, Mombasa County is divided into six sub-counties / constituencies namely Changamwe, Jomvu, Kisauni, Nyali, Likoni and Mvita. Of these, only Kisauni and Nyali sub-counties / constituencies are in Mombasa North Mainland.

The water supply and sanitation systems in Mombasa County is managed by Mombasa Water Supply and Sanitation Company Ltd, MOWASSCO.

5.2 Physical Environment

5.2.1 Climate

Mombasa has a tropical wet and dry climate. The rains occur during the inter-monsoonal period, with the long rains starting from March to June, while the short rains occur from October to December.

Mombasa is generally hot and humid all year round. The mean daily temperature ranges between 22°C to 29.5°C. Average relative humidity along the coastal belt is 65% but decreases towards the hinterland. The lowest temperature is experienced during the long rains season.

5.2.2 Topography and Geology

Mombasa County is divided into three physiographic belts i.e.:

The 'Coastal Plain' forms the white sandy beaches next to the Indian Ocean. The land formation is a build-up of eroded reef material i.e. corals, sand and alluvial deposits on the inshore side of the reef. This plain is approximately 6 km wide, and includes the Island Division, Kisauni on the North Mainland and Mtongwe to the South.

The 'Foot Plateau' occurs after the coastal plain made up of Jurassic shale rock which is broken/dissected through erosion. In some places, it is overlain with residual sandy plateau. This is found mainly in Changamwe

The Nyika Plateau is in the higher areas covered by Duruma Sandstone series and older rocks to the west.

5.2.3 Soils

The soils in Mombasa represent a wide range of profile characteristics. According to the Kenya Soil Survey (1982) they can be grouped into five categories:

- Soils in Mangrove Swamps: These soils are very poorly drained, very deep, olive to greenish and grey, soft, excessively saline, and moderately to strongly sodic, loam to clay, often with sulfidic material (thionic fluvisols and cleyic Folonchaks). The soil texture is medium to heavy.
- Soils Developed in Shales: These soils are heavy and moderately to highly fertile. They are an association of: (a) well drained to imperfectly drained; shallow to moderately deep; yellowish brown to very dark grey; firm to very firm clay, dissected parts (eutric CAMBISOLS, partly lithic phase and (b) imperfectly drained, deep, dark grey very firm clay, with humid topsoil and sodic deeper subsoil or interfluves (verto luvis PHAEZEMS sodic phase, with vertic Cambisols, sodic phase). The soils are found near Mtwapa to the north and Mazeras to the North West.
- Soils Developed on Higher Level Lagoonal Deposits (Kilindini Sands) Soils in this category are light and of low to very low fertility. They are excessively drained, very deep, reddish yellow to white, loose sand to loamy (albic and ferratic Arenosols). These soils are to be found at Port Reitz and Changamwe.
- Soils Developed on Lower Level Lagoonal Deposits Here the soils are variable and of low fertility. They are a complex of very deep soils of varying drainage condition, colour, consistence, texture and salinity (albic Arenosols, orlric Ferrosols, gleyic Luvisols, solodic Planosols, pellic Vertisols). The soils are found at Mtongwe and Nyali.
- Soils Developed on Raised-Coral-Reef Limestone, with a Mixture of Lagoonal Deposits These soils are of light, medium to heavy texture and of low fertility. They are well drained, deep, dark red to reddish brown, friable sandy clay loam to sand clay, with topsoil of loamy sand (rhodic Ferrasols). These soils are found in Likoni along the coastline.

5.2.4 Hydrology

There are two main rivers that drain into the coast - river Tana and River Sabaki. River Tana is the longest; originating from Mt Kenya and draining into the Indian Ocean, a distance of about 850km. It has a catchment area of 132,000 km² and discharges an annual average of 4.7 x 10⁹ million m³ of freshwater and 3.0 million tonnes of sediment into the Indian Ocean with peak discharges during the rainy season from April to June. It enters the ocean at Kipini. About 30 km upstream, River Tana branches and the tributary proceeds to form the Tana delta.

There are also several semi-perennial and seasonal rivers such as the Mwache, Kombeni, Tsalu, Nzovuni, Umba, Ramisi, Mwachema and Voi, all of which drain into the coastal region from arid and semi-arid catchments. The Ramisi River, which arises in the Shimba Hills forested area, discharges 6.3 million M³ of freshwater and 1,500 tonnes of sediments annually into the Funzi -Shirazi Bay in the southern part of the

Kenyan coast. The Unga discharges 16 million m³ of freshwater into the Funzi - Shirazi Bay while the Mwachema and Mwache rivers discharge 9.6 million M³ and 215 million M³ of freshwater annually, respectively.

The project area is located within Mombasa Municipality which is an urban setup highly influenced by anthropogenic activities which have led to the area dominated by housing, commercial and residential structures. Therefore, no streams or rivers except for storm water drains belonging to Mombasa county government. Additionally, residents have dug shallow wells to supplement water supply from MOWASSCO.

5.3 Biological Environment

5.3.1 Vegetation and Flora

Most of the natural vegetation on dry land in Mombasa has been cleared from sites for construction of residential and industrial quarters. Nonetheless five vegetation zones can be distinguished albeit obliterated or broken on certain parts of the County:

Afzelia-Albizia/Panicum (Lowland Moist Savanna): The areas suited for this type of vegetation include Mombasa Island, Chagamwe, and Likoni.

Manilkara-Dalbergia/Hypargyrea (Lowland Cultivation Savanna): This is found in a small area around Mtongwe.

Brachystegia-Afzelia: (Lowland Woodland): The Lowland Woodland type of vegetation thrives in the north coast in Kisauni and on a small part to the south of Mtongwe.

Combretum Schumanii-Cassipourea: (Lowland Dry Forest on Coral Rag): This vegetation zone is found all along the coastline from Cannon Point through Shelly Beach to Diani Beach in Kwale County.

Mangrove Thickets: This is the only natural vegetation zone in Mombasa County that has not been cleared out completely and that is mainly because mangroves grow in tidal swamps unsuitable for human settlements. In addition, they are gazetted forest, and therefore protected and managed by Kenya Forest Service. The mangrove thickets are found at Port Reitz Creek, Port Tudor Creek and Mtwapa Creek, covering an area of approximately 3,059.0 ha.

Potentially Mombasa County has an outstanding diversity of natural vegetation but being an urban area, natural vegetation has very little chance of survival except on selected areas such as parks. Mangroves are threatened because of the huge demand for mangrove poles in the building industry. Much of the project area is situated in urban centres where vegetation cover is very low.

Within the Project area, anthropogenic activities have led to cleared vegetation cover within the proposed routes to provide space for construction of residential and commercial structures. Therefore, impact to vegetation cover within the Project alignment will be minimal limited to species like the Coconut trees, Mango, baobab tree commonly referred to as 'Mmbuyu', Neem tree locally referred to as "Mukurudadi:

5.3.2 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 already developed.

However, limited rodents like squirrels, moles and different bird and insect species among others are found in the area. Livestock keeping is significant with cattle livestock, goats, sheep, bees, poultry, rabbit and pigs

5.4 Social Economic Setting

5.4.1 Population

As earlier mentioned, Mombasa County, which is the area of jurisdiction of MOWASSCO WSP, comprises of four distinct Geographical Areas which correspond to Administrative Divisions, namely:

- Mombasa Island (Island Division)
- North Mainland (Kisauni Division)
- South Mainland (Likoni Division)
- West Mainland (Changamwe Division)

Based on the Medium Variant Growth Rate adopted in the study, the population of Mombasa County was estimated to be **1,233,745** (year 2016), projected to grow to **1,426,072** in the year 2020 and ultimately rise to **2,427,157** by the year 2040. The population of Mombasa North Mainland which is the project area was estimated to be **513,059** (year 2016), projected to grow to **600,207** in the year 2020 and ultimately rise to **1,057,858** by the year 2040.

The population density patterns are dictated by the availability of infrastructure and cheap housing. North Mainland is predominantly a residential area with several commercial shopping centres. Its Coastal strip with Sandy beaches is mainly occupied by hotels and tourist resorts.

The population in Mombasa North Mainland is projected to have a high growth rate due to:

- Change of the nature of residential developments from “Swahili” type single storey buildings to multi-storey apartment blocks
- Increased number of people seeking employment in the region in tourism sector and other businesses

5.4.2 Land Ownership

Land ownership in most areas is not guaranteed as most of the residents do not legally own land. They live on land owned by absentee landlords. A number of informal settlements exist in the County. The growing population continues to exert pressure on existing units of housing, creating a huge demand for quality and affordable housing. The current land tenure has also made it difficult for physical planning of the county to be undertaken.

The proposed pipelines alignments lie within existing road reserves and wayleaves shared by local utilities owned by the relevant Road Authorities i.e. Kenya Urban Roads Authority (KURA), Kenya Rural Roads Authority (KeRRA) or Kenya National Highways Authority (KeNHA). Therefore, no land will be acquired since the PAPs are occupying the land informally.

5.4.3 Land Use

Human settlement in the coast is characterized by rapid urbanization and mushrooming of unplanned settlements due to high population growth rate and shortage of quality and affordable housing. The informal settlements lack proper access roads, drainage systems, water and provision of social amenities such as schools.

In the past, industrial development took place only in the island. The town planning scheme of 1926 set aside specific areas which were zoned for industry and warehousing, as well as the port and other urban functions. In the 1950's, large amounts of land were purchased at Changamwe with the intention of making it available for industries; thus the oil refineries at Changamwe.

The main crops under cultivation in the County include cassava, cucurbits family, maize, vegetables, millet and sorghum. These are most preferred due to their resistance to diseases and pests. The total acreage under food crop stands at 400 ha while the total acreage under cash crop is 500 ha. Livestock keeping and fishing is also practiced in the County.

5.4.4 Settlement Patterns

Population distribution and settlement patterns in the County are influenced by proximity to vital social and physical infrastructure networks such as roads, housing, water and electricity. Other factors that influence settlement patterns include accessibility to employment opportunities, availability of cheap housing, security and land tenure systems.

Highly populated areas are in Majengo, Bamburi, Bangladesh, Mikindani, Jomvu, Miritini, Migadini, Port Reitz, Mishomoroni and Bombolulu. The County has various settlement schemes namely Mwakirunge, Jomvu-Kuu, Bububu-A, Shika Adabu, Vyemani, Mwembelegeza and Majaoni. Considerable number of landless people most of whom live in the city 's slums of Mishomoroni, Junda and Kisumu ndogo in Kisauni (North Mainland), Shika-Adabu and Ngomeni in Likoni (South Mainland) and Bangladesh in Changamwe (West Mainland).

5.4.5 Gender Based Violence (Situational Analysis)¹

The Sexual and Gender Based Violence (2017) defines Sexual and gender-based violence (SGBV) as violence inflicted or suffered on the basis of gender differences. This form of violence mostly impacts women who are considered generally vulnerable. The National Crime Research Centre data on SGBV provides a grim image of instances of SGBV. It is indicated in their report that the Centre has so far supported over 21,341 survivors of SGBV, of whom 56% were women, 36% girls, 3% men and 5% boys. A study conducted by Dimovitz, Kirsten on GBV management in Nairobi revealed that male victims of SGBV were a smaller proportion compared to women which ratio stood at 14:86.

The study further revealed that medical facilities are not accessible to victims and in most instances are at least 40-90 minutes from near bus stations. Police were also indicated to be a puzzle in the long line of bureaucratic processes and which is compounded by outside of legal services which have their own barriers in seeking services and help. These factors are said to create high attrition rates in access to justice, because survivors do not have the time, resources, or willpower to navigate the system.

Coastal region similarly experiences its own forms of SGBV which is said to be compounded by the fact that most culprits go scot free due to lack of evidence as most residents are not aware of how to preserve evidence. It is in fact more severe that a majority of child sexual abuse cases go unreported because of fear of stigmatization in the region.

An organization known as Sauti ya Mwanamke has been on the forefront trying to fight SGBV within the Coastal region. With support from the Peace Initiative Kenya, the group has engaged with Coastal region resulting into passing of a policy to establish a GBV kitty to support victims and survivors of GBV. Essentially therefore, Counties are seen as a great actor in aiding the fight against SGBV. Despite the existing data on SGBV in Kenya, reporting has been a challenge due to underlying infrastructural impediments and lack of one national SGBV monitoring and evaluation framework that can consistently collate and present data on SGBV for analysis.

5.4.6 Source of Energy

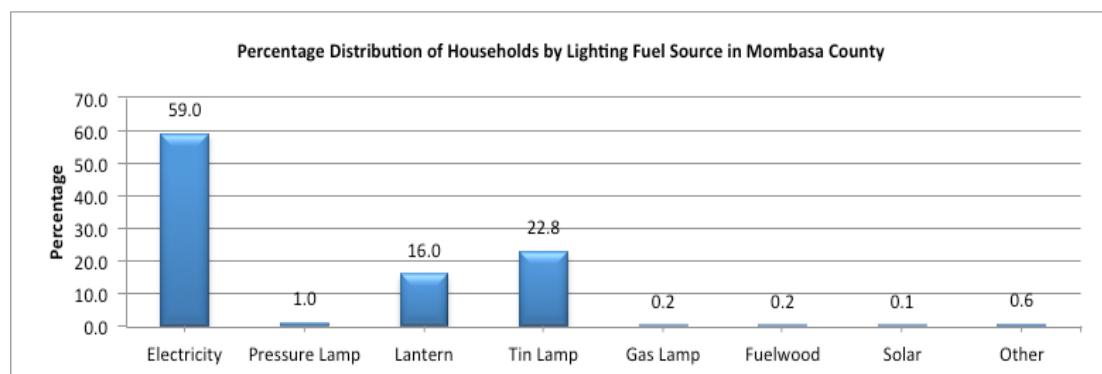
The Kipevu power plant produces power which is fed into the national grid. There are plans to construct an 800MW LNG power plant in Dongo Kundu area.

Only 9% of residents in Mombasa County use liquefied petroleum gas (LPG), and 39% use paraffin. 6% use firewood and 41% use charcoal. The most common cooking fuel among male headed households is paraffin and charcoal at 40% each while the most common cooking fuels for female headed households is charcoal 45%.

Likoni Division has the highest level of charcoal use in Mombasa County at 46%.

¹ Statistics provided in this sub section was borrowed from the Policy of Sexual and Gender Based Violence of 2017

Changamwe Division has the highest level of use of paraffin in Mombasa County at 49%. A total of 59% of residents in Mombasa County use electricity as their main source of lighting. A further 16% use lanterns, and 23% use tin lamps. 0.2% use fuel wood. **Figure 5.1** below shows distribution of households by lighting fuel source.



Source KNBS 2013

Figure 5.1: Distribution of households by lighting fuel source

5.4.7 General Infrastructure

In Mombasa County, 71% of homes have either brick or stone walls. 24% of homes have mud/wood or mud/cement walls. Less than 1% has wood walls. 1% has corrugated iron walls. less than 1% has grass/thatched walls, 5% have tin or other walls.

77% of residents have homes with cement floors, while 14% have earth floors. Less than 1% has wood and 5% have tile floors. 9% of residents have homes with concrete roofs, while 75% have corrugated iron roofs. Grass and makuti roofs constitute 4% of homes and less than 1% has mud/dung roofs.

82% of residents in Mombasa County use improved sanitation, while the rest use unimproved sanitation.

There are a total of 257.17Km of bitumen surface roads, 127Km of gravel surface roads and 91.29 Km of earth surface roads in the county. The Dongo-Kundu by-pass is expected to ease congestion at the central Business district, as traffic from Nairobi to South coast shall be diverted at Miritini towards Likoni and Diani. Major roads within North Mainland include Nyali, Links, Mount Kenya, Old Malindi, Bamburi and Malindi.

All the major banks operating in Kenya have a presence in Mombasa County. The Central Bank of Kenya has a branch in the city which offers financial services to commercial Banks.

5.4.8 HIV and AIDS

Due to the location of the county as a sea port, cases of drugs and substance abuse and trafficking have been on the increase. HIV/AIDS prevalence at the county was at 8.1% against a national average of 6.35 (KNBS, 2013). AIDS related deaths are common and those mainly affected are within the productive age group of 15-49 years

of age, leaving minors and the elderly people to take care of households. It was also noted that the number of HIV/AIDS orphans is on the increase.

Drug abuse is viewed as a major cause of HIV/AIDS. Poverty also increases vulnerability of people with HIV, hence there is need to redirect resources towards support services to poor households. Progressive gains on poverty reduction may be reversed if concerted efforts are not urgently put in place to bring the HIV/AIDS pandemic under control. Implementation of the project thus needs to create comprehensive HIV/AIDS awareness among the workers along the project area.

5.4.9 Water Supply

The main water supply within the area is from Mombasa Water Supply and Sanitation Company Ltd. However, water supply is not reliable and therefore to supplement water supply, resident and private entities have drilled private boreholes and shallow wells.

The wells are uncovered and shallow and hence posed a health hazard to the population using them for their water supply. Furthermore, although some of the wells had been equipped with hand pumps, due to lack of maintenance none of the pumps were working and well users had broken the concrete plates covering wells and reverted to drawing water from the wells using a rope and bucket.

6 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

6.1 Introduction

The water distribution network proposed under immediate works for Mombasa North Mainland will be implemented under several Laws, By-laws, Regulations and Acts of Parliament. Therefore, this section assesses existing policies and legislative framework applicable during management of infrastructure Projects at different stages.

6.2 Policy Provision

The proposed investments will be implemented within provisions of various government policies as summarized in **Table 6.1** below:

Table 6.1: Policy Framework

No	Policy	Applicability
1	Constitution of Kenya 2010	The CoK at Article 43 (1) provides that every person has the right – (b) to accessible and adequate housing, to reasonable standards or sanitation; and, (d) to clean and safe water in adequate quantities. These provisions oblige state organs and bind them to provide not just high quality or clean and safe water but also adequate quantities to all people that they will serve. Also, 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.
2	Kenya Vision 2030	This is the current national development blueprint for period 2008 to 2030. The vision has three pillars – economic, social and political. It is recognized that Kenya is a water scarce Country but stated (Kenya, 2007: 115) that the Vision for the water and sanitation sector is “to ensure water and improved sanitation services availability. The Project will directly contribute towards achievement of objectives of vision under the environment and social pillar through provision of the planned sanitation investments under the Master Plan.
3	National Climate Change Response Strategy, 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 (Kenya, 2010: 53). Importantly the ESIA has proposed measures to be complied with during Project operation by MOWASSCO in order to reduce o water loses that are triggered by illegal connections and leakages.
4	National Environment Policy (NEP)	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. During construction and operation phases of the Project the ESMMP provided in chapter 8 of this assessment should be implemented in order to ensure that the ecosystems are not destabilized by the subsequent

No	Policy	Applicability
		Project activities especially effluent pollution of communal water points that are used by the community as alternative water sources.
5	HIV and AIDS Policy 2009	Mombasa town is a tourist town which receives visitors; therefore, cases of HIV/AIDs prevalence could be high because of existence of people from diverse social backgrounds. The HIV Policy therefore will be complied with during implementation of the Project; the Contract will incorporate in Bid Document and implement HIV awareness initiatives during construction of the Project.
6	Gender Policy 2011	This Policy will be referred to during Project implementation especially during hiring of staff to be involved in the Project, procuring of suppliers, sub consultants and sub-contractors to the Project
7	The Sustainable Development Goals (SDGs)	The concept of the SDGs was born at the United Nations Conference on Sustainable Development, Rio+20, in 2012. The objective was to produce a set of universally applicable goals that balances the three dimensions of sustainable development: environmental, social and economic. The Investments will therefore contribute towards achieving this goal through the proposed sanitation Project.
8	Policy on Gender and Sexual Based Violence 2017	The purpose of this policy is to put in place a framework to accelerate implementation of laws, policies and programmes for prevention and response to SGBV. The overall objective of the policy is to progressively eliminate sexual and gender-based violence through the development of a preventive, protective, supportive and transformative environment
9	Kenya National Youth Policy 2006	This Policy aims at ensuring that the youth play their role alongside adults in the development of the Country. The National Youth Policy visualizes a society where youth have an equal opportunity as other citizens to realize their fullest potential. Proposed Sanitation Project will provide direct employment to the youth as required by the Policy.
10	The National Environmental Sanitation and Hygiene Policy-July 2007	The Policy is devoted to environmental sanitation and hygiene in Kenya as a major contribution to the dignity, health, welfare, social well-being and prosperity of all Kenyan residents. The Policy recognizes that healthy and hygienic behavior and practices begin with the individual. The implementation of the Policy will greatly increase the demand for sanitation, hygiene, food safety, improved housing, use of safe drinking water, waste management, vector control at the household level and encourage communities to take responsibility for improving the sanitary conditions of their immediate environment. Implementing the Project will directly contribute to achievement of the Policy

6.3 Kenyan Legislations

The proposed investment will be implemented within provisions of various Acts of Parliament and Local Legislations as summarized in **Table 6.2** on **Page 6-3**:

Table 6.2: Acts of Parliament

No	Policy	Applicability
1	EMCA 1999 CAP 387 as amended in 2015	The Act provides for the establishment of a legal and institutional framework for the management of the environment. This is achieved through various regulations. Applicable regulations are; EMCA (Waste Management) Regulations, 2006 Legal Notice No. 121; EMCA (Water Quality) Regulations, 2006 Legal Notice No. 120; EMCA (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 Legal Notice No. 61; EMCA (Air Quality Regulations 2014)
2	The Environmental (Impact Assessment and Audit) Regulations, 2003	The regulation provides a framework under which Environment and Social Impact Assessment for the Project will be prepared, Regulation 4(1) further states that: (a) "...no Proponent shall implement a project: likely to have a negative environmental impact. (b) for which an environmental impact assessment is required under the Act or these Regulations, unless an environmental impact assessment has been concluded and approved in accordance with these Regulations..." The EIA to be carried out on the potential interventions should be carried out in accordance to the regulations. -An initial environmental audit should also be carried out in the first year of operation of the schemes.
3	Environmental Management and Coordination (Water Quality) Regulations, 2006	Regulation 9 of these regulations provides for water quality monitoring. It states that the "Authority in consultation with the relevant lead agency, shall maintain water quality monitoring for sources of domestic water at least twice every calendar year and such monitoring records shall be in the prescribed form as set out in the second schedule to these regulations". The regulation provides for the protection of ground and surface water resources. It also Provides the water quality standards for sources of domestic water which shall be complied with by the contractor during project construction and MOWASSCO during operations of the water supply system
4	(Waste Management Regulations, 2006	Regulation 4 (1) states that "no person shall dispose of any waste on a public highway, street, road, recreational area or in any place except in a designated receptacle". Regulation 4 (2) further states that "a waste generator shall collect, segregate and dispose such waste in the manner provided for under these regulations". The proponent will use provisions of this regulation to ensure that waste is handled, stored, transported and disposed as per this regulation. Provides for standards for handling, transportation and disposal of various types of wastes including hazardous wastes. -Requirements to ensure waste minimization or cleaner production, waste segregation, recycling or composting. -Disposal of generated waste including soil, vegetation, boulders; and will be appropriately disposed, the contractor will be required to develop Waste Disposal and Management Plan to be approved by the Resident Engineer

No	Policy	Applicability
		-Generation of hazardous wastes such as used oil and oily parts from construction machinery, such wastes will be collected by a NEMA licensed waste handler to be recruited by the contractor.
5	Noise and Excessive Vibration Pollution (Control) Regulations, 2009	<p>The Contractor will be required to ensure compliance with the above regulations in order to promote a healthy and safe working environment throughout the Construction Phase. This shall include regular inspection and maintenance of equipment and prohibition of unnecessary hooting by vehicles. The regulations provide for a maximum of 60 dBA during the day and 35 dBA during the night for a construction site.</p> <p><u>Sensitive receptors have been identified under this assessment under chapter 2 of the main report Such receptors are at a high risk of suffering impacts associated with noise and excessive vibrations.</u></p> <p>-License to emit noise/vibrations in excess of permissible levels to be acquired if necessary. -Sound level limits of 55dBA (day) and 35dBA (night) to be observed during construction of the project. At project operation no noise and excessive vibrations are envisaged.</p>
6	The Environmental Management and Coordination (Air Quality Regulations 2014)	<p>These regulations provide a framework for management of plant and equipment emissions of hydrocarbons on site. The regulations require that all plant and equipment on site should be well serviced to manufacturers specifications to avoid air pollution, the regulation also require monitoring of baseline air quality within construction site and implementation of correction action where the standards are not complied to.</p> <p>Water spray will be used at all times when working in dry areas to avoid risks associated with dust menace.</p> <p>The regulation provides</p> <ul style="list-style-type: none"> -Provides for ambient air quality tolerance limits. -Prohibits air pollution in a manner that exceed specified levels. -Provides for installation of air pollution control systems where pollutants emitted exceed specified limits. -Provides for the control of fugitive emissions within property boundary. -Provides for the control of vehicular emissions. -Provides for prevention of dispersion of visible particulate matter or dust from any material being transported. <p>The contractor will comply with these regulations by regulating.</p> <ul style="list-style-type: none"> -Exhaust emissions from construction machinery. -Site clearance and excavation of foundations. -Transportation and disposal of spoil.
7	Land Act, 2012	<p>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 general public.</p> <p>The Project proposed will be implemented within government land and along road reserves. The proposed pipelines alignments lie within existing road reserves and wayleaves shared by local utilities owned by the relevant Road Authorities i.e. Kenya Urban Roads Authority (KURA), Kenya Rural Roads Authority (KeRRA) or Kenya National Highways</p>

No	Policy	Applicability
		Authority (KeNHA). Therefore, no land will be acquired since the PAPs are occupying the land informally. However, an Abbreviated Resettlement Action Plan (ARAP) report has been prepared for compensation of likely assets and sources of livelihood that might be affected by the Project.
8	Water Act, 2016	The Water Act, 2002 was repealed in the year 2016 to align to the Kenyan Constitution 2010. The Act vests the responsibility of developing water and sanitation infrastructure (sewerage and water supply) in Mombasa County to Coast Water Works Development Agency (CWWDA) and operations to Mombasa County Government under the autonomous MOWASSCO. The Design and ESIA Teams have adequately involved MOWASSCO in the preparation of the Project.
9	County Government Act No. 17 of 2012	The proposed Project will be implemented in North Mainland within Mombasa County. Part II of the Act empowers the County Government to oversee the functions described in Article 186 of the Constitution, (county roads, water and sanitation, health). The Project once complete will be handed to MOWASSCO which is owned by Mombasa County Government for operation and maintenance.
10	Physical and Land Use Planning Act 2019	Section 56 of the said Act empowers the County Governments to reserve and maintain all land planned for open spaces, parks, urban forests and green belts as well as land assigned for public social amenities. The Project identified will be implemented as provided by Mombasa County Government and Land Use Plan for target towns.
11	The Urban Areas and Cities Act 2011	This Law passed in 2011 provides legal basis for classification of urban areas (City) when the population exceeds 500,000; a municipality when it exceeds 250,000; and a town when it exceeds 10,000) and requires the city and municipality to formulate County Integrated Development Plan (Article 36 of the Act). The Project described in this assessment is within Mombasa County CIDP 2013-2017.
12	Occupational Health and Safety Act (OSHA 2007)	The Act provides Environment Health and Safety (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.
13	The Public Health Act (Cap.242)	The Act provides Guidelines 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.
14	HIV and AIDS Prevention and Control Act 2011	The object and purpose of this Act is to (a) promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS; (b) extend to every person suspected or known to be infected with HIV and AIDS full protection of his human rights and civil liberties. The Act provisions will be applied during Project implementation phase where the contractor will be required to create awareness among workers and community at large.
15	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 minor (children).

No	Policy	Applicability
16	Child Rights Act (Amendment Bill) 2014	This Act of Parliament makes provision for parental responsibility, fostering, adoption, custody, maintenance, guardianship, care and protection of children. It also makes provision for the administration of children's institutions, gives effect to the principles of the Convention on the Rights of the Child and the African Charter on the Rights and Welfare of the Child. The contractor under this Project will be required to comply to provisions of the Act during Project implementation
17	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. This act will be applied by labour force on site in addressing disputes related to working conditions.
18	National Gender and Equality Commission Act 2011	The over-arching goal for National Gender Equality Commission Act (NGEC) is to contribute to the reduction of gender inequalities and the discrimination against all; women, men, persons with disabilities, the youth, children, the elderly, minorities and marginalized communities. This Act will be applied during hiring of workforce on site
19	Employment Act 2007	This Act of Parliament makes provisions for sexual harassment. It mandates all employers who employ twenty or more employees to issue a policy statement on sexual harassment and prohibits the worst forms of child labor
20	Public Participation Bill of 2018	The Bill is an Act of Parliament that provides a general framework for effective public participation and to give effect for the constitutional principles of democracy. The purpose of the act includes promotion of democracy and public participation of the people according to Article 10 of the Constitution, promote community ownership for public decisions and promote public participation and collaboration in governance processes. Therefore, adequate consultations were held within MOWASSCO Project area as discussed in Chapter (7) of this report.
21	The National Museums and Heritage Act 2006	An Act of Parliament to consolidate the law relating to national museums and heritage; to provide for the establishment, control, management and development of national museums and the identification, protection, conservation and transmission of the cultural and natural heritage of Kenya; to repeal the Antiquities and Monuments Act (Cap. 215) and the National Museums Act; and for connected purposes. This act together with World Bank policy OP 4.11 on Physical Cultural Resources will be triggered in the event that the project will encounter such materials, chance find procedures have also been provided in appendix 2
22	Community Land Act 2016	AN ACT of Parliament to give effect to Article 63 (5) of the Constitution; to provide for the recognition, protection and registration of community land rights; management and administration of community land; to provide for the role of county governments in relation to unregistered community land and for connected purposes. However, as indicated, no land acquisition is anticipated, this act will be referred to in the event the project will require to hire or lease community land
23	The Factories and Other Places of Work (Noise Prevention and	This Act will be referred to regularly together with provisions of OSHA 2005 and Noise and excessive vibration 2009 referenced (above)

No	Policy	Applicability
	Control) Rules, 2005	
24	Public Roads and roads of Access Act CAP 399, 2010	This is an Act of Parliament which provides legal guidance on roads of public travel and access to public roads. Section 8 and 9 of the Act provides for the dedication, conservation or alignment of public travel lines including construction of access roads adjacent to lands from the nearest part of a public road. Section 10 and 11 allows for notices to be served on adjacent land owners seeking permission to construct the respective roads including installation road furniture and other utilities.

6.4 World Bank Operational Policies (OPs)

Applicable World Bank Operational Safeguard Policies are listed in **Table 6.3** below.

Table 6.3: Applicable World Bank Operational Safety Policies

Safeguards Policies	Provision	Relevance to the Project
World Bank OP 4.01 on Environmental Assessment	-Provides for environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making	-An Environmental and Social Impact Assessment of the development/rehabilitation of water supply schemes will be carried out.
World Bank OP 4.12 on Involuntary Resettlement	The World Bank Involuntary Resettlement Policy OP 4.12 covers direct economic and social impacts that result from Bank-assisted investment projects.	-The total number of PAPs enumerated within the Project area were 31 PAPs who will suffer economic displacements
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 (Appendix 2) to be adopted by the contractor during civil works.

6.5 World Bank Group Environmental Health and Safety Guidelines on Water and Sanitation

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry- specific examples of Good International Industry Practice. When one or more members of the World Bank Group are involved in a project, these EHS Guidelines are applied as required by their respective policies and standards.

These industry sector EHS guidelines are designed to be used together with the General EHS Guidelines document discussed in 6.4 (above), which provides guidance to users on common EHS issues potentially applicable to all industry sectors.

The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs.

Application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets, with an appropriate timetable for achieving them.

Relevance to the Project

The EHS Guidelines for Water and Sanitation include information relevant to the operation and maintenance of:

- (i) Potable water treatment and distribution systems
 - (ii) Collection of sewage in centralized systems or decentralized systems and treatment of collected sewage at centralized facilities.
- The above discussed Guidelines/ Instruments, present Environmental Health issues concerned with Water Distribution and the necessary requirement to assure adequate capacity to supply the water demand.

The most significant environmental issues associated with operation of water distribution systems include: Water system leaks, loss of pressure and water discharges. The design for the project has ensured these environment risks are mitigated.

6.6 Legal and Policy Provisions for Stakeholder Participation

Stakeholder and public participation are guided by various legal and policy framework documents. For the proposed Mombasa North Mainland Water Distribution Network Project, public consultation activities conform to both National and International Legal Instruments as described in **Table 6.4** below.

Table 6.4: Legal and Policy Provisions for Public Participation

Level	Statutes
National (Kenya)	Kenya Constitution 2010 Articles 10(2), 35, 69(1), 118, 174(c), 184(1)(c), 196, 201(a), 232(1)d
	Public Participation Bill 2016
	The Environmental Management and Coordination Act (EMCA), 2015 and subsequent regulations of Environment Impact Assessment and Audit Regulation of 2003
International	World Bank Operational Policy of Environment Assessment (OP 4.01)

(a) Kenyan Constitution 2010

Table 6.5 below provides in detail, Sections of the Kenya Constitution which require public participation in governance.

Table 6.5: Kenya Constitution Provision for Stakeholder and Public Participation

Article	Public Participation Provision
Article 10(2)	Provides national values and principles of governance , this Article bind all State Organs, State Officers, Public Officers and all persons whenever any of them (c) makes or implements public policy decisions.

Article	Public Participation Provision
	The national values and principles of governance as provided in the constitution include; patriotism, national unity, sharing and devolution of power, the rule of law, democracy and participation of the people and sustainable development .
Article (35)	Provides for Access to information , the articles indicate that every citizen has the right of access to information held by the State; an information held by another person and required for the exercise or protection of any right or fundamental freedom. The same article provides that the State shall publish and publicize any important information affecting the nation.
Articles 174(c)	State objectives of devolutions, among them is that devolution gives powers of self-governance to the people and enhance the participation of the people in the exercise of the powers of the State and in making decisions affecting them and to recognize the right of communities to manage their own affairs and to further their development
Article 184	It is exclusive to urban areas and Cities , the article provides that National legislation shall provide for the governance and management of urban areas and cities and shall, among other provisions provide for participation by residents in the governance of urban areas and cities.
Article 201(a)	Provides Principles of public finance which require openness and accountability, including public participation in financial matters;
Article 232(1)	Provides values and principles of public service include among others involvement of the people in the process of policy making;

Kenya's Environmental Impact Assessment / Audit Regulations of 2003 require that in the process of conducting Scoping, Environmental and Social Impact Assessment (ESIA), the proponent (in this case Coast Water Works Development Agency CWWDA) shall in consultation with the National Environment Management Authority (NEMA); seek the views of persons who may be affected by the Project.

Also, in accordance with the Kenyan Constitutional requirement (Article 10) on Public Participation, it's a democratic right of every Kenyan to participate in public decisions and collaborate in Public Projects such as proposed Water Distribution Project.

7 STAKEHOLDER AND PUBLIC PARTICIPATION

7.1 Objectives of Stakeholder Participation

Stakeholder consultation is generally useful for gathering environmental data, understanding likely impacts, determining community and individual preferences, and designing viable and sustainable mitigation and compensation plans.

Stakeholder consultation during ESIA process is undertaken during the design, implementation and initial operation stages of the Project. The aim is to disseminate information to interested and affected parties (stakeholders), solicit their views and consult on sensitive issues.

The specific aims of the Public Consultation and Participation process during the Preparation of the ESIA at the design stage include:

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

7.2 Stakeholder Mapping

This was done to ensure that all the stakeholders likely to be affected or influenced by the Project were identified and involved in ESIA assessment. **Table 7.1** below presents details of stakeholders who were engaged in the process.

Table 7.1: Institutional Consultation

Institution	Office Consulted
MOWASSCO	Environmental and Safeguards Officer- MOWASSCO
	Ag General Manager Business Commercial - MOWASSCO
	Ag General Manager Engineering -
	Ag Business Unit Manager- North Mainland (Kisauni)
Local Administration	Chief Kisauni
Kenya National Highways Authority (KeNHA)	Coastal Region Manager KeNHA

7.3 Stakeholder Participation Process

Therefore, to comply with the above discussed statutes, consultations were done with relevant stakeholders within the Project area during preparation of the ESIA Report. **Table 7.2** below provides schedule of institutional consultations. Details of issues discussed and their feedback is in **Appendix 1**.

Table 7.2: Schedule of Institutional Consultations

Date	Officer consulted	Institution
31 st October 2018	Mwalimu Cristom K	Environmental and Safeguards Officer- MOWASSCO
31 st October 2018	Naima T. Yusuf	Ag General Manager Business Commercial - MOWASSCO
31 st October 2018	Mark Mwambota	Ag General Manager Engineering
31 st October 2018	Maldrine Mshai	Ag Business Unit Manager- North Mainland (Kisauni)
31 st October 2018	Hamisi S. Kesi	Chief Kisauni
19 th November 2018	Eng Jared Makori	Regional Manager KeNHA Coast Region

More consultations were done with the Public and other interested parties through Public Meetings. Mobilisation for such meetings was done through the area Chiefs in the target area as presented in table 7.3.

Table 7.3 below provides a schedule of public meeting held with Project Interested Persons.

Table 7.3: Schedule of Public Meeting within Mombasa North Mainland Area

Date of the Meeting	Meeting Venue	Participants Involved	Number of participants & Gender Representation
8th November 2018 at 11 am	North Mainland Kisauni Sub Location Mombasa County	<ul style="list-style-type: none"> Area Assistant Chief Nyumba Kumi Chairperson Consultant representative MOWASSCO representatives Residents of Bamburi and Mto Panga 	Male 15 Female 8
			TOTAL 23

Summary of the issues discussed, and outcomes of the consultative meeting are given in **Table 7.4** below.

Table 7.4: Issues discussed in Public Meetings and Response Given

Town	Summary of Issues Discussed	Response
North Mainland – Kisauni Meeting.	Interruption of public amenities during Project implementation and associated risks of interfering with tourism activities	The contractor will be supervised by a consulting Engineer, he/she will be required to comply to Environment Health and Safety Guidelines of the World Bank
	Project impacts on structures and sources of livelihood encroaching	All structures and livelihoods encroaching will be enumerated and compensated appropriately.

Town	Summary of Issues Discussed	Response
	into the proposed water easement corridor	
	Benefits of the Project to local residents in addressing water related challenges	The project once implemented will address perennial water shortages in the within Kisauni Location in North Mainland



Figure 7.1: Photos of Public Participation Forum

8 ENVIRONMENTAL AND SOCIAL IMPACTS ASSESSMENT AND MITIGATION MEASURES

8.1 Introduction

This ESIA assessment has been systematically conducted to determine whether the proposed Project will have a diverse impact on the environment. The Environmental Management and Co-Ordination Act (EMCA) No.8 of 2015 provide the legal and statutory guideline for the Environment and Social Impact Assessment process in Kenya. Also, the World Bank OP 4.01 on environment assessment provides guidelines of assessing environment and social risk for World Bank funded Projects and the World Bank's Good Practice Note (2018) for addressing Gender-based Violence in Investment Project Financing involving major civil works.

The impacts in this Chapter have been generated based on the analysis of the proposed environment in relation to the proposed project. The impacts arising during each of the phases of the proposed development namely construction, operation and decommissioning, can be categorized into:

- Impacts on biophysical environment.
- Health and safety impacts
- Social-economic impacts including those related to Sexual Exploitation and Abuse

8.2 Definition and Classification of Environment Impact

An environmental impact is any change to the existing condition of the environment caused by human activity or an external influence. Impacts may be:

- Positive (beneficial) or negative (adverse);
- Direct or indirect, long-term or short-term in duration, and wide-spread or local in the extent of their effect.

Impacts are termed cumulative when they add incrementally to existing impacts. In the case of the project, potential environmental impacts would arise during the construction and the operations phases of the Project and at both stages positive and negative impacts would occur.

8.3 Sensitive Receptors Likely to be Impacted

The assessment identified several sensitive receptors located within close proximity of 200m to 500m to the proposed water lines that might be affected by Project civil activities at the time of construction.

The receptors might suffer damage associated with the Project activities, for instance, if the receptor is a school, the impact could be related to Health and Safety of pupils or if the receptor is a market associated impacts could be disruption of business and demolition of structure. If the receptor is a communal water body, the associated impact could be pollution of the water resource.

8.3.1 Sensitive Receptors in Mombasa North Mainland

The assessment identified several receptors located within close proximity of 200m to 500m to the proposed water lines that might be affected by Project civil activities at the time of construction in North Mainland in Mombasa as detailed in **Table 8.1** below.

Table 8.1: Sensitive Receptors in Mombasa North Mainland.

Type of Receptor	Adjacent Pipeline	GPS coordinates of the Receptor	Name of Receptor
Technical School	NM 13	S 04° 1'29.42 E 39°42'4.63	Bombolulu Workshop
School(s)	NM 14	S 04°23.231' E 039°34.456'	Kadzandani Primary School
	NM 07	S 04°21.385' E 039°69.256'	Frere Town Primary School
	NM 16	S 04°55.807' E 039°34.278'	Mtopanga Secondary School
	NM 20	S 04°22.961' E 039°34.087'	St. Joseph Herman Marx Primary School
Hospital/Health Centre(s)	NM 07	S 04°23.425' E 039°34.967'	Kisauni Dispensary
	NM 17	S 04°23.215' E 039°33.678'	Vikwatani Sub-county Health Centre
Bus Stage	NM 13	S 04° 1'30.54 E 39°41'58.06	Bombolulu Stage
	NM 12	S 04° 0'12.95 E 39°42'39.27	Mwembeni stage
	NM 05	S 04° 0'55.36 E 39°41'33.04	Kanu stage- Bakarani
Church/Mosque(s)	NM 09	S 04°23.152' E 039°34.407'	Masjid Answar Sunna
	NM 15	S 04°23.305' E 039°34.563'	Repentance and Holiness Kings Church
	NM 12	S 04°23.013' E 039°34.293'	Deliverance Church Mwembeni
	NM 13	S 04°23.305' E 039°34.563'	Vineyard Mega Church- Bombolulu
	NM 05	S 04°23.563' E 039°34.924'	Masjid Rawdha
	NM 14	S 04°23.894' E 039°34.520'	Masjid Al Hasan Wazalendo
	NM 06	S 04°56.821' E 039°34.067'	Masjid Tawheed
	NM 03	4° 0'43.23"S 39°42'44.40"E 4° 1'27.75"S 39°41'32.03"E	<ul style="list-style-type: none"> Emmanuel Evangelical Baptist Church Power in the Word Church
	NM 20	S04° 049911 E039°679294	Al Farsy Mosque
	NM 04	S 04°56.134' E 039°33.112'	<ul style="list-style-type: none"> SDA Church- Kisimani A.B.C Church Kisauni
Estate	NM 15	4° 0'27.81"S	<ul style="list-style-type: none"> Fahari estate gate A

Type of Receptor	Adjacent Pipeline	GPS coordinates of the Receptor	Name of Receptor
Public Utility		39°41'58.07"E	• Ajanta estate phase 2
	NM 16	4° 0'47.87"S 39°41'26.12"E	Mtopanga estate
	NM 04	4° 1'34.01"S 39°41'35.11"E	• Chandaria Social Hall • Public toilets
	NM	4° 1'33.19"S 39°41'38.99"E	Frère Town public toilets

Figure 8.1 below show some of the sensitive Receptors in North Mainland



Frere Town public toilets a project initiated by the NG-CDF



Emmanuel church where the lines pass adjacent to it



Bombolulu workshop, where technical training on woodworking is offered



Frère Town Primary School front gate

Figure 8.1: Sensitive Receptors in Mombasa North Mainland

8.4 Positive Impacts during Construction Phase

The construction Phase will include Pre-Construction Phase, Construction and Decommissioning Phases. Construction period depends on the nature of the project activities and normally vary from one year to three years.

The positive impacts are summarized below:

- Employment opportunities during construction, the design report has provided for 90% unskilled labour and 60% skilled labourers to be sourced from the local market this will include employment opportunities for women
- Provision of ready market for construction materials such as sand, ballast and cement that will be sourced from local market, this will lead to injection of money into the local economy
- The Project will be associated with technological and knowledge transfer to the local sector, this will be through the artisan who will be employed and trained by the Project

8.5 Negative Impacts during Construction Phase

The following negative impacts are associated with the Construction Phase of the Project:

8.5.1 Impacts on Vegetation Resources

Anthropogenic activities have cleared vegetation cover within the propose route to provide space for construction of residential and commercial structures. Therefore, impact to vegetation cover within the Project alignment will be minimal limited to species like the Coconut trees, Mango, baobab tree commonly referred to as '*Mmbuyu*', Neem tree locally referred to as "*Mukurudadi*".

Project activities will also result to disruption of soil structure within the Project easement. The loose soils eventually are washed down into the surface drainage channels and communal water points resulting to increased sedimentation. **Table 8.2** below illustrates assessment impacts on vegetation cover.

Table 8.2: Project Impacts on Vegetation Cover

Impact Sources	Clearing of vegetation cover along the Water pipeline identified for the Project		Mitigation Efficiency
Nature of impact	<ul style="list-style-type: none"> • Clearing of vegetation cover exposes soils to agents of soil erosion such as wind and runoff, this could lead to soil degradation. • Triggers sedimentation in nearby drainage channels for storm water and sedimentation of communal water points, could also lead to flooding. 		High
Reversibility of impact	Permanent vegetation clearance along the Project corridor footprint and replanting of vegetation that is not within the Pipeline corridor		
Affected areas	Flora and fauna along the proposed Water pipeline routes		
Magnitude	Extent	Site – 2	
	Intensity	Medium-3	
	Duration	Short to medium-2	
	Probability	Likely-3	
Significance	Weighting	(Extent+ Intensity +Duration + Probability) x WF (2+3+2+3) x3= 30 (Low-Medium)	Low to Medium

Mitigation Measures

The following measures shall be implemented in order to mitigate against soil erosion and its effects and enhance vegetation cover:

- Compensatory planting of trees² that will be cut by the contractor during excavation of water pipeline trenches. This will be achieved through a tree planning program to be initiated under the works contractor. This program will be undertaken by the Contractor in liaison with Kenya Forest Services Coastal Region. A budget of Ksh 100,000 is provided for purchase of seedlings and care to the trees. This budget is included in the Ksh 1,050,000 cost of implementing the ESMP as provided for in this Report.
- Vegetation shall only be cleared along the Project easement and where it will interfere with Project construction and/or present a hazard.
- The local community shall be given a chance to harvest the targeted vegetation if they so wish.
- Areas to be cleared shall be agreed and demarcated before the start of the clearing operations to minimize exposure.
- Stage vegetation clearance is also recommended so as not to clear the entire corridor all at once.
- The use of existing cleared or disturbed areas for the Contractor's Camp, stockpiling of materials etc. shall be encouraged.

8.5.2 Impacts on Water Resources

The Project excavation activities will trigger limited discharge of silt into storm water channels and shallow wells dug by households for domestic water supply. Also, plant and equipment on site during excavations have the potential of discharging oil residuals into the same resources, also accumulated solid wastes from work areas could be washed down into the same resources as indicated in **Table 8.3** below.

Table 8.3: Project Impacts to Water Resource Rating

Impact Sources	<ul style="list-style-type: none"> • Discharge of silt and oils into storm water channels and water bodies leading to pollution • Erosion of soils that are washed off into water sources • Discharge of oil spills into water bodies • Washing off of solid wastes from project sites into drains and water sources 		Mitigation Efficiency
Nature of impact	<ul style="list-style-type: none"> • Could lead to contamination of aquifers and underground water sources • Could lead destruction of aquatic ecosystem downstream within the natural water springs of the project area. 		Medium
Reversibility of impact	Yes		
Affected stakeholders /areas	Fauna and flora and shallow wells		
Magnitude	Extent	location– 3	
	Intensity	Medium-3	
	Duration	Medium-3	
	Probability	Likely-3	

² Popular coastal trees in the area are Baobab tree, Neem tree, palm trees and coconut trees.

Significance	Weighting	(Extent+ Intensity +Duration + Probability) x WF (3+3+3+3) x3= 36(Low to Medium)	Low to Medium
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Water Resources Pollution

The mitigation measures summarized below will be adhered during Project construction in order to minimize and eliminate pollution of any Water Resources including aquifers.

Mitigation Measures

- No grey water runoff or uncontrolled discharges from the working areas (including wash down areas) will be allowed to drain into adjacent storm water channels without pre-treatment.
- Water containing such pollutants as cements, concrete, lime, chemicals and fuels shall be discharged into a conservancy tank for removal from site where applicable
- The Contractor shall also prevent runoff loaded with sediment and other suspended materials from the site/working areas from discharging to storm water channels and any surface water bodies;
- Tools and plant to be washed out and cleaned in designated areas within the site compound where runoff can be isolated for treatment before discharge to storm water channels
- Debris and other material will be prevented from entering watercourses; Construction sites
- Discharges to storm water drains will only be carried out under consent of the relevant governing bodies such as WRMA not to be allowed unless otherwise relevant discharge permits have been procured from both NEMA and other relevant authorities.

Siltation and Sedimentation

The Project activities associated with excavation of Water Lines trenches will not significantly disturb the soil structure along the Project corridor. However, soil erosion will be triggered which leads to siltation and sedimentation of existing storm water channels that can cause flooding of roads.

The shallow wells are an important resource for the communities along the proposed project corridor as supply from MOWASSCO is not reliable.

Mitigation Measure

- Debris and other material will be prevented from entering storm water channels. Construction of Sustainable drainage system (such as settlement lagoons or other temporary attenuation) to be used during construction if necessary; Diversion of minor watercourses will be carefully managed to prevent suspension of silt (or contamination by other pollutants);
- Sand/silt traps should be used so as to prevent silt and any other sediments from getting into water channels
- Site compounds and stockpiles will be located away from shallow wells and water channels.

8.5.3 Impacts on Soil Resources

The Project activities including vegetation clearing and trench excavation are likely to trigger impact soil resources including;

- (i) Destruction of soil structure due to topsoil excavation.
- (ii) Soil contamination caused by oils and fuel leaks from construction equipment
- (iii) Soil erosion due to clearing of vegetation cover and trenching activities.

Removal of vegetation cover during site clearance will further expose soil to water and wind which are agents of erosion. Excavation and ground clearance works will also have the direct effect of loosening the soils making them easier to be washed away by water and wind.

The assessment also identified that less significance impacts are anticipated on Soil resource as discussed in **Table 8.4** below.

Table 8.4: Impacts on Soil Resources

Impact Sources	Project activities which could lead to soil compacting and interference with soil structure hence making top soils loose and susceptible to agents of erosion.		Mitigation Efficiency	High
Nature of impact	<ul style="list-style-type: none"> • Destruction of Soil Structure due to topsoil breaking leading to reduced soil aeration • Movement of plant and equipment could result to soil compacting which inhibits soil aeration leading to death of soil microorganisms. • Soil contamination caused by oils and fuel leaks from construction equipment leading to Oil Acidity increase • Soil Erosion due to clearing of vegetation cover and trenching activities which results to death of soil microorganism and reduced soil productivity 			
Reversibility of impact	Yes			
Mitigation	As discussed below			
Affected stakeholders /areas	Terrestrial ecosystems			
Magnitude	Extent	Site – 2		
	Intensity	Medium-3		
	Duration	Medium term-3		
	Probability	Likely – 3		
Significance	Weighting	(Extent+ Intensity +Duration + Probability)x WF(2+3+3+3) x1=11 (Low)		Low

Mitigation Measures to Project Impacts to Soils

(a) Soil Erosion due to Clearing of Vegetation Cover

- Excavations will be controlled so that land that is not required for the Project works is not disturbed;
- Wherever possible, excavation will be carried out during the dry season to prevent soil from being washed away by the rain.
- Excavated materials will be kept at appropriate sites approved by the Supervising Engineer.
- Areas affected by construction related activities and/or susceptible to erosion must

be monitored regularly for evidence of erosion, these include areas stripped of topsoil, Soil stockpiles and Spoil sites.

- Any work along storm water drainage channels will be isolated to prevent silt propagating downstream;
- Debris and other material will be prevented from entering water channels; Construction settlement lagoons or other temporary attenuation to be used during construction if necessary; Diversion of minor watercourses will be carefully managed to prevent suspension of silt (or contamination by other pollutants);
- Where possible, sieves will be placed next to water bodies so as to prevent silt and any other sediments from getting into the resources

(b) Civil Works Resulting to Soil Compaction

- Split compacted area to reduce runoff & re-vegetate where necessary
- Vehicles to be kept in designated access roads.
- Minimize compaction during stockpiling by working the soil in dry state.

(c) Civil Works Resulting to Soil Pollution

- The contractor will develop an emergency response plan that includes spill response strategy.
- Spills will be immediately addressed per the appropriate spill management plan and initiate soil clean up and soil removal if needed. Spill kits should be availed to aid this
- Spill prevention practices and response actions will be applied in refuelling and vehicle use areas to minimize accidental contamination
- Containment around the garage, fuel store and fuelling station will be ensured so that these potentially polluting substances can be properly handled and any intended escape of material from that area can be contained until such time as remedial action can be taken
- Proper handling of material through use of dip trays, directing spills to an oil sump which should be emptied into a designated disposal site
- Refuel in designated refuelling areas that include a temporary berm to limit the spread of any spill.
- Proper maintenance of machinery and equipment to avoid or minimize leakages from machines.

8.5.4 Workers, Community Health and Safety Risks

Workers, Community Health and Safety risks are often triggered by Project activities during Project Construction Phase. These risks often affect both workers on site as well as general community in close proximity to the work site.

Management of these risks is required to be as provided for by the Occupational Health and Safety Act (OSHA 2007), Waste Management Regulation 2006, Noise and excessive vibration regulations of 2009 and air quality regulations of 2014.

This assessment identified potential Environment, Health and Safety in the following context and analysis in **Table 8.5** below.

- (i) Wastes Management (Liquid and Solids)
- (ii) Excessive noise and vibrations
- (iii) Air Pollution and Dust Generation
- (iv) Risk of Accidents at Work Sites

Table 8.5: Impacts on Workers, Community Health and Safety

Impact Sources	Adverse Impact associated with Health and Safety	Mitigation Efficiency	Low to Medium
Nature of impact	<p><u>Solid and liquid Wastes</u></p> <ul style="list-style-type: none"> - Impact involves pollution of the environment caused by construction generated solid and liquid waste which include waste water, fuels, oils, hazardous substances and other liquid pollutants. <p><u>Noise and excessive vibrations</u></p> <ul style="list-style-type: none"> - noise and excessive vibrations due to un-serviced plant and equipment and Activities associated with blasting and rock breaking - Hearing impairment and respiratory related illness <p><u>Health and Safety risks</u></p> <ul style="list-style-type: none"> - Open trenches within the settlement which pose health hazards to workers and community. - Construction traffic accidents - Failure to use required correct signage and safety marshal on site - Un-serviced plant and equipment which emit hydro carbons through equipment exhaust system. - Poor workmanship & failure to use water sprays during dry season could also result to air pollution. - Failure to observe safe work environment requirements like use of PPEs, Warning Taps, site labelling. - Sanitation facilities will be procured by the contractor, these will include toilets both at the camp site and along work sites and proper housing facilities for workers <p><u>Air pollution</u></p> <ul style="list-style-type: none"> - Anticipated impact may originate from vehicle and machinery fumes and dust 		
Reversibility of impact	Yes		
Affected stakeholders /areas	Workers and Community		
Magnitude	<i>Extent</i>	Site – 2	
	<i>Intensity</i>	Medium-5	
	<i>Duration</i>	Medium term-4	
	<i>Probability</i>	Likely – 4	
Significance	Weighting	(Extent+ Intensity +Duration + Probability) x WF (2+5+4+4) x4=60 (Medium to High)	Medium to high

8.5.4.1 Health Impact – Spread of COVID-19 amongst construction workers

The World Health Organization declared COVID-19 a global pandemic after assessing both its alarming levels of spread and severity, and the alarming levels of inaction. Consequentially, WHO issued various guidance and measures to prevent the spread of

the virus. The measures have been adopted worldwide. Similarly, the Kenyan government has since then issued several guidance and directives after the first case was registered on March 13th, 2020. These included complete cessation of movement to and from areas considered hot spots and night curfew, social distancing guidelines, closure on non – critical and essential enterprises, closure of places of worship and public gatherings, mandatory use of masks in public places, among others.

During project execution (civil works), large numbers of workers will be required to assemble together in consultation engagements, meetings, toolbox talks and even at work sites; varied number of workforce including suppliers of material and services are also expected to come in from various places in the country which may be COVID-19 hot spots; and interaction of workers with the project host community will happen as workers find accommodation close to work sites, and/or return to their homes after works. The potential for the spread of any infectious disease like COVID-19 by projects is high. There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services including the project host community. The presence of international workers, especially if they come from countries with high infection rates, may also cause social tension between the foreign workers and the local populations.

Recently, the WHO has warned that the virus is here to stay for a long time and might persist and become our new way of life. The Government of Kenya has also lifted some of the initial movement controls and allowed the resumption of business, with certain industry specific guidelines being enforced. The duty of care has now been transferred to individual citizens and enterprises. Recognizing the potent risk this may present, it's difficult to clearly outline exhaustive mitigation measures under the mitigation impacts. As such, there is need for the client and the contractor to develop and adopt COVID-19 Standard Operating Procedure (SOPs) in line with the World Bank guidance, Ministry of Health Directives and site-specific project conditions. These SOPs need to be communicated to all workers and enforced to the latter without fail. In addition to the requirement of the SOPs, the following mitigation measure shall also be adopted:

COVID-19 – Mitigation Measures against spread of COVID-19 amongst workers:

- (i) The Contractors will develop SOPs for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilization. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions;
- (ii) Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including workers and visitors;
- (iii) Avoid concentrating of more than 15 workers at one location. Where there are two or more people gathered, maintain social distancing of at least 2 meters. All workers and visitors accessing worksites every day or attending meetings shall be subjected

to rapid Covid-19 screening which may include temperature check and other vital signs;

- (iv) The project shall put in place means to support rapid testing of suspected workers for covid-19;
- (v) Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used;
- (vi) Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc;

8.5.4.2 Social Risk - Spread of COVID-19 amongst community members during consultations

During implementation of the ESIA and RAP, various activities will be undertaken. For efficient and meaningful engagement, a wide range of individual participants, groups in the local community and other stakeholders will be involved. The consultations will involve induction of the RAP Implementation Committee, verification of PAPs covering the occupants of the affected area and vulnerable persons and groups; awareness raising, sensitization of PAPs and gauging attitude to the project; training and capacity building for livelihoods restoration grievance redress, execution of site - specific surveys among others. If carried out conventionally, these activities would lead to close interaction between the proponent and the community members leading to a high risk of spreading COVID – 19 amongst community members during the consultation process.

To minimize the social risk of spread of COVID-19 amongst community members, alternative means of consultation will be required as mitigation measures to ensure social distancing and appropriate communication measures. The mitigation measures will be supervised by a communications/stakeholder engagement/social safeguards expert in the project proponent's team.

Mitigation measures against spread of COVID-19 amongst community members

- i. Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible. One on one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;
- ii. Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;
- iii. The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;
- iv. Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Allow participants to provide feedback and suggestions.

- v. Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration.
- vi. In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chat groups.
- vii. Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants.

8.5.4.3 Solid Wastes on Site

During construction, solid waste will be generated from a wide range of project activities. Some of the waste includes, wrapping materials discarded by the workers on site, food waste from kitchens, waste from the workshops and offices consisting of waste papers, toners and cartridges, broken equipment and containers, steel, timber, etc.

To minimize pollution and visual intrusion, waste will to be managed appropriately as provided in this sub section.

Solid Wastes Impacts Mitigation Measures

- (i) The contractor shall develop a comprehensive Waste Management Plan (WMP) prior to commencement of works
- (ii) Properly labelled and strategically placed waste disposal containers shall be provided at all places of work
- (iii) Litter bins will have secured lids to prevent animals and birds from scavenging
- (iv) All personnel shall be instructed to dispose of all waste in a proper manner
- (v) Recycling of construction material shall be practiced where feasible e.g. containers and cartons
- (vi) The project shall engage services of a NEMA accredited waste handler to collect and dispose all waste from site in line with the waste regulation and the waste management plan to be developed by the contractor;
- (vii) The construction camps should be situated away from the primate reserve and wildlife corridors to prevent wildlife from scavenging polluted waste.

8.5.4.4 Liquid Wastes on Site

During construction various types of liquid waste will be produced such as concrete washings, runoff from workshops and grey water from contractor's camp. Just as with solid waste, liquid waste can attract rodents and birds especially for meeting their drinking water needs. This can affect pose health hazards to both workers and community.

Liquids Wastes Impacts Mitigation Measures

- (i) Water containing pollutants such as concrete or chemicals should be directed to a conservancy tank for removal from the site where applicable
- (ii) Potential pollutants of any kind and form shall be kept, stored and used in such a

- manner that any escape can be contained
- (iii) In case of any form of pollution the contractor should notify the Resident Engineer (RE)
 - (iv) Wash areas shall be placed and constructed in such a manner to ensure that the surrounding areas including groundwater are not polluted
 - (v) No grey water runoff or uncontrolled discharges from the working areas (including wash down areas) will be allowed to drain into adjacent storm water channels without pre-treatment.

8.5.4.5 Fuels, oils, Hazardous Substances

The construction phase will involve use of stationary and mobile plant and equipment which will require fueling and lubrication. There are chances of accidental spillage of used engine oils, grease and diesel which may lead to soil contamination. Should this spillage occur during the rainy season, the contaminants may be washed off by surface runoff and find their way into the storm water channels along the water easement.

Hazardous Wastes Impacts Mitigation Measures

- (i) The contractor shall ensure that the machines and equipment are in good condition when on site and regularly serviced.
- (ii) Ensure proper handling of lubricants, fuels and solvents while maintaining the plant and equipment.
- (iii) Any chemical or fuel spills shall be cleaned up immediately. The spilt liquid and clean-up material shall be removed, treated and transported to an appropriate site licensed for its disposal.
- (iv) A safety and emergency response plan will need to be developed for all operations with emphasis on the protection of the environment prior to start up.
- (v) Storm water shall be diverted away from the fuel handling and storage areas. An oil water interceptor shall be provided to treat any rainwater from fuel storage and handling areas;
- (vi) Measures should be taken to ensure proper storage of fuel, oil and bitumen. Oil-water interceptors or sumps should be constructed to capture discharge of oils, fats and other polluting liquids from maintenance workshops, vehicle and equipment washing bays and kitchen drains;
- (vii) Secondary containment of up to 100% should be provided for fuel storage areas and other hazardous fuels identified in (iv) above before disposal through a licensed waste handler.
- (viii) At the work sites the contractor will be expected to maintain strict surveillance particularly when working within the vicinity of water supply points and the rivers within the project area;
- (ix) Tank equipment such as dispensing hoses, valves, meters, pumps, and gauges shall be located within the containment or provided with own containment

8.5.4.6 Excessive Noise and Vibrations

The risk often affects both workers on site and community at large. Common sources noise and excessive vibrations are as a result of use of un-serviced plant and equipment as well as activities associated with blasting and rock breaking.

Noise generating activities such as equipment operations and the workers themselves

could be a public nuisance to nearby settlements and commercial centres, health centres and schools especially those within 200m of the road reserve. As required, OSHA 2007 and EMCA 2015 Noise and Excessive Vibration 2009 as well as World Bank EHS Guidelines should be adhered to.

Figure 8.2 below provides permissible noise levels for a residential and construction sites

MAXIMUM PERMISSIBLE NOISE LEVELS FOR CONSTRUCTIONS SITES

(Measurement taken within the facility)

<i>Facility</i>		<i>Maximum Noise Level Permitted (Leq) in dB(A)</i>	
		Day	Night
(i)	Health facilities, educational institutions, homes for disabled etc.	60	35
(ii)	Residential	60	35
(iii)	Areas other than those prescribed in (i) and (ii)	75	65

Figure 8.2: Permissible Noise Levels

Mitigation Measure to Excessive Noise and Vibration

- (i) Contractor will comply with provisions of EMCA 2015 (Noise and Excessive Vibrations Regulations of 2009)
- (ii) The Contractor will keep noise level within acceptable limits (60 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas
- (iii) Hospitals, schools and other sensitive receptors as identified in chapter 2 shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity

8.5.4.7 Air Pollution and Dust Generation

Significant air pollution will most likely be attributable to particulate matter (PM), especially dust generated from dust blown from plant and equipment on site. The particulate matter generated could affect the hospitals, schools and other sensitive receptors as identified in **Section 8.3** of this Report.

As required by OSHA 2007 and EMCA 2015 (Air Quality Regulations 2014) as well as World Bank, EHS Guidelines should be adhered to.

Mitigation Measure to Project Related Dust and Air Pollution

- (i) The contractor will comply to the provisions of EMCA 2015 (Air Quality Regulations 2014)
- (ii) Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the contractor's specifications
- (iii) Water sprays shall be used to suppress dust on site all the time and intensified in areas within 200 metres of human settlement especially during the dry season
- (iv) The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilised as soon as practically

- possible;
- (v) Do not carry out dust generating activities such as excavation during times of strong winds
 - (vi) Vehicles delivering soil materials shall be covered to reduce spills and windblown dust;
 - (vii) Vehicle speeds shall be limited to minimise the generation of dust on site and on diversion and access

8.5.4.8 Risk of Occupational Illnesses, Diseases and Accidents at Work Sites

The risk of accidents at worksites often affects both workers on site and community at large. These risks at times can be fatal as they could lead to death or permanent disability of victims. This risk could be significant at Hospitals, schools and other sensitive receptors as identified in **Section 8.3** of this Report.

The risks are commonly caused by failure to observe safety requirements as required by the C-ESMP, contractor safe working procedures, OSHA 2007 regulations, Factory Rules of 2005, public health act, and the World Bank EHS Guidelines, as well as the World Bank Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).

Mitigation Measure to Risks of Accidents on Site

- (i) Contractor to undertake a risk assessment and develop an Occupational Health and Safety Management Plan alongside other Construction Environmental and Social Management plans (CESMPs) prior to the commencement of works to be approved by the Supervising Engineer. These CESMPs will include but not limited to:
 - An Occupational Health and Safety Management Plan
 - Waste Management Plan
 - Labour influx strategy
 - Gender based Violence Action Plan, including:
 - *SEA Prevention and Response Strategy*
 - *GBV Mitigation Plan*
 - *SEA redress mechanism*
 - *SH redress mechanism*
 - Child protection strategy
 - Employment plans
 - Occupational Health and Safety Plan
 - Traffic Management Plan
 - Decommissioning Plan
 - Hazard Material Management Plan
 - Asbestos handling protocol;
 - Emergency Response Plan;
 - Spoil management plan;
 - Grievance redress Mechanism;
 - Stakeholders engagement and communication plan;
 - ESHS, VAC & SEA and SH Codes of Conduct
 - Community Health and Safety Management Plan
 - Water Quality Management Plan
 - Air Quality, Noise and Vibration Management Plan
 - Emergency Preparedness and Response Plan

- (ii) All workers to be trained and inducted on the requirement of the C-ESMPs before commissioned to start working;
- (iii) Provide adequate and appropriate Personal Protective Equipment (PPEs) including gloves, gum boots, overalls and helmets to workers. Use of PPE to be enforced by the Supervising Engineer.
- (iv) Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles
- (v) Strict use of warning signage and tapes where the trenches are open and at other active construction sites
- (vi) Contractor to Employ and train Road Safety Marshalls who will be responsible for management of traffic on site
- (vii) Contractor and supervising consultant to retain experienced full-time occupational health and safety officers to supervise and advice the project on OHS compliance including contractor preparedness to handle emergencies of fire, medical and social unrest
- (viii) Ensure all workers including management staff are inducted and sign the ESHS, GBV and VAC codes of conduct before beginning any works.

8.5.4.9 Risks Associated to Exposure to Asbestos materials (AC Mains)

The Project involves replacement of Asbestos Cement (AC) Mains. Therefore, to mitigate Environmental Health and Safety issues associated with handling and disposal of AC Mains, the mains will be decommissioned and left below the ground since there is no licensed hazardous waste disposal site nearby.

Mitigation Measure to Risks of Exposure to Asbestos Material

In the event decommissioning and disposal has to be carried out, the following mitigation measures shall be implemented within the Project Area:

1. Proper mapping of existing asbestos cement pipes as provided in the layout plans in the Project Design Report. A work plan will be developed prior to demolition work, to protect workers, the general community and provide for proper waste disposal. This will be guided by a detailed risk assessment to be conducted by a duly registered occupational safety and health advisor, as per the OSHA (2007) and NEMA (2013) guidelines in safe management and disposal of asbestos, to be retained on site by the contractor before commencing works and during the works along the affected pipeline sections
 2. Filing Notification to NEMA as per the NEMA notification form (providing information on the location, condition of the materials, estimated the quantities involved, the quantities to be disposed etc.)
 3. Asbestos Cement Material (ACM) should be transported in leak-tight containers to a secure landfill operated in a manner that precludes air and water contamination that could result from ruptured containers. The waste will be disposed appropriately by a licensed NEMA hazardous waste handler.
 4. Protection from “retaliatory and disciplinary measures” of workers who remove themselves from work because they believe ACM poses a danger to their health
 5. Provision of appropriate Personal Protective Equipment (PPEs) for workers
 6. Provision of adequate changing rooms on site and at campsite and wash facilities to prevent dust from being carried to homes
 7. Training of workers about the health hazards of ACM to themselves and their families. The training shall further involve inspections, maintenance, removal, or laboratory analysis of waste material.
 8. Periodic medical examination of workers during the contract period

9. Periodic air quality monitoring of the work environment with records filed at the local NEMA office in Mombasa.

8.5.4.10 Risks Associated with Traffic on Site

The term 'vehicles' includes cars, vans, lorries, low-loaders and mobile plant such as excavators, lift trucks and site dumpers etc. Construction site vehicle incidents can and should be prevented by the effective management of transport operations throughout the construction process.

Occupational Health and Safety Act (OSHA 2007) provides for site traffic organization so that vehicles and pedestrians using site routes can move around safely. The routes need to be suitable for the persons or vehicles using them, in suitable positions and sufficient in number and size.

This assessment provides for key management principles that will guide the Contractor when dealing with traffic on Site during the construction of the Project. In order to reduce risks of accident on site, the contractor should ensure the below listed measure are assessed in detail.

- (i) Keeping pedestrians and vehicles apart
- (ii) Minimizing vehicles movement
- (iii) People on Site
- (iv) Turning of Vehicles
- (v) Visibility
- (vi) Signs and Instructions

As per the requirement of the Occupational Health and Safety Act (OSHA) 2007, EMCA 1999 and its 2015 revisions, and World Bank EHS guidelines, all ESHS incidents, accidents, dangerous occurrences including occupational diseases shall be promptly reported to the respective regulatory institutions in the prescribed manner and template outlined in DOSH ML/DOSH/FORM 1 and further to the World Bank.

Table 8.6 below provides details on how traffic will be managed on site under the above discussed principles.

Table 8.6: Traffic Management Plan

Safety Principle	Management Measure
Keeping pedestrians and vehicles apart on Site	<ul style="list-style-type: none"> - Entrances and exits- provide separate entry and exit gateways for pedestrians and vehicles; - Walkways- provide firm, level, well-drained pedestrian walkways that take a direct route where possible; - Crossings- where walkways cross roadways, provide a clearly signed and lit crossing point where drivers and pedestrians can see each other clearly; - Visibility- make sure drivers driving out onto public roads can see both ways along the footway and road before they move on to it; - Obstructions- do not block walkways so that pedestrians have to step onto the vehicle route; d - Barriers- think about installing a barrier between the roadway and walkway
Minimizing vehicles movement	<ul style="list-style-type: none"> - Limit the number of vehicles on site - Provide car and van parking for the workforce and visitors away from the work area; - Control entry to the work area; and - Plan storage areas so that delivery vehicles do not have to cross the site.
People on Site	<ul style="list-style-type: none"> - Contractor will take steps to make sure that all workers are fit and competent to operate the vehicles, machines and attachments they use on site by, for example: - checks when recruiting drivers/operators or hiring contractors; - training drivers and operators; - managing the activities of visiting drivers - Authorized experienced drivers to drive construction vehicles to avoid accidents. - Access to vehicles will be managed and people alerted to the risk
Turning of Vehicles	<p>The need for vehicles to reverse will be avoided where possible as reversing is a major cause of fatal accidents.</p> <ul style="list-style-type: none"> - One-way systems will be adopted by the contractor as this can reduce the risk, especially in storage areas. - A turning circle could be installed so that vehicles can turn without reversing
Visibility	<p>If vehicles reverse in areas where pedestrians cannot be excluded the risk is elevated and visibility becomes a vital consideration. This ESIA provides for:</p> <ul style="list-style-type: none"> - Aids for drivers- mirrors, rear cameras or reversing alarms that can help drivers can see movement all-round the vehicle; - Signallers- who can be appointed to control manoeuvres and who are trained in the task; - Lighting- so that drivers and pedestrians on shared routes can see each other easily. Lighting may be needed after sunset or in bad weather; - Clothing- pedestrians on site should wear high-visibility clothing.
Signs and Instructions	<ul style="list-style-type: none"> - Make sure that all drivers and pedestrians know and understand the routes and traffic rules on site. Use standard road signs where appropriate including the Heavy Vehicles turning sign - Provide induction training for drivers, workers and visitors and send instructions out to visitors before their visit

8.5.5 Social Impacts

8.5.5.1 Resettlement Impacts

The Project proposed will be implemented within government land and along road reserves. However, an Abbreviated Resettlement Action Plan (ARAP) report has been prepared for compensation of likely assets and sources of livelihood that might be affected by the Project.

Several alternatives and mechanisms have been considered to avoid or minimize displacement and restricted access to socio-economic services during the design and implementation of project activities. This is also in consideration of the concerns of community members and institutional stakeholders consulted.

- i) **Use of Existing Public Land:** The water pipelines will be designed to follow roads Right of Way
- ii) **Reduction in the Required Working Space / Easement:** Attempts have been made to reduce the required corridor for the Project; a practical working space of about 4m within private farms.
- iii) **Use of Manual Excavation:** The Project will adopt manual excavation in some cases to limit potential destruction of people's properties.
- iv) **Temporary Set-Back:** PAPs will be given adequate notice after compensation that will enable them to reconstruct their structures away from the water easement.
- v) **Selection of Non-Residential Sites:** As much as possible, besides engineering design prerequisites, site selection has been guided by the desire to minimize the displacement of human settlements/residences.

The Abbreviated Resettlement Action Plan (ARAP) report identified that the proposed improvement of Water Distribution Network within MOWASSCO has the potential of triggering risks associated with loss of residential and business structures, loss or disruption of business livelihoods. However, **loss of land will not be triggered.**

Resettlement Impacts in Mombasa North Mainland

Table 8.7 on Page 8-17 provides a summary of Resettlement Impacts for Water distribution lines targeted for construction in Mombasa North Mainland. The total number of PAPs losing structures in Mombasa North Mainland are 31 PAPs among them 7 PAPs are female while 24 PAPs are male, 3 PAPs are elderly and weak therefore regarded as vulnerable because they will require assistance in relocation of their affected structures. All the PAPs will lose structures and livelihood sources derived from small scale business.

The affected lines are in Mtopanga, Fahari, Bandari, Bombolulu, Manoni and Vikwatani within North Mainland.

Table 8.7: Total Project Affected Persons in North Mainland

Design Horizon	Water Mains (Layout Map)	Sub Location	Total Number of PAPs	Total Number of Women PAPs	Total Number of Male PAPs	Vulnerable PAPs
2020	NM11	Mtopanga	17	5	12	1 female
	NM15	Fahari	1	0	1	0
	NM12	Bandari	2	0	2	0
	NM13	Bombolulu	2	1	1	0
	NM05	Mtopanga	3	0	3	0
	NM20	Manoni	4	0	4	1 male
	NM17	Vikwatani	2	1	1	1 male
	Total		31	7	24	3

Abbreviated Resettlement Action Plan Budget

The Project design has ensured that the Water Lines will follow Road Reserves. The estimated ARAP budget as presented by this ARAP is **Kshs 2,164,715 (Two Million, One Hundred Sixty-Four Thousand, Seven Hundred and Fifteen Shillings Only)**.

Table 8.8 below provides grand total required for ARAP implementation prior to commencement of Project Civil Works.

Table 8.8: Grand ARAP Budget

Description	Amount (Kshs.)
North Mainland	
Asset Loss	1,235,215
Livelihood Loss	379,500
Sub Total 1	1,614,715
Vulnerability Support and assistance	150,000
Financial Management Training, Awareness raising and sensitization of PAPs ³	100,000
Training and Capacity Building for GRM ⁴	100,000
Operational & Administrative Costs of ARAP Committees	100,000
Monitoring and Evaluation	100,000
Sub Total 2	550,000
Total ARAP Cost	2,164,715

8.5.5.2 Other Social Risks

The Project activities as described in the report have the potential of triggering various social risks both at Project Construction Phase and Operation Phase. This assessment has identified potential social risks associated with the Project as listed below and analyzed in **Table 8.10** on **Page 8-19**.

- (i) Labour Influx and related Impacts
- (ii) Human Rights and gender inclusivity

³Gender Sensitizations and Training, Bank accounts, use of compensation money etc.

⁴ The GRM will require sufficient skills in data management, including data entry, data analysis and storage. The team will also require training conflict resolution procedures, such as mediation and reconciliation, and other management areas such as record-keeping, report-writing and ICT equipment management.

- (iii) Child Protection
- (iv) Increased Transmission of communicable diseases including HIV/AIDS
- (v) Sexual Exploitation and Abuse
- (vi) Gender-based violence at the community level

At the ESIA stage, adverse social risks associated with the project in Mombasa North Mainland Project area is summarized in **Table 8.9** below. The risks were adopted as guided by the “*Good Practice Note of the World Bank (1st December 2016) on Managing the Risks of Adverse Impacts on Communities from temporary project*”.

Table 8.9: Adverse Social Impacts

Social Impact	Description
Risk of social conflict:	Conflicts may arise between the local community and the construction workers, which may be related to religious, cultural or ethnic differences, or based on competition for local resources. Tensions may also arise between different groups within the labor force, and any pre-existing conflicts in the local community may be exacerbated. Ethnic and conflicts may be aggravated if workers from one group are moving into the territory of the other.
Risk of the spread of COVID-19 amongst community members during consultations	The activities necessary for effective and meaningful consultations will lead to close interaction between the proponent and the community members leading to a high risk of spreading Covid – 19 amongst community members during the consultation process. The activities may take the form of one –on –one or onsite presence in the community, large gatherings and long duration of engagement sessions.
Increased risk of illicit behavior and crime:	The influx of workers and service providers into communities may increase the rate of crimes and/or a perception of insecurity by the local community. Such illicit behavior or crimes can include theft, physical assaults, substance abuse, prostitution and human trafficking.
Influx of additional population (“followers”):	Especially in projects with large footprints and/or a longer timeframe, people can migrate to the project area in addition to the labor force, thereby exacerbating the problems of labor influx. These can be people who expect to get a job with the project, family members of workers, as well as traders, suppliers and other service providers (including sex workers), particularly in areas where the local capacity to provide goods and services is limited.
Impacts on community dynamics:	Depending on the number of incoming workers (to be determined by the contractor) and their engagement with the host communities in Mombasa, the composition of the local community, and with it the community dynamics, may change significantly. Pre-existing social conflict may intensify as a result of such changes.
Increased burden on and competition for public service provision:	The presence of construction workers and service providers (and in some cases family members of either or both) can generate additional demand for the provision of public services, such as water, electricity, medical services, transport, education and social services.
Increased risk of communicable diseases and burden on local health services:	The influx of people may bring communicable diseases to the project area, including sexually transmitted diseases (STDs), or the incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health resources. Workers with health concerns relating to substance abuse, mental issues or STDs may not wish to visit the project’s medical facility and instead go anonymously to local medical providers, thereby placing further stress on local resources.

Social Impact	Description
Gender-based violence:	Construction workers are predominantly younger males. Those who are away from home on the construction job are typically separated from their family and act outside their normal sphere of social control. This can lead to inappropriate and criminal behavior, such as sexual harassment of women and girls, exploitative sexual relations, and illicit sexual relations with minors from the local community. A large influx of male labor may also lead to an increase in exploitative sexual relationships and human trafficking whereby women and girls are forced into sex work.
Child labor and school dropout	Increased opportunities for the host community to sell goods and services to the incoming workers can lead to child labor to produce and deliver these goods and services, which in turn can lead to enhanced school dropout.
Local inflation of prices	A significant increase in demand for goods and services due to labor influx may lead to local price hikes and/or crowding out of community consumers.
Increased pressure on accommodations and rents	Depending on project worker income and form of accommodation provided, there may be increased demand for accommodations, which again may lead to price hikes and crowding out of local residents.
Increase in traffic and related accidents:	Delivery of supplies for construction workers and the transportation of workers can lead to an increase in traffic, rise in accidents, as well as additional burden on the transportation infrastructure.

Impact ranking of social risks is presented in **Table 8.10** below.

Table 8.10: Impacts on Social Setting

Impact Sources	Project Impacts to social setting of the Project area	Mitigation Efficiency	High
Nature of impact	(i) Labour Influx Impacts (ii) Human Rights and gender inclusivity (iii) Child protection (iv) Increased Transmission of communicable diseases including HIV/AIDS (v) Sexual exploitation and abuse (vi) Gender-based violence at the community level (vii) Spread of COVID-19 amongst community members as a result of participation in consultations		
Reversibility of impact	no		
Mitigation Measures	As detailed below		
Affected stakeholders	Workers and Community		
Magnitude	Extent	Site – 2	
	Intensity	Medium-5	
	Duration	Medium term-4	
	Probability	Likely – 4	
Significance	Weighting	(Extent+ Intensity +Duration + Probability)x WF (2+3+3+3) x3=33 (medium)	medium

(a) Labour Influx Effects

This impact is triggered during Project Construction Phase due to the Project attracting various categories of workers from local, national and international markets. This therefore leads to concentration of people in one area drawn from diverse social and cultural backgrounds often resulting to a number of issues as listed below;

- (i) Strain on various resources especially water resources for road works

- (ii) Grievances from local community members over job opportunities.
- (iii) Sexual Offences
- (iv) Teenage Pregnancies

Mitigation Measures to Labour Influx Impacts

- The contractor awarded the Project will develop a labour Management Plan (LMP) in consultation with local leaders.
- The contractor will ensure effective community engagement and strong grievance mechanisms on matters related to labour with a discrete mechanism for safely and confidentially reporting issues of SEA and GBV at the community level triggered by the Project
- Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx, the contractor should engage a local community liaison person who is also trained in PSEA....
- The contractor will ensure proper records of labour force on site while avoiding child and forced labour
- The contractor will ensure comply to provisions of Workplace Injuries and Benefits Act (WIBA) 2007
- The contractor will develop and implement a children Protection Strategy, this strategy will ensure that no child under the legal age of 18years is employed to the Project.

(b) Gender Based violence and Sexual Harassment

Sexual harassment can occur between workers, particularly male workers against female workers, when there is insufficient sensitization of workers against prohibitions for sexual harassment, as well as the absence of reporting and disciplinary measures

This impact is triggered during Project Construction Phase due to the potential of the Contractor's failure to comply with the following provisions;

- (i) Gender Inclusivity requirements in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule.
- (ii) Failure to protect Human Risk areas Associated with, Disadvantaged Groups, Interfering with Participation Rights, and interfering with Labour Rights

Mitigation Measures of Human Rights and Gender Requirements

- Ensure clear human resources policy against sexual harassment that is aligned with national law
- Integrate provisions related to sexual harassment in the employee COC
- Ensure appointed human resources personnel to manage reports of sexual harassment according to policy
- The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse
- The contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including:
 - ✓ effective and on-going community engagement and consultation, particularly with women and girls;

- ✓ review of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; etc.
- the contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc
- The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation

(c) Child Protection

The possibility of the contractor triggering child abuse is through hiring of child labour, also labour force on site might abuse children within the Project area through sexual advance that could lead to early pregnancies and school dropout including exposure to communicable diseases such as HIV and AIDS. The contractor will undertake the below listed mitigation measures.

Mitigation Measures to Child Protection

- The contractor will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated by the Project including SEA.
- All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behaviour
- Children under the age of 18years should not be hired on site as provided by Child Rights Act (Amendment Bill) 2014
- Wherever possible, ensure that another adult is present when working in the proximity of children.
- Not invite unaccompanied children to workers' homes, unless they are at immediate risk of injury or in physical danger.
- Refrain from physical punishment or discipline of children
- Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.
- Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation

(d) Sexual Exploitation and Abuse

This impact refers to sexual exploitation and abuse committed by Project staff against communities and represents a risk at all stages of the Project, especially when employees and community members are not clear about prohibitions against SEA in the Project.

Mitigation Measures to Risk of SEA

- Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).
- The SEA action plan will include how the project will ensure necessary steps are in

place for:

- Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials;
- Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management;
- Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights;
- Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.

(e) Gender-based Violence at the community level

This impact refers to gender-based violence that women and girls may experience as a result of Project implementation. This includes, for example, an increase in intimate partner violence (IPV) when compensation schemes that share funds equally among husband and wife at the household level do not provide adequate sensitization and safety measures to reduce potential for increased tensions due to females receiving funds. This also refers to other GBV-related risks incurred as a result of water and sanitation projects that do not adequately consult women and adolescent girls in the community about safety and security issues related to the delivery of water and sanitation services.

Mitigation Measures to Risk of GBV at the community level

- Develop and implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including:
 - effective and on-going community engagement and consultation, particularly with women and girls;
 - review of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; delivery of water supplies; etc.
 - Specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; water services; etc
- Ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation

(f) Increase in Prevalence of Communicable Diseases

This impact is triggered during Project Construction Phase due to the Project attracting various categories of workers from local, national and international markets. This therefore leads to concentration of people in one area drawn from diverse social and

cultural backgrounds often resulting to people engaging in risky sexual activities. Additionally, the construction and environmental and social safeguards implementation actions will be done during the COVID-19 pandemic era. The COVID – 19 is a highly infectious disease and since consultations are required such as during RAP implementation and training on E&S issues, these also pose a potentially high risk of infection to and among communities. It is important that alternative ways of managing consultations and stakeholder engagement are implemented to mitigate the impacts.

Mitigation Measures to Risk of Communicable Diseases

- HIV/AIDS Awareness Program and other communicable diseases to be instituted and implemented as part of the Contractor's Health and Safety Management Plan to be enforced by the Supervising Engineer.
- This will involve periodic HIV/AIDS and other communicable diseases Awareness Workshops for Contractor's Staff
- Access to Contractor's Workforce Camps by outsiders to be controlled
- Contractor to provide standard quality condoms to personnel on site

Mitigation Measures to prevent the spread of COVID-19 pandemic

Among construction workers during construction:

- i. Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible. One on one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;
- ii. Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;
- iii. The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;
- iv. Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Ensure to provide and allow participants to provide feedback and suggestions.
- v. Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration.
- vi. In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chart groups.
- vii. Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants.

Amongst community members during consultations:

- i. Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;

- ii. Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;
- iii. The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;
- iv. Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Allow participants to provide feedback and suggestions.
- v. Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration.
- vi. In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chat groups.

Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants

8.6 Positive Impacts During Operational Phase

The Project shall result in both direct and indirect benefits to the residents Mombasa as summarized below:

- (i) Improve affordable, clean, reliable water supply within Project area leading to improved health and hygiene.
- (ii) Reduce exposure to health risks posed by consumption of untreated water from existing community water schemes.
- (iii) Improve health and nutrition of beneficiaries through provision of treated safe water.
- (iv) Provision of clean reliable safe water supply will eliminate water burden to women and girl child, this will allow women to engage in other economic activities while girl child concentrate on education.
- (v) The Project once operational will save community members money, this is because the water will be billed at recommended tariff by Water Services Regulatory Authority as opposed to the current exorbitant tariffs posed by local community water schemes

8.7 Negative Impacts during Project Operational Phase

The Operation phase will have potential negative impacts; these impacts are less significant and can be easily mitigated as described in **Table 8.11** below.

Table 8.11: Negative Impacts and Mitigation measure during Project Operation

Issue	Summary of Mitigation
Risk of encroachment and construction of structures on the water easement corridor	<ul style="list-style-type: none"> Mapping and installation of beacons to illustrate the width of the pipeline reserve Regular patrol of the pipeline corridor for encroachment. Prosecution of encroachers as required by County By Laws on way leaves and road reserves maintenance.

Issue	Summary of Mitigation
	<ul style="list-style-type: none"> • Conduct public sensitization programs on importance of not interfering with way leaves and public reserve land
Risk of water pipeline bursts leading to water wastages (Non-Revenue Water percentages increase)	<ul style="list-style-type: none"> • Regular check, repair and maintenance of the water pipeline • Activate a community watch group for information sharing on the status of the water line • Implement a leak detection and repair program (including records of past leaks and unaccounted for water to identify potential problem areas)
Water Discharges during flushing/cleaning of pipes to remove sediments	<ul style="list-style-type: none"> • Identify environmental issues that need mitigation during operation of the Project component. • Develop management plans and procedures needed to address the environmental concerns • Monitor and evaluate the performance against set targets • Set a budget for environmental management and restorations • Schedule for revising and updating the ESMMP • Initiate sensitization programmes on best practices on solid waste management right from the source, sorting, transportation and disposal • Conducting an initial audit in the first year of operation of the projects and subsequent annual audits of the operational activities.
Safety of Workers working on repair and maintenance works along the pipeline	<ul style="list-style-type: none"> • MOWASSCO to Employ and train Road Safety Marshalls who will be responsible for management of traffic on site • Strict use of warning signage and tapes where the trenches are open and at other active construction sites • Provide workers with adequate and appropriate Personal Protective Equipment (PPEs) such as gloves, ear gears, sturdy rubber boots and overalls • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles

9 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

9.1 Purpose and Objectives of ESMMP

The specific objectives of the ESMMP are to:

- Serve as a guiding document for the environmental and social monitoring activities for the supervising consultant, contractor and the client management including requisite progress reports.
- Provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment and/or the affected population
- Provide instructions to relevant Project personnel regarding procedures for protecting the environment and minimizing environmental and/or the affected population effects, thereby supporting the Project goal of minimal or zero incidents.
- Document environmental concerns and appropriate protection measures; while ensuring that corrective actions are completed in a timely manner.

9.2 Auditing of ESMMP

Coast Water Works Development Agency (CWWDA) and the Contractor shall conduct an initial and subsequent annual self-audit to the ESMMP to ensure that the system for implementation of the ESMMP is operating effectively. The World Bank will also supervise progress during regular supervision missions. 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.
- A discrete mechanism for safely and confidentially reporting issues of SEA and of GBV at the community level triggered by the Project
- Referral pathways are in place for support of survivors of SEA and of GBV at the community level triggered by the Project
- Ensure that appropriate corrective and preventive action is taken by the Contractor once instructions have been issued

9.3 Incident Reporting

In line with the requirement of the Occupational Health and Safety Act (OSHA) 2007, EMCA 1999 and its 2015 revisions, and World Bank EHS guidelines, all ESHS incidents, accidents, dangerous occurrences including occupational diseases shall be promptly reported to the respective regulatory institutions in the prescribed manner and

template outlined in DOSH ML/DOSH/FORM 1 and further to the World Bank.

Records of all incidents shall also be maintained and made available for inspection on site throughout the project implementation phase. Investigation shall be conducted, and a corrective action plan developed for every reportable incident to prevent recurrence.

9.4 Management Responsibility of ESMMP

In order to ensure the sound development and effective implementation of the ESMMP including monitoring implementation of GBV and SEA, it will be necessary to identify and define the responsibilities and authority of the various persons and Organizations that will be involved in the project.

The following entities should be involved in the implementation of this ESMMP:

- CWWDA/ MOWASSCO
- NEMA Mombasa County
- Contractor
- Supervising Consultant;
- County Government of Mombasa
- Community members

9.4.1 Coast Water Works Development Agency (CWWDA) / (MOWASSCO)

CWWDA in conjunction with MOWASSCO the Project proponent, will be charged with the responsibility of ensuring that the proposed development has been put up in an environmentally sound manner. This can be achieved by inclusion of environmental specifications in the tender documents, selection of renowned environmentally conscious contractors and supervision to ensure that the objectives of this ESMMP are met.

9.4.2 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. Specific NEMA roles are listed below.

- Reviewing and provide approval or issuance of improvement comments on the project ESIA report.
- Issue ESIA license and the associated conditions
- Routinely monitor the ESMP, ESIA license conditions compliance and issuance of compliance note or stoppage or improvement orders to the project.

9.4.3 The Contractor

The persons/firms contracted to put up the proposed water Projects plant will be required to comply with the requirements of the ESMMP within this report. To ensure strict compliance environmental specifications and social risk mitigation measures that address project related SEA and GBV at the community level and SH of this ESMMP should form part of the contract documents.

The contractor will be required under the contract to engage a competent Environment Safety Health and Safety Advisor/officer to advise them on the ESMP compliance; Undertake risk assessments and prepare project specific Construction ESMPs for review and approval and implement the approved C-ESMP

9.4.4 Consultant

The sourced consultant will have to ensure that the relevant sections related to the contractor's responsibilities is up to date and is being used by the contractor. Periodic audits of the ESMMP will have to be done to ensure full compliance. The Consultant will also be responsible for mitigating social risks (detailed above) during implementation stage and developing monthly and quarterly E&S monitoring reports as envisaged in the project ESMF.

9.4.5 County Government of Mombasa

The relevant departmental officers within Mombasa County will be called upon where necessary during Project implementation to provide the necessary permits and advisory services to the MOWASSCO.

9.5 Environment and Social Management and Monitoring Plan

Tables 9.1 and 9.2 on Pages 9-4 to 9-15 present the ESMMP for the proposed Improvement of Water Distribution Network within Mombasa North Mainland area of Jurisdiction, during construction, operation and decommissioning phases respectively.

Table 9.1: Construction Phase: Environmental and Social Management and Monitoring Plan

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
Seeking approvals from NEMA for ESIA, approval of campsite by Directorate of Occupational Health and Safety (DOSH)	Delay in implementation of the Project due to objections and stop orders	Low	<ul style="list-style-type: none"> The Contractor shall ensure that all pertinent permits, certificates and licences have been obtained prior to any activities commencing on site and are strictly enforced/ adhered to; The Contractor shall maintain a database of all pertinent permits and licences required for the contract as a whole and for pertinent activities for the duration of the contract 	<p>All the Project components</p> <p><u>Responsibility</u> MOWASSCO & Contractor</p>	<ul style="list-style-type: none"> Availability of approvals / permits issued 	75,000
Construction campsites	Environmental degradation risks	Medium	<ul style="list-style-type: none"> Isolate through fencing the camp sites from access by the public for their safety Preferably to be located on land already cleared land wherever possible The Contractor's Camp layout shall take into account availability of access for deliveries and services and any future works 	<p>Campsites</p> <p><u>Responsibility</u> Contractor</p>	<ul style="list-style-type: none"> Number of public outcry due to accidents 	100,000
Access to campsites and construction sites	Environmental degradation risks	Medium	<ul style="list-style-type: none"> Utilize to the extent possible the existing public roads to avoid social and economic disruption Ensure road safety measures for the construction vehicles to the extent possible by observing all traffic regulations 	<p>Access Roads</p> <p><u>Responsibility</u> Contractor</p>	<ul style="list-style-type: none"> Cases of private land required Accidents occurrence incidences 	No direct cost associated
Environmental and Social Training and Awareness	Risks of Environmental and Social degradation risks and occupational health and safety related accidents and risk mitigation of SH and SEA	Medium	<ul style="list-style-type: none"> The Contractor and sub-contractors shall be aware of the environmental requirements and constraints on construction activities contained in the provisions of the ESMMP An initial environmental awareness training session shall be held prior to any work commencing on site, with the target audience being all project affected persons The Contractor will be required to provide for the appropriate Social Risk Management Training and Awareness as described in this ESMMP, including specific and ongoing training on the COC in his costs and programming An initial social risk awareness training on SH and SEA shall be held prior to any work commencing on site, with the target audience being all project affected persons. 	<p>All Workers</p> <p><u>Responsibility</u> Contractor</p>	<ul style="list-style-type: none"> Number of Trainings Held Availability of Training reports Attendance list of participants during the training sessions 	100,000

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
HIV/AIDS awareness and prevention campaign	Risks of Increased HIV and Aids transmission in the area	Medium	<ul style="list-style-type: none"> The Contractor shall institute HIV/AIDS awareness and prevention campaign amongst his workers for the duration of the contract, contracting and implementing organisation, with preference for an organisation already working on this issue in the Project area; The campaign shall include the training of facilitators within the workers, information posters in more frequented areas in the campsite and public areas, availability of promotional material (T-shirts and caps), availability of condoms (free), coordination with GBV prevention messages and theatre groups. 	<p>All Workers</p> <p><u>Responsibility</u> Contractor</p>	<ul style="list-style-type: none"> Number of Trainings Held Availability of Training reports Attendance list of participants during the training sessions 	75,000
COVID-19	Spread of COVID-19 amongst workers	High	<ul style="list-style-type: none"> The Contractors will develop a SOPs for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilization. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions; Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including visitors. Avoid concentrating of more than 15 workers at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters. All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs; The project shall put in place means to support rapid testing of suspected workers for covid-19; Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used; 	<p>All the Project components</p> <p>Responsibility CWWDA, MOWASCO & Supervising Eng. & Contractor(s)</p>	Availability of SOP(s), Training material, PPE, sanitizing facilities etc	100,000.00

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
			<ul style="list-style-type: none"> Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, doorknobs, handrails etc; 			
COVID-19	Spread of COVID-19 amongst community members during consultations processes		<ul style="list-style-type: none"> Electronic means of consulting stakeholders and, holding meetings, whenever possible, shall be encouraged. One on one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced; Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters; The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet; Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Ensure to provide and allow participants to provide feedback and suggestions. Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration. In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chat groups. 	<p>All the Project components</p> <p>Responsibility CWWDA, MOWASCO & Supervising Eng. & Contractor(s)</p>	Availability of SOP(s), Training material, PPE, sanitizing facilities etc.;	50,000.00

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
			<ul style="list-style-type: none"> Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants A statement on COVID-19 be part of the project sign board 			
Local Labour/ Employment	Delay in Project implementation due to opposition from aggrieved community members	Medium	<ul style="list-style-type: none"> Wherever possible, the Contractor shall use local labour, and women must be encouraged to be involved in construction work The contractor shall ensure compliance to the gender balance as required by the 2/3 gender rule The contractor shall implement strategies presented in section 8.5.5.2 to reduce risk of GBV 	<p>All the Project Lots</p> <p><u>Responsibility</u> Contractor</p>	<ul style="list-style-type: none"> Number of workforce employed from the local community Number of females employed 	No direct costs associated
Excavations (Vegetation clearance, channeling and site preparations)	Vegetation Cover destruction	Low to medium	<ul style="list-style-type: none"> Construction activities will be limited to Project sites / routes which already exist therefore limited destruction to vegetation cover, Compensatory planting of trees that will be cut by the contractor during excavation of water pipeline trenches. This will be achieved through a tree planning program to be initiated under the works contractor. 	<p>All work areas</p> <p><u>Responsibility</u> Contractor in liaison with Kenya Forest Services Coastal Region</p>	<ul style="list-style-type: none"> Soil erosion extend and intensity on site 	100,000
	Impacts on Water Resources - water pollution	Low to medium	<ul style="list-style-type: none"> No grey water runoff or uncontrolled discharges from the working areas (including wash down areas) will be allowed to drain into adjacent storm water channels without pre-treatment. Water containing such pollutants as cements, concrete, lime, chemicals and fuels shall be discharged into a conservancy tank for removal from site where applicable The Contractor shall also prevent runoff loaded with sediment and other suspended materials from the site/working areas from discharging to storm water channels 	<p>All work areas</p> <p><u>Responsibility</u> Contractor</p>	<ul style="list-style-type: none"> Water quality flowing through storm 	No direct cost
	Siltation and Sedimentation Control	Low	<ul style="list-style-type: none"> Any work along storm water channels will be isolated to prevent silt propagating downstream; Debris and other material will be prevented 	<p>civil works areas</p> <p><u>Responsibility</u> Contractor</p>	<ul style="list-style-type: none"> Silt load in storm water channels 	No direct cost

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
			<ul style="list-style-type: none"> from entering Storm water channels; contamination by other pollutants); Sand/silt traps should be used so as to prevent silt and any other sediments from getting into storm water channels Site compounds and stockpiles will be located away from shallow wells and storm water channels 			
	Soil Erosion Impacts	Low	<ul style="list-style-type: none"> Excavations should be controlled so that land that is not required for the Project works is not disturbed; Wherever possible, excavation should be carried out during the dry season to prevent soil from being washed away by the rain. Excavated materials should be kept at appropriate sites approved by the Supervising Engineer. 	Civil works areas <u>Responsibility</u> <ul style="list-style-type: none"> Contractor Supervising Engineer 	<ul style="list-style-type: none"> Extend of soil erosion on site 	No direct cost
Site Activities	Risk of Accidents at Work Sites	High	<ul style="list-style-type: none"> Contractor to provide a Healthy and Safety Plan (HSP) prior to the commencement of works to be approved by the Supervising Engineer. Provide Personal Protective Equipment (PPE) including gloves, gum boots, overalls and helmets to workers. Use of PPE to be enforced by the Supervising Engineer. Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles Strict use of warning signage and tapes where the trenches are open and at other active construction sites Contractor to Employ and train Road Safety Marshalls who will be responsible for management of traffic on site 	Civil works areas <u>Responsibility</u> <ul style="list-style-type: none"> Contractor Supervising Engineer 	<ul style="list-style-type: none"> Number of fatalities and accidents recorded in the incidence book 	75,000
	Solid Wastes impacts	High	<ul style="list-style-type: none"> The contractor shall develop a comprehensive Waste Management Plan (WMP) prior to commencement of works Properly labelled and strategically placed waste disposal containers shall be provided at all places of work Litter bins should have secured lids to prevent animals and birds from scavenging All personnel shall be instructed to dispose of all waste in a proper manner 	Civil works areas <u>Responsibility</u> Contractor <ul style="list-style-type: none"> Supervising Engineer 	<ul style="list-style-type: none"> Quantity of solid Wastes Generated and appropriately disposed 	75,000

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
			<ul style="list-style-type: none"> Recycling of construction material shall be practiced where feasible e.g. containers and cartons 			
	Hazardous Wastes (Asbestos pipes)		<ul style="list-style-type: none"> Mapping of existing asbestos cement pipes Carrying out asbestos handling and disposal risk assessment AC handling induction for workers Provision of appropriate PPEs to workers 	Civil works areas Contractor Supervising Engineer	<ul style="list-style-type: none"> AC mains map and load records AC handling specific training records PPE issuance records Medical examination records 	
Site Activities	Sexual Harassment between project workers		<ul style="list-style-type: none"> The contractor will ensure clear human resources policy against sexual harassment that is aligned with national law The contractor will integrate provisions related to sexual harassment in the employee COC The contractors will ensure appointed human resources personnel to manage reports of sexual harassment according to policy 	Civil works areas <u>Responsibility</u> Contractor Supervision	<ul style="list-style-type: none"> SH Policy Number of trainings for staff on SH HR trained in SH 	
	Liquid Wastes Impacts	High	<ul style="list-style-type: none"> Water containing pollutants such as concrete or chemicals should be directed to a conservancy tank for removal from the site where applicable Potential pollutants of any kind and form shall be kept, stored and used in such a manner that any escape can be contained In case of any form of pollution the contractor should notify the Resident Engineer (RE) Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas including groundwater are not polluted No grey water runoff or uncontrolled discharges from the site or working areas to any adjacent Storm water channels. 	Civil works areas <ul style="list-style-type: none"> Contractor Supervising Engineer 	<ul style="list-style-type: none"> Quantity of liquid Wastes Generated and appropriately disposed 	50,000
	Sanitation issues resulting from both solid and liquid wastes on site	High	<ul style="list-style-type: none"> The Contractor shall adhere to laws relating to public health and sanitation All temporary/ portable toilets or pit latrines shall be secured to the ground to the satisfaction of the RE to prevent them from toppling over 	All work areas <u>Responsibility</u> <ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Incidence of reported cases of water related diseases among the 	No direct cost associated

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
	Risks associated with water borne diseases exposed to community and workforce		<ul style="list-style-type: none"> A wash basin with adequate clean water and soap shall be provided alongside each toilet. Staff shall be encouraged to wash their hands after use of the toilet, in order to minimise the spread of possible disease Toilets will be sex-segregated in order to ensure the privacy, safety and dignity of women and men 	Supervising Engineer	workforce and neighbor community	
Site Activities	Fuels, Oils and other hydro-carbons	High	<ul style="list-style-type: none"> The contractor shall ensure that the machines and equipment are in good condition when on site. Ensure proper handling of lubricants, fuels and solvents while maintaining the plant and equipment. Any chemical or fuel spills shall be cleaned up immediately. The spilt liquid and clean-up material shall be removed, treated and transported to an appropriate site licensed for its disposal. 	civil works areas <u>Responsibility</u> <ul style="list-style-type: none"> Contractor Supervising Engineer 	<ul style="list-style-type: none"> Quantity of waste fuels and oils appropriately disposed Availability of spill kits on site 	50,000
	Storage of fuel oils, lubricants, chemicals and flammable materials Hazards of fire outbreak, oil and chemical spills.	High	<ul style="list-style-type: none"> Follow specifications of the Occupational Health and Safety Act 2007, EMCA 2015 and others in the development and operation of stores. 	All work areas <u>Responsibility</u> <ul style="list-style-type: none"> Contractor Supervising Engineer 	<ul style="list-style-type: none"> Incidence of reported cases of fuel leaks and fire incidences 	No direct cost associated
	Noise and Vibration control from plant and equipment Risk to health and safety of community and workers	High	<ul style="list-style-type: none"> The Contractor shall keep noise level within acceptable limits and construction activities shall, where possible, be confined to normal working hours in the residential areas hospitals and other noise sensitive areas shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity Any complaints received by the Contractor regarding noise will be recorded and communicated to the RE The Contractor must adhere to Noise Prevention and Control Rules of April 2005 Workers exposed to prolong noisy working environments should be issued with appropriate PPEs (noise plugs, ear muffs) 	civil works areas <u>Responsibility</u> <ul style="list-style-type: none"> Contractor Supervising Engineer 	<ul style="list-style-type: none"> Reported complaints from neighbor community and institutions 	No direct cost associated

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
	Air Quality Control Air pollution causing respiratory disorders to human	High	<ul style="list-style-type: none"> Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the contractor's specifications The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilised as soon as practically possible The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds Vehicles delivering soil materials shall be covered to reduce spills and windblown dust Water sprays shall be used on site to suppress dust especially in areas within 200metres of human settlement. 	<p>All work areas</p> <p><u>Responsibility</u></p> <ul style="list-style-type: none"> Contractor Supervising Engineer 	<ul style="list-style-type: none"> Cases of respiratory complication at nearby health centre 	No direct costs (integrated in the works costs)
Traffic management on site	Risks of Accidents, Injuries or death of workers or community member	high	<ul style="list-style-type: none"> Strict use of warning signage and tapes where the trenches are open and active sites Employ and train road safety Marshalls who will be responsible for management of traffic on site Contractor to provide a traffic management plan during construction to be approved by the resident engineer 	<p>Civil works areas</p> <p><u>Responsibility</u></p> <ul style="list-style-type: none"> Contractor Supervising Engineer 	<ul style="list-style-type: none"> Accidents occurrence incidences Availability of agreed/approved traffic management plan, signages,, presence of the traffic marshals 	No direct cost
	Resettlement Impacts	High	<ul style="list-style-type: none"> Implement ARAP assessment prepared for the Project. The total number of Project Affected Persons in North Mainland is 31 PAPs. Among them 7 PAPs are female, 24 are male & 3 PAPs are weak and elderly and therefore vulnerable. 	<p>All the Project components.</p> <p><u>Responsibility</u></p> <p>CWWDA, MOWASSCO / Mombasa County Government</p>	<ul style="list-style-type: none"> Numbers of satisfied PAPS Extent of route opened to the contractor 	Kshs. 2,164,715
	Labour Influx	Medium to High	<ul style="list-style-type: none"> The contractor awarded the Project will develop a labour Management Plan (LMP) in consultation with local leaders. The contractor will ensure effective community engagement and strong grievance 	<p>Project Corridor</p> <p><u>Responsibility</u></p> <ul style="list-style-type: none"> Contractor Supervising 	<ul style="list-style-type: none"> Number of grievances recorded by disgruntled works force 	No direct cost

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
			<p>mechanisms on matters related to labour including sexual exploitation and abuse</p> <ul style="list-style-type: none"> Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx, the contractor should engage a local community liaison person. The contractor will ensure proper records of labour force on site while avoiding child and forced labour The contractor will ensure comply to provisions of Work Place Injuries and Benefits Act (WIBA) 2007 <p>▪ The contractor shall require his/her employees, sub-contractors, sub-consultations and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct, with specific provision on protection from sexual exploitation and abuse</p>	Engineer	and community	
	Gender Inclusivity in Project activities	Low	<ul style="list-style-type: none"> The contractor will mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule. Special provisions for reporting and addressing any GBV risks at the community level (ie. backlash in the home) related to employment of women The existing community structures headed by location chiefs should be involved in local labour hire, emphasize the requirement of hiring women, youth and people with disability and VMGs Protecting Human Risk areas Associated with, Disadvantaged Groups, Interfering with Participation Rights and interfering with Labour Rights ▪ To include promotion of human rights, including gender equality and equity in Employee's Code of Conduct 	<p>Project Corridor</p> <p><u>Responsibility</u></p> <ul style="list-style-type: none"> Contractor Supervising Engineer 	<ul style="list-style-type: none"> women and Men employed by the Project 	No direct cost
	Children abuse impacts	High	<ul style="list-style-type: none"> The contractor will develop and implement a Children Protection Strategy that will ensures 	Project Corridor	<ul style="list-style-type: none"> Number of cases reported 	No direct cost

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
			<p>minors are protected against negative impacts associated by the Project.</p> <ul style="list-style-type: none"> All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behaviour Children under the age of 18years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014 	<p><u>Responsibility</u></p> <ul style="list-style-type: none"> Contractor Supervising Engineer 	involving abuse of children	
	Gender-based violence at the community level		<p>The contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including:</p> <ul style="list-style-type: none"> Effective and on-going community engagement and consultation, particularly with women and girls; Review of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes for women, employments schemes for women, etc.; Specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment The contractor will ensure adequate referrals mechanisms are in place if a case of GBV at the community level is reported related to project implementation 		<ul style="list-style-type: none"> plan for GBV occurring at the community level as a result of project implementation Number of GBV cases happening at the community level that receive survivor-centered referral and care 	200,000
	Sexual Exploitation and Abuse by project workers against community members		<ul style="list-style-type: none"> Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). The SEA action plan will include how the project will ensure necessary steps are in place for: <ul style="list-style-type: none"> Prevention of SEA: including COCs and ongoing sensitization of staff on 		<ul style="list-style-type: none"> SEA Action Plan Code of Conduct Number of staff trainings SEA FP Community Liaison Officer trained in PSEA 	

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
			<p>responsibilities related to the COC and consequences of non-compliance; project-level IEC materials;</p> <ul style="list-style-type: none"> Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management; Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights; Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers. 		<ul style="list-style-type: none"> IEC materials for workers' sites and community Discrete SEA reporting pathway Relevant policies, e.g. investigations and discipline and whistleblower protection Monthly minutes from SEA coordination meetings 	
	Increase of communicable	High	<ul style="list-style-type: none"> HIV/AIDS Awareness Program and other communicable diseases to be instituted and 	All Workers	<ul style="list-style-type: none"> Number of Trainings 	Budgeted as above in

Activity	Associated Impacts	Impact Levels	Management Actions	Target Areas& Responsibilities	Monitoring Indicator	Budget (Kshs)
	diseases including HIV and AIDS		<p>implemented as part of the Contractor's Health and Safety Management Plan to be enforced by the Supervising Engineer.</p> <ul style="list-style-type: none"> This will involve periodic HIV/AIDS and other communicable diseases Awareness Workshops for Contractor's Staff Access to Contractor's Workforce Camps by outsiders to be controlled Contractor to provide standard quality condoms to personnel on site 	<p><u>Responsibility</u> Contractor</p>	<p>Held</p> <ul style="list-style-type: none"> Availability of Training reports Attendance list of participants during the training sessions 	(HIV/AIDS Awareness and Prevention)
Contractor de-mobilization and site reinstatement	Associated risks of environmental degradation	Medium	<ul style="list-style-type: none"> The site is to be cleared of all construction materials, including litter prior to hand over Fences, barriers and demarcations associated with the construction phase must be removed from the site Fences, barriers and demarcations associated with the construction phase must be removed from the site Rehabilitation Activities of Environmental Cases identified must continue throughout the defect liability period 	<p>All work areas</p> <p><u>Responsibility</u></p> <ul style="list-style-type: none"> Contractor Supervising Engineer 	<ul style="list-style-type: none"> Closeout audit report findings 	No direct anticipated
Total Estimated Cost for ESMMP					EMP	1,050,000.00
ARAP Cost					ARAP	2,164,715.00

Table 9.2: Operational Phase: Environmental and Social Management and Monitoring Plan

No.	Issue	Action required	Responsibility	Provisional Budget
1	Risk of encroachment and construction of structures on the water easement corridor	<ul style="list-style-type: none"> Mapping and installation of beacons to which illustrate the width of the pipeline reserve Regular inspection of the pipeline corridor for encroachment. Prosecution of encroachers as required by City County By laws on way leaves and road reserves maintenance. Conduct public sensitization programs on importance not interfering with wayleaves and public reserve land 	MOWASSCO	To be established at operation phase and included in the operation of the projects
2	<p>Risk of water pipeline bursts leading water wastages (Non-Revenue Water percentages increase)</p> <p>Water system leaks can reduce the pressure of the water system compromising its integrity and ability to protect water quality (by allowing leakage of contaminated water into the system)</p>	<ul style="list-style-type: none"> Regular check, repair and maintenance of the water pipeline Activate a community watch group for information sharing on the status of the water line Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas) 	MOWASSCO	To be established at operation phase and included in the operation of the projects
3	Risk of illegal connection to the water pipeline	<ul style="list-style-type: none"> This is common in the informal settlements where residents illegally tap the water pipeline This will require constant inspection by MOWASSCO officials and installation of leak and burst detectors at designated areas along the pipeline. Conduct public sensitization programs on importance not interfering with the water pipeline and the need to seek official water connection from MOWASSCO 	MOWASSCO	To be established at operation phase and included in the operation of the projects
4	<p>Water Discharges during flushing/cleaning of pipes to remove sediments is also a potential impact in this phase.</p> <p>The major environmental aspect of water pipe flushing is the discharge of flushed water, which may be high in suspended solids, residual chlorine, and other contaminants that can harm surface waterbodies harm terrestrial and aquatic fauna and flora</p>	<ul style="list-style-type: none"> Identify environmental issues that need mitigation during Project operation. Develop management plans and procedures needed to address the environmental concerns Monitor and evaluate the performance against set targets Set a budget for environmental management; and restorations Schedule for revising and updating the ESMMP. Initiate sensitization programmes on best practices on solid waste management right from the source, sorting, transportation and disposal Conducting an initial audit in the first year of operation of the projects and subsequent annual audits of the operational activities. 	MOWASSCO	To be established at operation phase and included in the operation of the projects
5	Risk of Sexual Exploitation and Abuse by project workers against community members	<ul style="list-style-type: none"> Identify and assess GBV/SEA risks at the community level Establish procedures to review and update risk assessments during project implementation Assess the capacity and the availability of quality, safe and ethical services for survivors 	MOWASSCO	To be established at operation phase and included in the operation of the projects

No.	Issue	Action required	Responsibility	Provisional Budget
		<ul style="list-style-type: none"> • Conduct a GBV service mapping • Include GBV sensitive approaches in GRM • Develop and implement a SEA Action plan including a prevention and Accountability and Response Framework (as detailed above) • Develop and implement GBV mitigation Plan • Consider having a GBV specialist in the supervision consultant's team 		
6	Safety of Workers working on repair and maintenance works along the pipeline	<ul style="list-style-type: none"> • MOWASSCO to Employ and train Road Safety Marshalls who will be responsible for management of traffic on site • Strict use of warning signage and tapes where the trenches are open and at other active construction sites • Provide workers with adequate and appropriate Personal Protective Equipment (PPEs) such as gloves, ear gears, sturdy rubber boots and overalls • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles 	MOWASSCO	To be established at operation phase and included in the operation of the projects

9.6 Decommissioning Flow Chart

The Project has been designed to operate effectively for over 20 years. In the event that the infrastructure will be required to be overhauled, then steps should be considered in order to undertake the procedure in a structured manner with minimum impact to both human and natural environment as illustrated in **Table 9.3** below.

Table 9.3: Decommissioning Flow Chart

Stage	Action	Actor
Step 1	Initiation Development of an Objective Worksheet and checklist incorporating references, legal and policies Undertake decommissioning audit	Proponent
Step 2	Prepare Road Map for Decommissioning Design Conduct design review to validate elements of the design and ensure design features are incorporated in the decommissioning design. Public consultations	Proponent
Step 3	Prepare and Award Contract Prepare a contract that incorporates validated Project information and award to a contractor as per the Procurement rules.	Proponent
Step 4	Execute Decommission Works Implement design elements and criteria on the Project in accordance with specifications and drawings. Inspect during decommissioning and at Project completion to ensure that all design elements are implemented according to design specifications.	Contractor
Step 5	Commissioning Environmental Management Plan	Contractor
Step 6	Non-Conformance, Corrective/Preventive Action Determine root cause Propose corrective measures Propose future preventive measures.	Contractor

10 FINDINGS AND CONCLUSION

10.1 Conclusion

The Environmental and Social Impact Assessment (ESIA) undertaken for the Project indicates that the Project will have the following impacts:

- (i) The Project area is located within Mombasa North Mainland. This area is influenced by anthropogenic activities and no sensitive environment ecosystems were identified along the Proposed Water line routes. Therefore, there will be no direct interaction of the Project activities at the time of construction with the natural sensitive ecosystems.
- (ii) The Environment and Social impacts will be less significant impacts which can be easily be mitigated as discussed in **Chapter 8** of this assessment.

10.2 Recommendations

This assessment provides the following:

- (i) The **Bid Documents** prepared for the Project incorporates the Environment, Social Health and Safety Provisions discussed under Chapter 8 (Environment and Social Impact Assessment and Mitigation Measures).
- (ii) The **Project Contract Document** should include provisions for the contractor preparing and implementing site specific **Environment and Social Management Plan (ESMP)**, appendices to the ESMP will include:
 - *Health, Hygiene and Safety Plan*
 - *Labour Management Plan*
 - *Child Protection Strategy*
 - *Waste Management Plan*
 - *Asbestos handling protocol, including safe disposal where necessary*
 - *Contractors Code of Conduct including provisions on VAC, SEA, and SH*
 - *Gender Based Violence and Sexual Harassment Prevention Plan*
 - *GBV Action Plan, including:*
 - ✓ *SEA Prevention and Response Strategy*
 - ✓ *SH Policy*
 - ✓ *GBV Mitigation Plan*
 - ✓ *SEA Redress Mechanism*
 - ✓ *SH Redress Mechanism*
 - *HIV/Aid & Communicable Diseases Prevention Strategy*
- (iii) The Project supervising engineer will engage on a fulltime basis environment and social safeguards officers who will be in charge of ensuring compliance of the contractor to environment and social provisions provided by the ESIA and Construction Environment and Social Management Plans (CEMP) prepared by the contractor. The officer will participate in monthly and quarterly meeting and will generate monthly and quarterly environment and social safeguards compliance reports.
The recruitment of a community liaison officer who will act as a link between the

community and the contractor.

- (iv) At Project Implementation Stage, the Contractor will report to the Project management team comprising of the Consultant and the Project proponent monthly on how ESHS provisions detailed in this ESIA are addressed
- (v) At Project completion stage, within the defects liability Period, Coast Water Works Development Agency (CWWDA) will initiate and an **Initial Environment and Social Audit** and subsequent annual audits for the Project as required by EIA/EA Audit regulation of the year 2003. The audit will develop an Environment and Social Audit Action Plan (ESAAP) that will be used to track Project Environment and Social Compliance during Project implementation stage.

The ARAP Report prepared has been in conformity with the provisions of the ARAP as required by World Bank (Environment and Social Standard on Involuntary Resettlement). The ARAP findings are summarized in **Table 10.1** below.

Table 10.1: Summary of ARAP Findings

Item	Description	Affected PAPs
1	Mombasa North Mainland	
1.1	PAPs who are Women	7
1.2	PAPs who are Men	24
1.3	PAPs who are Vulnerable within the total number of PAPs	3
	Total number of PAPs	31

Estimated ARAP budget as presented by the ARAP Report is **Kshs. 2,164,715 (Two Million, One Hundred Sixty-Four Thousand, Seven Hundred and Fifteen Shillings Only)**.

LIST OF APPENDICES

- Appendix 1 - Public Participation Minutes, List of Participants and Summary of Institutional Consultations
- Appendix 2 - Chance Find Procedures
- Appendix 3 - Abstract on Asbestos Cement Water Pipeline Health Risk & Handling Protocol
- Appendix 4 - Environment and Social Screening Checklist
- Appendix 5 - Grievance Redress Mechanism
- Appendix 6 - Lead Expert License 2019

Appendix 1

Minutes and List of Attendance to Consultative Meetings

**MINUTES FOR PUBLIC CONSULTATIVE MEETING HELD AT ASSISTANT CHIEF'S
OFFICE KISAUNI SUB LOCATION MOMBASA COUNTY ON
8TH NOVEMBER 2018 AT 11 AM**

MEMBERS PRESENT

1. Area Assistant Chief
2. Nyumba Kumi Chairperson
3. Consultant representative
4. Residents of Bamburi and MtoPanga

AGENDA

1. Reason for Stakeholder Consultation
2. Current Sanitation situation and Challenges
3. CWWDA interventions to address the challenges
4. Potential Project Impacts (Both Positive and Negative)
5. Any Other Business and plenary

MIN 1/11/2018: Introduction

The meeting kicked off at 10.00 am with the introduction of parties present, opening remarks from the area assistant chief ward and later an opening prayer said by a resident of Mtopanga.

The area assistant chief highlighted the numerous challenges that residents face which include; lack of sufficient water supply, poor sanitation that leads to numerous water borne diseases like typhoid, diarrhoea and cholera. He also lamented that residents especially women and children spend a lot of time trying to fetch water from fresh water points that are far and usually experience long queues. Some residents have opted to drill boreholes and dig shallow wells within their home, water quality from these sources has high salinity levels. Drilling of boreholes closely can also lead to over abstraction of underground water.

The ESIA (Environmental and social impact assessment) expert enlightened the community on the importance of conducting ESIA and why the public should participate before development projects are implemented as guided by the Kenyan constitution and EMCA 2015, residence was further informed that the ESIA team will identify impacts that are likely to occur during both project implementation and operation phases and come up with appropriate ways of mitigating the impacts.

MIN 2/11/2018: LEGAL AND POLICY PROVISIONS WITH REGARDS TO ESIA

Legal Requirement: EMCA 1999 amended in 2015 to align to Kenyan Constitution 2010 and EIA/EA 2003 requires that during preparation of EIAs of such as Project, all relevant stakeholders are identified and consulted with regards to the proposed Project. Input from stakeholders helps development of Impacts Mitigation Measures and Finalization of Engineering Designs.

MIN 3/11/2018: LEGAL AND POLICY PROVISIONS WITH REGARDS TO ARAP

The consultant guided PAPS present on legal and policy provision with regards to ARAP. The PAPS were informed that Kenya – Land Act 2012 and World Bank OP 4.12 on Involuntary Resettlement were the main statutes which protect PAPs against impacts caused to them by development projects.

MIN 4/11/2018: IDENTIFIED ENVIRONMENTAL AND SOCIAL IMPACTS ASSOCIATED WITH THE WATER DISTRIBUTION PROJECT (both positive and negative)

Potential Positive Project impact: Improved Hygiene and Sanitation, Reduced Cases of Water Related Diseases, Reduced time and money spend on fetching water, Increased Land Value in the Project Area.

Potential Negative Impact: Impacts on Biophysical Environment (Vegetation destruction, Soils, Water Resources – through pollutants from the construction site), Impacts on Social Environment (Labour influx, Child Labour, gender inclusivity, Human rights, teenage pregnancies, school dropouts, HIV and Aids).

Health and Safety Impacts (Noise and Vibrations, Air pollution, Accidents on site, fire disasters).

MIN 5/11/2018: IDENTIFIED ARAP IMPACTS IN THE PROJECT AREA TO BE IDENTIFIED DURING THE ARAP CENSUS AND APPLICABLE ENTITLEMENT

The PAPs were informed that during census the below listed category of impacts will be recorded in the settlement.

- (i) PAP's whose structures used for business or residential purposes will be partially or total affected.
- (ii) PAP's whose business or sources of livelihood will be affected.
- (iii) Tenants who reside in structures that will be totally affected.

Further the PAPs were informed that the PAPs will be entitled to the below.

- (i) Loss of Structures will be replaced at full replacement cost, the owners will also be given three months' notice to remove the affected asset and the right to salvage materials.
- (ii) Loss of Rental Income: PAPs are entitled to three months' notice and a two month cash grant equivalent to average income.
- (iii) Loss of Business: Affected businesses will be given two months cash grants equivalent to average income as a means of facilitation.
- (iv) Loss of Shelter: The PAPs residing in main houses will be entitled to two month rent allowance to look for alternative houses within the settlement. In addition, a three months' notice for vacation will be issued to allow the PAPs adequate time to look for alternative accommodation
- (v) Vulnerability: Vulnerable PAPs will be given tailor made assistant to enable them to relocate easily.

MIN 6/11/2018: STAKEHOLDERS INCLUSIVITY IN THE PROCESS

Stakeholders attending the meeting highlighted the importance of extensive participation right from the start of the process until completion. The County Government of Mombasa, Mombasa Water Supply and Sanitation Company (MOWASSCO), National Government and residents should be consulted at each stage in order to incorporate their views and address any concerns that might arise.

MIN 7/11/2018: SUPPORT TO VULNERABLE GROUPS

The PAPS were informed that vulnerable PAPs are a distinct groups of people who might suffer disproportionately or face the risk of being marginalized as a result of resettlement and specifically include: (i) female-and child-headed households, (ii) disabled household heads, (iv) Households headed by elderly persons with no means of support.

Vulnerable PAPs, will be entitled to additional financial support for the first 2 months, specialized assistance during relocation and priority in disbursement of compensation funds. The elderly will also be enlisted to government social programme such as the "Inua Jamii cash transfer programme for aged persons.

MIN 8/11/2018: PLENARY DISCUSSION

The below listed issued in Table 1 were discussed with the residents in attendance at the plenary session.

Table 1: Plenary Discussion during the Meeting

Issues	Discussion	Way forward
Way leave issues	<ul style="list-style-type: none"> Residents of Bamburi and Mto panga raised concerns about the way leave for the proposed pipeline. They wanted to know where the pipeline will be laid since their area was densely populated. They also wanted to know if the water pipeline will serve them or if it has a different target area 	<ul style="list-style-type: none"> Residents were informed that from the preliminary designs the pipeline has been proposed to be laid on road reserves and access routes. No way leave acquisition is being anticipated for the entire line. They were further informed that the line being proposed is for distribution of water within the project area and the lines are relatively small therefore they will fit in the existing access routes and road reserves.
Commencement date and criteria for water application	<ul style="list-style-type: none"> Residents wanted to know the commencement date for the project. They were concerned that some projects have been initiated in the area studies done but implementation has never kicked off. Residents Wanted to know how they will get connections from the new water line and if it will be supplied by Coast Water Works Development Agency or Mombasa Water Supply and Sanitation company 	<ul style="list-style-type: none"> Residents were informed that the consultant is currently doing final designs for the pipeline. Once complete Coast Water service board will source for a contractor to implement the project depending on the availability of funds. Residents will apply water to MOWASSCO for connections and a meter provided. Coast Water Works Development Agency will only develop the infrastructure but management will be under MOWASSCO.

Issues	Discussion	Way forward
Compensation of PAPs	<ul style="list-style-type: none"> • They all agreed that some kind of facilitation should be offered by the Government for affected property • Residents suggested certified valuer be contracted to do the valuation of their properties. • The consultant should engage local administration to verify property and land ownership. 	<ul style="list-style-type: none"> • The ARAP report will identify all eligible PAPs who will be enumerated and their assets valued and documented for purposes of compensation. • A cut off date will be set after all PAPs have been enumerated to eliminate issues of ghost PAPs.
Employment opportunities	<ul style="list-style-type: none"> • Residents wanted to know if they will get any employment opportunities during project implementation phase. 	<ul style="list-style-type: none"> • They were informed that during implementation, the contractor will hire youth from the area complement his workforce. • Also, during the ARAP Process some youth and village elders will be engaged to help conduct the census.

MIN 9/11/2018: AOB

The representative Nyumba Kumi initiative urged residents to cooperate with the consultant and provide all the information needed to make the exercise a success.

The area chief urged the community to support the project because the target areas are growing fast, therefore improved water network is a necessity to avert the risks of waterborne ailments. He asked youth in the area to shun the use of drugs that makes most youth incapable of engaging in honest income generating activities and opt for crime. The chief was very categorical that his office will deal firmly with anyone found engaging in crime.

PHOTO PLATE



Chairperson Nyumba Kumi addressing residents



Environmentalism addressing residents



A resident asking questions



A resident asking questions

SUMMARY OF INSTITUTIONAL CONSULTATIONS

Institution	Issues Discussed
Environmental and Safeguards Officer- MOWASSCO	<ul style="list-style-type: none"> That all the relevant key stakeholders will be informed of the ESIA and ARAP exercise to be carried out so as to ensure smooth process. The need to consult all the business unit managers for West Mainland, South Mainland, North Mainland and the Island that is Mombasa Town. In case the consultant needed to talk to the local administration, he would help with the introductions.
Ag General Manager Business Commercial - MOWASSCO	<ul style="list-style-type: none"> The need to contact all the business unit managers and alert them of the coming visitors in their areas, and also the need for cooperation The issue of public participation to sensitize the locals about the new upcoming project was also discussed with the GM emphasizing on the need to do a proper consultation.
Ag General Manager Engineering -	<ul style="list-style-type: none"> Some of the old lines which had been proposed for augmentation would real improve on the service delivery of the company, this idea was welcomed. The fact that the new lines had been to be laid majorly on road reserve was a huge point to note. He recommended that compensation should be considered in case the lines would affect people's properties.
Ag Business Unit Manager- North Mainland (Kisauni)	<ul style="list-style-type: none"> The population growth of the area had increased over a short period of time hence the need to increase the water supply, due to this factor; the project would be welcomed in the area.
Chief Kisauni	<ul style="list-style-type: none"> The chief advised the team that during the resettlement action plan, a village elder should walk around with his authority to make the exercise smooth. He also requested that when the project implementation phase came through the locals should be considered first in employment opportunities That currently his area was facing lots of water rationing with some totally missing it out. Due to this the project would be welcomed if proper channels are followed. The office of the chief was there to support great projects that would help the people, so he would support the project and even help in organizing for the public participation forum.
Coastal Region Manager KeNHA	<ul style="list-style-type: none"> KeNHA in collaboration with KURA has embarked on a Rapid Results initiative of beaconing all road reserves of all class A and B roads in the coast. After beaconing, the road reserves will be clear and those who have encroached will be required to move. CWWDA when implementing the water pipeline project should seek for approvals before laying the water pipes within the road reserves. Before approval is granted, KeNHA / KURA will assess the request in line with the roads development master plan and advise CWWDA appropriately



MIBP
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





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Preparation of Water Distribution Master Plans for Water Service Providers (5 WSPs) in Mombasa, Kilifi, TaitaTaveta and Kwale Counties
PUBLIC PARTICIPATION

ATTENDANCE LIST

VENUE: MTOPONGA ASST CHIEF'S OFFICE DATE: 8/11/2018

No	Name	Phone	Location/Designation	Sign
1	JINGENI SIMIYU	0734745538	MATINGASI	
2	KOMBE EKETE KEMBE Duma Khumisi Chumba	0713532903	MATINGASI Mitopanga	 Duma
3	HALIMA KAPASI		MATINGASI	HALIMA
4	MWANANGI AGI	0718568134	MITOPANGA	MWANANGI
5	JOICE KAMBU	0717061255	MITOPANGA	
6	Firdaus Hassan	0729909765	Mafisini	
7	FEDINARD MKOMBE CHLUMU	0724965098	MWANDONI	
8	JUMA AH RASHID	0727645501	MWANDONI	
9	GONGA SAGARI FOMBO	0733662020	MATINGASI	
10	SADIKI MGOMBA RUWA	0727106629	MAFISINI (MASHUGU MAPRA)	
11	DENNIS OMENDO KUVOGA	0723650575	MAFISINI (KATBEE)	
12	PATRICK OTIHO	0704040218	MAFISINI/MAJENKOMBWA	
13	PHILIP BATA KOMBE	0702448697	MKONGENI	
14	RAMA CHWAPA		KADZANDANI	RAMA
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[illegible]

Appendix 2

Chance Find Procedures

ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT PROJECT REPORT (ESIA)
FOR IMPROVEMENT OF WATER DISTRIBUTION NETWORK WITHIN
(MOWASSCO) JURISDICTION

Policy and Legal Provision

National Museums and Heritage Act 2006 laws of Kenya provides for; *'if you believe that you may have encountered any archaeological materials or any material national importance stop work in the area and follow the procedure box below'*

Chance Find Procedures

- (i) All construction activity in the vicinity of the remains is to cease immediately.
- (ii) The Supervising engineer or Environment Officer shall contact Kenya National Museums Immediately

Public relations:

E-mail: publicrelations@museums.or.ke

Director General: -

Email: dg@museums.or.ke

Fax: +254 -20-3741424

Tel: +254-20-8164134/35/36

- (iii) The find location will be recorded and all remains will be left in place.
- (iv) Potential significance of the remains will be assessed and mitigative options will be identified.
- (v) If the significance of the remains is judged to be sufficient to warrant further action and they cannot be avoided, then the Director of Kenya National Museums will determine the appropriate course of action
- (vi) In the case of human remains, if the remains are assessed to be archaeological, then Director of Kenya National Museums will determine how to handle them.
- (vii) Options could include avoidance or respectful removal and reburial.
- (viii) If human remains are encountered and they are not archaeological, then Mombasa County Government will be contacted immediately for appropriate reburial.

Appendix 3

Abstract on Asbestos Cement Water Pipeline Health Risk & Handling Protocol

ABSTRACT ASBESTOS CEMENT DRINKING WATER PIPES AND POSSIBLE HEALTH RISKS REVIEW

Introduction

Asbestos cement pipes have been widely used in many countries for many years, although installation of new asbestos cement water pipes has declined significantly over the past 10 years because of difficulties in handling, **public perception** and the availability of better materials (**HDPE pipes**). The health effects resulting from chronic inhalation of asbestos dusts are well established and include asbestosis and mesothelioma, a highly characteristic cancer of the lung. There is a very good qualitative understanding of the effects of inhaled asbestos fibres and the physical characteristics of the fibres are considered to be very important in determining their ability to cause disease. Concern that ingested asbestos fibres could also lead to possible health effects has resulted in this topic having been widely studied by both epidemiology and by studies in laboratory animals.

Occurrence of asbestos fibres in drinking water

Measurement of asbestos fibres in food and water is extremely difficult and requires the use of highly specialised techniques involving electron microscopy. Analysis for asbestos fibres in drinking water is not, therefore, carried out on a routine basis. However, research has indicated that most waters, whether or not distributed through asbestos cement pipes, contain asbestos fibres. Asbestos cement pipes do give rise to an increase in the numbers of asbestos fibres in drinking water in some circumstances (Chatfield and Dillon 1979, Webber et al 1989 Millette et al 1983, Conway and Lacey 1984), although studies from Italy showed that the numbers of fibres in water passing through asbestos cement pipes was apparently independent of the aggressiveness of the water. This was considered to be due to inorganic deposits and organic slimes on the surface of the pipes that acted as a physical barrier to fibres entering the water. The Italian studies also indicated that the highest number of fibres appeared just after the installation of new pipes but this decreased rapidly

As indicated above, the physical characteristics, including fibre dimensions and surface properties, are an important factor in the pathogenicity of asbestos. In general, the fibres that are considered to be of significantly greater risk are long thin fibres of greater than 8 mm length and less than 1.5 mm in diameter. In the WRc studies, the fibre size was predominantly less than 5 mm in length and that only one of 13 drinking water sites showed greater than 1 million fibres per litre.

Epidemiological Studies

The findings in the ESIA on health risks associated with Asbestos Cement Drinking Water Pipes and Possible Health Risks have discussed in reference to empirical research work done by John K Fawell (2002). The abstract from the research is para phrased below.

*“The World Health Organisation considered asbestos in drinking water arising from asbestos cement pipe in their 1993 edition of the Guidelines for Drinking Water Quality. The guidelines state “Although well studied, there has been little convincing evidence of the carcinogenicity of ingested asbestos in epidemiological studies of populations with drinking water supplies containing high concentrations of asbestos. Moreover in extensive studies in laboratory species, asbestos has not consistently increased the incidence of tumours of the gastrointestinal tract. There is therefore no consistent evidence that ingested asbestos is hazardous to health and thus it was concluded that there was no need to establish a **health-based guideline value for asbestos in drinking water**”.*

The assessment also referred to other epidemiological studies carried that clarify possible health risks associated with asbestos cement drinking water pipelines and possible health risks are summarized below:

1. Studies carried out in the San Francisco Bay area of California found some positive associations with gastrointestinal, peritoneal and lung cancer (Kanarek et al 1980) and a follow up study by Conforti et al (1981) found a significant excess of colon cancers in males and peritoneal cancers in females. There were, however, a number of serious flaws in these studies, not least of which was inappropriate statistical analysis and the fact that population mobility in the area was particularly high, so there was considerable uncertainty regarding the exposure period. There was also a lack of control for several important confounding variables.
2. A study in Quebec (Wigle 1977, Toft et al 1984) found that in areas of very high drinking water asbestos, there was an increase in overall cancer mortality in men, slight increases in stomach cancer in men and pancreatic cancer in women but no excess of overall cancers of the gastrointestinal tract. The authors concluded that the excess in males was probably due to occupational exposure. There were a number of flaws due to the lack of control for a significant number of confounding variables.
3. Epidemiological studies were also carried out in two areas where asbestos cement pipes had been extensively used. In Connecticut, studies by Harrington et al (1978) and Meigs et al (1980) found no consistent patterns of cancer associated with ingestion of asbestos from drinking water. However, there were limitations to both studies.
4. In Florida, a study in Escambia County by Millette et al (1983) concluded that there was no observed association between asbestos cement pipe and cancer mortality but noted that the study would not be sufficiently large to identify small changes.
5. In Washington State there have been studies of the impact of naturally occurring asbestos fibres in drinking water in the Puget Sound area. The first by Polissar et al (1982) found consistent associations with cancer of the small intestine but these were not statistically significant. A number of other positive and negative associations were also observed but none of these was consistent throughout the study groups.
6. In 1984, Polissar et al published a case control study as a follow up to the original ecological study. This second study was more sensitive than the ecological studies and was considered to be the best study to date. This found no consistent evidence of an increased risk of cancer from ingestion of asbestos fibres in drinking water.

Provisions of Good Practice Note: Asbestos: Occupational and Community Health Issues of the World Bank

The note provided that good practice is to minimize the health risks associated with Asbestos Cement Material (ACM) for water pipes by avoiding their use in new construction and renovation, and, if installed asbestos-containing materials are encountered, by using internationally recognized standards and best practices including Kenya's Water Quality Regulations of 2006 as listed below their impacts should be mitigated.

1. ISO 10312 (1995): Ambient air -- Determination of asbestos fibres -- Direct transfer transmission electron microscopy method
2. ISO 13794 (1999): Ambient air -- Determination of asbestos fibres -- Indirect-transfer transmission electron microscopy method.
3. ISO/FDIS 16000-7: Indoor air -- Part 7: Sampling strategy for determination of airborne asbestos fibre concentrations.
4. ISO 8672: Air quality -- Determination of the number concentration of airborne inorganic fibres by phase contrast optical microscopy -- Membrane filter method
5. Kenya's EMCA 2015: Waste Management Regulations, 2006 (Fourth Schedule Y36 Wastes containing asbestos in the form of dust or fibres)
6. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

The World Bank Good Practice Note on Asbestos refers to Health hazards from breathing asbestos dust include asbestosis, a lung scarring disease, and various forms of cancer (including lung cancer and mesothelioma of the pleura and peritoneum). These diseases usually arise decades after the onset of asbestos exposure. Mesothelioma, a signal tumor for asbestos exposure, occurs among workers' family members from dust on the workers' clothes and among neighbours of asbestos air pollution point sources. Some experimental animal studies show that high inhalation

exposures to all forms of asbestos for only hours can cause cancer. Very high levels of airborne asbestos have been recorded where power tools are used to cut A-C products and grind brake shoes.

Mitigation against Risk Associated with exposure to Asbestos fibre / dust

Therefore, with an understanding as per the analysis (above) and as provided by the International Labor Organization (ILO) that established an Asbestos Convention (C162) in 1986 to promote national laws and regulations for the “prevention and control of, and protection of workers against, health hazards due to occupational exposure to asbestos.

The Project involves replacement of Asbestos Cement (AC) Mains. To mitigate Environmental Health and Safety issues associated with handling and disposal of AC Mains, the mains will be decommissioned and left below the ground given that there is no licensed asbestos disposal site nearby.

In the event decommissioning and disposal has to be carried out, the following mitigation measures shall be implemented by the appointed contractor within the Project Area:

1. Proper mapping of existing asbestos cement pipes as provided in the layout plans in the Project Design Report. A work plan will be developed prior to demolition work, to protect workers, the general community and provide for proper waste disposal. The work plan will be guided by a risk assessment to be conducted by a duly registered occupational safety and health advisor as per the OSHA (2007) and NEMA (2013) guidelines on safe management and disposal of asbestos
2. Filing Notification to NEMA as per the NEMA notification form (providing information on the location, condition of the materials, estimated the quantities involved, the quantities to be disposed etc.)
3. Asbestos Cement Material (ACM) should be transported in leak-tight containers to a secure landfill operated in a manner that precludes air and water contamination that could result from ruptured containers. The waste will be disposed appropriately by a licensed NEMA hazardous waste handler.
4. Protection from “retaliatory and disciplinary measures” of workers who remove themselves from work because they believe ACM poses a danger to their health
5. Provision of appropriate Personal Protective Equipment (PPEs) for workers
6. Provision of adequate changing rooms on site and at campsite and wash facilities to prevent dust from being carried to homes
7. Training of workers about the health hazards of ACM to themselves and their families. The training shall further involve inspections, maintenance, removal, or laboratory analysis of waste material.
8. Periodic medical examination of workers during the contract period as per the OSHA (Medical Examination) Rules, 2005 Periodic air monitoring of the work environment with records filed at the local NEMA office in Mombasa

National guidelines on safe management and disposal of asbestos by National Environment Management Authority (NEMA) 2013 also provide measures for safe handling and storage of asbestos material as summarized below.

Removal of asbestos shall adhere to the listed provisions below.

1. Secure the site to prevent unauthorized persons and to restrict movement
2. Wet the asbestos sheets before removal. If asbestos sheets should begin to crack or crumble, immediately wet the cracked or broken areas with the pintsize spray bottle or garden pump sprayer. NB. Breakage releases asbestos fibres.
3. Remove pieces of asbestos sheets by pulling any fasteners (nails, screws, rivets) or cutting fastener heads so as to minimize breakage. If necessary, carefully lift asbestos sheets with pry tools to expose the fasteners’ heads.
4. Do not slide asbestos sheet over each other.

5. Carefully lower removed asbestos sheets to the ground. Do not throw or drop it.
6. Care should be taken not to stand or sit on the asbestos sheets to avoid breakage.
7. The workers removing the asbestos must have the appropriate Personal protective equipment as defined in the NEMA guidelines (including: Respirators, coverall, eye protection and rubber boots) which must be removed as they enter the shower room immediately after removal of the asbestos

Temporary Storage of asbestos shall adhere to the listed provisions below

1. Temporary storage refers to the time between removal and final disposal of asbestos waste.
2. The duration for temporary storage of asbestos waste should not exceed thirty (30) days from the time of removal.
3. The temporary site should be within the premises where the asbestos is being removed.
4. The removed bulky asbestos, such as roofing sheets, beams, joists, and studs, should be stacked and wrapped, into stacks which can be easily loaded into the transportation vessel, in a plastic sheet of a minimum of 500-gauge double wrapped and secured with tape and labeled
5. Any debris (broken pieces) should be collected in a sealed polythene woven bag or any other air tight container. The bags should then be wrapped, into stacks which can be easily loaded into the transportation vessel, in a polythene sheet awaiting final disposal.
6. The bags should be considered full when half full and should be tightly sealed or when filled up to a level where the open neck can be twisted tightly, folded over into a "gooseneck," and the ends sealed to the side of the bag with heavy plastic tape such as duct tape.
7. Care should be taken to ensure that sharp pieces do not puncher the bags/ wrappers. Removed asbestos sheets should not be allowed to lie about the site where they may be further broken or crashed by machinery or site traffic.
8. The storage area must have restricted entrance and locked or secured on a 24-hour basis.
9. Warning label ("Asbestos hazard area, keep out") and danger signs should be affixed to each wrapped stack or storage area using English, Swahili and Local language
10. The contractor shall maintain Asbestos waste tracking documents as per the EMC (Waste Management) Regulations

Appendix 4

Environment and Social Screening Checklist

MOMBASA SCREENING CHECKLIST

SECTION B: ENVIRONMENTAL ISSUES

Will the sub-project:	Yes	No
Create a risk of increased soil erosion?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Create a risk of increased deforestation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Create a risk of increasing any other soil degradation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Affect soil salinity and alkalinity?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Divert the water resource from its natural course/location?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cause pollution of aquatic ecosystems by sedimentation and agro-chemicals, oil spillage, effluents, etc.?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Introduce exotic plants or animals?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Involve drainage of wetlands or other permanently flooded areas?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cause poor water drainage and increase the risk of water-related diseases such as malaria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Reduce the quantity of water for the downstream users?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Result in the lowering of groundwater level or depletion of groundwater?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Create waste that could adversely affect local soils, vegetation, rivers and streams or groundwater?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Reduce various types of livestock production?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Affect any watershed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Focus on biomass/bio-fuel energy generation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

SECTION C: SOCIO-ECONOMIC ISSUES

Will the sub-project:	Yes	No
Displace people from their current settlement?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Will the Project lead to forced evictions and displacement	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Infringe on Human Rights Principles	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Interfere with the normal health and safety of the worker/employee?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reduce the employment opportunities for the surrounding communities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reduce settlement (no further area allocated to settlements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reduce income for the local communities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Increase insecurity due to introduction of the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Increase exposure of the community to communicable diseases such as HIV/AIDS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Induce conflict?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have machinery and/or equipment installed for value addition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Introduce new practices and habits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lead to child delinquency (school drop-outs, child abuse, child labour, etc.)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Infringe on provision of ILO on labour and working conditions	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lead to gender disparity?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lead to poor diets?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lead to social evils (drug abuse, excessive alcohol consumption, crime, etc.)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

However SPAPs might be affected in Voi town

could be triggered

Section D: Natural Habitats

Will the sub-project:	Yes	No
Be located within or near environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands) or threatened species? <i>NB: If the answer is yes, the sub-project should not proceed.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Adversely affect environmentally sensitive areas or critical habitats – wetlands, woodlots, natural forests, rivers, protected areas including national parks, reserves or local sanctuaries, etc.)? <i>NB: If the answer is yes, the sub-project should not proceed.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Affect the indigenous biodiversity (flora and fauna)? <i>NB: If the answer is yes, the sub-project should not proceed.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cause any loss or degradation of any natural habitats, either directly (through project works) or indirectly? <i>NB: If the answer is yes, the sub-project should not proceed.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Affect the aesthetic quality of the landscape?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reduce people's access to the pasture, water, public services or other resources that they depend on?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Increase human-wildlife conflicts?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Use irrigation system in its implementation? <i>NB: If the answers to any of the above is 'yes', please include an ESMP with sub-project application.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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If the answer to the above is 'yes', please consult the IPM that has been prepared for the project.

SECTION E: Pesticides and Agriculture Chemicals

Will the sub-project:	Yes	No
Involve the use of pesticides or other agricultural chemicals, or increase existing use?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cause contamination of watercourses by chemicals and pesticides?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cause contamination of soil by agrochemicals and pesticides?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Experience effluent and/or emissions discharge?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Export produce? Involve annual inspections of the producers and unannounced inspections?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Require scheduled chemical applications?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Require chemical application even to areas distant away from the focus?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Require chemical application to be done by vulnerable group (pregnant mothers, chemically allergic persons, elderly, etc.)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Section F: Vulnerable and Marginalized Groups meeting requirements for OP 4.10

	Yes	No
Are there:		
People who meet requirements for OP 4.10 living within the boundaries of, or near the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Members of these VMGs in the area who could benefit from the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VMGs livelihoods to be affected by the subproject?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the answer to any of the above is 'yes', please consult the VMGF that has been prepared for the project.
structure camp could be leased no displacement impact / land acquisition

Section G: Land Acquisition and Access to Resources

	Yes	No
Will the sub-project:		
Require that land (public or private) be acquired (temporarily or permanently) for its development?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Use land that is currently occupied or regularly used for productive purposes (e.g. gardening, farming, pasture, fishing locations, forests)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Displace individuals, families or businesses?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Result in temporary or permanent loss of crops, fruit trees and pasture land?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Adversely affect small communal cultural property such as funeral and burial sites, or sacred groves?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Result in involuntary restriction of access by people to legally designated parks and protected areas?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Be on monoculture cropping?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the answer to any of the above is 'yes', please consult the mitigation measures in the ESMF, and if needed prepare a (Resettlement Action Plan) RAP.

ARAP prepared

Section H: Proposed action

(i) Summarize the above:	(ii) Guidance
<input type="checkbox"/> All the above answers are 'No' <input checked="" type="checkbox"/> There is at least one 'Yes'	<ul style="list-style-type: none"> • If all the above answers are 'No', there is no need for further action; • If there is at least one 'Yes', please describe your recommended course of action (see below).

(iii) Recommended Course of Action

If there is at least one 'Yes', which course of action do you recommend?

☒ The Environment and Social Specialist will provide detailed guidance on mitigation measures as outlined in the Scoping Report; and

☒ Specific advice is required from the Environment and Social Specialist and the technical team regarding sub-project specific EIA(s) and also in the following area(s)

[type here]

☒ All sub-project applications/proposals MUST include a completed Environment and Social Screening checklist. The Environment and Social Specialist will review the sub-project proposals and sign off;

☒ The proposals will then be submitted to the Project Technical Committee for clearance for implementation by communities in the proposed subprojects.

Expert Advice

☒ The National Government through the Department of Monuments and Sites of the National Museums of Kenya can assist in identifying and, mapping of monuments and archaeological sites; and

Project requires EIA

- ☒ Sub-project specific EIAs, if recommended, must be carried out by experts registered with NEMA and be followed by monitoring and review. During the process of conducting an EIA the proponent shall seek views of persons who may be affected by the sub-project. The WB policy set out in OP 4.01 requires consultation of sub-project affected groups and disclosure of EIA's conclusions. In seeking views of the public after the approval of the sub-project, the proponent shall avail the draft EIA report at a public place accessible to project-affected groups and local NGOs/CSOs.

Completed by: [type here]

Name: [type here]

Position / Community: [type here]

*Godwin Lida huli S-KWA
30-07-2018
NEMA LEAD EXPERT 2492
G-KWA*

Date: [type here]

Field Appraisal Officer (CDE): [type here]

Signature: []

Date: [type here]

Note:

Project category	Characteristics
A	Full and extensive ESIA needed- irreversible environmental impacts; impacts not easy to pick or isolate and mitigation cost expensive; ESMP design not easily done; Must have the EIA done and future annual EAs instituted
B	Site specific environmental impacts envisaged; mitigation measures easy to pick, not costly and ESMP design readily done; need an ESIA and future EAs

C	Have minimal or occasionally NO adverse environmental impacts; exempted from further environmental processes save environmental audits
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Appendix 5

Grievance Redress Mechanism

GRIEVANCE REDRESS MANAGEMENT PLAN

This ESIA provides for a Grievance redress mechanisms (GRM) includes instruments, methods, and processes by which a resolution to a grievance is sought and provided. The processes are as shown below.

(i) Local Residents Complaints Procedure

The purpose and scope of local resident's complaints procedure is to ensure all complaints from local residents are dealt with appropriately with corrective actions being implemented and the complainant being informed of the outcome. It will be applicable to all complaints received from any local within the project area.

The contractor will employ a Community Liaison Officer and or sociologist who will be responsible for collating written complaints and co-coordinating responses to all complaints.

(ii) Procedure

All complaints shall be handled in accordance with the flowchart in below. Both verbal and written complaints are to be entered a Grievance Complaint Log

When receiving a complaint all employees shall refer the complainant to the Community Liaison Officer (CLO) or the resident engineer. The person receiving a complaint shall ensure that the Grievance Complaint Log is completed. The form shall then be forwarded to the Community Liaison Officer who will assign it a number. The Community Liaison Officer shall ensure that all actions are made to close out the complaint.

(iii) Grievance Complaint Log

Ensures that each complaint has an individual number and that tracking and recording actions are carried out. It also records who is responsible for an individual complaint and records dates for the following actions:

- Date the complaint was reported;
- Information on proposed corrective action sent to complainant (if appropriate);
- The date the complaint was closed out; and
- Date response sent to complainant.

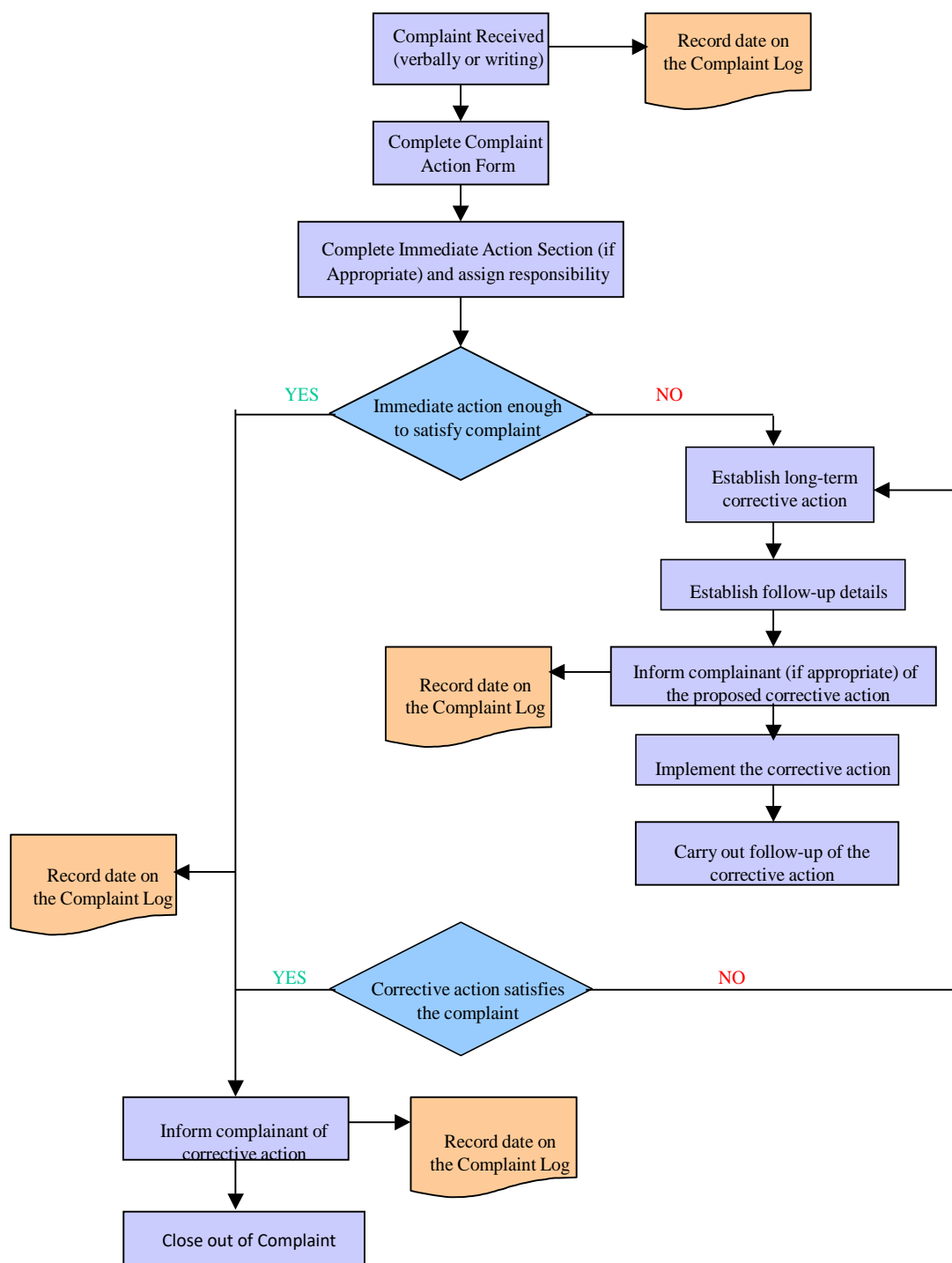
(iv) Responding to a Complaint

All complaints shall be responded to in writing, though a verbal response will be provided as well if this is more appropriate in the circumstances (e.g., where the complainant cannot read). All complaints must be responded to within two weeks of being received, even if the response is just a summary of what is planned and when it is likely to be implemented. Further correspondence should be given once the complaint is closed out.

(v) Monitoring Complaints

The CLO through the contractor will be responsible for providing a Monthly report detailing the level of complaints and any outstanding issues to be addressed. Monthly reports will include analysis of the type of complaints, levels of complaints and action taken to reduce complaints. The CLO shall file all documentation related to complaints in a file in his office.

Grievance Resolution Flow Chart



Appendix 6

DOSH Form 1

ML/DOSH/FORM 1

REPUBLIC OF KENYA
DIRECTORATE OF OCCUPATIONAL SAFETY AND HEALTH SERVICES
NOTICE BY EMPLOYER OF AN OCCUPATIONAL ACCIDENT/DISEASE OF AN EMPLOYEE

PART I

1. Employer/Occupier Particulars:-

ii. Name of Employer/Occupier.....

iii. WIBA' registration No.....OSHA' Registration No.

iv. Full Address P. O. Box.....Physical Location.....

v. E- Mail address.....Tel.....

vi. Nature of Work

vii. Name and address of Insurance Company which has insured employee against accident

2. The Injured/sick employee's particulars :-

i. Name.....

ii. Sex.....

iii. Age.....

iv. Occupation

v. Full Address.....

vi. E- Mail address.....Tel:.....

vii. Identity Card No. *(Incase of fatal injury, Death Certificate No.).....

viii. Home County:District:Division:

Location:Sub-location

3. Occupational Accident

i. Date of Accident Time:Fatal /Non fatal

ii. Has the worker resumed working Yes/NoDate of resumption

iii. Place where accident took place.....

iv. What is the injured worker's Occupation.....

v. What duties was the employee undertaking at the time of the accident?

vi. Length of service with the present employer.....

vii. What work is the worker employed to undertake.....

viii. Cause of Injury.....

ix. Type of Injury

x. Part of Body Injured.....

4. Occupational Disease

Detail about the Occupational disease affecting the employee.

i. Date of diagnosis of the occupational disease

ii. Name of medical practitioner who made the diagnosis

iii. Date the employer was notified of the disease by the employee or medical practitioners.....

iv. Describe the Cause of the occupational disease

5. Total Monthly earning at the date of the Accident/disease:-

Salary/wage Sh.....

Allowances paid regularly (including house, medical etc) Sh.....

Overtime payment or/and other special remuneration for work done whether by way
of bonus otherwise if of constant character and for work habitually performed. .. Sh.....

Total earning per month Sh.....

Total earnings paid to the employee during the period of incapacity Sh.....

Name of Employer or person notifying on behalf of EmployerSignature

DesignationDate

Note:-

1. In the case of injury to an employee involving incapacity for work for three or more consecutive days, it is requested that the employer complete Part I in triplicate and then dispatch the forms immediately as hereunder:
One copy: - To the Occupational Health and Safety Officer in charge of the District in which the accident occurred.
2 copies: - To the medical practitioner attending or examining the injured/sick employee. The forms to be forwarded to the Occupational Health and Safety Officer immediately the doctor completes part II
2. Please attach any evidence detailing any payment forming part of the employee's total earning that the employee has been paid during the period of temporary disablement when he/she was out of work as a result of the injury.
3. Indicate who has paid for the medical bills
4. In the case of an occupational accident/disease causing the death of an employee, Part I should be completed in duplicate and then dispatched as hereunder:
One copy: - Immediately to the Occupational Health and Safety Officer in charge of the District in which the death occurred.
The other copy together with a copy of the death certificate:- to the Occupational Health and Safety Officer in charge of the District in which the death occurred.
5. The original form should be filled as original on both pages (not carbon copied).

PART II (for use by the Medical Practitioner)

MEDICAL REPORT

Name of employee.....
 Date admitted to hospital..... Discharged.....
 In-patient No.
 Attendance as out-patient from..... to.....
 Out -patient No.
 Type of injury.....or
 Occupational disease.....
 Is there permanent incapacity?.....*Yes/No
 If yes please give:
 a) Details and nature of permanent incapacity.....

 b) Percentage of permanent incapacity to be indicated in both words and figures(*reference must be made to the first and second schedule of the Work Injury Benefit Act No. 13 of 2007*).....

per cent.
 Temporary incapacity :- (Duration of absence from work in days, from the date of injury or acquiring occupational disease/or diagnosis of occupational disease to the time of resumption of duty or death.).....(employee's working days)
 Is a further examination required before final assessment of permanent incapacity can be given?.....If yes ;
 a) which ones

 b) when?.....
 c) Who paid the medical bills paid (Employee or Employer).....
 Name of Medical Practitioner.....KMP&DB No.....
 Signature.....Date.....
 Name of Hospital/Clinic/Private Practice.....

PART III

(For use by Occupational Health and Safety Officer)

Compensation *is / is not being claimed on behalf of the employee/dependants of the deceased employee.

District and Accident Register No.....

Station.....Date.....

Occupational Health and Safety Officer


*Delete whichever is inapplicable

Appendix 7

Lead Expert License 2019

FORM 7

(r.15(2))


nema
mazingira yetu | uhai wetu | wajibu wetu

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/8725
Application Reference No: NEMA/EIA/EL/12211


M/S GODWIN LIDAHULI SAKWA
(individual or firm) of address
P.O. Box 18075-00500, Nairobi

is licensed to practice in the
capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **2492**
in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: 1/7/2019 Expiry Date: 12/31/2019

Signature..... 

(Seal)
 **Director General**
The National Environment Management Authority

P.T.O.

P.O. Box 18075-00500, Nairobi